



Bangladesh – India Friendship Power Company (Pvt.) Limited
(A Joint Venture of NTPC Ltd. and BPDB)

*Monitoring of Environmental Parameters and Environmental Management Plan
along with Engineering Activities of 2X660 MW MSTPP
at Rampal, Bagerhat of Khulna Division*

46th Quarter Monitoring Report

Monitoring Period: August 2025 – October 2025



May 2026



Center for Environmental and Geographic Information Services
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*Monitoring of Environmental Parameters and Implementation of Environmental Management
Plan along with Engineering Activities for 2x660 MW Maitree Super Thermal Power Project at Rampal,
Bagerhat*

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Acknowledgments

The Center for Environmental and Geographic Information Services (CEGIS) is thankful to Bangladesh-India Friendship Power Company (Pvt.) Limited (BIFPCL) for awarding the contract on “Monitoring of Environment Parameter and Implementation of Environmental Management Plan Along with Engineering Activities for 2x660 MW Maitree Super Thermal Power Project at Rampal, Bagerhat.” to CEGIS. This document constitutes the 46th quarterly monitoring aspects, covering all the preselected parameters and locations specified in the Approved EIA of both the Power Plant and Coal Transportation.

CEGIS is grateful to the Secretary, Power Division, Ministry of Power, Energy, and Mineral Resources, for his dynamic leadership in this sector. CEGIS also appreciates the Chairman of the Bangladesh Power Development Board (BPDB) for his continuous inspiration and support during the study. Furthermore, CEGIS expresses its gratitude to the Chairman of BIFPCL for his vibrant role and wise guidance in completing the study. Moreover, the CEGIS team acknowledges the Managing Director and Project Director of BIFPCL for their kind consideration and anticipation in this regard. Additionally, CEGIS thanks GM (Operation), DGM (Chemistry), and DM-Environment for their consistent support in this regard.

In addition, CEGIS is grateful to the field officials of various Government and Non-Government Organizations (NGOs) for their contributions and for sharing their ideas and views regarding the project activities, the existing problems in the study area, and their suggestions for the sustainable continuation of the project activities and related issues concerning power plant construction.

Last but not least, the study team appreciates and acknowledges the concerns and perceptions of local people regarding the project, as well as their active participation during the field study visits.

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Abbreviations and Acronyms

AAS	Atomic Absorption Spectrophotometer
AECL	Adroit Environment Consultants Ltd
As, Pb, Hg	Arsenic, Lead and Mercury
BCSIR	Bangladesh Council of Scientific and Industrial Research
BDS	Business Development Studies
BIFPCL	Bangladesh-India Friendship Power Company (Pvt.) Limited
BOD	Biochemical Oxygen Demand
BPDB	Bangladesh Power Development Board
BUET-BRTC	Bangladesh University of Engineering and Technology - Bureau of Research, Testing and Consultation
CDM	Clean Development Mechanism
CEGIS	Center for Environmental and Geographic Information Services
COD	Chemical Oxygen Demand
CPUE	Catch per Unit Effort
CSR	Corporate Social Responsibility
dBH	Diameter at Breast Height
DCR	Duplicate Carbon Receipt
DO	Dissolved Oxygen
DoE	Department of Environment
DPHE	Department of Public Health Engineering
EC	Electrical Conductivity
ECR	Environment Conservation Rules
EHS	Environmental Health Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPC	Engineering Procurement Construction
ESP	Exchangeable Sodium Percentage
FGD	Focus Group Discussion
FGD	Flue Gas Desulfurization
FSR	Fisheries Species Richness
GIS	Geographic Information System
GoB	Government of Bangladesh

GPS	Global Positioning System
GW	Groundwater
HS	Household Survey
IFC	International Finance Corporation
IGA	Income Generation Activities
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
Kg	Kilogram
KII	Key Informants Interview
MoPEMR	Ministry of Power, Energy and Mineral Resources
MW	Mega Watt
MSDS	Materials Safety Data Sheet
NTPC	National Thermal Power Corporation
OHSAS	Occupational Health and Safety Management Systems
PCU	Passenger Car Unit
PGCB	Power Grid Company of Bangladesh Ltd
PMU	Project Management Unit
PRA	Participatory Rural Appraisal
PWD	Public Works Department
QMR	Quarterly Monitoring Report
RRA	Rapid Rural Appraisal
RS	Remote Sensing
SAR	Sodium absorption ratio
SRDI	Soil Resources Development Institute
SRF	Sundarbans Reserve Forest
TDS	Total Dissolved Solid
TH	Total Hardness
ToR	Terms of References
TSS	Total Suspended Solid
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

Units

dB	Decibel	mg	Milligram
hr	Hour	MW	Mega Watt
Kg	Kilogram	Nm	Normal Meter
Km	Kilometre	ppm	parts per million
KV	Kilo Volt	ppt	parts per trillion
KW	Killo Watt	ton/year	Ton Per Year
m	Meter	s	Seconds

Units Conversion

General Units

$$1^{\circ}\text{C} = 274.15 \text{ K} = 33.8^{\circ} \text{ F}$$

$$1 \text{ hectare} = 10^{-2} \text{ km}^2 = 2.471 \text{ acres}$$

$$1 \text{ kilogram} = 2.20 \text{ pound}$$

$$1 \text{ kilometre} = 0.62137 \text{ mile}$$

$$1 \text{ liter} = 0.001 \text{ cubic meter}$$

$$1 \text{ meter} = 3.2808 \text{ feet}$$

$$1 \text{ metric ton} = 1000 \text{ kg}$$

$$1 \text{ mg/l} \approx 1 \text{ g/m}^3 \approx 1 \text{ ppm (w/w)}$$

$$1 \text{ mg/m}^3 = 1 \mu\text{g /L}$$

$$1 \text{ pascal} = 1 \text{ N/m}^2 = 0.01 \text{ millibar}$$

$$1 \text{ square mile} = 640 \text{ acre} = 2.590 \text{ km}^2$$

Energy Units

$$1 \text{ GWyr} = 8.76 \times 10^9 \text{ kW}$$

$$1 \text{ horsepower} = 746 \text{ W}$$

$$1 \text{ KWh} = 3412 \text{ Btu}$$

$$1 \text{ kWh} = 859.85 \text{ kcal}$$

$$1 \text{ KWh} = 3.6 \times 10^6 \text{ J}$$

$$1 \text{ MW} = 1000 \text{ KW} = 10^6 \text{ W}$$

Glossary

<i>Aman:</i>	Group of rice varieties grown in the monsoon season and harvested in the post-monsoon season. This is generally transplanted at the beginning of monsoon from July-August and harvested in November-Dec. Mostly rain-fed, supplemental irrigation is needed in places during dry spells.
<i>Aus:</i>	Group of rice varieties sown in the pre-monsoon season and harvested in the monsoon season. These are broadcasted/transplanted during March-April and harvested during June-July. Generally, rain-fed, irrigation is needed for HYVT. (High yield variety) Aus.
<i>B Aus:</i>	Broadcast Aus
<i>Bazar:</i>	Market
<i>Beel:</i>	A saucer-shaped natural depression, that generally retains water throughout the year and in some cases seasonally connected to the river system.
<i>Boro:</i>	A group of rice varieties sown and transplanted in winter and harvested at the end of the pre-monsoon season. These are mostly HYV and fully irrigated, planted in December-January, and harvested before the onset of monsoon in April- May.
<i>Haat:</i>	A marketplace where market exchanges are carried out either once, twice, or thrice a week, however not every day.
<i>Gear/Jaal:</i>	Different types of fishing nets to catch fish from the water bodies.
<i>Kutchra:</i>	A house made of locally available materials with an earthen floor, commonly used in rural areas.
<i>Khal:</i>	A drainage channel usually small, sometimes man-made through which the water flows. These may or may not be perennial.
<i>Kharif:</i>	Pre-monsoon and monsoon growing season. Cropping season is linked to monsoon between March-October, often divided into kharif-1 (March-June) and kharif-2 (July-October).
<i>Perennial Khal:</i>	Water is available in the khal all year-round.
<i>Pacca:</i>	Well-constructed building using modern masonry materials.
<i>Rabi:</i>	Dry agricultural crop growing season; mainly used for the cool winter season between November and February.
<i>Seasonal Khal:</i>	Water is not available in the khal all year-round.
<i>T. Aman:</i>	Transplanted Aman
<i>Upazila:</i>	Upazila is an administrative subdivision of a District.

Executive Summary

This 46th quarterly monitoring report covers the status of EMP (Environmental Management Plan) implementation as per the recommendation of the EIA (Environmental Impact Assessment) report of the power plant, vide Memo No: DoE/Clearance/5062/2011 dt. 05/08/2013, and the EIA report of Coal Transportation, vide Memo No: DoE/Clearance/5532/2016 dt. 31/01/2018. During October 2025, covering the monsoon season, CEGIS team carried out the monitoring activities for every monitoring aspect as assigned in the ToR (Terms of Reference) and the approval conditions of DoE, along with valuable suggestions and recommendations from various national and international organizations. In other words, the aspects can briefly be addressed as monitoring of the Environmental Compliances and monitoring of the selected environmental parameters such as ambient air quality, noise level, water quality, land resources, traffic management status, water resources management status, agricultural resources monitoring, fisheries resources, socio-economic monitoring, aquatic & terrestrial ecosystem monitoring, and the Sundarbans Reserve Forest (SRF) health monitoring.

Environmental Compliance Monitoring

The current environmental compliance monitoring activity assesses the status of EMP implementation through physical observations, investigations, and interviews/discussions with the project authority, officials, and relevant staff of the Power Plant. A comprehensive and detailed checklist was developed to evaluate the environmental compliance status of various project components, including the Environmental and Social Management System and Action Plan; Labor and Working Conditions; Community Health, Safety, and Security; Biodiversity and Sustainable Management of Living Natural Resources; Waste Management; and other relevant issues. The major findings during the 46th field visit are as follows:

- a) Maintenance dredging is being conducted using a dredger with a capacity of 500 cubic meters per hour to maintain the required draft for the navigability of the coal carrying ships and or barges (lighterage) for transporting coal to the Plant's jetty from the transshipment area in Harbaria. The dredged materials are disposed of in a 200-acre designated pond located at the southeast corner of the Plant's premises. The accompanying water from the dredged slurry is carefully managed to ensure that only silt-free water is discharged into the river, thereby preventing sedimentation and minimizing physical and environmental impacts.
- b) The Coal Supplier, under the strict directives of the Project Proponent, has implemented corrective measures given by the IMA includes net-fencing of the receiving ship/barge to control coal dust dispersion during ship-to-ship coal transfer operations at the jetty area. However, elongating the existing flexible coal chute to ensure more controlled and contained coal transfer has also been recommended to further minimize dust emissions to protect the local aquatic ecosystem.
- c) The existing coal grabbers have already been modified and enclosed to the extent possible to minimize coal droppings during unloading operations. Since, the modified grabbers were installed after the visit of this monitoring quarter, so physical observation on coal droppings is remote. However, such modification is expected to significantly reduce coal spillage and dust emissions from the grabbers during the unloading process.



- d) Sand and/or earth piles were found uncovered at a few places inside the plant premises and the authority has been trying to reduce the number of such piles as low as possible and at the same time, they have been keeping the piles covered. Though minor, still this issue should be taken care properly due to health concern of the staff, workers and officials.
- e) The Proponent has already reached up the plantation target of two (02) lac saplings by the year 2025. During this quarter (August to October), 26,496 saplings have been planted which includes various species of mostly medicinal plants, coconut, Golpata jackfruits, etc. In total 2,01,496 saplings have been planted so far out of 300,000 saplings under this plantation program. It is recommended to plant mangrove species in the course of fulfilling the target.
- f) The environmental control measures like Flue Gas Desulphurization (FGD), FGD Waste Water Treatment Plant, Electrostatic Precipitator (ESP), Effluent Treatment Plant (ETP), Sewage Treatment Plant (STP), Solid Waste Management Plant (SWMP), etc. are in operation and fully functional.
- g) The Proponent has installed a community grievance box outside the main entrance of the plant premises so that the affected community (if any) can easily drop their complaints or grievances in the box to be accounted and resolved the issues by the authority.



Air Quality Monitoring

The 46th quarterly monitoring confirmed that ambient air quality remained satisfactory and compliant with the Air Pollution (Control) Rules, 2022, including within the Sundarbans Reserve Forest. The maximum concentration of PM_{2.5} (22.98 µg/m³) was recorded at Khan Jahan Ali Bridge, while the minimum (2.02 µg/m³) was observed at Harbaria. Elevated PM_{2.5} levels at Khan Jahan Ali Bridge may be attributed to vehicular emissions, frequent movement of heavy vehicles, and brake wear, tyre wear, and road dust. In contrast, the low concentration at Harbaria reflects minimal human activity and dense mangrove vegetation, which acts as a natural air filter. The concentrations of PM₁₀ and SPM were also recorded highest at Khan Jahan Ali Bridge (33.63 µg/m³ and 56.61 µg/m³, respectively) and lowest at Harbaria (2.78 µg/m³ and 45.8 µg/m³). Sulfur dioxide (SO₂) (10.23 µg/m³) and carbon monoxide (CO) (0.29 mg/m³) were highest at Maitree Township area & Khan Jahan Ali Bridge, while the lowest levels were observed at Bajua (2.07 µg/m³ and 0.11 mg/m³). Nitrogen dioxide (NO₂) and ozone (O₃) were highest in Maitree Township and Maidara, and lowest at Bajua (2.83 µg/m³ and 2.51 µg/m³). Cluster analysis identified minimal pollution at Hiron Point, Akram Point, and Harbaria, while Chalna, Mongla Ghat, and KJAB experienced higher pollution due to industrial activities, with other locations showing low to moderate levels.

Noise Level Monitoring

the observed level of noise at Chalna, (commercial area located at a distance of 4 km to the north-west direction of the chimney location) was recorded as 46.68 dB whereas its standard level is 70 dB. Similarly, noise levels at Kaigar Daskati (52.64 dB) (situated at the Gucchha Gram-a residential area located at north-west corner of the project area), Chunkuri-2 (47.86 dB) located at 4km south-west direction from the chimney location and Maidara Khal (45.33) (residential area-south-west corner of the project area) did not exceed their corresponding standard limit (55 dB). Likewise, noise level at Shapmari (township area) was recorded as 44.83 dB which denotes that, the level of noise didn't cross their corresponding standard value (55 dB) in this location. The noise level at Barni (Gaurambha) was recorded as 53.30 dB which was 6.30 dB lower than that of its standard limit (60 dB) of noise level for this location. Harbaria, Akram Point and Hiron Points are three ecologically silent zones in the study

area. the noise levels of these locations i.e., Harbaria (43.58 dB), Akram Point (36.31 dB) and Hiron point (40.70 dB) were not recorded to be exceeded their corresponding standard limit of noise level (std. 50 dB). The levels of observed noise at Khan Jahan Ali Bridge and at the Mongla port area were recorded as 60.86 dB and 59.26 dB, respectively.

Water Quality Monitoring

No significant pH differences were observed, apart from spatial variation in river water. On the other hand, salinity levels were seen highest in the pre- monsoon season, followed by winter, with the lowest during monsoon and post- monsoon. Similarly, higher DO levels were also observed during monsoon and post- monsoon seasons, which may result from air mixing during heavy rain, rainfall-driven currents, and increased freshwater input. Similarly, TDS tends to increase during the pre-monsoon and winter seasons, possibly due to reduced rainfall and upstream flow, leading to less dilution (Izonfuo and Bariweni, 2001¹). Minerals from the Bay of Bengal could also contribute to higher TDS during these seasons. Similar patterns were noted for total hardness (TH) and total suspended solids (TSS). Over the years, COD was found higher in pre- monsoon, followed by winter, characterized by low rainfall that increases organic matter density. During monsoon, higher discharge dilutes COD, lowering its concentration in the post- monsoon. Likewise, tidal interactions cause nitrate and sulfate levels to be higher in seawater and coastal rivers, supported by data showing increasing concentrations from downstream to upstream. These nutrient levels may result from natural mudflat efflux or human activities like agriculture and sewage discharge, with tidal cycles. The fluctuations are evident during monsoon and pre- monsoon, as freshwater runoff from agriculture, surface activities, cities, and wetlands modifies nutrient concentrations. Oil and grease levels remained below 2.0 mg/l across sites, surpassing the natural or reserved area limit but within the industrial limit of 5.0 mg/l. Higher levels of oil and grease in the Sundarbans may be attributed to bilge water discharges from unregulated vessels. In addition, cargo ships, passenger launches, tourist vessels, naval ships, and fishing trawlers that operate locally could contribute to this excessive oil and grease in the river water.

On the other hand, during the 46th quarterly monitoring period, the groundwater pH and the temperature showed no significant seasonal changes compared with the datasets of the previously monitored data of the same seasons. Dissolved oxygen levels fluctuated between 2.5 mg/l and 5.72 mg/l. Gradual salinity increases were observed at all sites. Total dissolved solids (TDS) peaked at 690 mg/l in the Rajnagar area but remained within ECR 2023 limits, while total suspended solids (TSS) were low (1 mg/l to 7 mg/l), also compliant. Total hardness ranged from 130 mg/l to 150 mg/l, likely due to mineral weathering and groundwater extraction. Chemical oxygen demand (COD) concentrations were found to be high. Likewise, nitrate, Sulfate, and phosphate levels stayed within standards too, as per the ECR 2023. Arsenic levels (0.001–0.053 mg/l) complied overall, though they exceeded limits in some seasons. Lead and mercury concentrations remained within permissible limits, found at <0.01 mg/l and <0.0001 mg/l, respectively.

Land and Agricultural Resources Monitoring

Soil samples were collected during October, 2025. The samples were immediately sent to SRDI, the Dhaka laboratory, for analysis. The result will be incorporated in the next report. HYV Aman was planted in Baranpara monitoring plot while Local Aman was cultivated in the remaining. The variety of rice in the study area are mostly BRRI dhan 73 and Chapshail for HYV Aman and Local Aman respectively. Kapalirmet remains fallow as aquaculture continues. However, agricultural practices and management remain similar to those in previous monitoring periods. Production and damage-related

1 Izonfuo W. A and. L Bariweni 2001. The effect of urban runoff water and human activities on some physicochemical parameters of the Epie creek in the Niger Delta. J. Appl. Sci. & Enviro. Mgt, 5(1): 4755.

data will be incorporated in the 48th monitoring report. No specific impacts on livestock were observed during this monitoring period.

River bed Sediment monitoring

This section presents the laboratory testing results for river bed sediment for the 46th Quarter, sampled in September 2025 collected from 05 distinct locations including Moidara, Akram Point, Project Jetty, Mongla Port, and Harbaria. The sediment samples from all locations exhibited slightly alkaline in characteristics, with pH values ranging from 8.42 to 8.76.

The test results reveal varying concentrations of key parameters, highlighted by significant fluctuations in Sulphate levels from 1038mg/kg at Akram Point to 164mg/kg at the Project Jetty Point. Additionally, trace heavy metals are present across all samples, with Arsenic (As) concentrations remaining relatively uniform between 4.22 mg/kg and 5.13 mg/kg, while Lead (Pb) reaches its highest concentration of 15.1mg/kg at Moidara, and Mercury (Hg) remains low, varying from 0.08 mg/kg to 0.26 mg/kg. The justification of this elevated concentration of Pb has been described in the “Appendix V: Analysis Results from the Laboratory”. The study concludes that this extreme value has been kept under observation and monitoring of samples of this point should be continued in future years to better understand the environmental changes in the river system and draw an inference on trend of Pb concentrations.

Traffic Volume and Status Monitoring

The traffic survey results reveal that Khulna–Mongla Road at Khudir Bottola continues to experience the highest traffic flow among the three monitoring locations. In comparison, relatively lower traffic volumes were recorded at the other two locations, namely Khulna–Mongla Road at Gonai Bridge and the Power Plant Access Road at Gonabelai Bridge. A comparison between the current and previous monitoring periods shows a similar traffic volume pattern across the surveyed locations. It is noteworthy that the 46th quarterly monitoring program was conducted over two weekend days and one weekday, consistent with the previous monitoring period. However, during the construction stage, frequent movement of heavy construction vehicles significantly contributed to the overall traffic volume. With the completion of construction activities, such vehicle movements have substantially declined, resulting in comparatively lower traffic levels within the survey areas.

Fisheries Resources Monitoring

Monitoring of 46-quarter for fisheries resources have been conducted at 13 sampling sites which were set at the inception stage. Out of these sites, effective samplings were done at 06 sites as fishing in other sites in the river were not observed. Amongst the effective sites, three (03) were in the river and three (03) were in the countryside (shrimp farms). The followings are the key findings of the 46th quarter monitoring in the fiscal year of 2025-26. Changes in habitat uses were observed in every past fiscal year along with the current one (as compared to the fiscal year of 2014-2015, 2015-2016, 2016-17, 2017-2018, 2018-2019, 2019-20, 2020-21, 2021-22, 2022-23, 2023-24 and 2024-25 caused mainly due to biophysical changes like tidal effect, forest erosion and vegetation coverage, seasonal variability, food availability and also fisheries management practices.

Moreover, through analyzing the type of habitat uses by different age group of fish species (based on the length-based community structure model) two types of habitats were found i.e. i) Omni Ground including Spawning, Nursery and Maturation Ground, and ii) Ground for Maturation and Feeding. Shannon-Weiner diversity index has also been observed to vary between 45th that of all previous quarters. Highest Shannon-Weiner index was found at Chalna Point (0.99) indicating high evenly distributed fish species. On the contrary, lowest evenness was found at Chandpai (0.52). However,

maximum FSR was obtained at Chandpai (n=21), while very low FSR was recorded at Chalna (n=2). Among the habitats in the up-stream of the river, Maidara was rich assemblage of Harina, Mokta, Chaka and Golda Chingri, Chandpai was rich assemblage of Bagda, Golda, Harina and Chami Chingri. Fish species like Bagda and Golda attain the maximum abundance among the migratory fish species. Moreover, among the migratory species Poma was observed to migrate long distance. In this monitoring, the highest productivity was found at Chalna Point, followed by Chandpai and Maidara. The present study revealed that the highest catch susceptibility was also found in case of Chandi Jal (2.45 kg/haul).

Ecological Monitoring

The 46th ecosystem and biodiversity monitoring indicates that environmental conditions around the project area remain generally stable, though site-specific pressures are evident. Vegetation assessment across 16 quadrats (10×10 m each) recorded 47 plant species from 24 families, with an overall Shannon–Wiener Diversity Index of 2.68, reflecting moderate diversity. This shows a slight decline compared to the previous cycle (49 species; $H' = 3.01$), likely linked to localized land-use changes such as road construction at Rajnagar and vegetation clearing at Chalkghona rather than broad ecological degradation. Canopy cover trends during the operational stage (2023–2025) were strongly site-dependent: Rajnagar recovered from 3% in 2023 to 21% in 2025 following earlier soil dumping impacts; Borni remained stable at 21–24%; Kalekarber maintained the highest and most stable canopy (23–24%); while Chalkghona declined sharply from 20% to 1% in 2025 due to pruning and fisheries-related vegetation management. Bird monitoring recorded 29 species during this cycle out of 58 species documented cumulatively, with abundance remaining satisfactory despite localized disturbances. Butterfly surveys identified 27 species across baseline and current periods, with species turnover indicating a shift toward disturbance-tolerant assemblages rather than total habitat loss. Aquatic monitoring shows clear spatial variation in dolphin occurrence from 2020–2025, with Bhadra Khal consistently recording the highest encounter rates, Dangmari Khal remaining low but stable, and Passur and Shella rivers showing persistently low sightings, suggesting chronic disturbance in larger navigation channels. Overall, ecological indicators point to functional ecosystem conditions with moderate, localized stress, underscoring the need for continued site-specific management and long-term monitoring.

Sundarbans Reserve Forest Health Monitoring

The 46th cycle of forest health monitoring in the Sundarbans indicates that the assessed mangrove stands remain structurally stable, regenerating, and functionally resilient. Monitoring was conducted through Permanent Sample Plots across five sites—Sutarkhali, Koromjol, Harbaria, Akram Point, and Hiron Point—using standardized bio-indicators including tree growth, seedling density, pneumatophore abundance, crab-hole density, canopy cover, light intensity, carbon stock, and phenology. Pneumatophore density remained stable or higher than baseline in most sites, with Sutarkhali increasing from 194,185 (baseline) to 375,180 (operational stage), and Harbaria sustaining high levels (391,732 during operation). Akram Point recorded comparatively lower values (59,948), consistent with ongoing bank erosion rather than physiological decline. Crab-hole density demonstrated ecological robustness, with Sutarkhali recovering from 140,765 (construction) to 194,204 (operation), and Akram Point maintaining high activity (307,062), reflecting sustained soil bioturbation.

Canopy cover remained above 93% in Sutarkhali, Koromjol, and Harbaria during most monitoring phases, peaking up to 99%, indicating strong crown integrity. A localized reduction was observed at Akram Point (92.3% to 82.8%) due to shoreline erosion. Light intensity trends corresponded directly with canopy variation, confirming internal data consistency and suitable regeneration conditions.

Seedling recruitment showed strong regenerative capacity. Sutarkhali increased from 6,366 (baseline) to 383,564 (construction), stabilizing at 214,682 during operation, reflecting natural self-thinning after mass recruitment. Similar peak regeneration was recorded at Koromjol (401,071) and Harbaria (404,891). Lower but gradually increasing seedling densities at Akram Point and Hiron Point reflect sediment instability rather than regeneration failure.

Carbon stock across all five plots showed no significant decline during the monitoring period. Minor fluctuations were linked to natural mortality (3–4 mature trees in some plots) and localized erosion-related plot relocation, without measurable impact on overall biomass. Phenological behavior during the 46th monitoring survey remained consistent with expected winter seasonal cycles, with normal leafing, flowering, fruiting, and propagule release patterns across major mangrove species. Overall, quantitative indicators confirm that the monitored Sundarbans Forest stands remain ecologically stable, structurally intact, and regenerating. Observed variations are site-specific and process-driven, primarily influenced by sedimentation, hydrology, and coastal dynamics rather than evidence of widespread forest degradation.

Socio-economic Monitoring

Of the 245 employees in the BIFPCL project office in Rampal, 89% are citizens of Bangladesh. Although support services like drivers, gardeners, and cleaners are frequently obtained through third parties, direct employment for the local community is still scarce. 200,000 seedlings are to be planted in order to improve the health of the local ecosystem. To increase accessibility for locals, a community grievance box has been successfully moved outside the main gate. Between August and October 2025, Maitree Hospital treated 4,176 patients, including 1,158 through free mobile medical camps. In order to alleviate water scarcity, eleven water supply systems (RO plants) were established; however, some of them have operating difficulties because of maintenance expenses and technical issues.

1. Introduction

1.1 Background

The scope of works, as assigned, is to monitor the environmental components, social indicators, and implementation status of the EMP (Environmental Management Plan) during the construction phase of the 2x660 MW Maitree Super Thermal Power Plant. As an independent environmental monitoring agency, CEGIS was engaged in conducting the said activities by the Power Plant EIA approval condition no. 32.

The location of the 2x660 MW MSTPP project encompasses Sapmari, Katakhal, and Kaigar Daskati Mauza of Rajnagar Union under Rampal Upazila of Bagerhat District (**Figure 1.1**). The Power Plant lies between latitude 22° 37' 0" N and 22° 34' 30" N and longitude 89° 32' 0" E and 89° 34' 5" E. The Project site is about 23 km south of Khulna City and approximately 14 km from the north-west direction of the nearest tip of the Sundarbans (considering the chimney location). The location of the study area, along with the distance from World Heritage sites, are presented in **Figure 1.1**.

The study area includes: i) an Area covering a 10 km radius from the Plant location, ii) an Area within a 5 km strip along both banks of the Passur River starting from the Plant site to Hiron point (**Figure 1.2**). As per the contract, the findings of the previously formulated quarterly monitoring reports have been submitted to BIFPCL.

Monitoring environmental parameters and collecting associated data is ongoing, taking into account spatial and seasonal variations. However, the CEGIS team completed the 46th quarterly monitoring activities in October 2025, covering all the preselected monitoring parameters.

1.2 Objectives

The prime objectives of the study are:

- To monitor the important environmental and social parameters during the construction phase of the Power Plant and
- To monitor environmental compliance regarding EMP implementation during the power plant construction and its associated activities.

1.3 Criteria for Selection of Monitoring Sites/Locations

The monitoring sites have been selected considering the sensitivity and the ambiance of the surroundings likely to be impacted by the Project-related activities, which include:

- Wind speed, direction, and sensitive receptors in and around the project site were considered for monitoring the ambient air quality. Potential areas were also identified and selected for noise level monitoring likely to be impacted by the project activities. Similarly, sites for water quality monitoring were selected considering the water resources (Maidara and other nearer water bodies, Passur River from Chalna to Hiron Point) likely to be impacted by the project activities.
- Potential locations for monitoring fisheries' resources were selected, considering the fish habitats, biodiversity, migration, and production zones likely to be impacted by the project activities.
- Monitoring locations for ecosystem and biodiversity, Soil, and land resources were selected considering the induced impacts of the Project-related activities on the project's surrounding areas.

- Monitoring of socio-economic conditions of the PAPs (Project Affected Peoples) and project surrounding communities was carried out on the basis of their circumstances likely to be transformed and /or altered by the project activities.
- Locations for Sundarbans Reserve Forest (SRF) Health Monitoring were selected considering the potential access routes of coal transportation through the Sundarbans Forest area and associated activities for different phases of the power plant development and operation, which might have significant effects on Sundarbans's flora and fauna.
- Monitoring aspects for Environmental compliance regarding EMP implementation status in and around the project area have been set as per suggestions made in the EIA reports and approval conditions from the DoE of both the Power Plant and Coal transportation studies, respectively, to ensure environmental sustainability and social acceptability.

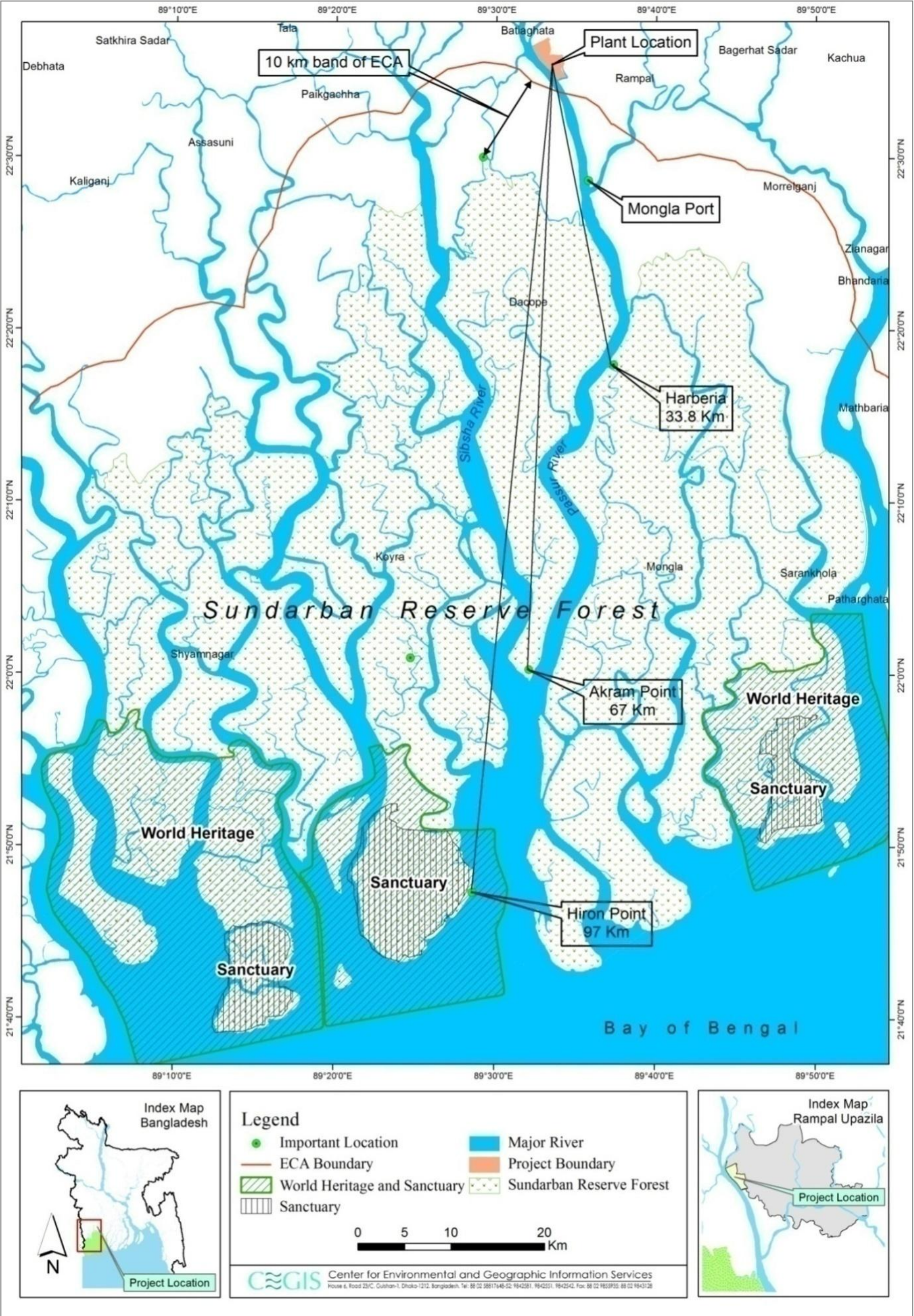


Figure 1.1: Location Map of the Study Area

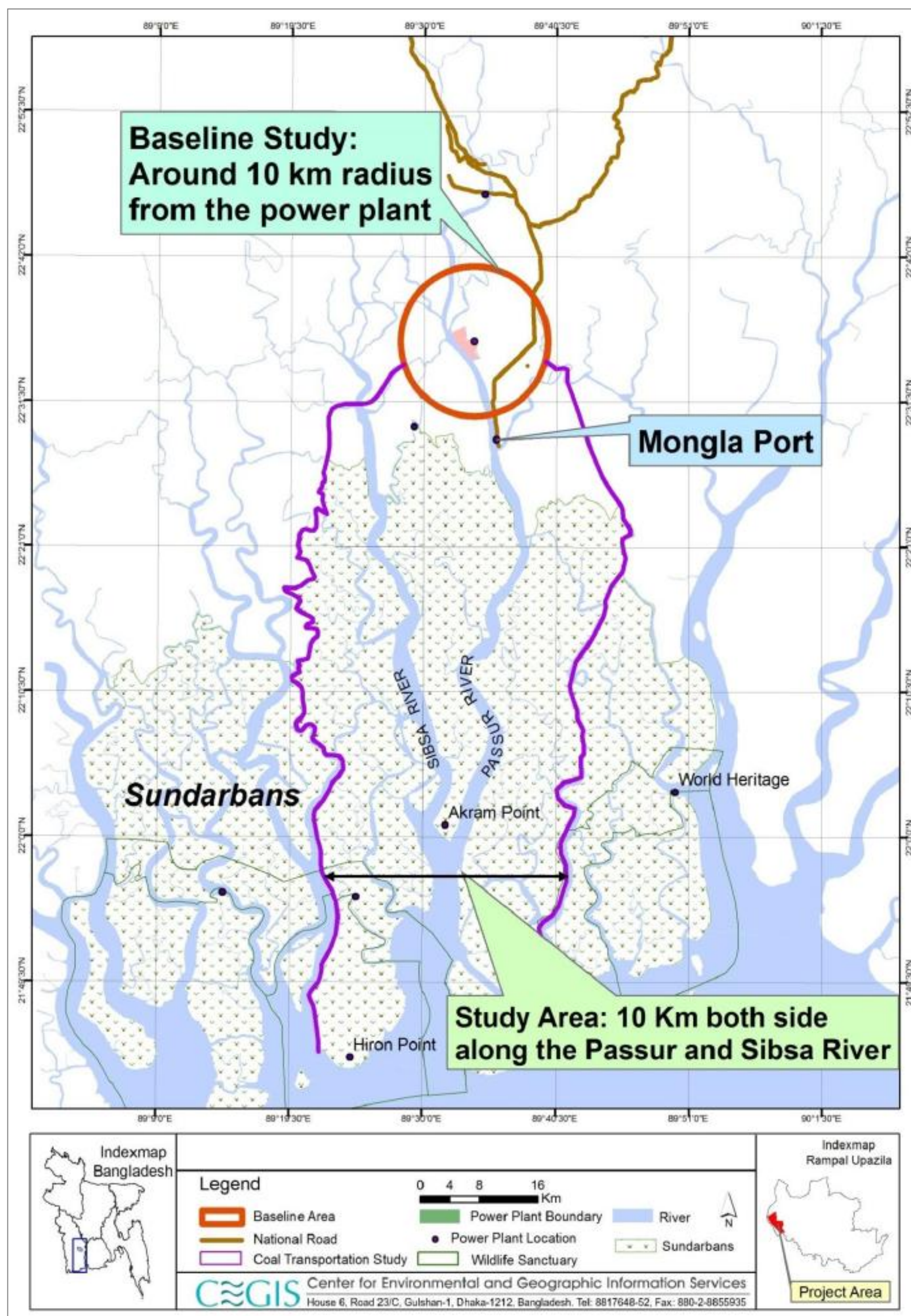


Figure 1.2: AOI of Environmental and Socio-economic Monitoring

1.4 Main Stakeholders

1.4.1 Forest Department

Monitoring of the Sundarbans Reserve Forest area needs to be addressed per the conditions set out by the DoE. Hence, permission from the Forest Department is essential to carry out the said activities. The Forest Department has been providing consent under certain conditions, i.e., keeping close communication with the Forest Department, submission of the monitoring reports to the Forest Department, along with the following activities:

- Inclusion of a Soil Scientist and a Botanist in the monitoring team,
- Monitoring of regeneration in growths (seedlings), diseases, and pests (if necessary, to carry out laboratory analysis),
- Monitoring of soil nutrients (macro, micro) and heavy metals,
- Monitoring of floral diversity, species richness, and dominancy,
- Measurement of carbon content both above and below the ground level,
- Assessment of impact on canopy cover, leaf phenology, flower behaviour, pneumatophore, and crab hole conditions.

However, BIFPCL forwards each copy of the earlier quarterly monitoring reports to the Chief Conservator of Forest, Bangladesh Forest Department, Agargaon, Dhaka, and the Conservator of Forest, Khulna Circle, Boyra, Khulna. Similarly, the 46th quarterly monitoring report will also be forwarded to the same officials of the corresponding Departments.

1.4.2 Department of Environment (DoE)

The monitoring plans, indicators, parameters, and location have been selected and arranged by incorporating the suggestions and approval conditions from both the Power Plant EIA study and the Coal Transportation EIA study. The monitoring reports are also presented to the Environmental Clearance Committee of the DoE during the renewal of the site clearance. In addition, a representative from the local DoE office is involved in each monitoring visit to accompany the monitoring team.

1.4.3 Bangladesh India Friendship Power Company (Pvt.) Limited (BIFPCL)

Bangladesh India Friendship Power Company (Pvt.) Limited (BIFPCL) is the Project Proponent of the Power Project. BIFPCL's officials have assisted the study team since the beginning of the study. Furthermore, BIFPCL is currently implementing the Environmental Management Plan (EMP), ensuring environmental and social safeguarding of the Project surroundings, including the Sundarbans Reserve Forest.

1.4.4 Local Community

Each social environment-monitoring program includes Project Affected Peoples (PAPs). The changes in important socio-economic indicators were examined through Focus Group Discussions (FGDs), Key informant interviews (s), and other informal discussions with the local people in different locations of the project-influenced area.

1.4.5 Major Component of Monitoring Study

The Physical, Biological, and social aspects are monitored regularly, and this quarterly monitoring report is furnished with the following subsequent chapters-

- Physical Environment covers monitoring of air quality, noise level, water quality, Soil and land resources, traffic management, and the morphological study;
- Biological environment covers monitoring of fisheries resources, ecological resources, and the Sundarbans Reserve Forest (SRF) health conditions;
- Socio-economic environment covers compensation, resettlement/rehabilitation, project-related employment generation, labour and working conditions, community health, security, safety, and corporate social responsibilities.
- Environmental compliance monitoring includes monitoring the implementation of the Environmental and Social Management System Action Plan, labour and working conditions, community health, safety, and security, and biodiversity and sustainable management of living natural resources in and around the project area.

2. Physical Environment

2.1 Air Quality

The monitoring activities were carried out at the designated locations in line with the EIA findings, expert recommendations, standard procedures, and guidelines to evaluate and compare the air quality in and around the project area, including the Sundarbans Reserve Forest (SRF), including along the coal transportation route.

2.1.1 Methodology

Criteria pollutants for monitoring include particulate matter (i.e., PM_{2.5}, PM₁₀, and SPM), SO₂, NO₂, CO, and O₃ in accordance with the EIA study. As per the EIA study, it was determined to monitor the criteria pollutants at the different phases of the power plant: pre-construction, construction, and operation. On the other hand, the monitoring locations were selected based on factors like receptor sensitivity, project activities (e.g., coal vessel movement, coal trans-shipment, power generation), and atmospheric conditions such as wind patterns, deposition, and stability classes. In this connection, the Continuous Ambient Air Quality Micro-Monitoring Station (caaqMMS- AirSENCE) was used to collect the ambient air quality data during the monitoring period, measuring gaseous pollutants (NO₂, CO, O₃, SO₂) and particulate matter (PM₁₀ and PM_{2.5}) at the selected locations.

2.1.2 Pollution Sources in the Sundarbans

The Significant contributors to air pollution in the study area consist of Port activities at Mongla Sea Port, which involve ship loading and unloading, cargo handling, operation, and other activities within the MSTPP area, emissions from cement plants, petroleum facilities, and other industrial activities engaged in material processing and clinker handling, unregulated vessel movements, traffic from transport vehicles and disturbance of sediments which can indirectly increase dust and pollutant resuspension.. These sources contribute significant quantities of air pollutants, including particulate matter (PM_{2.5}, PM₁₀, and SPM), SO₂, NO₂, and greenhouse gases (GHGs) to the airshed of the region. An inventory of the existing emission types and sources for the study area is provided in **Table A2** of **Appendix IV**.

2.1.3 Monitoring Locations

Air quality monitoring sites were selected based on DoE guidelines, pollution sources, and expert judgment to ensure representative coverage of the study area. **Table 2.1** provides details on each site, including coordinates, frequency, and monitoring methods. **Figures 2.1** and **2.2** illustrate field monitoring activities and the locations of monitoring sites within the study area, respectively.

Table 2.1: Air Quality Monitoring Plan

Sl. No.	Monitoring Indicators	Location ID	Locations	Coordinates	Frequency	Methods/Tools/ Techniques
1	Particulate Matter (PM _{2.5} , PM ₁₀ , and SPM)	AQ-1	South West corner of the Project boundary	89°33'34.5"E; 22°34'33.8"N	Each Quarter of the year	Continuous Ambient Air Quality Micro-Monitoring Station (caaqMMS). AirSENCE provides
2	SO _x , NO _x , CO and O ₃ .	AQ-2	The township area near Chimney location, Mauza: Sapmari Katakhal.	89°32'3.8"E; 22°36'32.5"N		

Sl. No.	Monitoring Indicators	Location ID	Locations	Coordinates	Frequency	Methods/Tools/ Techniques
3		AQ-3	North West corner of the Project boundary (Kaigar Daskati)	89°33'51.8"E; 22°36'1.06"N		Concentrations for gaseous pollutants including NO, NO ₂ , CO, O ₃ , SO ₂ , VOC, H ₂ S, and CO ₂ in addition to all particulate matter fractions such as PM ₁₀ , PM _{2.5} , and PM ₁ . Local weather and environmental data, such as wind speed and direction, noise, rainfall, and light can also be measured.
4		AQ-4	Barni, Gaurambha Union (4km North East from the chimney location)	89°34'37.7"E; 22°38'51.8"N		
5		AQ-5	Chunkuri-2, Bajua Union (4km South West from the chimney location)	89°34'01.1"E; 22°32'3.3"N		
6		AQ-6	Pankhali, Dacope, (4km North West from the Chimney location)	89°31'24.2"E; 22°36'6.7"N		
7		AQ-7	Mongla Port Area	89°35'50.4"E; 22°28'24.8"N		
8		AQ-8	Harbaria, Sundarbans	89°35'34.2"E 22°17'43.1"N		
9		AQ-9	Akram point, Sundarbans	89°30'54.1"E 22° '23.50"N		
10		AQ-10	Hiron Point, Sundarbans	89°27'53.2"E; 21°46'27.60"N		
11		AQ-11	Khulna city near Khan Jahan Ali Bridge	89°35'35.5"E; 22°46'36.8"N		
12		AQ-12	Project site-1 (The Township area)	89° 33' 13.7"E 22°35'43"N		
13		AQ-13	Access road bridge area	89°35'16.49" 22°34'37.11"N		



Source: Field Survey, October 2025

Figure 2.1: Acquisition of Ambient Air Quality Monitoring

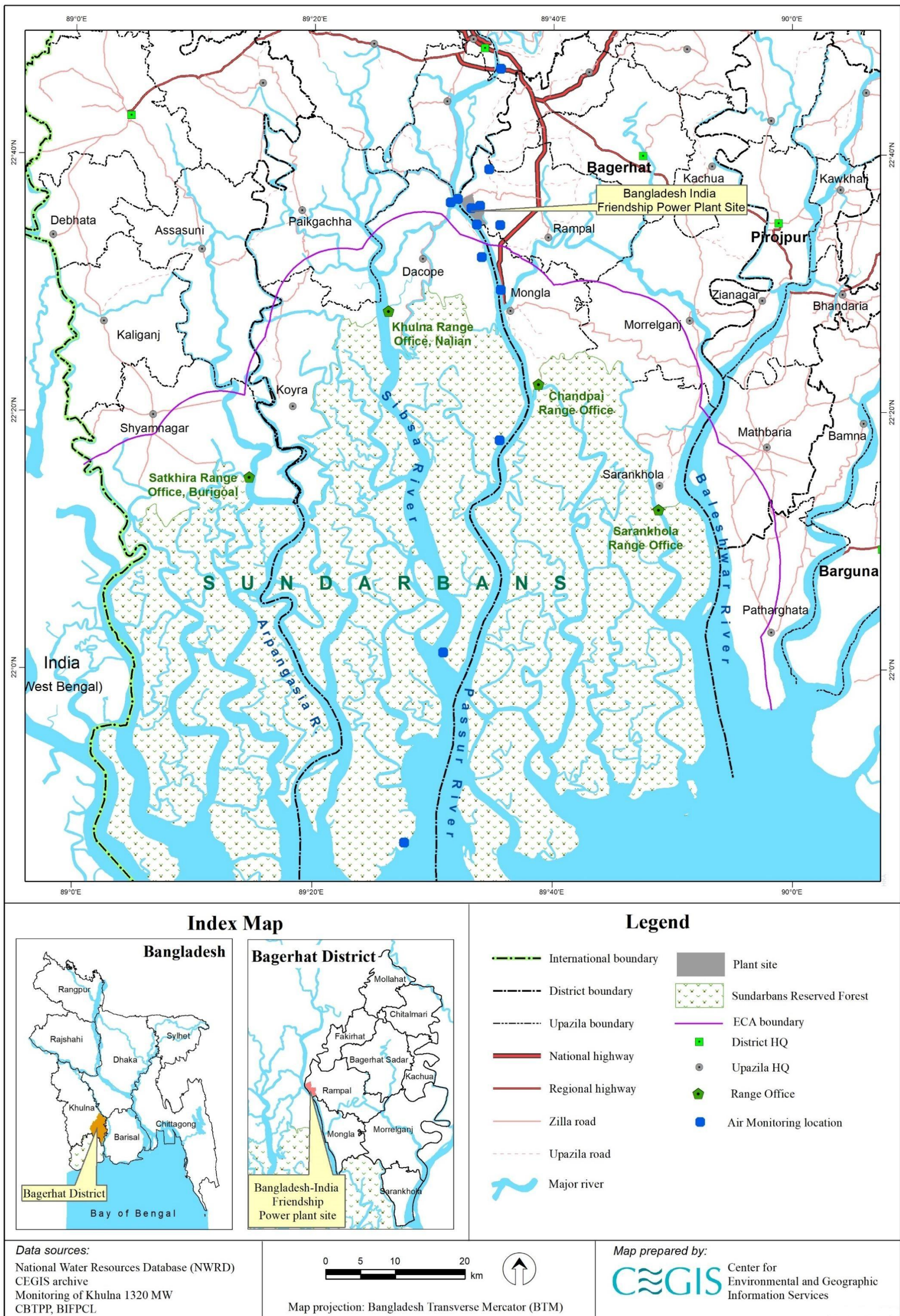


Figure 2.2: Air Quality Monitoring Locations

2.2 Status of Air Quality

Table 2.2 presents the results from the 46th monitoring quarter, indicating that all observed data remained within the permissible limits specified in the Air Pollution (Control) Rules, 2022 and the Environmental Conservation Rules (ECR), 1997 for Suspended Particulate Matter (SPM). This indicates that ambient air quality in and around the project area, including the Sundarbans Reserve Forest, stayed within acceptable standards during this period. During the monitoring period, the maximum concentration of PM_{2.5} (22.98 µg/m³) was recorded at Khan Jahan Ali Bridge, while the minimum (2.02 µg/m³) was observed at Harbaria. Elevated PM₂ levels at Khan Jahan Ali Bridge may be attributed to vehicular emissions, frequent movement of heavy vehicles, and brake wear, and road dust. In contrast, the low concentration at Harbaria reflects minimal human activity and dense mangrove vegetation, which acts as a natural air filter. The concentrations of PM₁₀ and SPM were also recorded highest at Khan Jahan Ali Bridge (33.63 µg/m³ and 56.61 µg/m³, respectively) and lowest at Harbaria (2.78 µg/m³ and 45.8 µg/m³). Sulfur dioxide (SO₂) (10.23 µg/m³) and carbon monoxide (CO) (0.29 mg/m³) were highest at Maitree Township area & Khan Jahan Ali Bridge, while the lowest levels were observed at Bajua (2.07 µg/m³ and 0.11 mg/m³). Nitrogen dioxide (NO₂) and ozone (O₃) were highest in Maitree Township and Maidara, and lowest at Bajua (2.83 µg/m³ and 2.51 µg/m³).

Overall, air quality varied across locations due to human activities, traffic intensity, and proximity to settlements or industrial areas. Dust from unpaved roads, vehicular emissions, and various commercial activities in the vicinity appears to be the main contributor to elevated particulate matter, but since all measured parameters remained within national standards, the ambient air quality can be considered satisfactory during the 46th monitoring quarter. **Table A1** in **Appendix IV** includes all monitoring data collected during the study period. Baseline emission scenarios are listed in **Table A2** of **Appendix IV**.

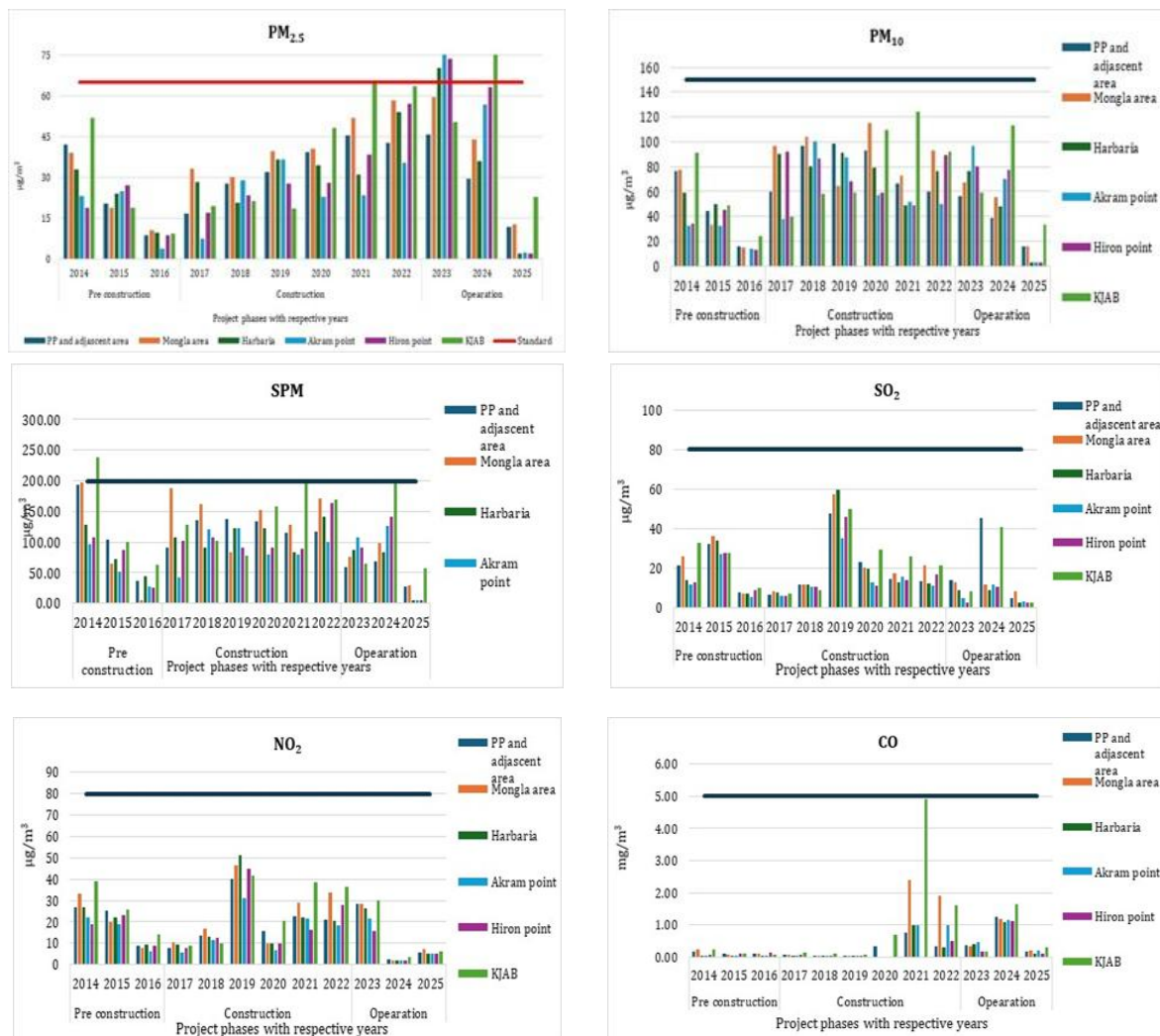
Table 2.2: Air Quality Monitoring Parameters and Observed Data (46th Quarterly Program)

Location	Parameters						
	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	SPM (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)
AQ-1	7.14	9.15	16.29	8.51	9.39	0.18	16.35
AQ-2	4.05	6.51	10.56	9.46	7.34	0.17	13.38
AQ-3	12.05	15.56	27.61	4.07	4.68	0.15	5.05
AQ-4	17.45	24.47	41.91	3.14	5.94	0.24	7.33
AQ-5	10.07	13.20	23.28	2.07	2.83	0.11	2.51
AQ-6	19.76	27.64	47.41	2.35	4.73	0.18	7.53
AQ-7	12.69	16.12	28.81	8.48	7.23	0.20	11.52
AQ-8	2.02	2.78	4.80	2.51	5.12	0.12	3.69
AQ-9	2.24	3.04	5.28	3.13	4.99	0.21	3.62
AQ-10	2.10	2.87	4.97	2.53	5.15	0.12	3.77
AQ-11	22.98	33.63	56.61	2.66	6.26	0.29	6.63
AQ-12	5.15	6.94	12.09	10.23	11.47	0.16	12
AQ-13	4.05	5.23	9.28	8.28	7.93	0.17	13.97
Standard * (APCR, 2022)	65 (24 hrs)	150 (24 hrs)	200 (ECR'97)	80 (24 hrs)	80 (24 hrs)	5 (8 hrs)	100 (8 hrs)

Source: Field survey; October 2025; Standard*- Air Pollution (Control) Rules (APCR), 2022

Seasonal Variation

During the monitoring periods, it was observed that particulate matter ($PM_{2.5}$, PM_{10} and SPM) increased during the initial phases of pre-construction and construction, followed by a gradual decrease during the operational stage. On the other hand, particulate matters concentrations found to be higher at the Khan Jahan Ali Bridge area and Chalna bazar area compared to other monitoring sites. These levels are within the APCR, 2022 standards. However, the concentrations of other pollutants (SO_2 , NO_2 , and O_3) were found to be below the standard limits set by APCR 2022. As shown in **Figure 2.3**, the concentrations of the criteria pollutants ($PM_{2.5}$, PM_{10} , SPM, SO_2 , NO_2 , and O_3) were lower compared to the same season in previous years. Furthermore, all measured values during the operational phase complied with the permissible limits outlined in the APCR 2022 standards. **Figure 2.3** demonstrates the seasonal variations of air quality parameters during the postmonsoon season.



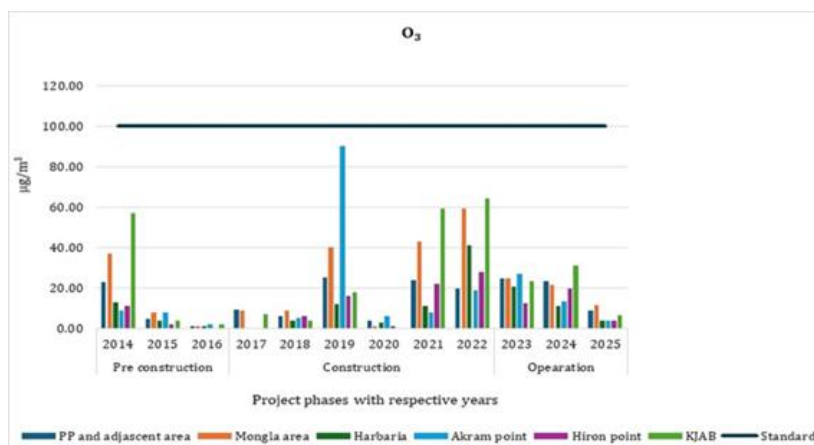


Figure 2.3: Seasonal Variation of the Air Quality Parameters

Cluster Analysis

Cluster analysis was performed to identify the grouping pattern of the criteria pollutants along with their corresponding locations. Euclidean distances were observed to measure the distances among the objects using as variables (annual average concentrations of the studied variables for every station). According to the dendrogram (**Figure 2.4**) Hiron Point (L10), Akram Point (L9), and Harbaria (L8) represent the locations of minimum pollution levels. On the other hand, Chalna (L6), Mongla Ghat (L7), and Khan Jahan Ali Bridge in Khulna (L11) are subjected to higher population density and increased industrial activities among all sites whereas Maidara (L1), Shapmari (L2), Koigardashkatir char (3), Gaurambha (L4), Access road bridge area (13) and Bajua (L5) represent lower to moderate commercial activities (**Figure 2.4**).

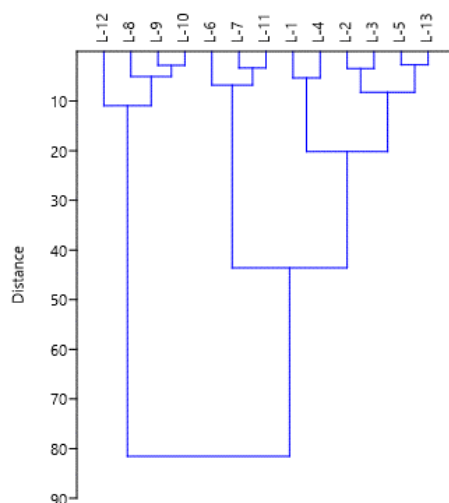


Figure 2.4: Dendrogram of the Monitoring Stations using Euclidean Distance

2.3 Noise Quality

Noise is described by a weighted sound intensity (or level), representing sound heard by the human ear and measured in decibels (dBA) units. However, engine boats, trawlers, small barges, ships plying over the waterways, birds' chirping, stormy wind, falling leaves from the trees, and the wave-breaking sound were the primary sources of noise generation in and around the Sundarbans. On the other hand, construction activities, the urban and rural vehicles, i.e., buses, trucks, local human haulers, auto-rickshaws, motorized vans, motorbikes, etc., were much noticeable outside the Sundarbans area.

Methodology

Ambient noise levels were measured during the day at eleven pre-selected locations surrounding the project and within the study area. Noise levels were recorded thrice a day (morning, afternoon, and evening) at eight locations and twice (morning and afternoon) at three locations using a KANOMAX-4431 ANSI Type II noise level meter for five minutes with an interval of 30 seconds. The noise level machine was adequately set up and calibrated following the instruction manual to ensure the standard practices (QA/QC).

Locations of Noise Level Monitoring

The monitoring locations were selected considering the sensitivity of the nearest receptors. The noise level monitoring activities in field are shown in **Figure 2.5**. Out of the selected (11) locations, three (03) locations were inside the Sundarbans (considering the coal transportation route), six (06) locations were in and around the Project site, one was at Khan Jahan Ali Bridge, and the remaining one was at Mongla Ghat area (**Figure 2.6**). Co-ordinates and the corresponding locations are mentioned in **Table 2.3**.

Table 2.3: Noise Level Monitoring Plan

SL. No.	Monitoring locations	Co-ordinates (Latitude; Longitude)
1	South West corner of the Project boundary	89°33'34.5"E; 22°34'33.8"N
2	The township area near the Chimney location, Mauza: Sapmari Katakali	89°32'3.8"E; 22°36'32.5"N
3	North West corner of the Project boundary (Kaigar Daskati)	89°33'51.8"E; 22°36'1.06"N
4	Barni, Gaurambha Union (4km North East from the chimney location)	89°34'37.7"E; 22°38'51.8"N
5	Chunkuri-2, Bajua Union (4km South West from the chimney location)	89°34'01.1"E; 22°32'3.3"N
6	Pankhali, Dacope, (4km North West from the Chimney location)	89°31'24.2"E; 22°36'6.7"N
7	Mongla Port Area	89°35'50.4"E; 22°28'24.8"N
8	Harbaria, Sundarbans	89°35'34.2"E; 22°17'43.1"N
9	Akram point, Sundarbans	89°30'54.1"E; 22°23.50"N
10	Hiron Point, Sundarbans	89°27'53.2"E; 21°46'27.60"N
11	Khulna city near Khan Jahan Ali Bridge	89°35'35.5"E; 22°46'36.8"N



Figure 2.5: Ambient Noise Acquisition in Study Area

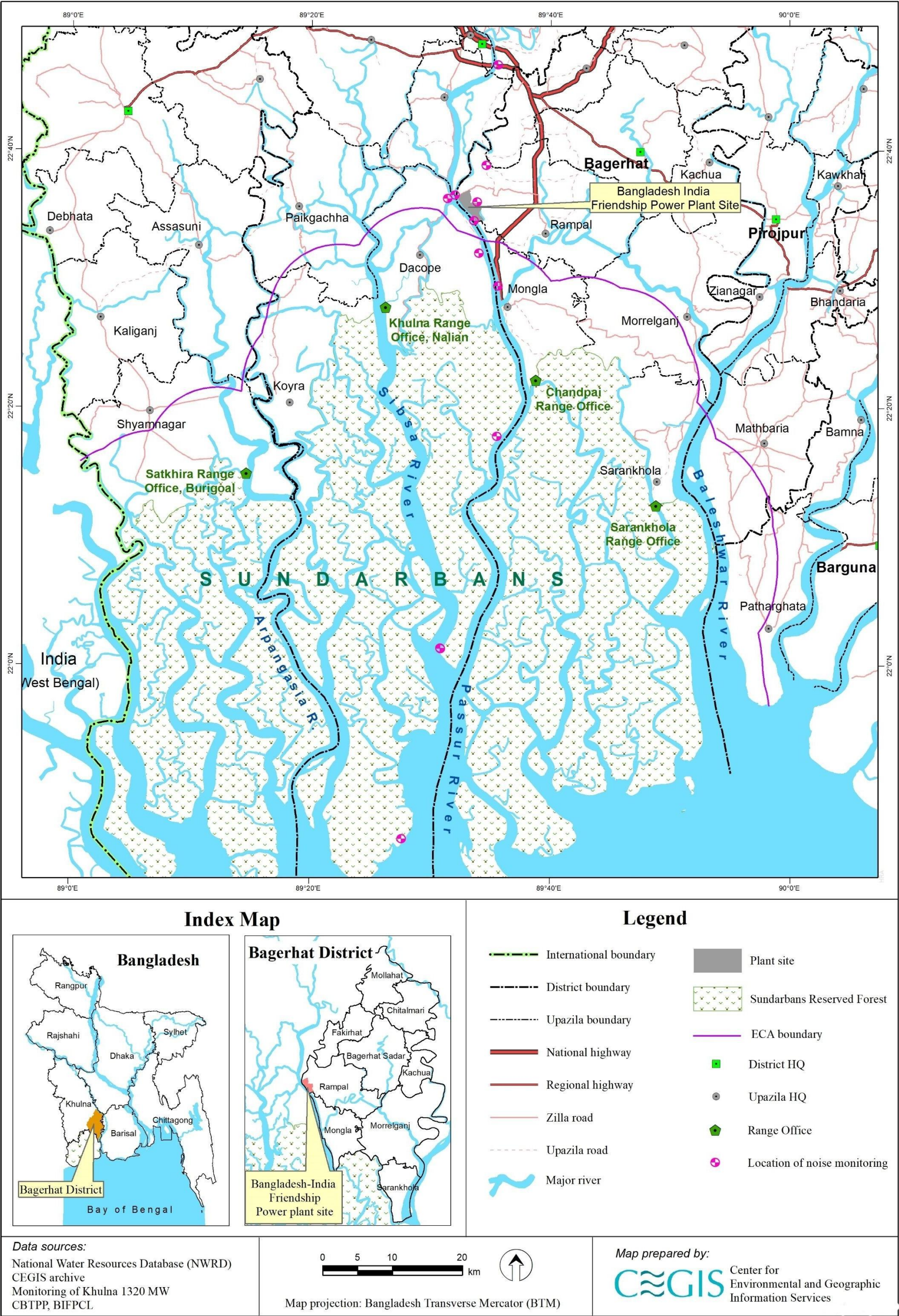


Figure 2.6: Noise Level Monitoring Locations

Noise in the Study Area

Among the sources of noise generation, engine boats, trawlers, small barges, ships plying along the waterways, birds' chirping, stormy wind, falling leaves from the trees, and the wave breaking sound were the primary sources of noise generation, in and around the Sundarbans. On the other hand, construction activities, the urban and rural vehicles, i.e., buses, trucks, local human haulers, auto-rickshaws, motorized vans, motorbikes, etc., were much more noticeable around the project area.

Status of Noise

The Department of Environment has set up the standard of permissible limits of noise level for different classified areas. According to Bangladesh Noise Pollution Control Rules (2025), the eleven monitored locations fall under different classified area like residential, commercial, mixed, silent and industrial class.

However, the observed level of noise at Chalna, (commercial area located at a distance of 4 km to the north-west direction of the chimney location) was recorded as 46.68 dB whereas its standard level is 70 dB. Similarly, noise levels at Kaigar Daskati (52.64 dB) (situated at the Gucchha Gram-a residential area located at north-west corner of the project area), Chunkuri-2 (47.86 dB) located at 4km south-west direction from the chimney location and Maidara Khal (45.33) (residential area-south-west corner of the project area) did not exceed their corresponding standard limit (55 dB). Likewise, noise level at Shapmari (township area) was recorded as 44.83 dB which denotes that, the level of noise didn't cross their corresponding standard value (55 dB) in this location. The noise level at Barni (Gaurambha) was recorded as 53.30 dB which was 6.30 dB lower than that of its standard limit (60 dB) of noise level for this location. Harbaria, Akram Point and Hiron Points are three ecologically silent zones in the study area. the noise levels of these locations i.e., Harbaria (43.58 dB), Akram Point (36.31 dB) and Hiron point (40.70 dB) were not recorded to be exceeded their corresponding standard limit of noise level (std. 50 dB). The levels of observed noise at Khan Jahan Ali Bridge and at the Mongla port area were recorded as 60.86 dB and 59.26 dB, respectively. Whereas, the standard noise limits for Khan Jahan Ali Bridge (a commercial zone) and Mongla port (an industrial zone) during the day are 70 dB and 75 dB, respectively.

In order to provide an overview of the noise level in the project adjacent areas as well as along the coal transportation route, the observed values for the respective locations are appended in **Table C1, C2, C3, C4, C5, C6, C7, C8, C9, C10 and C11**, respectively of **Appendix IV**. the observed noise levels at the pre-selected locations for the respective seasons are shown in **Figure 2.7**.

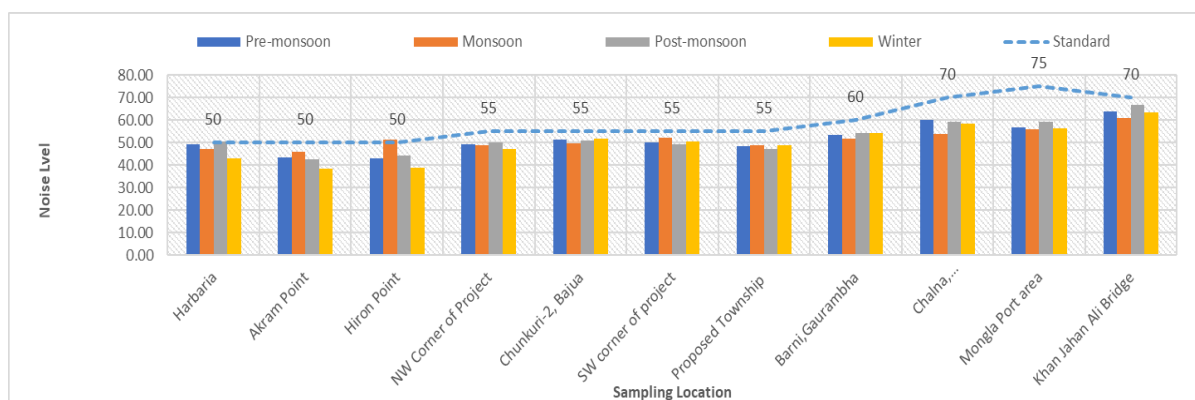


Figure 2.7: Seasonal variations of Noise Level at different monitoring locations

2.4 Water Quality

This section presents an assessment of surface water quality in the vicinity of the MSTPP area, focusing on four preselected locations along the Passur River up to Hiron Point: Mongla-Ghashiakhali confluence, Harbaria, Akram Point, and Hiron Point. Additionally, the report evaluates groundwater quality within the power plant vicinity and adjacent areas. Water quality monitoring data, including chemical analyses from the 45th quarterly monitoring conducted in July 2025, are reported, along with in-situ and physical sampling results from the 46th Quarterly Monitoring carried out in October 2025. Monitoring locations for both surface and groundwater sampling have remained consistent across quarters in accordance with the Environmental Impact Assessment (EIA), employing comparable parameters to assess water suitability for community consumption, aquatic ecosystems, and the Sundarbans Forest.

Methodology

Sampling locations for monitoring water quality were selected to effectively determine their impact on the surrounding ecosystems related to land development, construction, and the operation of MSTPP. In this context, water quality parameters, sampling frequency, and evaluation criteria have been established according to the conditions set by DoE and in accordance with their guidance as per ECR, 2023. Water sampling follows standard procedures, and laboratory analyses are conducted in reputable labs, including BCSIR, DPHE, and CEGIS. The selected water quality monitoring locations for both surface and groundwater are shown in **Figure 2.9**. Details of the monitoring plan, including sampling locations, geographical coordinates, frequency, and analysis techniques for surface and groundwater, are outlined in **Tables 2.5** and **Table 2.6** respectively.

Water Quality Parameter Analysis Techniques/Methods

Water quality parameters were analyzed according to the American Public Health Association (APHA) procedure and standard. The analytical methods for different parameters and standards are given in **Table 2.4**. The monitoring plans both for the surface water and groundwater are attached in **Table 2.5** and **2.6**. All the monitoring locations are shown in **Figure 2.9**.

Table 2.4: Testing Methodology and Standards of Water Quality Parameter

Parameters	Methods/Measuring Tools	Unit	ECR, 2023 (Surface water)	ECR, 2023 (Groundwater)
Temperature	Horiba U-50 multi-meter	°C	N/A	20-30
pH	Horiba U-50 multi-meter	-	6.5-8.5 (Natural area) 6.5-9.0 (Industrial area)	6.5-8.5
TDS	Horiba U-50 multi-meter	ppm or mg/L	N/A	1000
TSS	Horiba U-50 multi-meter	ppm or mg/L	25 (Natural area), 100 (Industrial area)	10
Salinity	Horiba U-50 multi-meter	ppt	N/A	N/A
DO	Horiba U-50 multi-meter	ppm or mg/L	≥5 (Natural area), ≥4 (Industrial area)	N/A
COD	Closed Reflux Method	ppm or mg/L	8 (Natural area), 5 (Industrial area)	N/A
Total Hardness (as CaCO ₃)	Titrimetric	ppm or mg/L	N/A	500
Phosphate (PO ₄ ³⁻)	UV-VIS Spectrophotometers	ppm or mg/L	0.05 (Natural area), 0.1 (Industrial area)	N/A

Parameters	Methods/Measuring Tools	Unit	ECR, 2023 (Surface water)	ECR, 2023 (Groundwater)
Nitrate (NO ₃ ⁻)	UV-VIS Spectrophotometers	ppm or mg/L	0.3 (Natural area), 1.0 (Industrial area)	45
Sulphate (SO ₄ ²⁻)	UV-VIS Spectrophotometers	ppm or mg/L	N/A	250
Oil and Grease	Liquid-liquid extraction with hexane, treatment with silica gel, and gravimetric determination	ppm or mg/L	0.01(Natural area), 5.0 (Industrial area)	0.01
Arsenic (As)	Atomic Absorption Spectrophotometers–Hydride Vapor Generating (AAS-HVG)	ppm or mg/L	0.001(Natural area), 0.003 (Industrial area)	0.05
Lead (Pb)	Atomic Absorption Spectrophotometers–Graphite Furnace (AAS-GF)	ppm or mg/L	0.05 (Natural area)	0.01
Mercury (Hg)	Mercury Analyzer	ppm or mg/L	0.0001(Natural area), 0.0001(Industrial area)	0.001
PAH	APHA 5310.B	mg/L	N/A	N/A
TOC and TC	APHA 5310. B	mg/L	N/A	N/A

Sampling Procedure

Tidal variations highly influence the surface water sampling locations in the study area. Hence, temporal and spatial variations of tides are considered in surface water sampling. The surface water samples were collected 30-50m away from the riverbank and at a depth of 6 cm below the water surface during low tides or relative slag period after the low tide for all parameters except oil and grease. The non-acidified sampling bottles were rinsed with respective water samples before sampling. Acidified sampling bottles were used to collect samples of heavy metals (i.e., As, Pb, and Hg). However, all samples were preserved according to the standard protocol. The in-situ testing of water quality parameters is shown in **Figure 2.8**.



Source: Field Survey, October 2025

Figure 2.8: Monitoring activities of water quality parameters

Table 2.5: Groundwater Quality Monitoring Plan

Sl. No.	Monitoring Parameters	Locations	Coordinates		Frequency	Methods/Monitoring Indicators/ Techniques
			Latitude	Longitude		
1	pH, Temperature, Salinity, DO, TDS, TH, TSS, COD, Nitrate, Sulphate, Phosphate, Arsenic, Lead, Mercury	Township Site	89.566139°E	22.594167°N	Quarterly	Horiba U-50 multimeters are used for in-situ testing of physical water quality parameters. For inorganic, non-metallic, aggregate organic, and metal quality, sample preservation and laboratory analysis are done at DPHE Central Laboratory and BCSIR.
2		Rajnagar Site	89.576056°E	22.612528°N		
3		Kapasdanga Site	89.563000°E	22.622528°N		

Table 2.6: Surface Water Quality Monitoring Plan

Sl. No.	Monitoring Parameters	Sampling Locations	Coordinates		Frequency	Methods/Tools/ Techniques
			Latitude	Longitude		
1	pH, Temperature, Salinity, DO, TDS, TH, TSS, COD, Nitrate, Sulphate, Phosphate, Arsenic, Lead, Mercury, Oil & Grease, PAH, TOC, TC	100m u/s of Northwest Corner of the Project Site on the Passur River Left Bank	22.604167°N	89.527222°E	Quarterly	In-situ measurement (pH, Temperature, Salinity, DO) and Laboratory analysis (TDS, TH, TSS, COD, Nitrate, Sulphate, Phosphate, Arsenic, Lead, Mercury, Oil & Grease, PAH, TOC, TC).
2		100m u/s of Northwest Corner of the Project Site on the Passur River Middle	22.607222°N	89.528889°E		
3		100m u/s of Northwest Corner of the Project Site on the Passur River Right Bank	22.609361°N	89.531417°E		
4		Project Site-Jetty on the Passur River Left Bank	22.584833°N	89.543583°E		
5		Project Site-Jetty on the Passur River Middle	22.587667°N	89.546472°E		
6		Project Site-Jetty on the Passur River Right Bank	22.589333°N	89.548222°E		
7		West Corner of the Project Site on the Passur River Left Bank	22.572889°N	89.552583°E		
8		West Corner of the Project Site on the Passur River Middle	22.574611°N	89.557500°E		
9		West Corner of the Project Site on the Passur River Right Bank	22.575667°N	89.559861°E		
10		Southeast Corner of the Project Site on the Ichhamati-Maidara Confluence	22.600639°N	89.565611°E		
11		The Township Site Point on the Maidara River	22.577472°N	89.569250°E		
12		Mongla Point on the Confluence of the Passur and Ghasiakhali Rivers	22.473861°N	89.602361°E		
13		Harbaria Point of SRF Area on the Passur River	22.295250°N	89.593139°E		
14		Akram Point of SRF Area on the Confluence of the Passur and Sibsa Rivers	22.024120°N	89.514220°E		
15		Hiron Point of SRF on the Passur River	21.774183°N	89.464778°E		

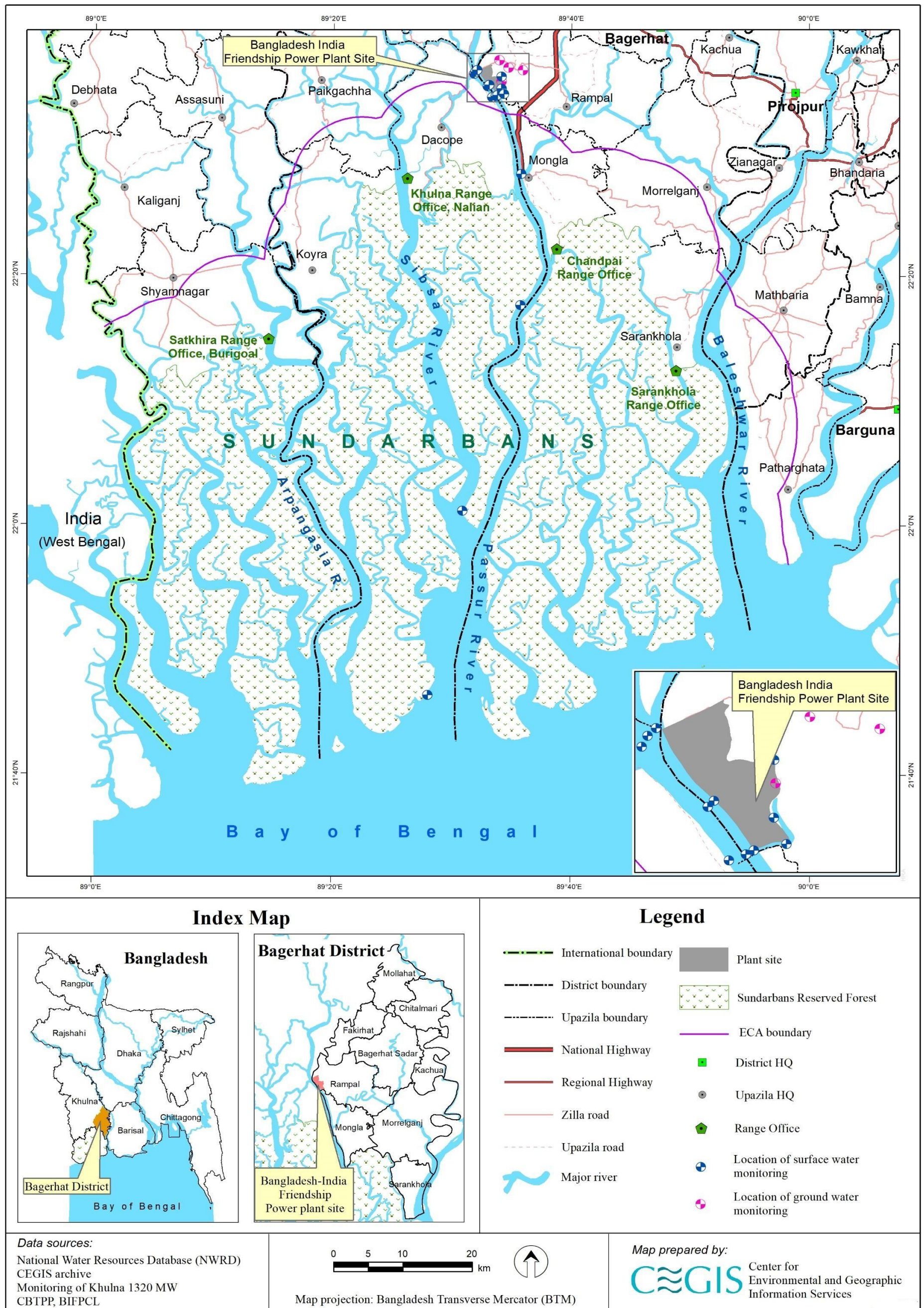


Figure 2.9: Surface Water and Groundwater Quality Monitoring Location

Surface Water Quality Parameters

The selected surface water quality parameters include Temperature, pH, Dissolved Oxygen (DO), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Total Hardness (TH), Turbidity, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Salinity, Nitrate (NO_3^-), Phosphate (PO_4^{3-}), Sulphate (SO_4^{2-}), Heavy Metals (As, Pb, Hg), and Oil and Grease. The parameters are categorized into four (04) groups:

- Physical and aggregate properties, i.e., pH, Temperature, Salinity, Hardness, TDS, TSS, Turbidity, Oil & Grease;
- Inorganic non-metallic constituents i.e., DO, NO_3^- , PO_4^{3-} and SO_4^{2-} ;
- Aggregate organic constituents, i.e., COD;
- Heavy metals, i.e., As, Pb, and Hg.

In addition to the above, the following parameters, i.e., PAH (Polycyclic Aromatic Hydrocarbons), TOC (Total Organic Carbon), and TC (Total Carbon), were included in the monitoring study as per the recommendation based on the EIA study of Coal Transportation. Again, the monitoring results of the additional parameters are recorded twice a year and submitted to the DoE and other concerned authorities as recommended in *condition no. 26* of the EIA approval of the coal transportation study.

Groundwater quality parameters

The selected groundwater quality parameters for monitoring include pH, Temperature, Dissolved Oxygen (DO), Total dissolved solids (TDS), Total Hardness (TH), Chemical Oxygen Demand (COD), Salinity, Nitrate (NO_3^-), Phosphate (PO_4^{3-}), Sulphate (SO_4^{2-}), and Heavy Metals (As, Pb, Hg).

Water Quality Reporting Arrangement

The water quality status of the adjacent water bodies of MSTPP and the tip to the end of the Sundarbans Reserve Forest (SRF) has been observed since April 2014. To do so, all sampling points are clustered in five different sampling sites, considering the sampling points' homogeneous characteristics and the type of ecosystem touching the sample points. The monitoring sites and the explanation of the clusters are presented in the following **Table 2.7**.

Table 2.7: Monitoring Sites and Characteristics

Sl. No.	Monitoring Sites	Site Characteristics
(a)	Power plant & adjacent areas	In these monitoring areas, 11 surface water sampling points were selected, and the values were averaged to represent the water quality status of the power plant's adjacent surface water bodies. These 11 sampling points are situated beside the MSTPP boundary on the Passur and Maidara Rivers, exhibiting similar characteristics, which is also supported by previous monitoring results indicating the same water chemistry. Therefore, this study presents the clusters in a more explainable and understandable way to reflect the water quality status of the areas.
(b)	Mongla-Passur confluence	This monitoring site is located at least 13 km downstream of MSTPP. It marks the confluence of the Passur River and the Mongla-Ghasiakhali Channel. The ecosystem is mainly composed of agricultural lands, followed by rural settlements.
(c)	Harbaria	The Harbaria site is located about 15 km downstream from the Mongla-Passur confluence, within the Sundarbans Reserve Forest. It functions as a designated lightering point for mother vessels transporting clinker, coal, and LPG gas.

Sl. No.	Monitoring Sites	Site Characteristics
(d)	Akram point	Akram Point is located about 35 km downstream from Harbaria Point. It sits on the bank of the Sibsa River, just before it joins the Passur River at Sibsa Point. The area is entirely dominated by a deep forest and estuarine ecosystem.
(e)	Hiron Point	Hiron Point is the most distant point in this surface water monitoring scheme, located 25 km downstream from Akram Point. The site is completely exposed to the Bay of Bengal and features dense forests as well as marine habitats.

2.4.1 Monitoring Results

Status of Surface Water Quality

Parameters Tested In-situ

This section presents the in-situ tested results of water quality parameters obtained during the 46th monitoring program (October 2025, post-monsoon season).

Generally, the Passur River water is alkaline, with pH values during this monitoring season ranging from 6.7 to 7.6 across all sites. Temperatures observed in this period varied from 25.77°C to 29.8°C at the monitored locations. This temperature range closely matches previous records for the same period. The highest salinity (5.4 ppt) was recorded at Hiron Point in the Sundarbans, while the lowest (0.1 ppt) was found in the Passur River in front of the Power plant area. In the monitored river systems, the highest salinity levels are usually observed during the pre-monsoon period, followed by winter, with the monsoon and post-monsoon periods showing lower levels. On the other hand, the dissolved oxygen (DO) concentration ranged from 4.75 mg/l to 8.2 mg/l during the monitoring period, complying with the ECR 2023 standard (≥ 5) mg/l). Seasonal variations in pH, temperature, salinity and DO are shown in **Figure 2.9, 2.10, 2.11** and **2.12** respectively.

Parameters Tested in Laboratory

This section presents the laboratory-tested results for water quality parameters obtained during the 45th monitoring program (July 2025, monsoon season).

TDS indicates the presence of minerals such as ammonia, nitrate, phosphate, alkalis, acids, sulfates, and metallic ions, found in both colloidal and dissolved forms (Tareq M. S., et al., 2013)². Concentrations of Total Dissolved Solids (TDS) in coastal surface waters can be exceptionally high due to the presence of dissolved salts, reflecting significant mineral content. Meanwhile, Total Suspended Solids (TSS), comprising inorganic and organic particles, exhibits considerable variability with rainfall, often reaching elevated levels during monsoon seasons. Total Hardness (TH), indicative of dissolved minerals such as calcium and magnesium, tends to be elevated in these coastal environments. Nevertheless, during the last quarterly monitoring (July 2025, monsoon season), TDS levels ranged from 150 mg/l to 4650 mg/l, TSS from 148 mg/l to 720 mg/l, and TH from 135 mg/l to 150 mg/l. Seasonal variations in TDS, TSS, and TH are shown in **Figure 2.13, 2.14**, and **2.15** respectively.

On the other hand, the nutrient concentrations i.e. Nitrate, Sulphate and Phosphate, differ significantly based on geographical location, seasonal changes, and the extent of different influencing factors like

² Tareq M S., Rahaman S M., Rikta Y S., Islam S M N., Sultana M S 2013; Seasonal Variations in Water Quality of the Ganges and Brahmaputra River, Bangladesh; Jahangirnagar University Environmental Bulletin, Vol.2; pages (71-82).

tidal input, agricultural runoff, domestic waste dumping, and industrial pollution (Spencer, 1975³; Kinne, 1984⁴; Gleick, 1993⁵; Rabalais, 2002, and Wetzel, 2001⁶), salinity intrusion etc. However, nitrate sulphate, and phosphate values were found to range between 0.13 mg/l to 7.17 mg/l, 35.95 mg/l to 193.2 mg/l, and 0.004 mg/l to 0.07 mg/l, respectively, during the monitoring period. The Seasonal variations in Nitrate, sulphate, and Phosphate are shown in **Figure 2.17, 2.18, and 2.19** respectively.

Heavy metals are primarily introduced into the environment through human activities. These include manufacturing industries and agricultural practices, which often release heavy metals as pollutants. When pollutants, such as materials, minerals, waste products, and bedload sediments, are discharged, they are transported by water into river systems. Over time, these heavy metals can accumulate in rivers and estuarine environments, potentially affecting aquatic ecosystems and water quality (Gavhane et. al. 2021⁷). During the last monsoon period (45th monitoring), average Arsenic (As) concentrations near the project site and in the Sundarbans Forest ranged from 0.003 mg/l to 0.005 mg/l. Seasonal variations in Arsenic concentration is shown in **Figure 2.20**. Meanwhile, the concentrations of Lead (Pb) and Mercury were found to be <0.01 mg/l and <0.0001 mg/l, respectively, which fully comply with the surface water quality standards stated in ECR, 2023 (A2 of Schedule-2: Coastal Surface Water).

The concentration of oil and grease was found to be less than 2.0 mg/L at all monitoring sites during the last monsoon season. The increase in the number of regulated and non-regulated mechanized vessels used for various purposes like cargo and human transport could be responsible for the high levels of oil and grease. Additionally, the indiscriminate discharge of bilge water (oil and grease mixed water) by non-regulated mechanized boats, especially during seasonal fishing at sea, contributes to river water contamination. Overall, vessels certified by the International Maritime Organization (IMO) adhere to all applicable regulations them. Over the years, COD was found higher in pre- monsoon, followed by winter, characterized by low rainfall that increases organic matter density. During monsoon, higher discharge dilutes COD, lowering its concentration in the post- monsoon. Seasonal variations in COD concentration is shown in **Figure 2.16**.

PAH, TC and TOC

During the last monitoring (monsoon), the PAHs was undetectable near the Project jetty site, Harbaria and at the Hiron point. It indicates that there were no PAHs pollution until now in the Passur-Sibsa RS. On the other hand, Total Carbon (TC) includes Dissolved Inorganic Carbon (DIC), Dissolved Organic Carbon (DOC), and Particulate Carbon. During the monitoring period, TC values ranged from 1.09% to 2.38%, indicating high productivity and carbon sequestration capacity. The concentrations are relatively high for aquatic environments, likely due to intensive decomposition of mangrove leaf litter and the export of organic acids from the sediment into the water column. The 2.38% peak probably reflects a high concentration of tannins and humic substances leached from mangrove roots (Rhizophora). It is clear that the pH buffer helps protect local marine life from acidity fluctuations

3 Spencer, C., 1975. The micronutrient elements. In: Riley, J.P., Skirrow, G. (Eds.), Chemical Oceanography, vol. II, seconded. Academic Press, London.

4 Kinne, O. (Ed.), 1984. Marine Ecology. John Wiley and Sons, London.

5 Gleick, P.H. (Ed.), 1993. Water in Crisis: A Guide to the World Fresh Water Resources. Oxford University Press, New York.

6 Wetzel, R.G., 2001. Limnology, 3rd ed. Academic Press.

7 Gavhane, S., Sapkale, J., Susware, N., & Sapkale, S. (2021). Impact of heavy metals in riverine and estuarine environment, Research Journal of Chemistry and Environment, 25(5), 226–233.

caused by high microbial respiration rates in tropical mangrove forests.

TOC measures the amount of carbon present in organic compounds within the water column. In mangroves, these values are affected by several factors, such as allochthonous and autochthonous inputs, and blue carbon export. High TOC levels are natural for mangroves; however, excessive levels can cause localized oxygen depletion (hypoxia) as microbes consume oxygen to break down the organic matter. Higher concentrations of TOC (9.99 mg/L) often occur during heavy rainfall (monsoon), when organic matter is "flushed" from the nutrient-rich mangrove sediments into the surrounding estuary. However, all the observed surface water is safe from TOC and TC contaminants so far. All monitoring results are presented in **Tables B23** and **B24** of **Appendix IV**.

Remarks

No significant pH differences were observed, apart from spatial variation in river water. On the other hand, salinity levels were seen highest in the pre- monsoon season, followed by winter, with the lowest during monsoon and post- monsoon. Similarly, higher DO levels were also observed during monsoon and post- monsoon seasons, which may result from air mixing during heavy rain, rainfall-driven currents, and increased freshwater input. Similarly, TDS tends to increase during the pre-monsoon and winter seasons, possibly due to reduced rainfall and upstream flow, leading to less dilution (Izonfuo and Bariweni, 20018). Minerals from the Bay of Bengal could also contribute to higher TDS during these seasons. Similar patterns were noted for total hardness (TH) and total suspended solids (TSS).

Likewise, tidal interactions cause nitrate and sulfate levels to be higher in seawater and coastal rivers, supported by data showing increasing concentrations from downstream to upstream. These nutrient levels may result from natural mudflat efflux or human activities like agriculture and sewage discharge, with tidal cycles. The fluctuations are evident during monsoon and pre- monsoon, as freshwater runoff from agriculture, surface activities, cities, and wetlands modifies nutrient concentrations. Oil and grease levels remained below 2.0 mg/l across sites, surpassing the natural or reserved area limit of 0.01 mg/l but within the industrial limit of 5.0 mg/l. Higher levels of oil and grease in the Sundarbans may be attributed to bilge water discharges from unregulated vessels. In addition, cargo ships, passenger launches, tourist vessels, naval ships, and fishing trawlers that operate locally could contribute to this excessive oil and grease in the river water.

Status of the Groundwater Quality

In-situ tested parameters

The in-situ test results obtained up to the 46th quarterly monitoring period (October 2025: post-monsoon season) are described below

pH and Temperature

The pH and temperature values of groundwater at the monitoring sites were found to meet the drinking water quality standards set by ECR 2023 (6.5-8.5 for pH and 20-30°C for temperature). During the 46th monitoring period, pH values ranged from 7.86 to 8.1, while temperatures were recorded between 28°C and 30°C. No significant differences were observed compared to previous results from the same seasons. The temperature remained relatively consistent with data from past seasons of the same quarter. However, the seasonal variations in pH and temperature, as observed up

8 Izonfuo W. A and. L Bariweni 2001.The effect of urban runoff water and human activies on some physicochemical parameters of the Epie creek in the Niger Delta. J. Appl. Sci. & Enviro. Mgt, 5(1): 4755.

to the 46th monitoring cycle, are shown in **Figure 2.21** and **Figure 2.22**, and the datasets are available in **Table B.17** of the **Appendix IV**.

Salinity and Dissolved Oxygen (DO)

Over time, groundwater salinity steadily increased. High groundwater extraction, salinity intrusion, and the percolation of saline water are likely key factors contributing to the rising salinity levels in the groundwater. During the monitoring period, salinity ranged from 0.1 ppt to 0.4 ppt. In contrast, the DO level ranged between 2.5 mg/l and 5.72 mg/l during the 46th quarterly assessment. Slightly low DO concentrations in drinking water may only affect taste, but higher DO levels can improve water taste and cause corrosion of supply pipes. Seasonal variations in DO and salinity concentrations are shown in **Figure 2.23** & **Figure 2.24**, and all monitoring results of salinity and DO at the selected sites are included in **Table B.18** of **Appendix-IV**.

Laboratory tested parameters

The laboratory-tested results obtained up to the 45th monitoring period (July 2025, monsoon season) are described as follows:

TDS, TSS, and TH

During the monitoring quarter, the highest TDS value of TDS was recorded near Kapashdanga (690 mg/l), followed by the Rajnagar site (410 mg/l), which was found to be within the permissible limit as per ECR 2023 (1,000 mg/l). Conversely, the TSS concentrations ranged from 1.0 mg/l to 7 mg/l at all monitoring locations, which is also below the allowable limit for Drinking Water in Bangladesh (TSS: 10 mg/l, ECR 2023). Additionally, the TH concentrations at the three monitoring sites varied from 130 mg/l to 150 mg/l, with the maximum value found at Project site followed by the Rajnagar. This higher concentration of TH might be due to groundwater salinity intrusion and weathering of Ca²⁺ bearing minerals in the aquifer. The seasonal variation of TDS, TSS, and TH are shown in **Figure 2.25**, **Figure 2.26** & **Figure 2.27**, and the observed datasets are attached in **Tables B.17**, **B.19**, and **B.20** of the **Appendix IV**.

Chemical Oxygen Demand, Nitrate, Sulphate, and Phosphate

During the last monitoring period (monsoon) the COD values were found to range from 4 mg/l to 8 mg/l. The primary cause of the increasing COD during the monsoon in the monitoring areas might be the rise of organic or inorganic compounds or ions in the groundwater, like domestic sewage and industrial discharge (Elumalai et al., 2020⁹, Sehar et. al., 2011¹⁰). On the other hand, the Nitrate (NO₃⁻) values ranged from 0.3 mg/l to 4.1 mg/l during the last monsoon period. The maximum value (4.1 mg/l) was recorded at Project site but found within the permissible limit as per ECR 2023 (45 mg/l) during the monitoring period. Similarly, SO₄²⁻ concentrations also complied with the Bangladesh Standard for Drinking Water Quality standard e.g., 250 mg/l. The observed results ranged from 0.48 mg/l to 14.90. mg/l in the monitoring sites. The concentrations in the monitoring wells never exceeded the limits during any of the monitoring periods. On the other hand, PO₄³⁻ concentrations varied between 0.41mg/l and 1.32 mg/l during the last monsoon monitoring period. However, the PO₄³⁻ concentrations displayed minor spatial and temporal variations. The seasonal variations in the Nitrate, Sulphate, and Phosphate are depicted in **Figure 2.28**, **Figure 2.29**, **Figure 2.30** and **Figure**

9 Elumalai, Dr & Natarajan, Rajmohan & Anbazhagan, Siddan. (2020). Monsoon impact on groundwater chemistry and geochemical processes in the shallow hard rock aquifer. CATENA. 195. 104766. 10.1016/j.catena.2020.104766.

10 Sehar, Shama & Naz, Iffat & Ali, Muhammad & Ahmed, Safia. (2011). Monitoring of Physico-Chemical and Microbiological Analysis of Under Ground Water Samples of District Kallar Syedan, Rawalpindi-Pakistan. Research Journal of Chemical Sciences. 1. 24-30.

2.32. The observed datasets are attached in **Table B.22** of **Appendix IV**.

Arsenic (As), Lead (Pb), and Mercury (Hg)

According to Bangladesh Standard (ECR 2023), the maximum acceptable concentration of Arsenic (As) in groundwater is 0.05 mg/l. During the last monsoon season, the concentrations among all monitoring locations ranged between 0.001 mg/l and 0.053 mg/l. The exceedance in As concentration might be due to two different mechanisms: oxidation of arsenic-rich pyrite by atmospheric oxygen introduced into groundwater due to lowering the water table (Das et al., 1996), and the reduction of iron oxyhydroxide by organic matter. Lead (Pb) and Mercury (Hg) concentrations were also measured, and the values were found within the permissible limit specified in ECR 2023 (0.01 mg/l for Pb and 0.001 mg/l for Hg).

Remarks

During the 46th quarterly monitoring period, the groundwater pH and the temperature showed no significant seasonal changes compared with the datasets of the previously monitored data of the same seasons. Dissolved oxygen levels fluctuated between 2.5 mg/l and 5.72 mg/l. Gradual salinity increases were observed at all sites. Total dissolved solids (TDS) peaked at 690 mg/l in the Rajnagar area but remained within ECR 2023 limits, while total suspended solids (TSS) were low (1 mg/l to 7 mg/l), also compliant. Total hardness ranged from 130 mg/l to 150 mg/l, likely due to mineral weathering and groundwater extraction. Chemical oxygen demand (COD) concentrations were found to be high. Likewise nitrate, Sulfate, and phosphate levels stayed within standards too as per the ECR 2023. Arsenic levels (0.001–0.053 mg/l) complied overall, though they exceeded limits in some seasons. Lead and mercury concentrations remained within permissible limits, found at <0.01 mg/l and <0.0001 mg/l, respectively.

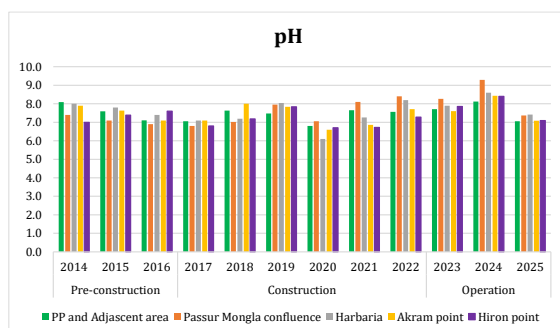


Figure 2.10: Seasonal variations in pH concentrations

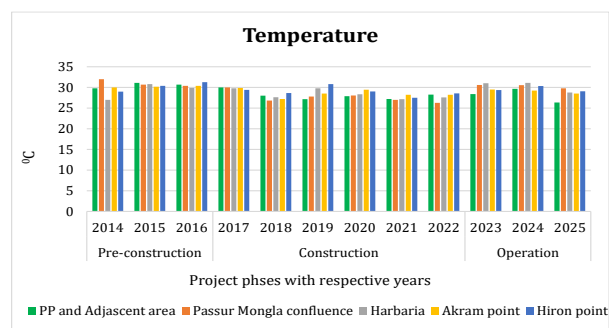


Figure 2.11: Seasonal variations in Temperature

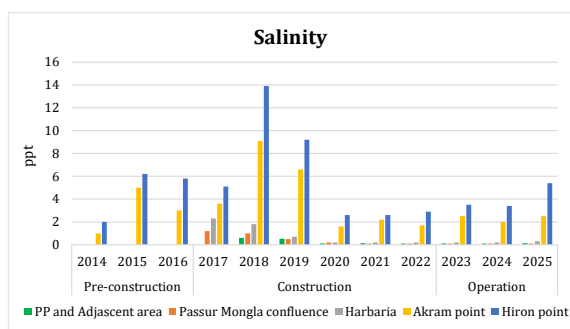


Figure 2.12: Seasonal variations in Salinity concentrations

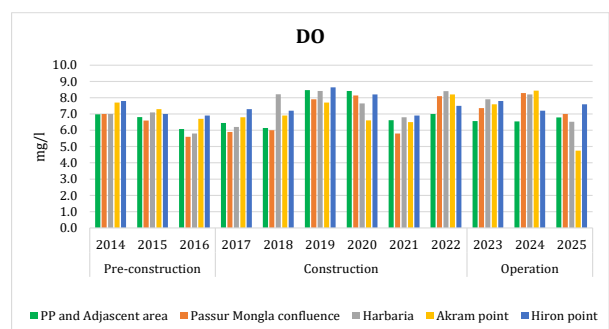


Figure 2.13: Seasonal variations in DO concentrations

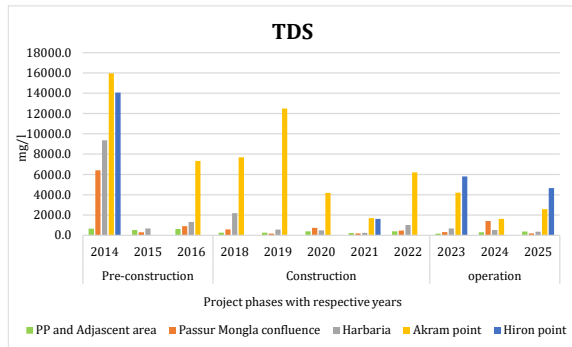


Figure 2.14: Seasonal variations in TDS concentrations

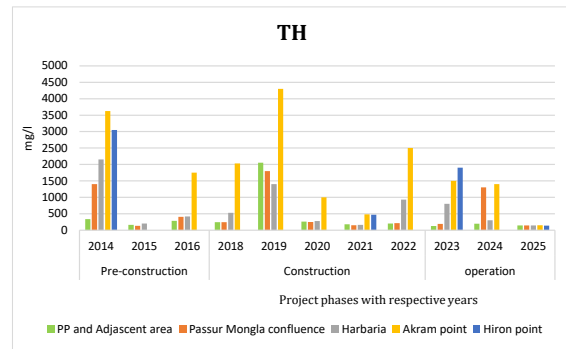


Figure 2.15: Seasonal variations in TH concentrations

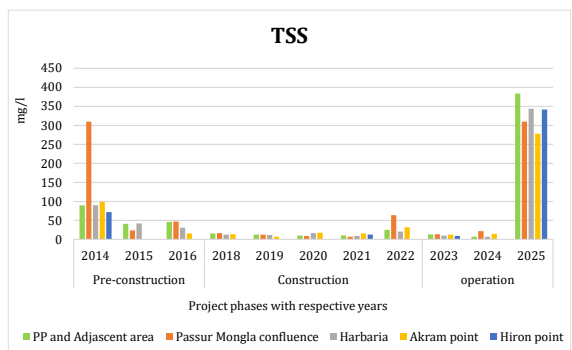


Figure 2.16: Seasonal variations in TSS concentrations

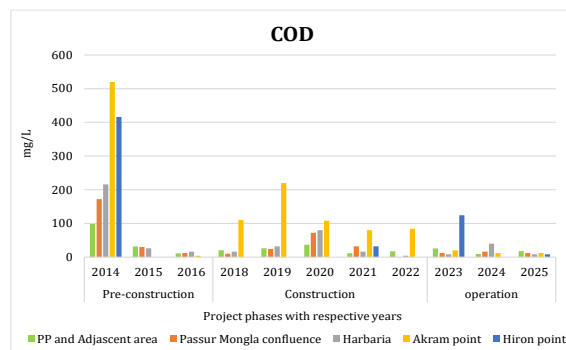


Figure 2.17: Seasonal variations in COD concentrations

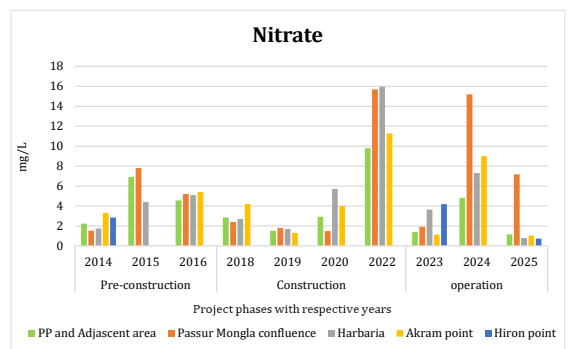


Figure 2.18: Seasonal variations in Nitrate concentrations

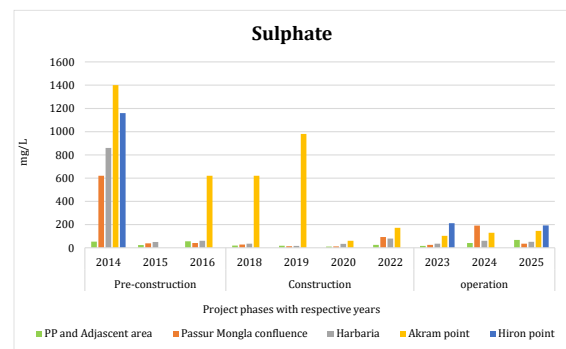


Figure 2.19: Seasonal variations in Sulphate concentrations

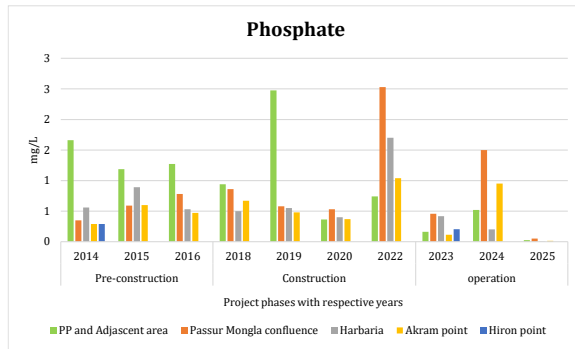


Figure 2.20: Seasonal variations in Phosphate concentrations

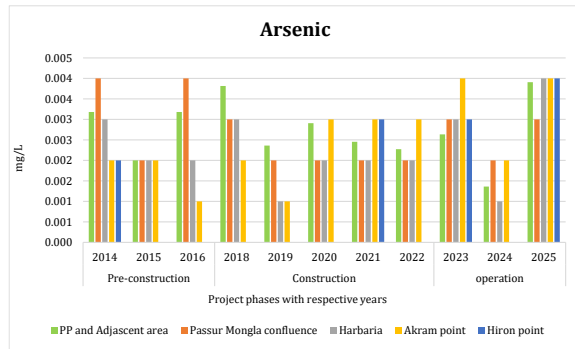


Figure 2.21: Seasonal variations in Arsenic concentrations

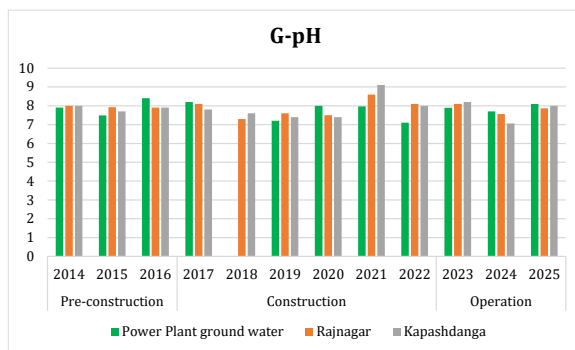


Figure 2.22: Seasonal variations in G-pH concentrations

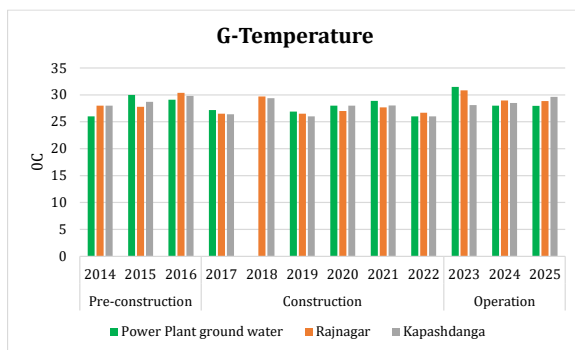


Figure 2.23: Seasonal variations in G-Temperature

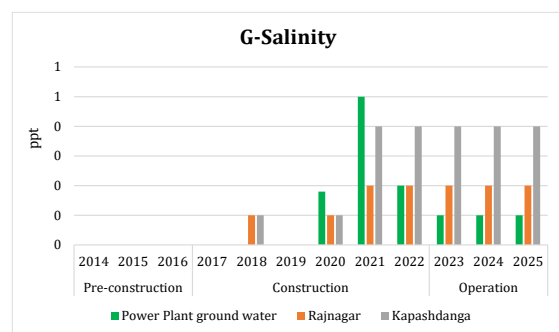


Figure 2.24: Seasonal variations in G-Salinity concentrations

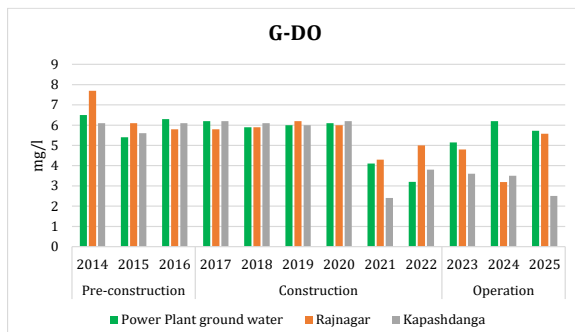


Figure 2.25: Seasonal variations in G-DO concentrations

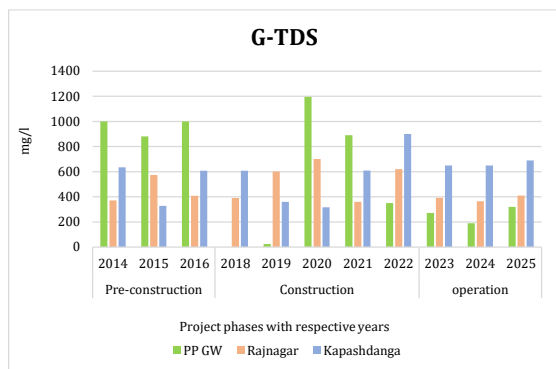


Figure 2.26: Seasonal variations in G-TDS concentrations

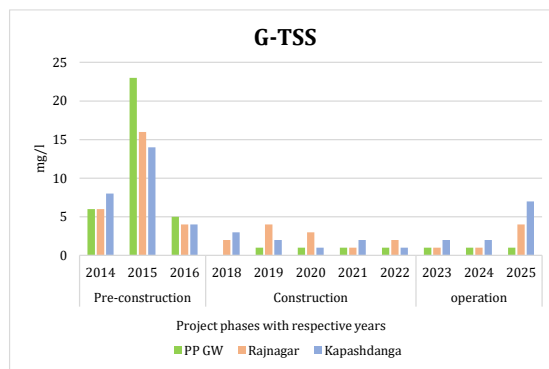


Figure 2.27: Seasonal variations in G-TSS concentrations

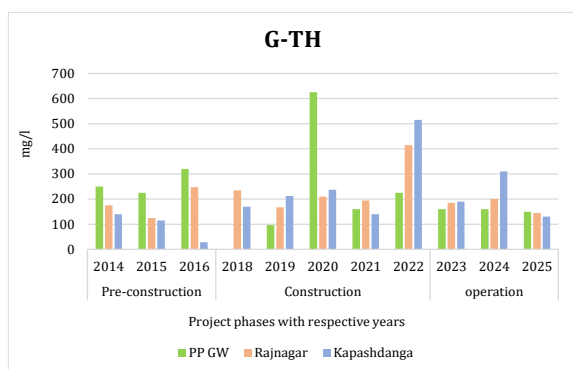


Figure 2.28: Seasonal variations in G-TH concentrations

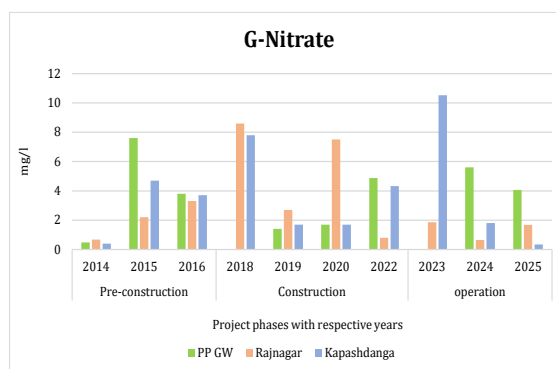


Figure 2.29: Seasonal variations in G-Nitrate concentrations

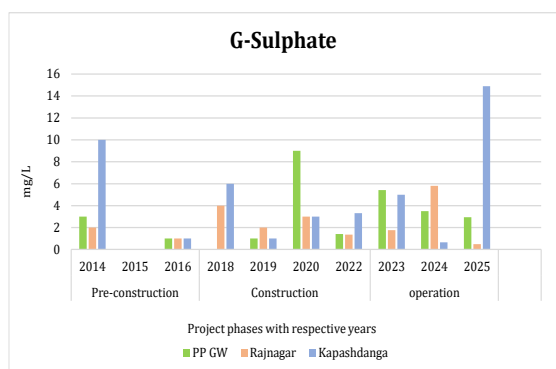


Figure 2.30: Seasonal variations in G-Sulphate concentrations

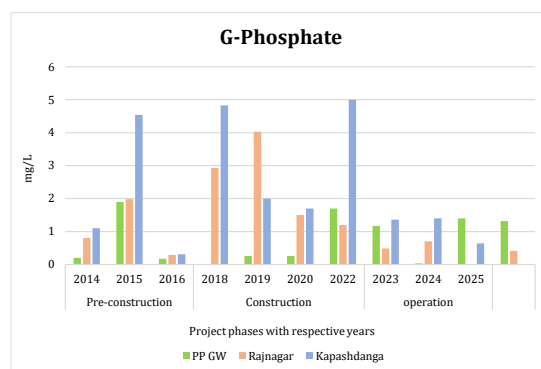


Figure 2.31: Seasonal variations in G-Phosphate concentrations

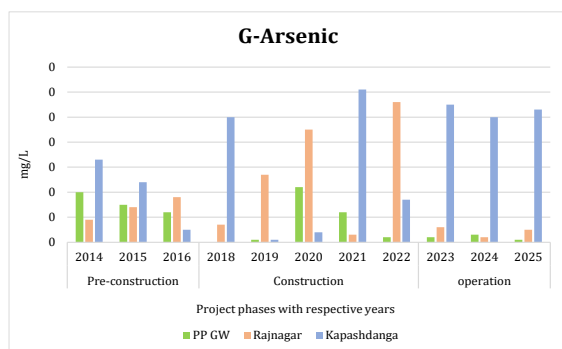


Figure 2.32: Seasonal variations in G-Arsenic concentrations

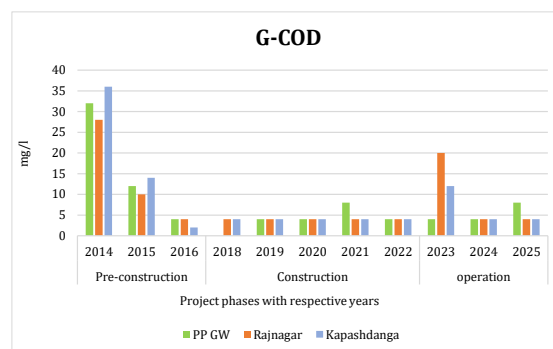


Figure 2.33: Seasonal variations in G-COD concentrations

2.5 Land and Agricultural Resources Monitoring

Monitoring of selected indicators is very crucial for better management of land resources in the study area. Plot/land use, soil fertility/nutrient status, soil contamination with heavy metals, and soil salinity have been considered major indicators for land resource monitoring. Before that (during the pre-construction and construction stages), only natural phenomena alter soil parameters.

2.5.1 Sampling Frequency

The frequency of monitoring for land resources data collection has been considered twice a year. Accordingly, the soil samples are collected during this monitoring (46th monitoring) field visit and sent immediately to the SRDI laboratory for analysis. The analysis data will be incorporated into the next monitoring report.

Location

The selected mauzas are Baranpara of Batiaghata Upazila, Chunkuri-2 of Dacope Upazila, Kapalirmet of Mongla Upazila, Chakgona, and Basherhula of Rampal Upazila. **Table 2.8** states the sampling locations with their corresponding coordinates. The locations of collected soil samples are presented in **Figure 2.33**.

Table 2.8: Land Resources Monitoring Plan

Site No.	Location	Coordinates		Sampling Frequency	Methods/Tools/ Techniques/parameters
		Northing	Easting		
1	Baranpara, Batiaghata; Khulna	22°37'57.0"	89°30'59.1"	Half yearly (April and October)	In situ field sampling and Laboratory Testing in SRDI (Plot use, Soil fertility, and nutrient, Chemical properties of soil (pH, Pb, Cd), Crop production, and damage)
2	Chunkuri-2, Bajua; Dacope, Khulna	22°34'51.0"	89°32'20.0"		
3	Kapalirmet, Mongla; Bagerhat	22°32'18.9"	89°36'8.8"		
4	Chakgona, Rampal, Bagerhat	22°34'18.3"	89°34'25.3"		
5	Basherhula, Rampal, Bagerhat	22°36'14.0"	89°34'25.0"		
6	Bidyarbon, Mongla, Bagerhat	22° 33'42.0"	89°34' 40.0"		

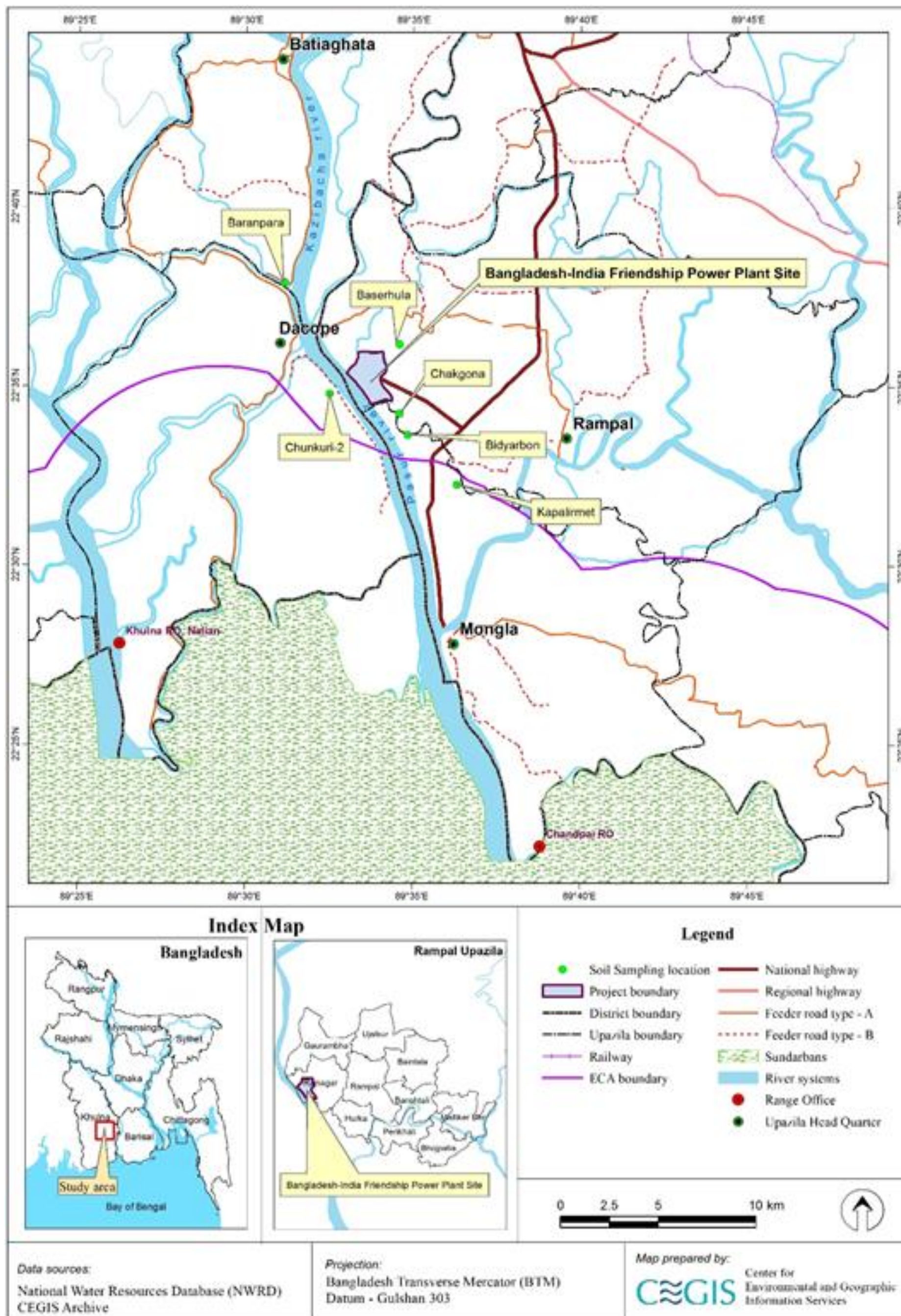


Figure 2.34: Land and agricultural resources monitoring locations

2.5.2 Monitoring Indicators

The continuous monitoring has given an opportunity to observe seasonal change along with spatial change of selected indicators of sampling plots. The selected indicators are soil reaction (pH), soil salinity (EC), Organic matter (OM), base cations-Ca, Mg, K and Na, status of macro nutrients (N, P and S), status of micro nutrients (B, Fe, Mn and Zn) and presence of heavy metals (Pb and Cd). Sodium absorption ratio (SAR), exchangeable sodium percentage (ESP) can be calculated from the analysed data. It can also be mentioned that the structural change of soils in the sampling plots may also be identified from these data. The formula to calculate SAR is given below, with concentration expressed in milli equivalents per liter (meq/L) analysed from a saturated paste soil extract.

ESP is the sodium absorbed on soil particles as a percentage of the Cation Exchange Capacity (CEC). It is calculated as

$$SAR = \frac{[Na^+]}{\sqrt{\frac{1}{2}([Ca^{2+}] + [Mg^{2+}]})} \quad \text{and} \quad ESP = \frac{[Na^+]}{CEC} \times 100$$

CEC is often estimated as the major exchangeable cations, including hydrogen. Both cation and CEC are expressed as meq/100g. ESP can also be calculated as:

$$ESP = \frac{[Na^+]}{[Ca^{2+} + Mg^{2+} + Na^+ + K^+]} \times 100$$

ESP is used to characterise the sodicity of soils only, whereas SAR applies to both soil and soil solution or irrigation water

2.5.3 Process of Soil Sample Collection

Plot Selection

Monitoring plots were selected at the very beginning of this study. The expert's judgment, along with the plot owner's opinion, was taken into consideration for this selection. Upazila Agriculture Officers of Batiaghata and Dacope of Khulna, Rampal and Mongla of Bagerhat District and Senior Scientific Officer of Soil Resource Development Institute (SRDI) of Khulna were contacted for collecting expert's judgement. Wind speed and wind direction were considered as potential local factor for the monitoring purpose. All the selected plots were characterized as medium high land (F₁), which are normally flooded in the range of 30-90 cm and remain inundated for more than two weeks to few months during the flood period.

Soil Samples Collection

Standard procedure was maintained during the collection of soil samples. In each plot, a minimum of 3 pits were dug with an auger to collect a composite sample. Each plot had three composite samples: top soil (0-15 cm), subsoil (15-30 cm) and substratum (30-45 cm). Soil samples were preserved in an air-tight plastic bag for laboratory analysis.

Laboratory Analysis

Collected soil samples have been handed over to the SRDI, Dhaka, for laboratory analysis. The analysis data and report are incorporated into the next monitoring report.

2.6 Agriculture Resources Monitoring

Monitoring of agriculture resources has been scheduled twice a year, as per the ToR's monitoring plan, and the survey was conducted in October 2025. Data on agricultural practices (Production, damage, input use, etc.) were collected through informal interviews (KII, RRA, and FGD) with local farmers in the monitoring area.

2.6.1 Methodology

Locations

The agricultural monitoring locations are the same as the soil sampling locations, as presented in **Table 2.4**.

Monitoring Indicators

For data collection, six sampling plots were selected at random within the project influence area during the construction-phase monitoring. The mauzas selected for land resources monitoring were also considered for agricultural resource monitoring.

During 46th quarterly visit, consultations and group discussions were organized with local people to know the use of agricultural inputs, present cropping patterns by land type, crop damages and other conditions like drainage congestion/water logging, salinity intrusion or other natural calamities induced impacts, diseases and pest infestation as well as management practices and crop production in the selected locations of the monitoring area

2.6.2 Present Cropping Patterns of Monitoring Plots

Detailed data on this year's cropping pattern were obtained through discussions with the plot owners. Based on the discussions, the plot-based cropping patterns were identified, and the associated data were collected in October, 2025 and described in the following sections.

Agriculture Plot-1 (Baranpara)

This plot is located at Baranpara mauza and the area is about 0.4 hectare. The farmers have been cultivating HYV rice rather than local varieties for the past couple of years. Due to satisfactory growth, the farmer didn't use any chemical fertilisers or pesticides. The cropping practice and management practice remain the same as the previous monitoring. The detailed cropping pattern is shown in **Table E.2 of Appendix IV**.

Agriculture Plot-2 (Chunkuri-2)

This monitoring plot is located at Chunkuri-2 and the size of the plot is about 0.93 hectare. This year, Local Aman was found to be cultivated in this plot in Kharif-II season. No chemical fertilizers were applied in this plot. The cropping practice and management practice remain the same as in the previous monitoring. A detailed cropping pattern has been shown in **Table E.2 of Appendix IV**.

Agriculture Plot-3 (Kapalirmet)

This monitoring plot is located at Kapalirmet and the size of the plot is 0.14 hectare. During the 1st monitoring period of pre-construction phase, it was found to be cultivated, but later on, this plot remained fallow from the 2nd and 3rd monitoring program due to increase in salinity. According to the opinion of the local people, Bangladesh Water Development Board (BWDB) decided to re-excavate the Ghona River and hence they had to remove all the obstacles to facilitate the re-excavation of the Golbunia khal mouth. Then the saline water was allowed to enter the settlement areas, including their

cultivated plots, during the year 2014-15 and remained inundated by saline water. As a result, farmers started practicing shrimp culture instead of cultivating traditional crops in these plots. However, a number of farmers tried to cultivate crops in their plot in this adverse condition, but all crops were actually damaged due to the above-mentioned fact.

Owners of Shrimp farms of this area used the saline water in these plots for shrimp culture as there was no scope to drain out saline water from this area. The situation is still not in farmers' favour. Farmer of this land decided that they would not cultivate crops in future due to increase in salinity. Rather they would only practice the shrimp culture in future. During the recent monitoring period, the plot remained fallow and used for shrimp cultivation. Detailed information for this plot is presented in Table E.2 of Appendix IV.

Agriculture Plot-4 (Chakgona)

This monitoring plot is located at Chakgona and the size of the plot is 0.14 hectare. Local Aman (Chapsail) was found in the field during field visit where no chemical fertilizer was used (Table E.2 of Appendix IV).

Agriculture Plot-5 (Basherhula)

This monitoring plot is located in Basherhula and the size of the plot is 0.47 hectare. HYV Aman is cultivated instead of Local Aman (Chapshail) during this year. But due to salinity intrusion, damage was evident. The cropping practice and management practice remain same as the previous monitoring. However, detailed cropping pattern is shown in **Table E.2 of Appendix IV**.

Agriculture Plot-6 (Bidyarbon)

The size of the plot is 0.1 ha. This year the farmer used for cultivate local Aman (Chapshail). Farmer use urea for the growth of rice but no other fertilizer or pesticides are used here. Detailed cropping pattern is shown in **Table E.2 of Appendix IV**.

2.6.3 Crop Production in Monitoring Plots

Crop production information will be collected after harvesting in April 2026. For this reason, crop production details will be incorporated in the 48th quarterly monitoring report.

2.6.4 Crop Damage in Monitoring Plots

Crop damage information will be collected after harvesting in April 2026. For this reason, crop damage details will be incorporated in the April 2026 report (48th QMR).

2.7 Livestock Resources Monitoring

2.7.1 Methodology

Monitoring Indicators

The frequency of monitoring for livestock resource data collection was set at twice a year. During the 46th quarterly visit, consultations and group discussions were organized with local people to know the status of feed/fodder and diseases of livestock in the adjacent of the project area. The data on livestock status was collected in October, 2025 and described in the following sections.

2.7.2 Feed/Fodder condition of Livestock Resources

The overall feed and fodder situation remains unchanged. Farmers in the sampled areas continue to report a shortage of fodder. Grazing land is shrinking gradually due to the commercial use of land by private organizations, making livestock farming increasingly challenging in these areas. However, this issue is not directly linked to the power plant, as the land required for the plant has already been designated and acquired, with no remaining disputes.

2.7.3 Diseases of Livestock Resources

Diseases of livestock/poultry remain similar to the previous monitoring periods. According to the Veterinary Surgeon (VS) of Rampal Upazila, the courtyard remains unhygienic from July to November, leading to the spread of diseases among livestock and poultry. However, some diseases were also found year-round. The severity of the infestation was reported to be roughly similar in this concurrent circumstance as in past situations. The mortality rate of the livestock/poultry becomes negligible, due to immunization and insemination program run by Department of Livestock.

2.8 River bed material (Sediment) quality monitoring

Monitoring Indicators

The main objective of sediment quality monitoring is to investigate the presence of heavy metal in river bed sediments. To find out the answers a biannual sediment monitoring is being carried out in different sampling points of the study area. The major indicators for monitoring have been considered as heavy metals (As, Pb and Hg), pH and Sulfate.

Location

The sampling locations were selected both in near the project area and inside the Sundarbans Reserve Forest area. The sampling locations are mentioned in following **Table 2.9** and are depicted in **Figure 2.35**.

Table 2.9: Location and Sediment Monitoring Plan

Site No	Monitoring Indicators	Location	GPS (Decimal Degree)		Sampling Frequency	Methods/Tools /Techniques
			Northing	Easting		
1	Heavy metals (Arsenic-As, Mercury-Hg, Lead-Pb); pH and Sulfate (SO ₄)	Project Site	N-22°35'21.2"	E-89°32'53.4"	Bi-yearly (January and July)	Laboratory Testing at BCSIR
2		Maidara River	N-22°34'33.4"	E-89°33'38.8"		
3		Mongla Port	N-22°30'57.1"	E-89°35'0.3"		
4		Harbaria	N-22°17'44.2"	E-89°32'53.4"		
5		Akram Point	N-22°01'07.6"	E-89°30'34.4"		

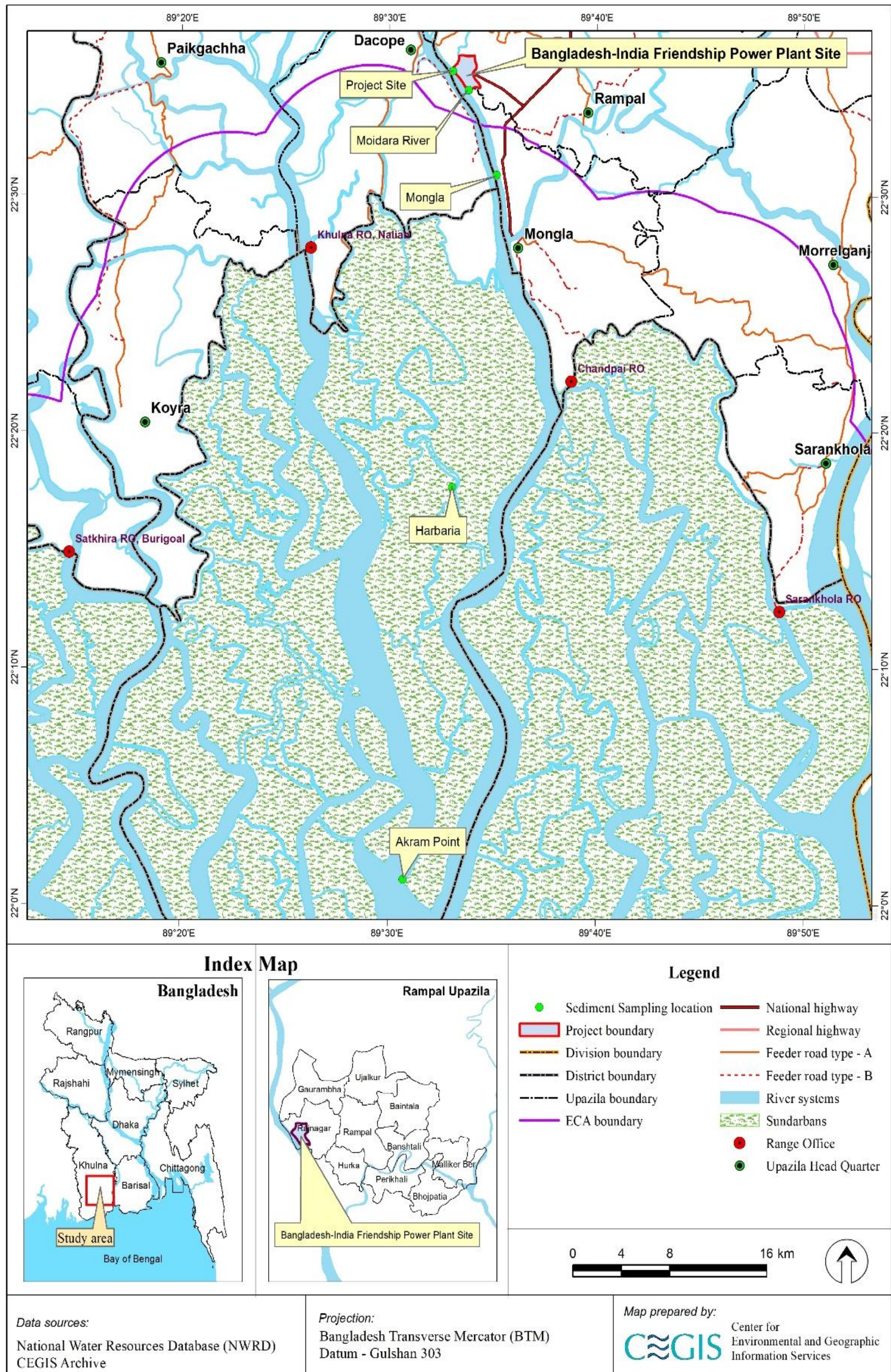


Figure 2.35: Sediment sampling locations

2.8.1 Process of Sediment Samples Collection

Plot Selection

The sampling locations were designated based on the potential coal transshipment points along the coal transportation route. The jetty site and the Maidara River are situated near the power plant area while Harbaria and Akram points are inside the Sundarbans area where the coal transportation will be carried out.

Sediment Samples Collection

Standard procedures as well as proper chain of custody were followed during the collection of sediment samples. At least three replications were taken to ensure composite samples. Sediment samples were preserved in an air-tight plastic bag for laboratory analysis.

Sampling frequency and Laboratory Analysis

Sediment samples are collected twice a year. Dry season samples are taken in January during the field visit, and wet season samples are taken in July as per the scope of works. Accordingly, the wet-season 2025 sample was collected in July 2025 during the 45th monitoring field visit. Laboratory data analysis of the 2025 wet season is incorporated into this section of report.

2.8.2 Status of sediment quality of the Passur River

Arsenic concentration showed an overall increase at all the locations as compared to the previous wet season survey. Lead (Pb) concentrations have increased in the project site, Maidara and Harbaria, while decreasing in the rest. Mercury (Hg) concentrations increased at the project site, Maidara, and Akram Point, while decreasing at the rest. The maximum concentration for Pb and Hg is found in the Maidara river, while Arsenic (As) recorded its maximum level in Harbaria. In contrast, the Jetty site showed the lowest levels of arsenic and lead, while the lowest mercury concentration was observed at Harbaria.

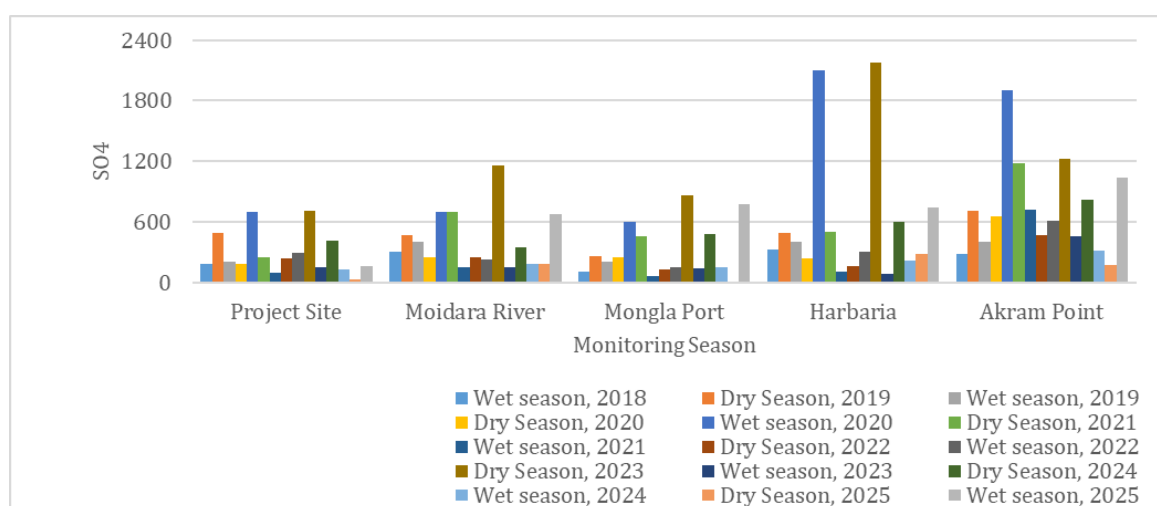
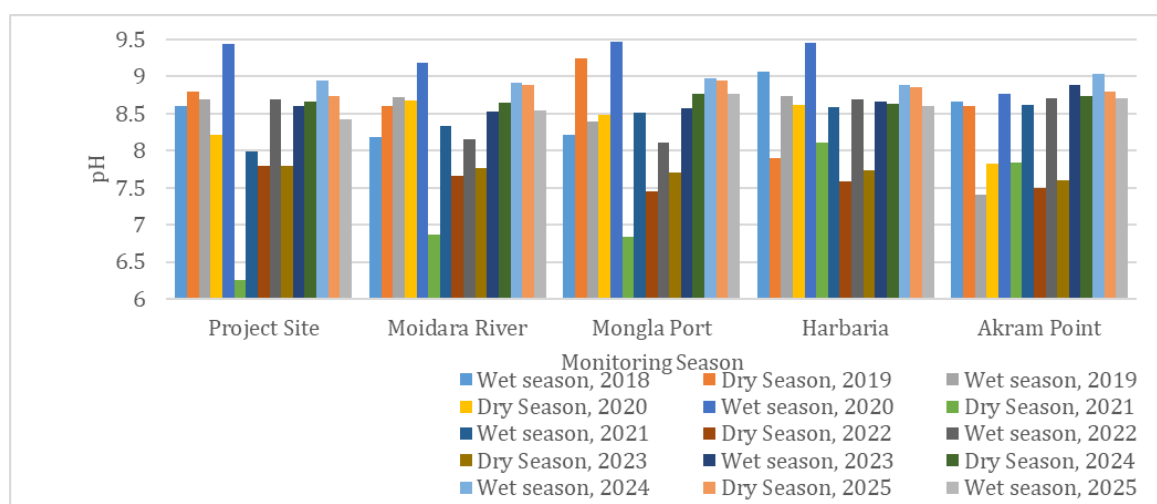
According to the laboratory data, Mercury (Hg) didn't cross the average shale value (ASV) (**Marowsky and Wedepohl, 1971**) but crossed the average upper crust value (AUCV) (**Rudnick and Gao, 2014**) at all sampling locations. Regarding Lead (Pb) concentration, it remains lower than ASV and AUCV at all the monitoring locations. Regarding Arsenic (As) concentration, levels remain within ASV and AUCV at all locations except Harbaria, where the element's concentration exceeds AUCV but remains within ASV. As and Pb values found within the stated limits, even in published reports (Ali *et al.*, 2018). The average concentrations of As, Pb, and Hg during this monitoring are 4.53, 8.05, and 0.87 ppm, respectively. All concentrations are higher than the previous wet season average. Previous monitoring data is incorporated in **Figure 2.36**.

Table 2.10: Reference level of different metals in sediment of the Passur River

Sl No.	Name of Heavy metal	Average upper crust concentration (ppm)	Average Shale Value (ppm)	Average heavy metal content in the Passur River in ppm (Ali <i>et al.</i> , 2018)	
				Summer	Winter
01.	Arsenic (As)	4.8	13	8.87	12.4
02.	Lead (Pb)	17	20	21.9	33.6
03.	Mercury (Hg)	0.05	0.4	-	-

Table 2.11: River bed materials (Sediment) quality at the selected locations of the Passur River

Locations	Parameters				
	pH	SO ₄ (mg/kg)	As (mg/kg)	Pb (mg/kg)	Hg (mg/kg)
Project Site	8.42	164	4.22	5.44	0.22
Maidara River	8.55	675	4.67	15.1	0.26
Mongla Port	8.76	770	4.25	6.66	0.13
Harbaria	8.6	741	5.13	7.28	0.08
Akram Point	8.71	1038	4.37	5.86	0.18



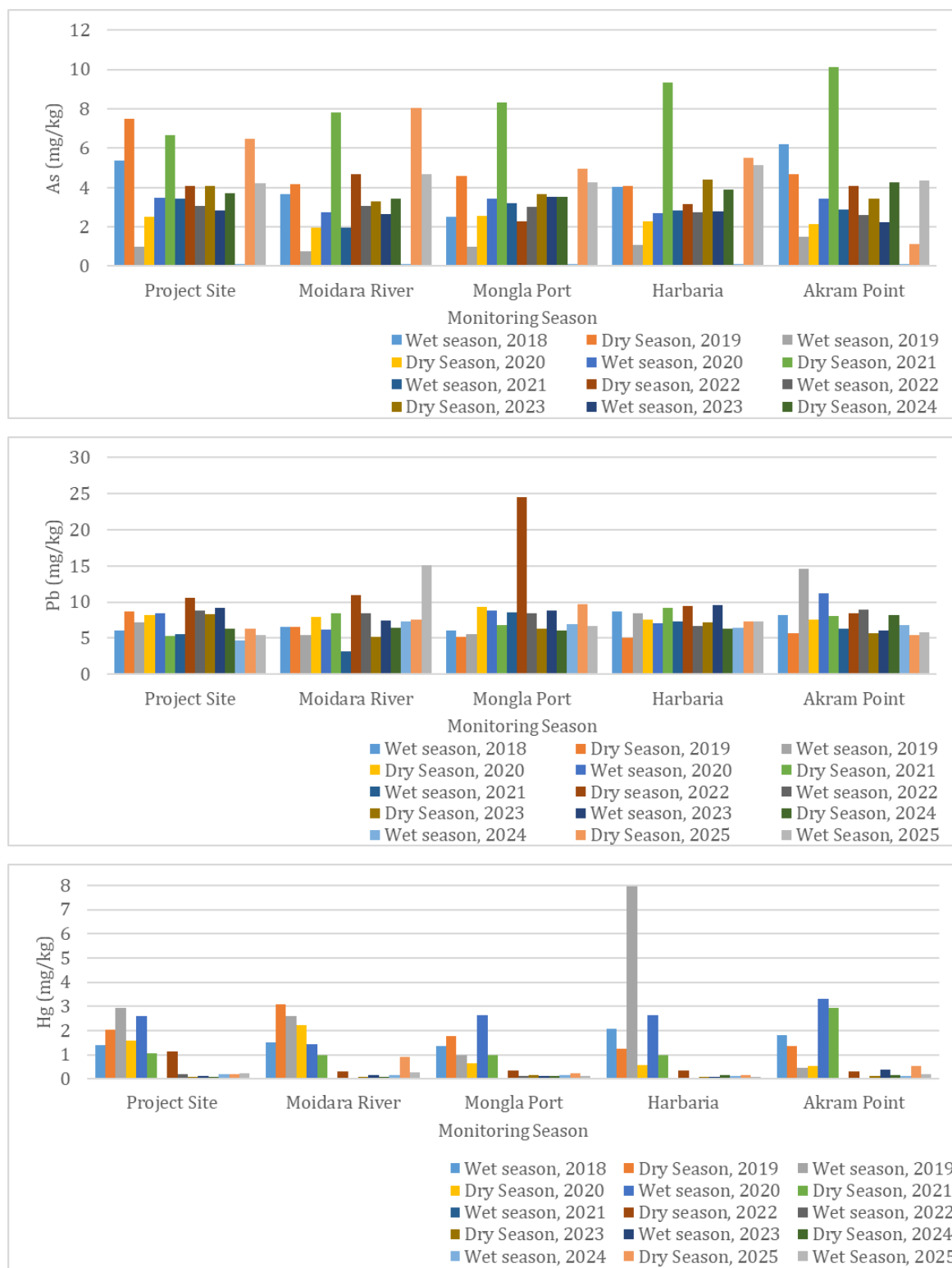


Figure 2.36: Sediment quality for the dry and wet periods at different locations of the Passur River

*Field sample collected by CEGIS and sample analysis in BCSIR in different seasons.

Seasonal and Spatial Variations of Lead

Lead concentrations displayed a strong spatial variability and inconsistent temporal patterns among the monitoring sites (**Figure 2.37**). Lead (Pb) concentrations during the wet season demonstrated considerable spatial variability. The Maidara River showed the most alarming increase, with Pb concentrations increasing from 6.59 mg/kg in 2018 to 15.10 mg/kg in 2025, equivalent to a 129.14% rise. In contrast, the Project Site, Harbaria, and Akram Point displayed declining trends of 9.78%, 16.03%, and 27.92%, respectively. Mongla Port showed a comparatively moderate increase in lead concentration, rising from 6.05 mg/kg in 2018 to 6.66 mg/kg in 2025 (+10.08%). The minimum value was observed in 2019 (5.62 mg/kg), while the maximum concentration occurred in 2023 (8.88 mg/kg).

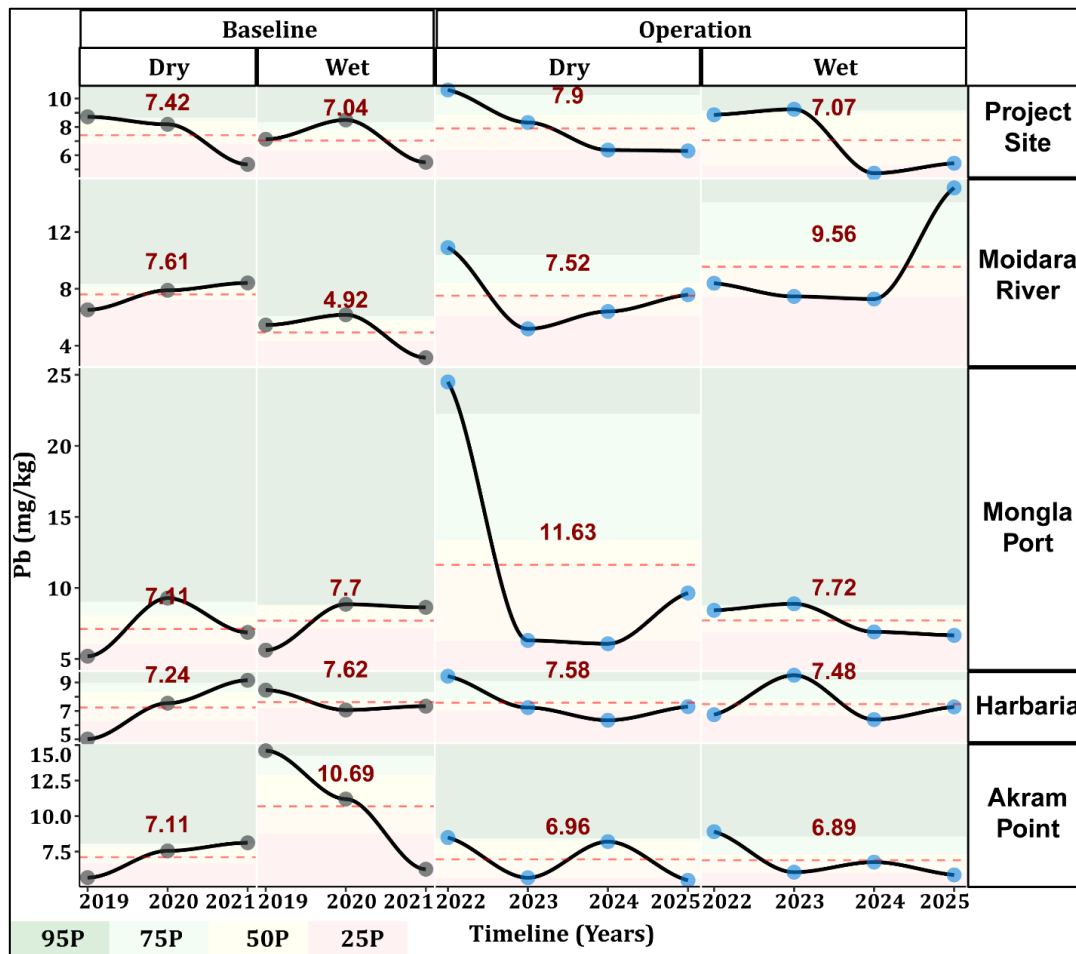


Figure 2.37: Historical concentration trend of lead (Pb) across different sampling sites

Lead Concentration Comparison Across Project Phases

The study also applied Dynamic Factor Analysis (DFA) using the MARSS R package to identify the hidden common trend in lead (Pb) concentration in riverbank sediment across the five (05) sampling sites. Before analysis, the raw data were standardized to unitless Z-scores, allowing direct comparison across sites and seasons on a unified statistical scale. It has been found that only a single DFA model ($m = 1$) is significant in fitting the shared trend, indicating that one underlying “Hidden Trend” has been driving the entire river system’s chemistry. The DFA, moreover, identifies the probable driving forces of the sampling sites on the Pb concentrations in the Passur River system by inferring factor loadings (z) across both seasons and two project phases (Baseline: 2019-2022 and Operation: 2023-2025). It has been found that the river system in the dry season of baseline phase was highly

synchronized where four out of five sites (Maidara, Mongla, Harbaria, and Akram Point) had strong positive loadings (>0.68), indicating that during the baseline period, the dry season Pb concentration levels were primarily driven by a single, powerful regional environmental signal, although an extreme event of 25 mg/kg Pb occurred. However, this synchronized environmental contribution has been broken down during the operational phase, respecting the dry season. The Project Site (-0.59) and Akram Point (-0.17) have been found to be flipped to negative loadings, whereas Maidara River (0.74) and Mongla Port (0.69) remained the synchronized dominant indicators for the common trend (based on the standardized z-score). It indicates that the dry-season dynamics are no longer a simple regional trend and that localized factors have been influencing Pb levels at the Project Site and Akram Point during the dry seasons, decoupled from the central signal.

The DFA identifies the most dramatic shift in Pb concentration during the wet season in the operation phase. While the driving system was fragmented in the baseline, Project Site (0.94), Mongla Port (0.95), and Harbaria (0.91) have become perfectly synchronized in influencing the common Pb trend in the Passur System in the operation phase. These findings suggest that a common driver—likely related to the coal power plant operations or increased shipping—is now the dominant "driver" for Pb across these three industrial hubs during the monsoon. However, the results for Maidara River in the Operation (Wet) phase ($Z = -0.48$) confirm that, while the Project Site, Mongla Port, and Harbaria are all spiking together (positive loadings > 0.9), Maidara River is moving in the opposite direction. This shows that the extreme Pb value observed during the wet season (e.g., 15.1) is site-specific. It suggests that the Maidara River has its own unique driving forces, distinct from the "industrial cluster" of the other three sites mentioned above.

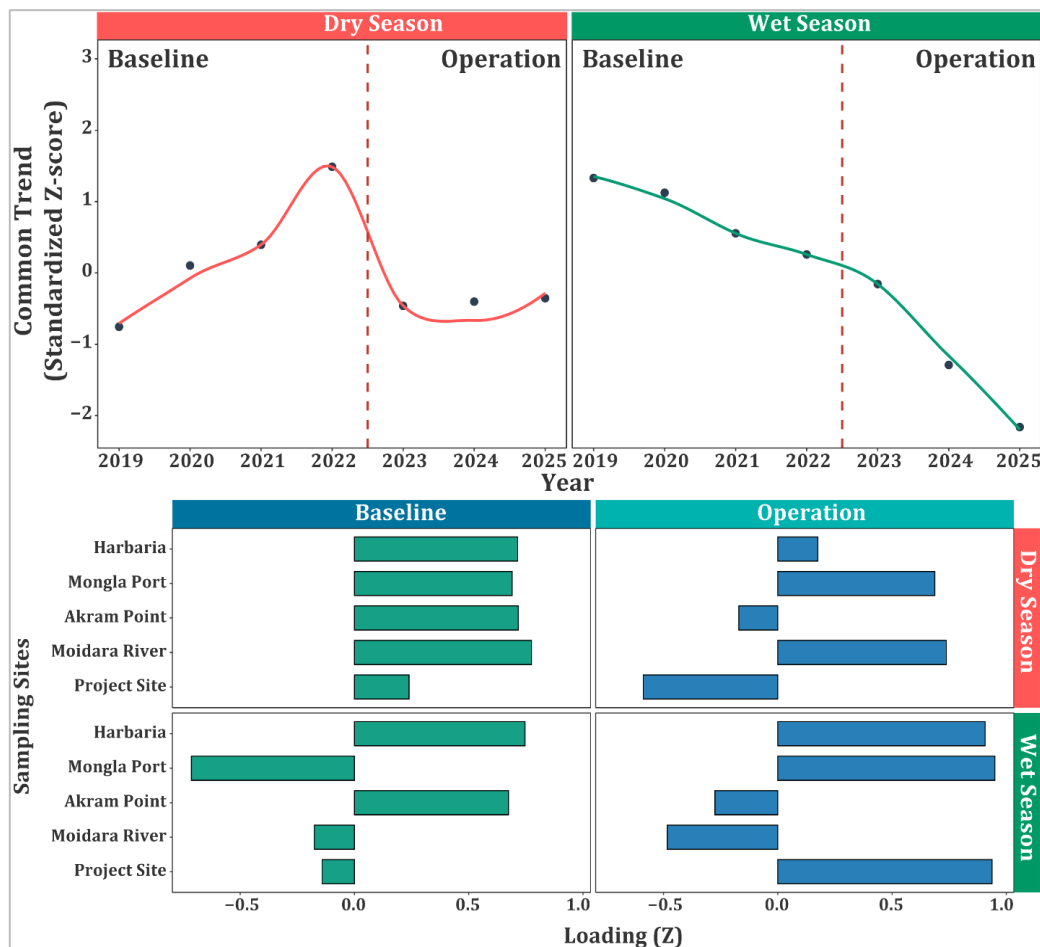


Figure 2.38: Common trend in lead (Pb) concentration in bank-side sediment across the sampling sites

Moreover, the study estimated the deviation of residual (raw) z-score from the standardized z-score to test the residual magnitude, assuming that if a spike's residual is significantly higher than the site's historical average, it is a localized error (outlier); if not, it is a legitimate regional shift (demonstrating that a whole river system plays a crucial role in causing an extreme value of Pb concentration). Two extreme events (24.5 mg/kg during the dry season in 2022 and 15.1 mg/kg during the wet season in 2025) of Pb concentration were evaluated at the Maidara River and Mongla Port, respectively (**Figure 2.37**). While a raw increase was observed, residual analysis (2025 Pb Residual = 0.48, which is only 1.18 times more variable rather than 3 to 5 times) confirmed that this value remains consistent with the latent trajectory (Historical Mean Residual = 0.41). It indicates that the Pb extreme event at the Maidara River during the wet season in 2025 is not a localized statistical outlier but a site-specific environmental response to a broader regional shift in aquatic chemical dynamics within the River System.

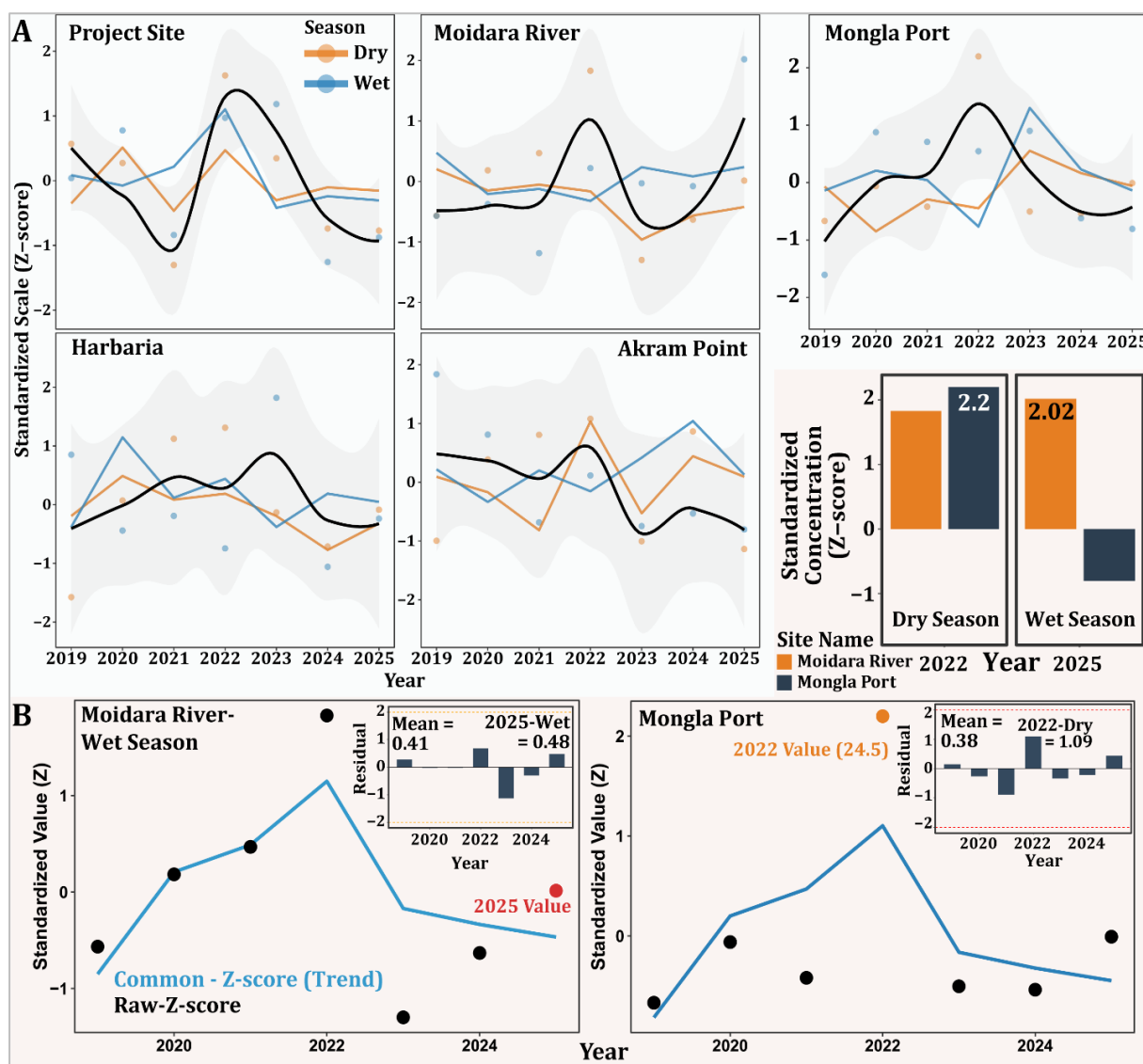


Figure 2.39: Common trend in lead (Pb) concentration in bank-side sediment across the sampling sites

The above two statistical sensitivity analyses, based on the factor loadings of standardized z-scores and residual deviations, thus demonstrate that the Lead (Pb) concentration of 15.1 mg/kg in the Maidara River presents a **“Systemic Paradox”**. While it represents an extreme concentration that

diverges from the industrial cluster's trajectory (negative loading of -0.48), its low residual (0.48) indicates it is mathematically consistent with the regional state-space. Therefore, it is suggested that this extreme Pb concentration be re-monitored more than 3 years from now.

Conclusions

The study analyzed the historical changes in Lead (Pb) concentration in riverbank sediments at different monitoring sites of the Passur River system. The results showed that Pb levels varied significantly across locations and over time. Among all sites, the Maidara River showed the highest increase in Pb concentration from 2018 to 2025, while some other locations showed decreasing trends. Statistical analyses indicated that during recent years, especially in the wet season, certain shipping mooring areas such as the Project Site Jetty, Mongla Port, and Harbaria became strongly connected in influencing Pb levels, possibly due to increased shipping operations and transshipment activities. On the other hand, high tides can significantly increase heavy metal concentrations in river water by pushing seawater upstream to form a denser "salt wedge" and provoke two primary biogeochemical mechanisms like sediment resuspension and salinity-induced desorption (NOAA's National Ocean Service). The denser incoming seawater flows underneath the lighter river water, creating a vertical layer of stratification. This wedge traps pollutants and prevents heavy metals from diluting or dispersing out to river. However, the unusually high Pb concentration observed in the Maidara River appears to be site-specific rather than a random error. The study concludes that this extreme value should be monitored again in future years to better understand the environmental changes in the river system.

2.9 Transportation Monitoring

The traffic survey for this 46th monitoring was conducted from October 31st to November 02nd, 2025 on two weekends and one weekday at three pre-selected locations around the project site. Weather was sunny on the days when the survey was conducted. The selected sites were Khudir Bottola and Gonai Bridge at Khulna Mongla Road and Gonabelai Bridge at Power Plant access road presented in the **Figure 2.34**.

2.9.1 Methodology

Traffic surveys were carried out at three distinct periods (morning - 7:00 AM to 10:00 AM, noon-12:00 PM to 2:00 PM, and evening- 17:00 PM to 19:00 PM) to understand the nature of traffic flow and traffic load on the preselected locations during different phases of the day. Vehicles were categorized based on the available vehicle types around the project area.

2.9.2 Traffic Volume Calculation

The survey results were used to compute the traffic volume of these roads in the Passenger Car Unit (PCU). PCU is a matrix used in Transportation Engineering, to assess traffic-flow rate on roadways. A PCU is essentially the impact that a mode of transport has on traffic variables (such as headway, speed, density) compared to a single car. While calculating the traffic volume in PCU, vehicle conversion factors suggested by the Roads and Highway Department of Bangladesh were used, as mentioned in **Table 2.12**.

Table 2.12: Factors Used for PCU Calculation

Vehicle type	Factor
Bus	2.5
Minibus/Truck	2

Car/Microbus/Zeep	1
CNG	0.5
Rickshaw/Auto Rickshaw	0.8
Tempo/Human hauler	0.6
Motorcycle	0.3
Bicycle	0.2
Push Chart	4

Source: Roads and Highway Department, Bangladesh

2.9.3 Results of Monitoring

The summary results of vehicular movements at three different locations in **Table 2.13** show that, according to the Passenger Car Unit (PCU) per hour, the Khulna-Mongla Highway receives the most significant number of vehicles compared to other surveyed roads.

Table 2.13: Calculated PCU in Three Locations at Three Different Periods

Location	7:00 AM to 10:00 AM	12:00 PM to 2:00 PM	05:00 PM to 07:00 PM
Khulna Mongla Road at Khudir Bottola	636	706	485
Khulna Mongla Road at Gonai Bridge	310	357	395
Power Plant access road at Gonabelai Bridge	55	82	63

Source: Field Survey, October 2025

The traffic survey results reveal that Khulna–Mongla Road at Khudir Bottola continues to experience the highest traffic flow among the three monitoring locations. In comparison, relatively lower traffic volumes were recorded at the other two locations, namely Khulna–Mongla Road at Gonai Bridge and the Power Plant Access Road at Gonabelai Bridge. A comparison between the current and previous monitoring periods shows a similar traffic volume pattern across the surveyed locations. It is noteworthy that the 48th monitoring was conducted over two weekend days and one weekday, consistent with the previous monitoring period. However, during the construction stage, frequent movement of heavy construction vehicles significantly contributed to the overall traffic volume. With the completion of construction activities, such vehicle movements have substantially declined, resulting in comparatively lower traffic levels within the survey areas. Detailed findings and calculations from the traffic volume surveys are presented in **Tables E.1, E.2, and E.3 of Appendix IV**.

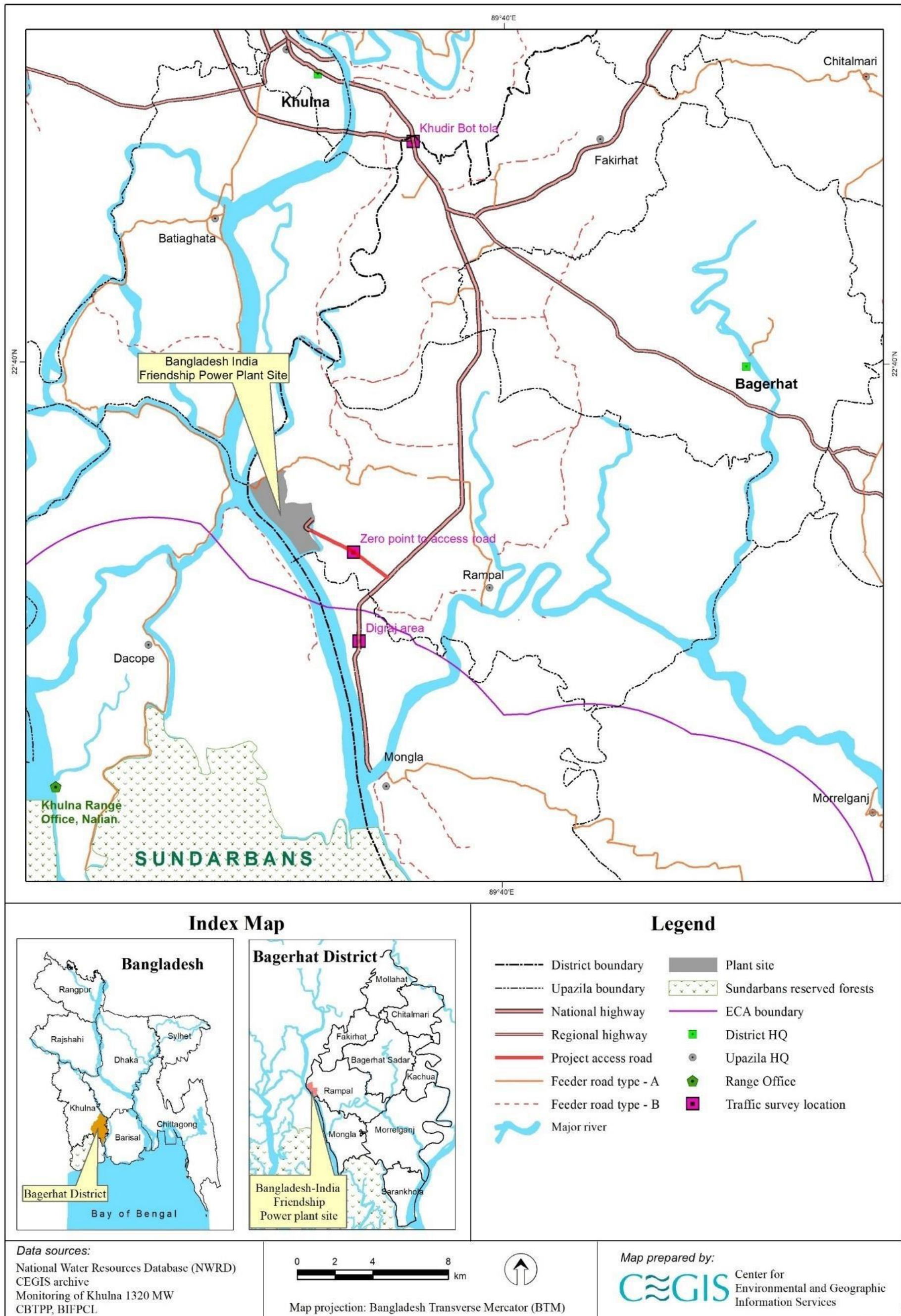


Figure 2.40: Locations of Traffic Survey Sites

3. Biological Environment

Biological resources include all living organisms within an ecosystem that interact with one another as well as with the concerned physical environment. The biological resources have been categorized into three major types e.g. fisheries resources, ecological resources, and Sundarbans Reserve Forest (SRF), and are being monitored in every quarter of the year to understand the changes in the functionality of the ecosystem in and around the project area as well as in the Sundarbans Reserve Forest area.

3.1 Fisheries Resources

Developing a fine monitoring plan, assessing the impacts of the project on fisheries resources, the impact on fish production and fish biodiversity during the project implementation, as well as suggesting possible mitigation and enhancement measures for increasing benefits of the positive impacts, are the prominent considerations for the fisheries resources monitoring. The monitoring activities as well as results of the previously conducted 45 nos. of quarters for the sessions of 2014-15, 2015-16, 2016-17, 2017-18, 2018-2019, 2019-20, 2020-21, 2021-22, 2022-23, 2023-24 as well as of 2024-25 was completed and reported earlier. This chapter contains the findings of the 46-quarter and a comparison with the earlier 45 quarters.

3.1.1 Methodology

Location of Monitoring Sites

During the period, the monitoring activities were carried out in the 13 pre-selected locations, among which 10 locations were selected for capture fish habitat, and the remaining three (03) sites were selected for shrimp/fish farms (culture fish habitat). Sampling sites for capture fishery were selected based on the available fishing grounds upstream, midstream, and downstream of the Passur River system. Sampling sites for culture fishery (shrimp/fish farms) were selected considering the project influence area. The fisheries resource monitoring locations are provided in **Table 3.1** and also shown in **Figure 3.1**.

Table 3.1: The Sampling Locations for Monitoring of Fisheries Resources

Sampling Site	Capture Habitat Location	Sampling Site	Capture Habitat Location
A	Akram Point	F	Chandpai
B	Haldikhali	G	Jongra
C	Charaputia	H	Mongla Port
D	Bhodra	I	Maidara
E	Harbaria	J	Chalna Point, Batiaghata
Sl. No.	Culture Habitat Location	Sl. No.	Culture Habitat Location
1	Bhekatkhali Khal, Rajnagar	3	Chunkuri-2
2	Kapasdanga-Muralia		

Selection of Parameters

According to ToR, five major components were selected for fisheries resources monitoring, such as fish habitat status, fish migration, fish diversity, shrimp/fish farm practices, and fish production. Fish habitat status was monitored by investigating habitat classification based on length frequencies of

different fish species, the sensitivity of fish diversity, and survival success of different life stages of fish. Fish migration status was monitored by assessing migratory fish species diversity, migration pattern, migration purpose, period and extent of migration, etc. Species evenness, species richness, and community structure were investigated for monitoring fish diversity. Shrimp/fish farm practice was monitored by viewing stocking patterns, growth rate, and mortality rate. Fish production monitoring was divided into capture and shrimp/fish farm production.

Fish Habitat Status

Fish habitat status was monitored by applying a numerical habitat model based on the habitat classification and sensitivity of fish diversity and survival success of different life stages to abiotic and biotic factors. Fish habitat classification was analysed by calculating Euclidean Distance among sampling sites. Moreover, the similarities in species composition among the sites were analysed using the Jaccard Index (JI) to estimate the extent of similarity between pairs of data sets.

Fish Migration

Migratory species were identified from the sampling sites by analysing the common species found in the catch assessment survey and based on the IUCN list.

Fish Diversity

Fish diversity was surveyed by the Catch Per Unit Effort (CPUE) method. The fish individuals were counted according to the length of each species from the samples. Diversity was estimated by analyzing the Shannon-Weiner Index ranges from 0 to 1. Fish species richness (FSR) was analyzed using the Simpson's Index which generates two types of values. The first one includes values from 0 to 1 expressing normalization scores for species richness status, and the second one includes values from one (01) to values equal to the total number of species found in the sample, which suggests how many species are dominant in this fish community. Fish community structure has also been analyzed by counting the length-wise fish individuals.

Fish-Shrimp Culture Practice

Three farms within the direct impact zone of the Power Plant were surveyed for monitoring shrimp/fish farms. The stocking pattern of the shrimp/fish farm is the major issue for successful production because of the natural genetic resources from the wild source of the Passur River System. Moreover, the mortality rate should be minimized to get more economic output from the farms. So, stocking patterns and mortality rates and their causes were surveyed intensively.

Fish Production

Riverine fish production was surveyed through CPUE. Information on the species-wise production of shrimp/fish farms was collected from the selected farms for the last catch.

3.1.2 Status of Monitoring

Followed by the quarter monitoring of the 2014-15, 2015-16, 2016-17, 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2023-24 and 2024-25 (up to 45th quarter monitoring), 46th quarter monitoring of session 2025-26 was conducted during October 2025. No fishing activities were observed at Bhadra (D), Jongra (G) and Mongla (H) point during the field visit in this quarter monitoring.



Figure 3.1: Fisheries Resources Monitoring Locations

Fish Habitat Status

Fish habitat status has also varied in the view of habitat classification and habitat use patterns of different life stages of fish species.

Habitat classification

Habitat classification was analysed by using the length-wise distribution of different fish species in the sampling sites. The length of different life stages of fish species was identified and evaluated from the literature review. Linkage distance was calculated with the similarity in distribution. The entire stretch of the Passur River System consists of three significant behavioural habitats. The sampling sites were classified based on the abundance of different life stages of fish species in those habitats. The following tables show the classification of seven (07) sampling sites for 1st to 15th quarter monitoring and ten (10) sampling sites from the 16th to 45th quarter monitoring according to the ToR with respect to habitat uses for previous quarters of fisheries monitoring (**Table 3.2**).

Table 3.2: Classification of Habitat use

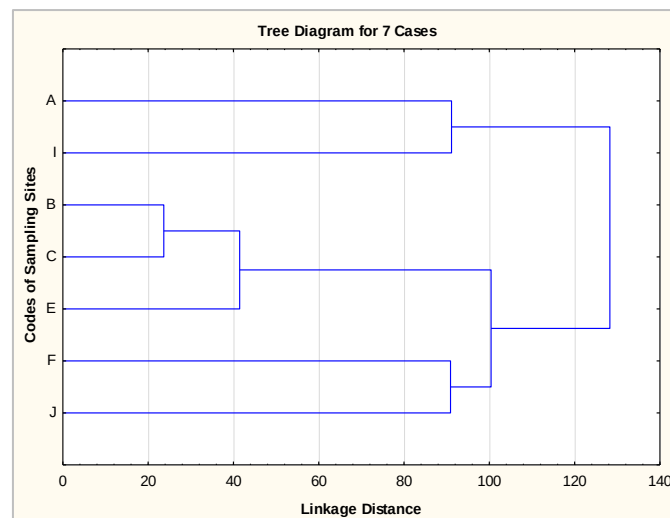
Monitoring Quarter	Type of Habitat Use
1 st (April, 2014)	• Grazing Ground • Grazing and Breeding Ground
2 nd (July, 2014)	• Grazing Ground • Spawning and Nursery Ground
3 rd (October, 2014)	• Grazing Ground • Grazing and Breeding Ground • Spawning, Nursery and Grazing Ground
4 th (January, 2015)	• Grazing Ground • Grazing and Breeding Ground • Spawning, Nursery and Grazing Ground
5 th (April, 2015)	• Grazing Ground • Nursery Ground • Spawning and Nursery
6 th (August, 2015)	• Grazing, Breeding Ground • Spawning, and Nursery Ground
7 th (October, 2015)	• Grazing Ground, • Nursery Ground and • Growing and feeding
8 th (January, 2016)	• Nursery and Feeding Ground • Growing and feeding
9 th (April, 2016)	• Spawning and Nursery Ground • Feeding and Growing Ground
10 th (July, 2016)	• Nursery Ground • Feeding and Breeding Ground
11 th (October, 2016)	• Breeding and Spawning Ground • Feeding and Grazing Ground
12 th (January, 2017)	• Grazing and Spawning Ground • Nursing Ground
13 th (April, 2017)	• Grazing and Feeding Ground • Nursing Ground
14 th (October, 2017)	• Grazing and Feeding Ground • Nursing Ground

Monitoring Quarter	Type of Habitat Use
15 th (January, 2018)	• Grazing and Feeding Ground • Nursing Ground
16 th (April, 2018)	• Feeding ground • Growing ground • Nursing ground
17 th (July, 2018)	• Spawning and Nursery Ground • Nursery Ground with Feeding and Growing Capacity • Growing and Feeding Ground • Omni-ground
18 th (November, 2018)	• Ground for Maturation • Omni-Ground: Nursery and Feeding Ground/Migratory Route; Ground for Maturation; Growing and Maturation Ground; Maturation Ground for Juveniles
19 th (February, 2019)	• Ground for Feeding • Omni-Ground including Nursery Ground and Ground for Maturation
20 th (April, 2019)	• Ground for Feeding and Maturation • Omni-Ground including Nursery Ground and Ground for Maturation
21 st (July, 2019)	• Ground for Feeding and Maturation • Omni-Ground including Nursery Ground and Ground for Maturation
22 nd (November, 2019)	• Spawning and Nursery Ground • Omni-Ground including Feeding and Maturation Ground
23 rd (February, 2020)	• Nursery Ground • Spawning ground • Ground for maturation and feeding
25 th (July, 2020)	• Nursery Ground • Ground for maturation and feeding
26 th (November, 2020)	• Nursery Ground • Omni-Ground including Spawning and Nursery Ground, and Maturation Ground
27 th (January, 2021)	• Nursery Ground • Omni-Ground including Spawning and Nursery Ground, and Maturation Ground
28 th (April, 2021)	• Spawning and Nursery Ground • Ground for Maturation and Feeding
29 th (September, 2021)	• Nursery Ground • Ground for Maturation and feeding
30 th (November, 2021)	• Feeding Ground • Omni Ground including Nursery ground, and Maturation and Feeding Ground
31 st (February, 2022)	• Nursery Ground • Maturation and Feeding Ground
32 nd (May, 2022)	• Spawning and Nursery Ground • Maturation Ground
33 rd (July, 2022)	• Spawning and Nursery Ground • Feeding and Maturation Ground
34 th (October, 2022)	• Feeding Ground • Ground for Maturation
35 th (January, 2023)	• Spawning and Nursery Ground • Ground for Maturation and Feeding

Monitoring Quarter	Type of Habitat Use
36 th (Jun, 2023)	• Spawning and Nursery Ground • Omni Ground including Nursery Ground, Maturation and Feeding Ground
37 th (Sep, 2023)	• Spawning and Nursery Ground • Omni Ground including Nursery Ground, Maturation and Feeding Ground
38 th (Nov, 2023)	• Feeding Ground • Omni Ground including Spawning, Nursery and Maturation Ground
39 th (Feb, 2024)	• Feeding and Maturation Ground • Omni Ground including Spawning, Nursery and Maturation Ground
40 th (May, 2024)	• Nursery and Feeding Ground • Omni Ground including Spawning, Nursery and Maturation Ground
41 st (August, 2024)	• Growing and Maturation Ground • Nursing and feeding ground
42 nd (November, 2024)	• Growing and Feeding Ground • Maturation Ground
43 rd (February, 2025)	• Spawning and Nursery Ground • Omni Ground including Nursery, Feeding and Maturation Ground
44 th (April, 2025)	• Spawning and Nursery Ground • Omni Ground including Spawning, Nursery and Maturation Ground
45 th (August, 2025)	• Omni Ground including Spawning, Nursery and Maturation Ground • Ground for Maturation and Feeding

The sampling sites were divided into two major classes- a) Omni Ground including Spawning, Nursery and Maturation Ground, b) Ground for Feeding and Maturation. The classification of functional habitat based on different life stages of fishes is shown in **Figure 3.2**. The classification of the functional habitats from 2014-15 to 2024-25 is attached in (**Figure D.1 of Appendix-IV**).

- a) **Spawning and Nursery Ground:** The sampling sites, Chandpai (F) and Chalna (J) were found to support primarily the length groups of <2cm and 2-3cm of available fish species. The sampling sites reveal to be used as spawning and nursery ground of available fish species.
- b) **Omni Ground including Feeding and Maturation:** The sampling sites Haldikhali (B), Charaputia (C) and Harbaria (E) were found to length group of 3-5cm and 5-10cm of available fish species, indicating feeding and maturation of the age-group fishes. The sampling sites, Akram Point (A) and Maidara (I) were found considerably to length groups of 10-20cm and >25cm of available fish species, indicating maturation of the age-group fishes.



(Note: Life stages are identified through length measurement of the fish individuals)

Figure 3.2: Habitat Classification based on Different Life Stages of Fish Species

The dendrogram indicated the Euclidean distances among the JI (Jaccard Coefficient Index) indices, which are opposite the JI values. It was found that the length-wise distribution relationship varied with the seasons and the year-to-year. In this quarterly monitoring in 2025-26, the JI value between Charaputia (C) and Chandpai (F) sampling sites were the highest (**Figure 3.3**), which indicates the maximum similarity in species occurrence between the two sites out of seven (07) sampling sites of available fishing. Jaccard Coefficient of similarity of the habitats from 2014-15 to 2024-25 is shown in (**Figure D.2 of Appendix IV**).

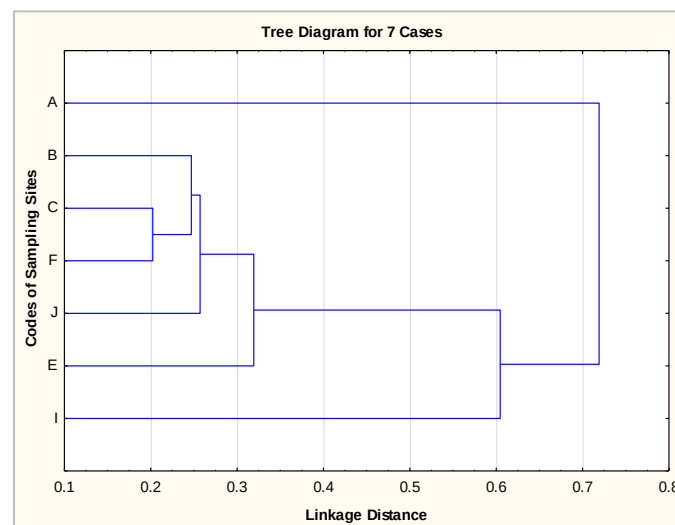


Figure 3.3: Dendrogram Showing Similarity in Binary Species Composition in Seven Sampling Sites

Fish Diversity

Shannon-Weiner Index

In this monitoring year of 2025-26, species evenness also varies among the sampling sites. The highest Shannon-Weiner index was found at Akram Point (0.97), indicating the most evenly distributed fish species. On the contrary, the lowest evenness was found at Haldikhali (0.32) shown in **Table 3.3**. It has also been found that both the number of fish species found in in-situ catch and the evenness of

their distribution within the sampling sites show high variation with the changing seasonal and yearly bio-physical conditions and even fishing effort. The Shannon-Weiner Index of the earlier quarters from 2014-15 to 2024-25 is shown in **Table D.1 of Appendix IV**.

Fish Species Richness (FSR)

Fish species richness was identified through Simpson's Index¹¹. Considerable differences are noticed in the fish species richness (FSR) in different habitat classes (**Table 3.4** and **Figure 3.4**). In this monitoring phase, species richness varies with the sampling sites. Maximum FSR was obtained at Charaputia (C) and Harbaria (F) site (n=17), while very low FSR was recorded at Akram Point (J) (n=2). Rich species number in the earlier quarters from 2014-15 to 2024-25 is shown in **Table D.2 and Figure D.3 in Appendix IV**.

Among the habitats in the upstream of the Passur River system, Chandpai was rich assemblage of Poma, Amadi, Tairel, Chewa and Motka Chingri, Maidara was rich Bele and Poma, Chalna was rich assamble of Golda, Harina Chingri, Motka Chingri, Bagda, Amadi and Tairel. The occurrence of fish species from 2014-15 to 2024-25 is shown in **Table D.4 and Table D.5 in Appendix IV**.

Table 3.3: Site Wise Species Diversity using Shannon-Weiner Index

Sampling Site	Species Number	Shannon-Weiner Index	Sampling Site	Species Number	Shannon-Weiner Index
A	2	0.97	F	11	0.73
B	9	0.32	G	-	
C	17	0.75	H	-	
D	-	-	I	4	0.80
E	17	0.84	J	12	0.82

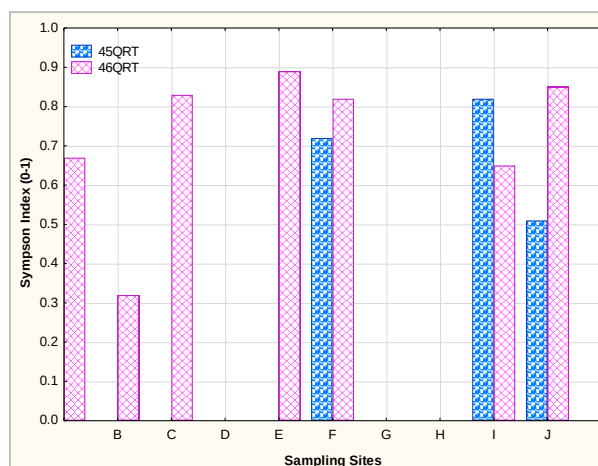
*According to Shannon-Weiner Index, 0-0.30: Low diversity/equally distribution (VH); 0.31-0.50: Moderate Diversity (M); 0.51-0.80: High Diversity (HD) and 0.80-1.0: Very High Diversity (VHD).

Table 3.4: Site Wise Rich Species Number

Sampling Site	No. of Rich Species	Sampling Site	No. of Rich Species
A	-	F	5
B	1	G	-
C	2	H	-
D	-	I	2
E	5	J	3

Source: Field Survey, November, 2025

¹¹Simpson's index is a method to calculate the community characteristics of fish in a particular habitat. It is mainly used to know about the species richness of a particular habitat to tell how many species are rich in their abundance. The value of this index ranges from 0 to 1. There is other kind of value which is described in the methodology section. The second value is mainly used to measure the species richness in the sampling sites.



(FSR is identified through Simpson's Index)

Figure 3.4: Site-wise Fish Species Richness (FSR) in the Passur River System

Fish Community Structure

The fish community structure was analyzed by counting the length-wise fish individuals (**Figure 3.5**). The following **Figure 3.5** shows that Fry dominants at Chalna and Chandpai sites. Adults are observed at Maidara and Akram Point. The length-wise distribution of fish species in this quarter is shown in **Table D.6 in Appendix IV**. The length-wise fish individuals in different sampling sites from 2014-15 to 2024-25 are shown in **Figure D.4 of Appendix IV**.

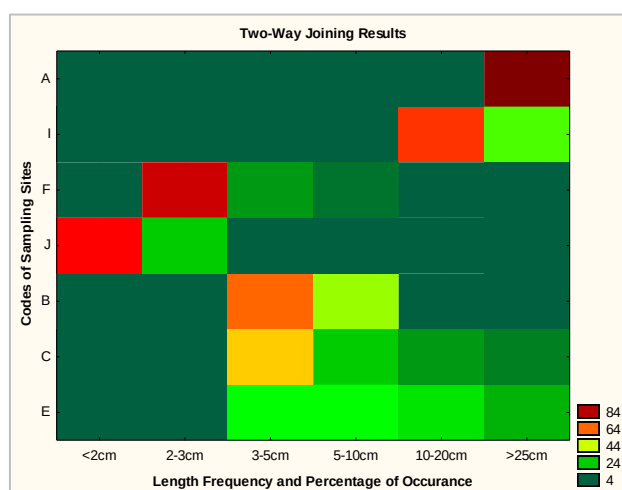


Figure 3.5: Habitat Distribution of Different Life Stages of Fish Species

Note: N.B.: Colour ranges from deepest green to deepest red. 0-4.99% Occurrence signifies Deepest Green; 5-9.99%-Shaded Green; 11-14.99%-Normal Green; 15-19.99%-Light Green; 20-24.99%; 25-29.99%-Lightest Green; 30-34.99%; 35-39.99%; 40-44.99; 45-49.99; 50-54.99-Light Magenta; 55-59.99-Deep Magenta; 60-64.99%; 65-69.99%; 70-74.99%; 75-79.99%-Light Red; 80-84.99%-Deep Red; 85-89.99%; 90-94.99%; 95-100%-Deepest Red.

Fish Migration

Migratory Species Diversity

Migratory species were identified by analysing the common species available in regular catch from the sampling sites. Fish species like Amadi, Bele and Tairrel attain the maximum abundance among the migratory fish species observed during the 46th quarter monitoring period. The relative abundance of the migratory species is given below in **Figure 3.6**.

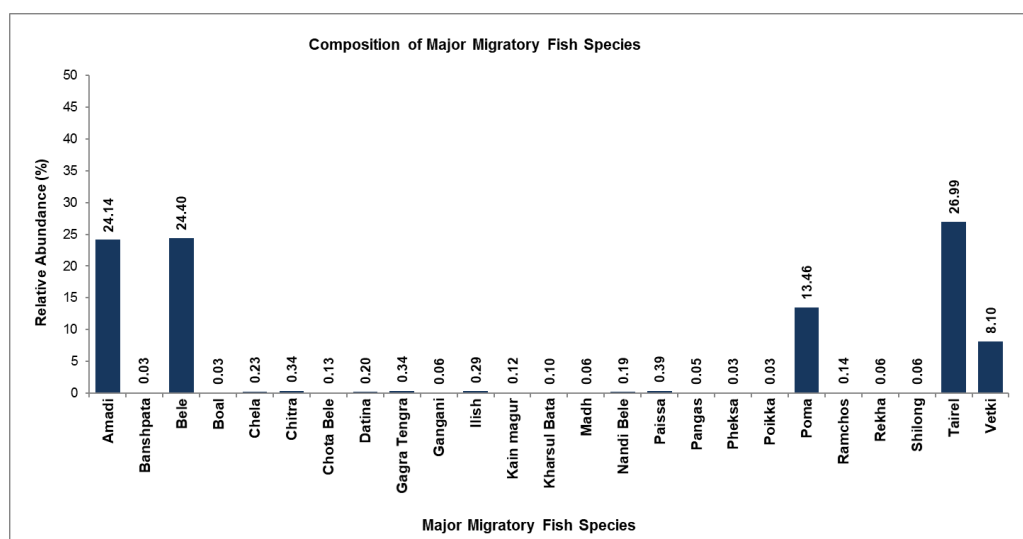


Figure 3.6: Relative Abundance of Major Migratory Fish Species in Sampling Sites

Migration Extent, Time and Purpose

In-situ catch showed interesting patterns in fish migration for different purposes, as mentioned in the following table, all along the sampling sites. Among the migratory species, Poma was supposed to migrate long distances (**Figure 3.7**). The purpose, timing, and extent of migration for migratory fish species from 2014-15 to 2024-25 is shown in **Table D.7** and **Table D.8** of **Appendix IV**.

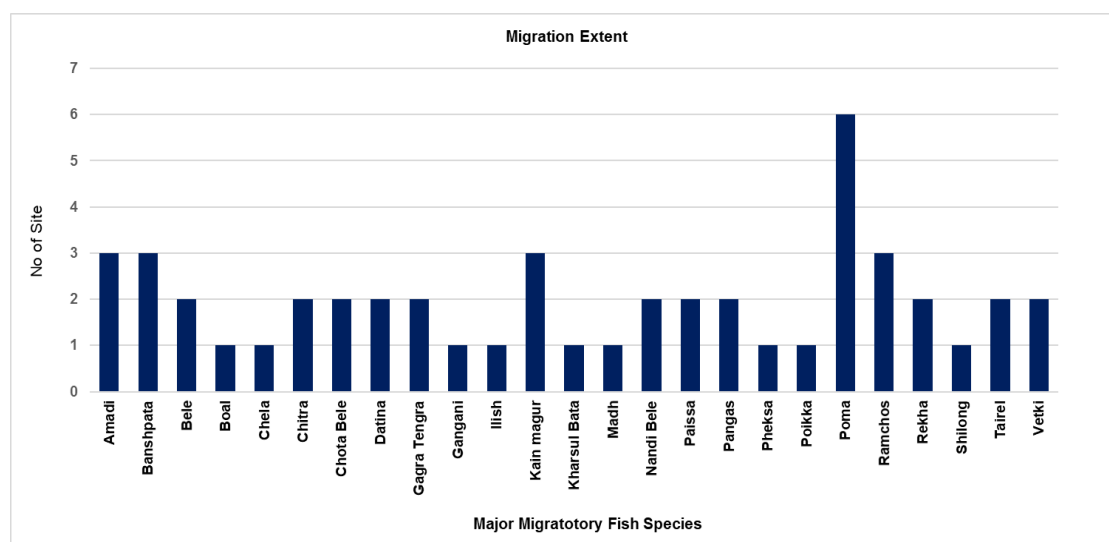


Figure 3.7: Migration Extent of Major Migratory Fish Species in Sampling Sites

Shrimp/Fish firm

Three farms are situated in the direct impact zone of the power plant and were surveyed to monitor shrimp/fish aquaculture. The stocking pattern of the shrimp/fish farm is one of the significant issues for successful production because of the natural genetic resources from the wild source of the Passur River System. Moreover, maximization of the growth rate and minimization of the mortality rate should be ensured for getting more economical output from the farms. So, stocking patterns, growth rates, mortality rates, and their causes were surveyed intensively.

Stocking Pattern

It is reported by the farmers of the shrimp farms that maximum stocking in case of *Bagda* was found at Rajnagar gher followed by Kapashdanga and Chunkuri-2. In case *Harina*, the stocking density was highest at Rajnagar followed by Chunkuri-2. Stocking pattern of different fish/shrimp species the farms is shown in **Table 3.5**.

Table 3.5: Stocking Pattern of Fish/Shrimp Farm

Name of shrimp farm	Name of species	Stocking Density (No/ha)	Stocking Period
Rajnagar (42.09 ha)	Bagda	14,255	August to November, 2025
	Rui	78	
	Mrigal	62	
	Grass Carp	16	
	Paissa	594	
	Golda	238	
	Horina	13,067	
Kapashdanga-Muralia (115.7ha)	Tilapia	605	
	Rui	778	
	Catla	346	
	Mrigal	259	
	Bagda	7,779	
	Vetki	69	
	Harina	259	
	Tengra	61	
	Paissa	86	
Chunkuri-2 (6.07ha)	Bagda	1647	
	Harina	3,954	
	Paissa	1,977	
	Khorsulla	824	
	Tipalia	247	

Source: CEGIS Field Survey, November 2025

Shrimp/Fish Growth and Mortality Rate

During the 46th quarterly monitoring period, the maximum mortality rate was observed in Chunkuri-2 (**Table 3.6**).

Table 3.6: Growth Rate and Mortality of Fish/Shrimp

Monitoring Quarters	Growth and mortality rates	Gher No.		
		1	2	3
1 st QM	Growth Rate (cm/day)	0.3	0.3	0.2
	Mortality (%)	15-20	30-35	25-30
2 nd QM	Growth Rate (cm/day)	0.2	0.3	0.2
	Mortality (%)	40	94	25
3 rd QM	Growth Rate (cm/day)	0.25	0.25	0.2
	Mortality (%)	50	10	65
4 th QM	Growth Rate	-	-	-

Monitoring Quarters	Growth and mortality rates	Gher No.		
		1	2	3
	Mortality (%)	-	-	-
5 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	30	-	10
6 th QM	Growth Rate (cm/day)	0.18	0.14	0.15
	Mortality (%)	25	20	50
7 th QM	Growth Rate (cm/day)	0.2	0.15	0.25
	Mortality (%)	60	100	20
8 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
9 th QM	Growth Rate (cm/day)	-	0.21	0.17
	Mortality (%)	-	15	30
10 th QM	Growth Rate (cm/day)	0.2	0.3	0.15
	Mortality (%)	20	40	30
11 th QM	Growth Rate (cm/day)	0.2	0.25	0.2
	Mortality (%)	60	50	30
12 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
13 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	30	10	25
14 th QM	Growth Rate (cm/day)	0.03	0.38	0.02
	Mortality (%)	50	35	25
15 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
16 th QM	Growth Rate (cm/day)	0.28	0.42	0.4
	Mortality (%)	-	-	-
17 th QM	Growth Rate (cm/day)	0.38	0.3	0.2
	Mortality (%)	80	70	50
18 th QM	Growth Rate (cm/day)	-	0.3	-
	Mortality (%)	-	80	-
19 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
20 th QM	Growth Rate (cm/day)	0.35	0.45	0.34
	Mortality (%)	50	80	40
21 th QM	Growth Rate (cm/day)	0.38	0.44	0.36
	Mortality (%)	-	-	-
22 nd QM	Growth Rate (cm/day)	0.35	0.45	0.37
	Mortality (%)			
23 rd QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
25 th QM	Growth Rate (cm/day)	0.38	0.48	0.32
	Mortality (%)	-	-	-
26 th QM	Growth Rate (cm/day)	0.42	0.45	0.38

Monitoring Quarters	Growth and mortality rates	Gher No.		
		1	2	3
	Mortality (%)	35	30	90
27 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
28 th QM	Growth Rate (cm/day)	0.41	0.35	0.39
	Mortality (%)	20	90	30
29 th QM	Growth Rate (cm/day)	0.38	0.42	0.4
	Mortality (%)			
30 th QM	Growth Rate (cm/day)	0.36	0.44	0.37
	Mortality (%)	-	-	-
31 st QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
32 nd QM	Growth Rate (cm/day)	0.36	0.43	0.33
	Mortality (%)	-	-	-
33 rd QM	Growth Rate (cm/day)	0.39	0.42	0.37
	Mortality (%)	20	25	60
34 th QM	Growth Rate (cm/day)	0.38	0.41	0.35
	Mortality (%)	22	25	29
35 th QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	-	-	-
36 th QM	Growth Rate (cm/day)	0.34	0.39	0.37
	Mortality (%)	15	20	15
37 th QM	Growth Rate (cm/day)	0.38	0.33	0.34
	Mortality (%)	10	30	15
38 th QM	Growth Rate (cm/day)	0.41	0.32	0.36
	Mortality (%)	-	60	-
39 th QM	Growth Rate (cm/day)	0.35	0.39	0.38
	Mortality (%)	80	30	40
40 th QM	Growth Rate (cm/day)	0.35	0.38	0.34
	Mortality (%)	80	25	20
41 st QM	Growth Rate (cm/day)	0.31	-	0.28
	Mortality (%)	80	-	70
42 nd QM	Growth Rate (cm/day)	0.35	-	0.32
	Mortality (%)	-	-	-
43 rd QM	Growth Rate (cm/day)	-	-	-
	Mortality (%)	40	30	35
44 th QM	Growth Rate (cm/day)	0.12	0.09	0.11
	Mortality (%)	80	40	70
45 th QM	Growth Rate (cm/day)	0.15	0.2	0.14
	Mortality (%)	20	25	70
46 th QM	Growth Rate (cm/day)	0.18	0.22	0.17
	Mortality (%)	15	11	16

Fish Production

Capture Fish Production

The present study found the highest catch susceptibility for Behundi Jal (8.35 kg/haul), as shown in Table 3.7. The highest production was observed at Akram Point, followed by Chandpai and Charaputia, as shown in **Table 3.8**. Fish production in the earlier quarters is shown in **Table D.3 in Appendix IV**.

Table 3.7: Total Catch in Different Gears in the Sampling Sites

Site	Habitat	Gear Name/Type	Haul Duration (hr)	No of Haul	Kg/haul
A	Confluence	Borshi	4	6	1.75
		Borshi	4	6	2.67
B	Haldekhali Khal	Behundi Jal	6	2	1.1
		Behundi Jal	6	2	1.25
		Borshi	4	4	0.04
C	Charaputia Khal	Charpata Jal	12	1	6.93
		Charpata Jal	12	1	5.9
D	Bhodra Khal	-	-	-	-
E	Passur River	Borshi		3	0.27
		Charpata Jal	12	1	4.32
		Charpata Jal	12	1	3.25
F	Shela River	Behundi Jal	6	1	5.35
		Behundi Jal	6	1	3.40
		Behundi Jal	6	1	3.45
		Ilish Jal	6	1	1.13
		Borshi	4	4	0.43
G	Jongra Khal	-	-	-	-
H	Passur River	-		-	-
I	Passur River	Bhola Jal	4	2	0.13
		Bhola Jal	4	2	0.63
J	Passur River	Behundi Jal	6	1	8.35
		Net Jal	6	1	-
		Bhola Jal	4	2	0.5

Source: Catch assessment survey, CEGIS; November 2025;

* Weight of Fry is not considered for catch assessment

Table 3.8: Total Catch in the Sampling Sites

Sampling Site	Total Catch (kg)	Sampling Site	Total Catch (kg)
A	26.5	F	16.15
B	4.85	G	-
C	12.83	H	-
D	-	I	1.5
E	8.37	J	9.35

*Average Weight 0.15kg/mud crab and average weight 0.6 kg/mud eel ** Weight of Fry is not considered for catch assessment

Culture Fish Production

During the 46th quarter monitoring phase, maximum shrimp/fish farms production was observed in Kapashdanga gher as shown in **Table 3.9**. Shrimp/fish production in the previous monitoring quarters (2014-15 to 2024-25) is shown in **Table D.9 and Table D.10 of Appendix-IV**.

Table 3.9: The Present Catch in Three (03) Sampling Ghers

Sampling Site	Species	Total Catch (ton)
1	Bagda	0.1
	Rui	0.8
	Mrigal	0.24
	Grass Carp	0.26
	Paissa	0.4
	Golda	0.08
	Horina	1.0
	Vetki	0.15
Sub-Total=		3.03
2	Tilapia	0.1
	Rui	2.0
	Catla	0.6
	Mrigal	0.7
	Bagda	0.06
	Vetki	0.4
	Harina	0.28
	Tengra	0.1
	Paissa	0.6
	Baila	0.2
	Kakra	0.07
Sub-Total=		5.09
3	Bagda	0.03
	Harina	0.06
	Paissa	0.15
	Tilapia	0.01
	Motka	0.03
	Baila	0.02
Sub-Total=		0.33

Source: CEGIS field survey, November 2025

3.2 Ecological monitoring**3.2.1 Indicator Framework**

The monitoring framework for this cycle followed the same ecological indicators used in previous rounds to maintain data consistency and trend comparability. Vegetation structure, species composition, and canopy cover were assessed as primary indicators of terrestrial ecosystem condition, reflecting productivity, stability, and human disturbance. Bird assemblages continued to be monitored as sensitive indicators of habitat quality. Resident bird presence reflects local nesting and resource availability, while migratory species indicate broader landscape suitability and seasonal habitat integrity.

For the aquatic system, dolphin occurrence remained the key indicator of river health. Changes in dolphin presence or movement patterns provide early signals of water quality deterioration, siltation, or habitat disruption.

3.2.2 Rationale for Monitoring Location Selection

Monitoring locations remained unchanged in the 46th cycle. Terrestrial monitoring sites are concentrated north of the project boundary, aligned with prevailing south-to-north wind patterns that increase the likelihood of project-related influence in this zone. The southern side of the project was excluded, as the Sundarban Reserve Forest—located approximately 14 km south—is already subject to separate, long-term ecological monitoring.

3.2.3 Description of Monitoring Sites

Rajnagar Homestead

Located approximately 2.5 km east of the project's upper northeast boundary, this homestead lies within a low-lying, damp landscape surrounded by small swamps. Poor soil water retention limits grass and herbaceous cover, making it a useful site for tracking subtle vegetation changes.

Kalekarber Homestead

Situated around 1.8 km east of the middle-east project boundary, this site is relatively elevated and largely flood-free. Its stable topography provides a contrast to lowland sites and supports consistent vegetation growth.

Chalkghona Homestead

This site lies about 0.5 km south of the southeast project boundary, positioned between the Maidara River to the north and saline shrimp farms to the south. Peripheral ditches and shallow waterbodies support salt-tolerant plant species, offering insight into salinity-driven ecological variation.

Borni Homestead

Located roughly 3.0 km north of the northeast boundary, the selected homestead sits near the village center. Vegetation is dominated by planted tree species, with soil characteristics comparable to Rajnagar, allowing cross-site comparison.

3.2.4 Plant Diversity Monitoring

Vegetation monitoring was conducted using a stratified random quadrat method across the four homesteads: Rajnagar, Borni, Kalekarber, and Chalkghona. Sixteen quadrats were surveyed, focusing on canopy and sub-canopy layers. Species presence, abundance, and spatial distribution were recorded to assess density, frequency, and overall plant diversity.

The 46th monitoring recorded a total of 47 plant species belonging to 24 families across the four study sites, based on four 10×10 m plots at each location. The overall Shannon–Wiener Diversity Index was 2.68, indicating moderate plant diversity within the monitoring area. Site-wise variation was evident. Chalkghona supported the highest species richness with 24 species ($H' = 2.18$), followed by Khalekarber with 21 species ($H' = 2.31$). Borni recorded 19 species with a diversity index of 2.21, while Rajnagar showed comparatively lower diversity with 17 species ($H' = 2.03$). These differences reflect localized land-use practices, planting intensity, and levels of disturbance among the sites.

When compared with the previously monitoring program, a slight decline in overall diversity is observed. The previous assessment documented 49 plant species from 27 families, with a higher

Shannon–Wiener Index of 3.01, based on 609 individual plants. That period indicated an improving trend in plant diversity, likely driven by natural regeneration and enrichment of homestead vegetation through local planting and species recruitment. In contrast, the 46th monitoring suggests a modest reduction in species richness and diversity, which may be associated with site-specific disturbances, changes in land management like road construction in Rajnagar site, or reduced recruitment during the current period.

Overall, the results indicate that plant diversity across the monitoring area remains moderate and relatively stable. Maintaining natural regeneration processes and encouraging diverse local planting practices will be important to sustain and enhance vegetation diversity in future monitoring cycles. **Plant species composition of the sampled homesteads is attached in Table F1 of Appendix-IV.**

3.2.5 Plant health

Plant health monitoring around coal-based power plants is essential because vegetation acts as the first biological buffer against air pollutants, dust deposition, soil compaction, and hydrological alteration. Long-term tracking of tree survival, canopy condition, and disturbance factors helps distinguish plant stress caused by industrial influence from that driven by natural events or local land-use practices. Continuous monitoring also supports adaptive management, early detection of degradation, and evidence-based mitigation planning in surrounding landscapes. This monitoring assessed plant health status at four locations—Rajnagar, Borni, Kalekarber Dighi, and Chalkgona—using repeated observations of individual plants across multiple years.

3.2.6 Site-wise observations

Rajnagar

Rajnagar shows mostly stable plant health, with coconut, date palm, and keora maintaining consistent presence over the monitoring period. However, localized declines were observed in some species due to physical alteration of the site. Dumping of sandy soil in parts of Rajnagar has buried root zones and altered soil structure, leading to reduced vigor and mortality in a few individuals, including *Manilkara zapota* and *Mangifera indica*. These impacts are clearly site-management related rather than ecological stress signals.

Borni

Borni remains one of the more stable sites in terms of plant health. Most species show long-term consistency with minimal mortality. A small number of unhealthy or dead individuals were recorded in coconut and date palm, mainly associated with age-related decline and occasional storm damage. No systematic cutting or land conversion was observed during the monitoring period.

Kalekarber Dighi

Kalekarber Dighi displays high stability across nearly all recorded species. Coconut, palmyra palm, mango, and guava show strong long-term persistence with negligible loss. Minor reductions in healthy counts were linked to natural events such as thunderstorms and lightning, which caused crown damage in isolated cases. Overall, this site represents a relatively undisturbed vegetation condition.

Chalkgona

Chalkgona recorded the highest number of species but also showed the most visible human-induced disturbances. Selective tree cutting and repeated clearing activities associated with nearby gher management have resulted in the loss of several individuals, particularly coconut and fruit trees. A

few cases of leaf drying and partial crown damage were noted, likely related to storm events combined with exposure following vegetation clearing. These changes are clearly management-driven rather than ecological decline. Moreover, overall status was count during this period, the following table shows present condition from the base situation. **Plant health status of the monitored homesteads is depicted in Table F2 of Appendix-IV.**



Figure 3.8: Cutting off date palm at Chokgona

3.2.7 Vegetation Canopy Status

The 46th monitoring cycle focuses exclusively on the operation stage of the project, covering the period from 2023 to 2025. Earlier baseline and pre-operation trends have been discussed in previous reports and are not repeated here. Canopy cover was assessed using densitometer readings from four fixed directions (north, south, east, and west) within selected homestead plots at each site. The objective was to understand short-term operational impacts and site-specific management pressures on vegetation canopy condition.

3.2.8 Results and Site-wise Interpretation

Rajnagar

Rajnagar showed the most pronounced change during the operation stage. In 2023, canopy cover was critically low at 3%, largely reflecting the delayed impact of sandy soil dumping carried out in 2022. This activity buried surface vegetation and disrupted soil structure, suppressing canopy development even after dumping ceased. A gradual recovery was observed in 2024 (8%), followed by a substantial improvement in 2025, when canopy cover reached 21%. This sharp increase indicates strong natural regeneration once physical disturbance declined. While recovery is encouraging, the canopy structure is still relatively young and remains sensitive to further disturbance.

Borni

Borni maintained a comparatively stable canopy throughout the operation period. Canopy cover increased from 21% in 2023 to 24% in 2024 and remained unchanged in 2025. No major land-use change or vegetation clearance was recorded during this phase. Minor human activities did not translate into measurable canopy loss, suggesting that the existing vegetation is mature and resilient. Borni can be considered ecologically stable during the operational stage.

Kalekarber

Kalekarber continued to exhibit consistently high canopy cover across all three years, ranging between 23% and 24%. The absence of significant anthropogenic disturbance during the operation stage allowed the site to retain its mature canopy structure. The negligible year-to-year variation reflects a well-established vegetation system with balanced regeneration and minimal extraction pressure. Among all sites, Kalekarber remains the most stable during this monitoring phase.

Chalkghona

Chalkghona showed a slight but notable decline in canopy cover during the operation stage. Canopy remained at 20% in both 2023 and 2024, before decreasing to 1% in 2025. Field observations indicate that pruning of trees along gher boundaries for firewood and fisheries-related management was the primary driver of this reduction. Although the decline is not severe, it signals increasing pressure on homestead vegetation.

During the operation stage, canopy dynamics were strongly site-specific. Rajnagar reflects a recovery trajectory following earlier physical disturbance, while Borni and Kalekarber demonstrate stability under relatively low operational pressure. Chalkghona, although still within a moderate canopy range, shows early signs of management-driven stress. These findings highlight the importance of site-level vegetation management during operation, particularly in areas linked to fisheries and fuelwood dependence. The following figure shows the canopy cover trend in operation stage.

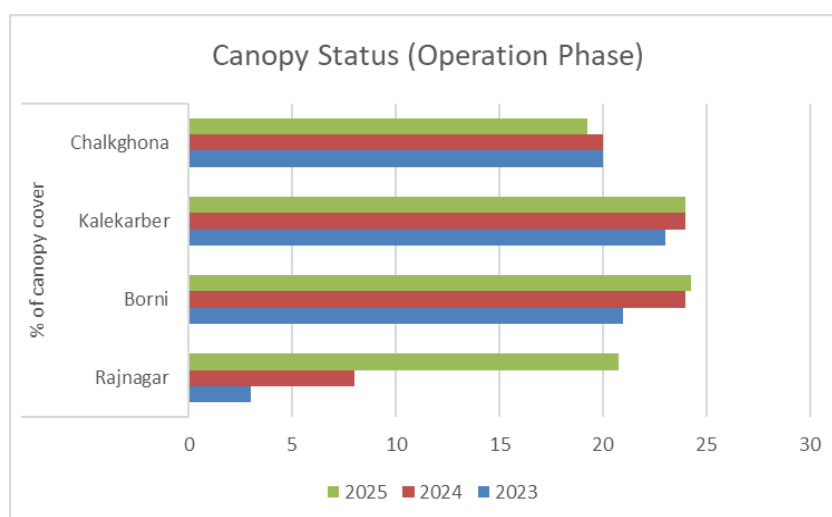


Figure 3.9: Site-specific trends of Canopy cover

3.2.9 Bird Habitat

During the current monitoring period at Rampal, we recorded a total of 29 bird species, with 58 species recorded over the entire survey period. Although the number of species observed this period is lower than the cumulative total, the overall abundance remains good, indicating that the local bird assemblage is holding up. The area around Rajnagar continues to be impacted by road construction activities, but despite this disturbance, we observed a healthy presence of birds.

Species recorded during this monitoring period include Jungle Myna, Common Myna, Common Iora, Common Kingfisher, Indian Pond Heron, Cattle Egret, Little Heron, Great Egret, Oriental Magpie-Robin, Asian Palm Swift, Rufous Treepie, Fulvous-breasted Woodpecker, Black Drongo, Black-rumped Flame back, White-throated Kingfisher, Brahminy Kite, Coppersmith Barbet, Green Bee-eater, White-browed

Wagtail, Black-hooded Oriole, Common Tailorbird, House Sparrow, Little Cormorant, Red-vented Bulbul, Spotted Dove, Asian Pied Starling, Collared Kingfisher, Yellow Wagtail, and Purple Sunbird.

The abundance and diversity of species suggest that breeding conditions are not severely disrupted. Although bird counts can vary due to daily activity patterns, seasonal movements, fruiting phenology, and other ecological factors, so random counts should be interpreted with those in mind. The bird community in the study area appears to be in generally good condition at this point in the monitoring cycle. There are no obvious signs of severe disturbance in abundance or diversity. The following figures (**Figure 3.10 to Figure 3.14**) show the birds presence in this monitoring circle.



Figure 3.10: Common dove at Barni



Figure 3.11: Bronzed drongo at Kalkharber



Figure 3.12: Yellow wagtail at Chakgona

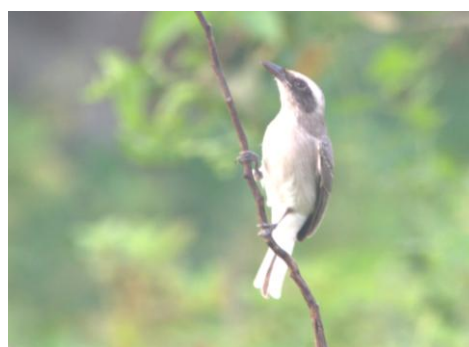


Figure 3.13: Common wood shrike at Rajnagar



Figure 3.14: Great egret and little egret at Gher side in Study Area

Source: CEGIS field visit, November, 2025

3.2.10 Butterfly Status

Butterflies were used as indicators of terrestrial ecosystem health to compare baseline conditions in November 2014 with the post-operation scenario in November 2025 in the surroundings of the Rampal Power Plant. Based on secondary literature, 36 butterfly species were considered relevant to the study area. Field surveys were conducted during the same seasonal period to ensure comparability. Among the reference species, nine were not recorded in either survey, including Swamp Tiger, Mangrove Jewel, and Monarch, suggesting that suitable habitat conditions for these species were limited even prior to plant operation. Overall, 27 butterfly species were recorded across both survey periods, indicating that a substantial portion of the butterfly community has persisted despite landscape modification.

Species composition and abundance, however, showed clear spatial and temporal variation. In 2014, the highest butterfly density was recorded in Kalekharber village, reflecting relatively better habitat structure and vegetation diversity during the baseline period. By contrast, the 2025 survey showed the highest butterfly population in Borni village, which is adjacent to Kalekharber and also located near the Rampal Power Plant. Seven species, including Common Crow, Common Palmfly, Peacock Pansy, Grey Pansy, Lemon Pansy, Rice Swift, and Dainty Grass Blue, were consistently observed in both years, indicating their tolerance to disturbed and semi-managed habitats. At the same time, eleven species present in 2014, such as Blue Tiger, Orange Tiger, and Indian Sunbeam, were not recorded in 2025, pointing to changes in habitat quality and resource availability following the operational phase of the power plant.

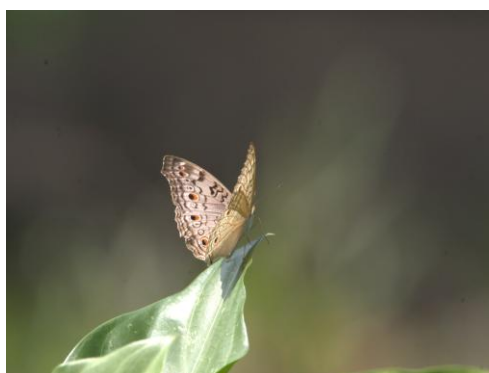


Figure 3.15: Grey pansy at Borni village



Figure 3.16: Small grass yellow at Chokgona

Conversely, nine species not observed during the 2014 baseline, including Evening Brown, Small Grass Yellow, and Common Red-eye, were recorded in the 2025 survey, particularly around Borni village. These species are commonly associated with grassland edges, secondary growth, and disturbed landscapes, suggesting a shift in butterfly assemblage toward generalist and disturbance-tolerant species. The observed change in dominant survey locations, along with species turnover, indicates a moderate impact on land ecosystem health rather than complete degradation. While butterfly presence remains relatively widespread, the shift in species composition and population centers reflects gradual ecological stress linked to land-use change and continued operation of the Rampal Power Plant, highlighting the need for sustained ecological monitoring and habitat management. The following figure shows the winter period butterfly availabilities. **The butterfly observation datasheet is attached in Table F3 of Appendix-IV.**

3.2.11 Aquatic Health Monitoring

Aquatic health monitoring during the 46th reporting period continued to assess the ecological condition of major riverine and tidal channels through dolphin occurrence and encounter rates recorded in winter surveys. River dolphins, including the Ganges River Dolphin (*Platanista gangetica*) and Irrawaddy Dolphin (*Orcaella brevirostris*), remain reliable bioindicators of river health, reflecting prey abundance, hydrological suitability, and disturbance levels within the Sundarbans aquatic system.

Monitoring was conducted across four key aquatic units: Passur River, Shella River, Dangmari Khal, and Bhadra Khal. These waterways are hydrologically connected through tidal creeks and canals and are influenced by fishing intensity, vessel movement, and seasonal freshwater inflow. Bhadra Khal and Dangmari Khal function as relatively confined channels, while Passur and Shella rivers experience higher navigation pressure and extensive Hilsa fishing activities.

3.2.12 Dolphin Occurrence and Encounter Trend

The encounter data from 2020 to 2025 (November surveys) reveal clear spatial differences and a strong site-specific trend in dolphin use. Bhadra Khal consistently recorded the highest dolphin encounter rates throughout the monitoring period. From moderate values in 2020, encounter rates increased steadily and peaked in 2024, indicating sustained habitat suitability and relatively lower disturbance compared to other sites. Although a decline was observed in 2025, encounter rates in Bhadra Khal remained higher than all other surveyed rivers and khals.

Dangmari Khal showed consistently low but stable dolphin occurrence across the years, suggesting limited habitat capacity or intermittent disturbance rather than complete habitat loss. It may be the tourist viechle movement issues. In contrast, Passur and Shella rivers exhibited persistently low encounter rates with minor year-to-year fluctuations. Despite being hydrologically important, these rivers showed no long-term improvement in dolphin occurrence during the monitoring period. The dolphin sighting distribution and inter-annual trends are illustrated in the accompanying figure.

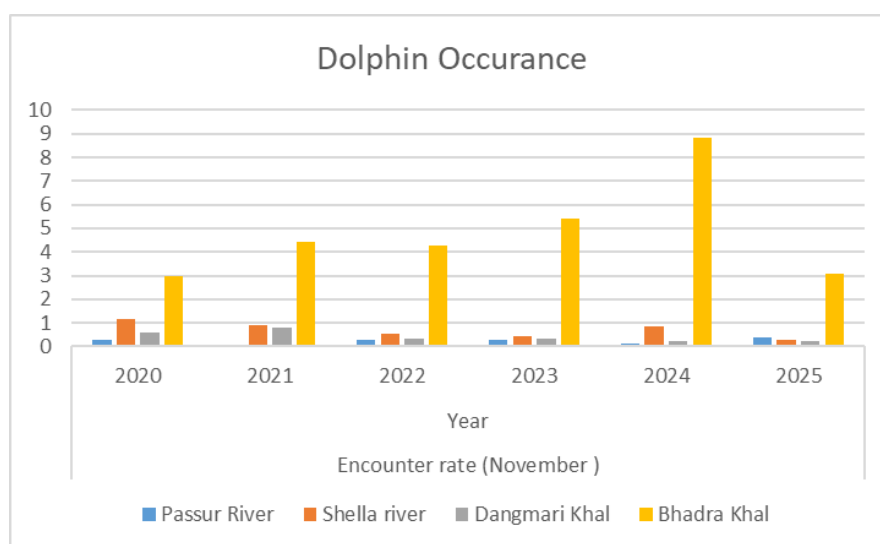


Figure 3.17: The dolphin sighting distribution and inter-annual trends

Dolphin sighting distribution are illustrated in following figure.

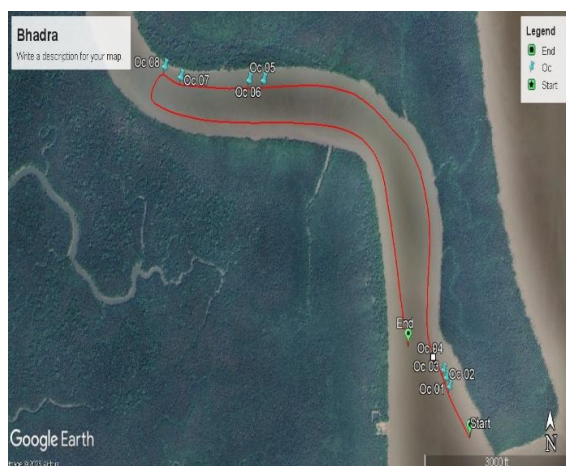


Figure 3.18: Dolphin sighting at Bhadra

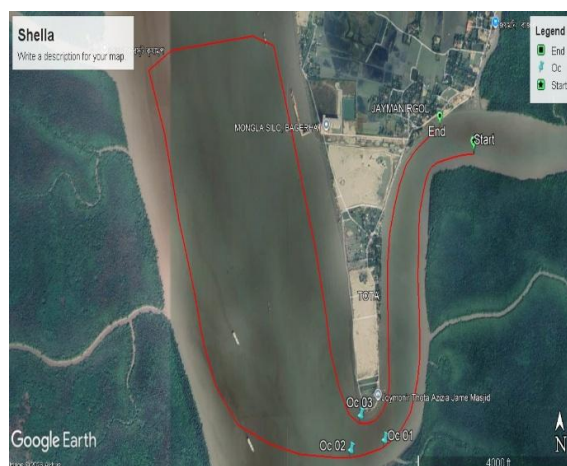


Figure 3.19: Dolphin sighting at Chadpai

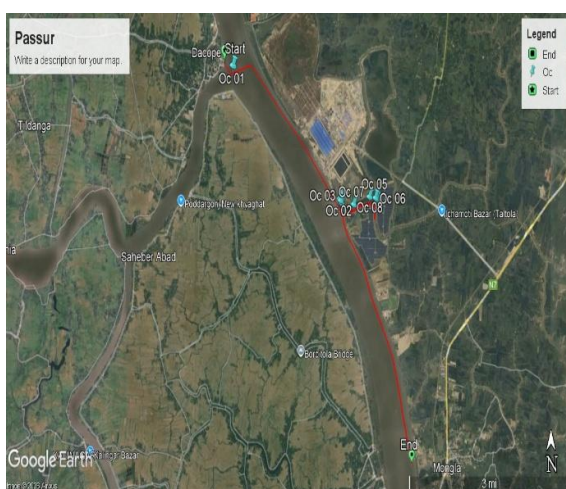


Figure 3.20: Dolphin sighting at Passur



Figure 3.21: Dolphin sighting at Dangmari

3.2.13 Ecological Implications

The 46th report clearly demonstrates that dolphin distribution within the monitoring area is not uniform and is strongly influenced by localized human activities. The long-term persistence of dolphins in Bhadra Khal underscores the importance of protecting smaller tidal channels that function as refuge habitats. Conversely, the consistently low dolphin use of Passur and Shella rivers indicates chronic disturbance rather than temporary fluctuation. The **Dolphin observation Datasheet is attached in table F4 of Appendix-IV.**

3.3 Sundarbans Forest Health Monitoring

The Sundarbans, the world's largest contiguous mangrove forest and a UNESCO World Heritage Site, plays a critical role in coastal protection, carbon sequestration, nutrient cycling, and the sustenance of rich aquatic and terrestrial biodiversity (Iftekhar & Saenger, 2008; Giri et al., 2015). This ecosystem functions as a natural buffer against cyclones and storm surges while supporting fisheries and livelihoods for millions of people in coastal Bangladesh. Despite its ecological importance, the Sundarbans is increasingly exposed to anthropogenic pressures arising from industrial development in its surrounding landscape.

The forest health parameters provide an integrated understanding of mangrove forest health, linking

below-ground processes, regeneration potential, and above-ground structure. A robust, long-term forest health monitoring program is therefore not optional but necessary to safeguard the ecological integrity, resilience, and World Heritage value of the Sundarbans under increasing industrial pressure.

3.3.1 Methodology

Monitoring Framework and Rationale

Forest health monitoring in the Sundarbans was designed as a long-term, indicator-based assessment to detect early ecological changes associated with natural processes and potential anthropogenic stressors. The methodology emphasizes repeatability, spatial comparability, and sensitivity to gradual structural and functional changes in mangrove ecosystems. Permanent Sample Plots (PSPs) were therefore adopted as the core monitoring unit to enable consistent data collection across monitoring cycles (**Figure 3.24**).

Selection of Bio-Indicators

A suite of bio-indicators was selected to represent key components of mangrove ecosystem structure, function, and regenerative capacity. The choice of indicators was guided by their ecological relevance, sensitivity to environmental stress, and feasibility of repeated field measurement within available time and resource constraints. Monitoring frequency for each indicator was determined based on cost, logistical practicality, and their expected rate of ecological response. The indicators assessed under this monitoring tier include seedling regeneration, pneumatophore density, crab hole density, canopy cover, leaf area index (LAI), above-ground carbon stock, and leaf phenology and phenological behavior.

Sampling Design and Permanent Sample Plot Layout

At each selected study site, a transect line was established perpendicular to the adjacent river or canal bank to systematically capture vegetation gradients from the riverine edge toward the interior forest. This orientation reflects the dominant hydrological and sedimentation gradients influencing mangrove distribution in the Sundarbans.

Along each transect, three circular nested Permanent Sample Plots were established at fixed intervals, positioned progressively inland to represent river-fringe, intermediate, and upper mangrove zones (**Figure 3.22**). The first plot was located approximately 40 meters from the river or canal edge to minimize the influence of active bank erosion and unstable substrates. Subsequent plots were positioned further inland at standardized distances to ensure consistency across sites.

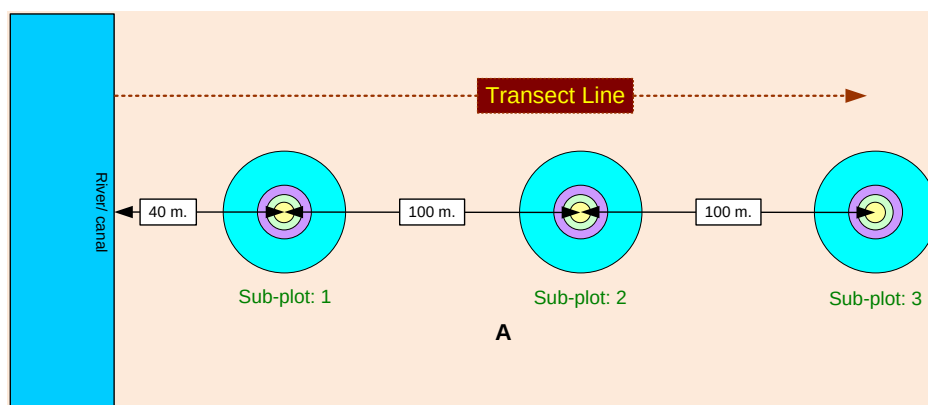


Figure 3.22: Layout of the subplots and transect line perpendicular from ecotone (river or canal bank)

Each circular plot had a radius of 12.62 meters providing an area sufficient to capture tree species diversity and stand structure while remaining practical for repeated field measurements. Within each main plot, four smaller quadrats (**Figure 3.23**). were delineated to facilitate detailed assessment of tree density, seedling regeneration, pneumatophore abundance, and other fine-scale structural attributes. This nested design allows data collection at multiple spatial scales within the same sampling unit.

Measurement Consistency and Long-Term Monitoring

All PSPs and subplots were permanently marked to ensure precise relocation during subsequent monitoring visits. Standardized measurement protocols were applied across all sites and indicators to maintain data comparability over time.

Table 3.10: General Description of Permanent Sampling Plots (PSPs)

Transect	Plot	Range	Compartment No.	GPS $\pm$ (m)		Soil Description	Plot Location Notes
				Latitude (N)	Longitude (E)		
Sutar khali	1	Khulna	32	22.4981	89.4875	Hard Clay	Just opposite from Sutar Khali Forest Station and 40m SW from Sutar Khali Canal
	2	Khulna	32	22.4973	89.4871	Hard Clay	Just opposite from Sutar Khali Forest Station and 140m SW from Sutar Khali Canal
	3	Khulna	32	22.4965	89.4866	Hard Clay	Just opposite from Sutar Khali Forest Station and 240m SW from Sutar Khali Canal
Karamjal	1	Chandpai	31	22.4253	89.5943	Hard Clay	Plot center 40m west from Passur River
	2	Chandpai	31	22.4252	89.5934	Hard Clay	Plot center 140m west of Passur River
	3	Chandpai	31	22.4226	89.5925	Hard Clay	Plot center 240m west of Passur River
Herbaria	1	Chandpai	29	22.2061	89.5924	Hard Clay	40m west of Passur River
	2	Chandpai	29	22.2962	89.5917	Hard Clay	140m west of Passur River
	3	Chandpai	29	22.2962	89.5908	Muddy	240m west of Passur River
Akram Point	1	Khulna	17	22.0187	89.5134	Hard Clay	40m east of Shibsha River
	2	Khulna	17	22.0180	89.5140	Clay	140m east of Shibsha River
	3	Khulna	17	22.0168	89.5145	Hard Clay	240m east of Shibsha River
Hiron Point	1	Khulna	44	21.9166	89.2333	Sandy	350m east from Gogari Canal
	2	Khulna	44	22.1833	89.5000	Sandy	40m north of the Bay of Bengal
	3	Khulna	44	21.7775	89.4598	Hard Clay	648m southeast of Shibsha River

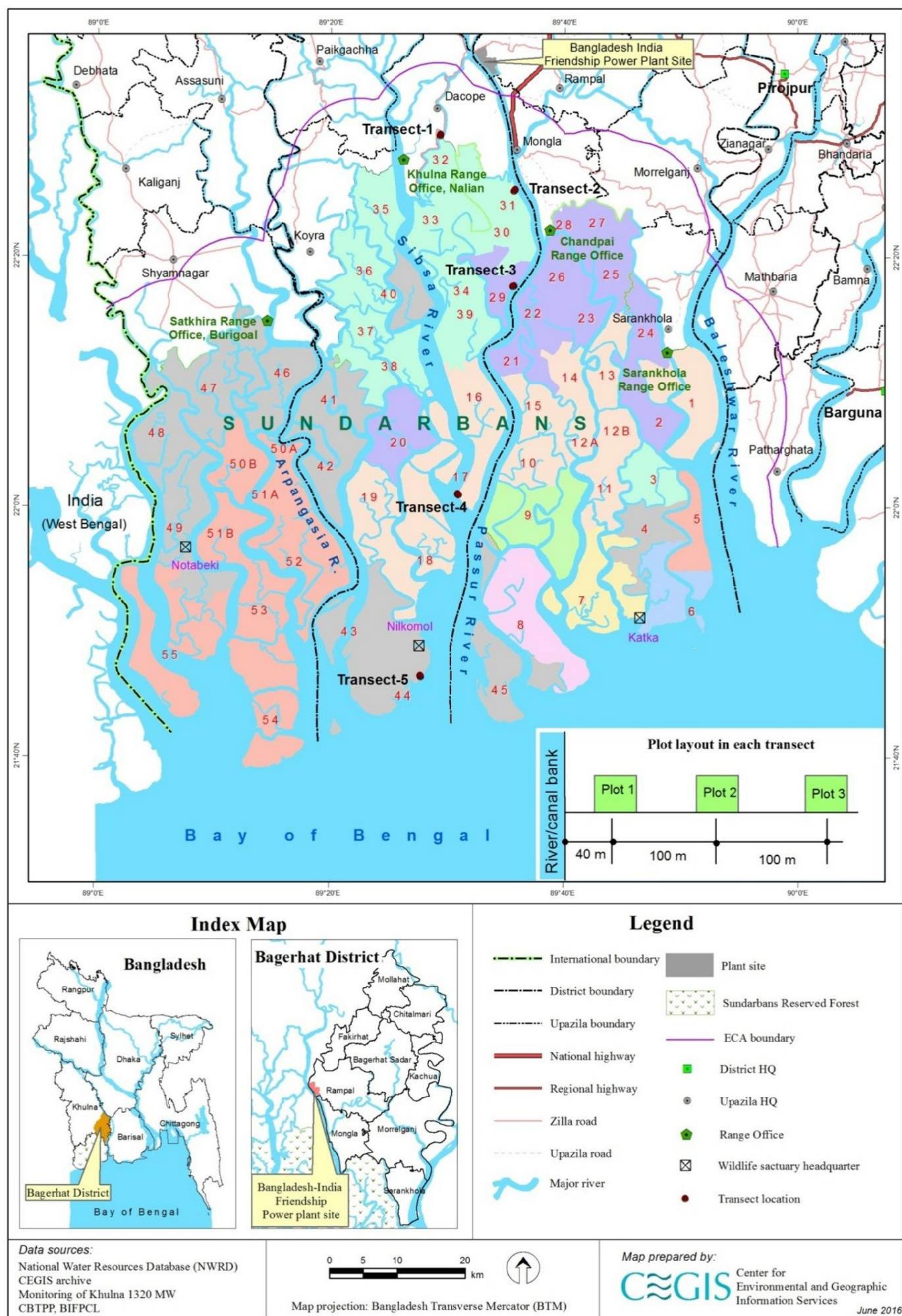


Figure 3.23: Location Map of Sundarbans Forest Health Monitoring Plots (PSP)

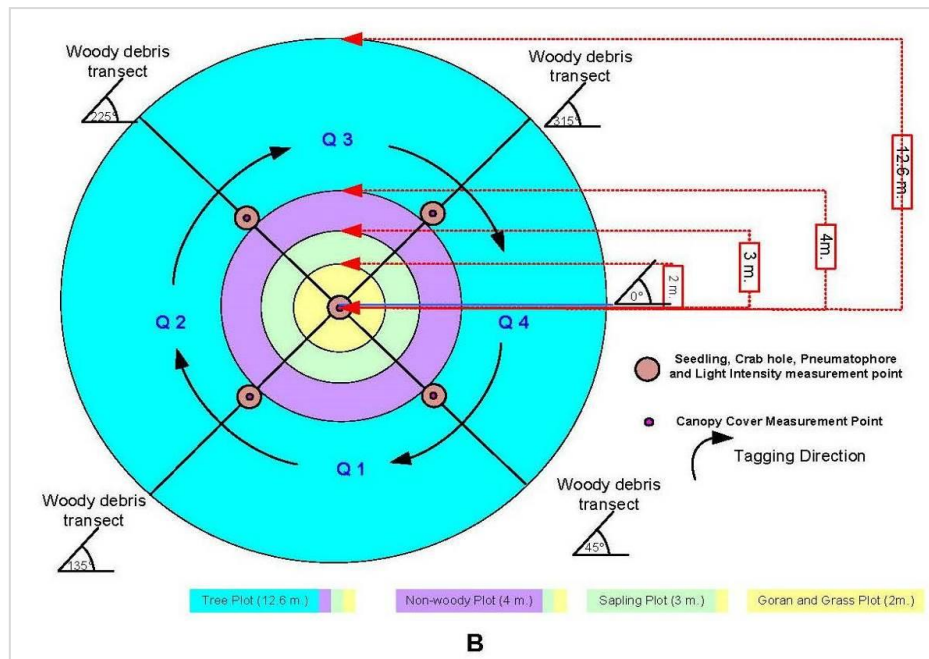


Figure 3.24: Layout of the survey activities in each subplot

Tree Growth

Within each circular Permanent Sample Plot (radius 12.62 m), a complete census of woody vegetation is conducted during every monitoring visit. All standing trees that meet the inclusion criteria are recorded, including individuals with a diameter at breast height (DBH) greater than 5 cm and a lean angle exceeding 45 degrees. For each qualifying tree, standard measurements—specifically total height and DBH—are taken to characterize stand structure and growth patterns (**Figure 3.25**).

To capture forest dynamics over time, saplings that newly cross the DBH threshold of 5 cm between monitoring cycles are incorporated into the tree inventory. These individuals are treated as recruits and measured following the same protocol as established trees. This approach ensures that changes in stand composition, growth, and recruitment are systematically documented across successive monitoring periods.



Figure 3.25: Mangrove structure monitoring by team members by DBH and Height measurements and recording

Seedlings

Regeneration and under storey vegetation were evaluated within each Permanent Sample Plot using standardized micro-sampling units. Seedlings, defined as woody individuals with a height not exceeding 1.37 m, along with associated herbs and climbers, were assessed inside circular plots with a 1-meter radius. Within each subplot, observations were conducted at five fixed sampling points to ensure spatial consistency. One sampling point was located at the subplot centre, while four additional points were positioned at the midpoints of woody debris transects oriented along 45°, 135°, 225°, and 315° bearings. At each point, all live individuals within the sampling circle were identified, counted, and assessed for general condition.

Pneumatophores

Pneumatophore abundance was quantified using the same spatial framework applied for regeneration assessment. Counts of live pneumatophores were conducted within 1-meter radius circular plots established at the five fixed sampling points within each subplot. The central point and the four transect-based points allowed consistent measurement of pneumatophore distribution under varying micro-topographic and hydrological conditions. Pneumatophore density was used as an indicator of soil aeration status and below-ground environmental conditions.

Crab Hole

Crab activity was assessed through counts of crab burrows, which serve as a proxy for bioturbation intensity and soil ecological functioning. Burrows were enumerated within 1-meter radius circular plots located at the centre of each subplot and at the midpoints of the four woody debris transects. The consistent placement of sampling units across plots enables comparison of crab activity among sites and monitoring periods.

Canopy Cover

Canopy cover was estimated using a spherical densitometer, a gridded convex mirror that provides rapid field estimates of overhead canopy closure. Measurements were taken by holding the instrument at elbow height, approximately 30–40 cm away from the observer, ensuring that the observer's head was not visible in the mirror (**Figure 3.26**). After leveling the densitometer using the built-in bubble, the number of grid points not obstructed by canopy was recorded. Within each subplot, readings were taken at four directions—north, south, east, and west—and canopy cover was calculated as the mean of these measurements. This method captures directional variability and improves the reliability of canopy closure estimates.



Figure 3.26: Canopy cover and Pneumatophore count inside the Akram point plot

Leaf Area Index

Leaf Area Index (LAI) was assessed as an indicator of canopy density and light interception capacity. LAI measurements were derived from light intensity readings collected using a digital light meter. For each subplot, open-canopy light intensity (I_o) and under-canopy light intensity (I) were recorded. These values were applied to the standard LAI equation:

$$LAI = \ln(I/I_o) / -K$$

where K represents the canopy light extinction coefficient, assumed to be 0.5. LAI values theoretically range from 0, indicating absence of canopy, to approximately 10 under very dense forest cover. This light-based approach provides a reliable and repeatable estimate of canopy structure across monitoring plots (Bioscience, 2016).

Biomass and carbon stock estimation

Above-ground biomass (AGB) of trees and saplings was estimated using the allometric equations developed by Chave et al. (2005), while below-ground biomass (BGB) was calculated following Komiyama et al. (2008). The equations applied were:

$$AGB \text{ (kg)} = \rho \times \exp [-1.349 + 1.980 \ln(DBH) + 0.207 (\ln(DBH))^2 - 0.0281 (\ln(DBH))^3]$$

$$BGB \text{ (kg)} = 0.199 \times \rho^{0.899} \times DBH^{2.22}$$

where ρ represents wood density and DBH is the diameter at breast height. Total carbon stock was derived by assuming that carbon constitutes 50 percent of dry woody biomass, following the approach proposed by Brown (1997).

Leaf phenology and phenological behaviour

Phenological processes, including leaf flushing, leaf fall, flowering, fruiting, and propagule release, were monitored as part of the forest health assessment. These events are known to respond sensitively to environmental stressors such as air pollution and climatic variability. During each field visit, phenological stages were systematically observed and recorded through direct visual assessment within all Permanent Sample Plots. Temporal changes in phenological patterns were used as qualitative indicators of ecosystem condition and physiological stress.

3.3.2 Monitoring Result and discussion of SRF Health

Sutarkhali

The Sutarkhali plot exhibited overall structural stability during the monitoring period, with approximately one foot of sediment deposition indicating active geomorphological processes typical of the Sundarbans. Tree growth was observed across most species, with *Heritiera fomes* (Sundori) showing the highest dominance, followed by *Excoecaria agallocha* (Gewa) and *Xylocarpus mekongensis* (Passur). Although bird activity was relatively low, the presence of Bengal monitor lizard and otter footprints reflects functional faunal use of the habitat. Four Sundori mortalities were recorded, including one previously damaged individual, suggesting localized stress rather than widespread decline. The absence of new recruits in two cases may be linked to anthropogenic interference such as selective removal. Overall, the plot maintains a healthy forest structure with stable growth dynamics, though continued monitoring of regeneration and human pressure is recommended.

Koromjol

Koromjol demonstrated strong regeneration potential, particularly for Sundori, with widespread seedling emergence and successful germination under highly inundated conditions. The muddy

substrate and moderate crab activity indicate an active mangrove floor system, while reduced litter accumulation likely reflects frequent tidal flushing. Bird calls, deer footprints, and general faunal signs suggest a biologically active environment. Growth increments in Gewa and Kakra were notable, reflected by increasing DBH across subplots, indicating favorable growth conditions. The introduction and establishment of Baen seedlings across all subplots further enhanced structural diversity. Although plastic debris was observed, pointing to tourist and boat-related disturbances, these impacts have not yet suppressed regeneration. The stand overall reflects a resilient mangrove system with high recruitment and ongoing structural development.

Harbaria

The Harbaria plot is characterized by a muddy forest floor with moderate ecological activity. While bird presence was lower compared to other sites, successful germination of Golpata and measurable DBH increases in Ammor, Gewa, Passur, Sundori, and Urmai indicate steady growth across multiple species. This mixed-species response suggests balanced nutrient availability and stable site conditions. One Sundori mortality and one missing individual in Subplot 2 may be associated with localized anthropogenic disturbance. Despite this, the plot maintains healthy growth trends and species coexistence, supporting its role as a structurally functional mangrove stand.

Akram Point

Akram Point showed comparatively lower tree density, reflecting a more open stand structure. A thick humus layer was present across the forest floor, indicating active organic matter accumulation and decomposition. Gewa exhibited positive growth responses in Subplots 1 and 3, with moderate growth in Subplot 2, while Sundori showed moderate DBH increases overall. Although Sundori decline and Gewa mortality associated with bark borer infestation were observed, signs of recovery were also noted, including the regeneration of a previously top-dying Sundori individual. Three new tree deaths were recorded during the monitoring period; however, these were spatially limited and did not indicate widespread stand collapse. The plot retains regenerative capacity, though pest-related stress warrants close future observation.

Hiron Point

Hiron Point displayed active sediment dynamics, with approximately half a foot of sediment accumulation at breast height, supporting Sundori seedling establishment. Flowering and fruiting of Goran, Jhana Garjan indicate healthy reproductive cycles. Although waterlogging was evident near creeks affecting Subplots 2 and 3, no significant structural change was detected in Subplot 2. The forest floor contained a thick humus layer mixed with decomposing Goran leaf litter, contributing to nutrient cycling. Gewa showed the most pronounced DBH growth, while Goran and Passur were present at lower abundance. Pest-induced Gewa mortality and isolated Sundori deaths were recorded but remained limited in scale. Overall, the plot reflects a functioning mangrove system with active growth, regeneration, and seasonal hydrological influence.

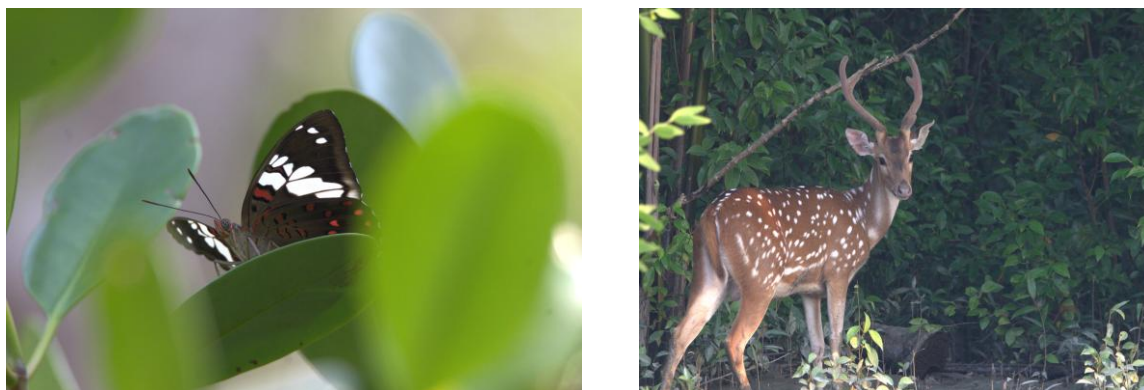


Figure 3.27: Presence of wildlife and butterfly sign in PSP during field visit

3.3.3 Result and discussion

Pneumatophore Density

Across the monitoring period, pneumatophore abundance shows an overall stable to increasing trend during the construction stage, followed by site-specific adjustments during the operational stage, reflecting local hydrological and sedimentary dynamics rather than generalized forest decline. At Sutarkhali, pneumatophore counts increased substantially from the baseline year (194,185) to the construction phase (473,156), likely driven by sediment accretion and reduced scouring near the forest edge. Such responses are common in sediment-rich zones of the eastern Sundarbans, where mangroves enhance aerial root production under moderate sedimentation stress. During the operational phase, numbers declined to 375,180 but remained well above baseline, suggesting structural adaptation rather than degradation, consistent with observations from sediment-affected sites in the Indian Sundarbans.

Koromjol exhibited consistently high pneumatophore densities across all stages (576,733 to 387,047). The slight decline during operation coincides with prolonged waterlogging and dominance of mature Baen (*Avicennia officinalis*) and Kakra (*Bruguiera gymnorhiza*) stands in the inner plots. Mature mangrove stands typically stabilize root density once canopy closure is achieved, a pattern well documented in mixed-species Sundarbans forests. At Harbaria, pneumatophore density increased markedly from baseline (212,497) to construction (405,660) and remained high during operation (391,732). Given minimal tourism pressure and limited direct human disturbance within plots, this trend indicates favourable soil aeration and stable hydrological conditions.

In contrast, Akram Point consistently recorded lower pneumatophore numbers (68,080 to 59,948), which aligns with long-term bank erosion and substrate instability observed since the first monitoring cycle. Similarly, Hiron Point, influenced by wave action and periodic sand deposition, maintained moderate but stable pneumatophore densities (145,605 to 324,781), reflecting dynamic yet resilient coastal fringe conditions. Overall, pneumatophore trends suggest functional root adaptation across sites, with no evidence of large-scale physiological stress.

Crab-Hole Density

Crab burrow abundance, a proxy for soil bioturbation and nutrient cycling, remained ecologically robust across all sites, with fluctuations reflecting microhabitat conditions rather than ecosystem decline. At Sutarkhali, crab hole density declined during construction (174,036 to 140,765) but rebounded strongly during operation (194,204). This recovery suggests short-term disturbance effects followed by re-establishment of soil fauna, a pattern commonly reported in managed mangrove

landscapes near settlements.

Koromjol showed a steady increase from baseline (77,879) to construction (122,964), with a moderate reduction during operation (98,499). This trend corresponds with mixed vegetation structure and waterlogged conditions, where crab activity remains present but spatially redistributed. Harbaria exhibited a pronounced peak during construction (229,399) compared to baseline (141,984), followed by stabilization during operation (140,551). The absence of tourism or direct disturbance within plots likely supported sustained crab populations.

At Akram Point, crab hole density remained consistently high (344,496 to 307,062), even under erosional stress, indicating strong benthic resilience. Hiron Point displayed lower absolute values but clear responsiveness to sediment dynamics, increasing from baseline (30,463) to construction (91,618) before declining slightly during operation (64,122). These patterns align with findings from both Bangladesh and Indian Sundarbans, where crab populations fluctuate with sediment texture and inundation frequency rather than pollution alone.

Canopy Cover

Canopy cover remained high and stable across most sites, reflecting mature forest structure and strong vertical integrity. Sutarkhali, Koromjol, and Harbaria all maintained canopy cover above 93% throughout the monitoring period, with peaks during construction (up to 99%). This suggests enhanced leaf production and crown expansion during mid-stage monitoring, possibly linked to favourable nutrient availability. Harbaria, in particular, showed a gradual increase from 94.8% to 98.1%, consistent with its low disturbance regime. In contrast, Akram Point experienced a notable decline during the operational stage (from 92.3% to 82.8%), likely due to ongoing bank erosion and tree loss along exposed edges. Hiron Point also showed a slight reduction (98.4% to 94.9%), attributable to wave action and episodic sand washout. Despite these localized reductions, canopy cover values remain within healthy ranges for Sundarbans mangroves, indicating no widespread canopy degradation.

Light Intensity

Under-canopy light intensity exhibited inverse relationships with canopy cover, supporting internal consistency of the dataset. During the construction stage, light intensity decreased at most sites (e.g., Sutarkhali from 4.01 to 2.71; Akram Point from 3.37 to 0.71), corresponding with peak canopy closure. During the operational stage, light levels increased again, particularly at Koromjol (7.69) and Harbaria (5.03), reflecting canopy stratification and small-scale gap formation. At Akram Point, lower light intensity persisted due to erosion-driven canopy thinning rather than regeneration gaps. Hiron Point showed moderate increases, consistent with dynamic coastal processes. These light regimes remain suitable for mangrove regeneration and are typical of healthy, structurally complex Sundarbans forests.

Seedling Dynamics

Seedling abundance shows the strongest positive signal for forest health, particularly during and after the construction stage. At Sutarkhali, seedling numbers increased dramatically from baseline (6,366) to construction (383,564), followed by partial thinning during operation (214,682). Such self-thinning after mass recruitment is a well-documented regeneration pattern in Sundarbans mangroves. Koromjol and Harbaria followed similar trajectories, with peak recruitment during construction (401,071 and 404,891 respectively) and stabilization during operation. These trends indicate successful regeneration despite proximity to human activity, suggesting that disturbance levels remain below ecological thresholds. In contrast, Akram Point and Hiron Point consistently recorded

lower seedling densities, reflecting substrate instability, erosion, wave action, and occasional washout. However, even here, gradual increases over time indicate ongoing recolonization, especially during favourable seasons.

Time series analysis

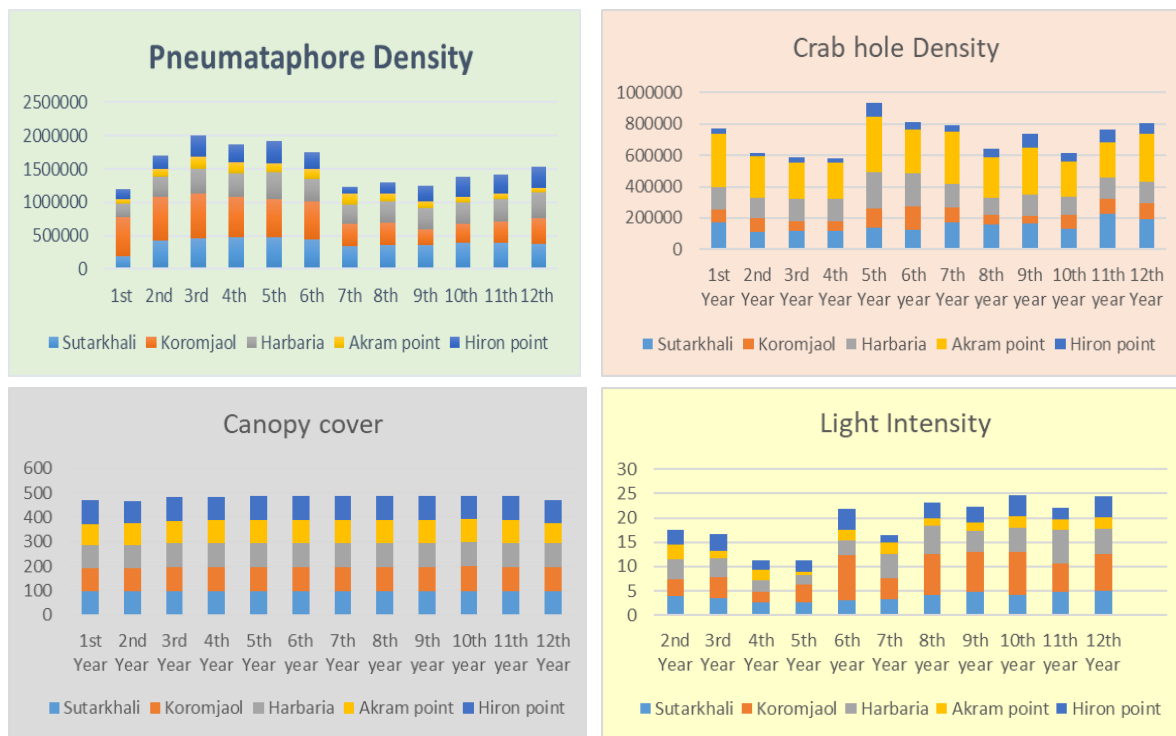


Figure 3.28: Time series analysis of pneumatophore, crabhole density, and canopy coverage, light intensity among 5 monitoring plots

Carbon density:

Carbon stock assessment across Sutarkhali, Koromjol, Harbaria, Akram Point, and Hiron Point indicates no significant change in overall carbon storage during the monitoring period. Observed variations remain within the expected range of natural mangrove dynamics and do not suggest any systematic decline in forest condition. At Sutarkhali, Koromjol, and Harbaria, carbon stocks remained largely stable throughout the monitoring cycles. Minor fluctuations reflect natural processes such as sedimentation, regeneration, and stand-level structural adjustment. Limited tree mortality was observed, with three to four mature trees dying across plots during the period; however, this did not result in any measurable reduction in total carbon stock.

At Akram Point and Hiron Point, localized physical disturbances such as bank erosion, wave action, and sand deposition affected individual trees and plot conditions. In these sites, two monitoring plots were relocated following physical damage to the original plots. The newly established plots initially recorded lower carbon values, consistent with younger or regenerating vegetation rather than loss of ecosystem function.

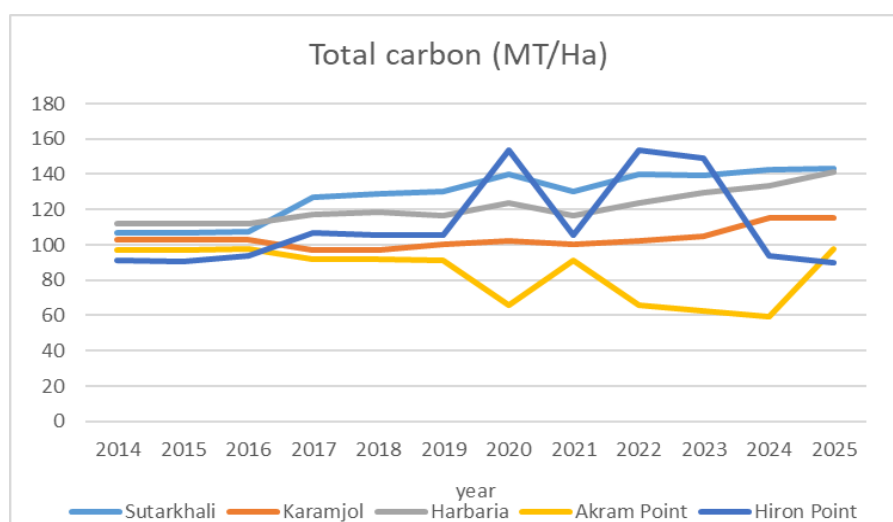


Figure 3.29: Time series carbon stock in five plots

Phenological Behavior

Phenological Behaviour of Major Mangrove Species in the PSPs and show the behavior same from last monitoring. The present survey (November 2025) phenological monitoring shows a pattern that fits very well with what we expect in the winter season of the Bangladesh Sundarbans (**Figure 3.29**).



Figure 3.30: Phonological behaviour (Amoor & Sundori) observed during this monitoring period

3.3.4 Overall, Forest Health

Taken together, the stage-wise monitoring results indicate that the Sundarbans Forest stands assessed in this study remain structurally intact, functionally active, and regenerating. Variations observed across baseline, construction, and operational stages are largely site-driven and process-oriented, shaped by sedimentation, erosion, hydrology, and stand maturity rather than systemic degradation.

Sites closer to human settlement and tourism zones (Sutarkhali, Koromjol, Harbaria) show adaptive resilience, while remote and physically dynamic sites (Akram Point, Hiron Point) reflect natural coastal stress regimes typical of the Sundarbans. Overall, the indicators collectively point toward a stable and resilient mangrove ecosystem, consistent with observations from comparable zones in

Bangladesh. The total health of each parameter shows below chart

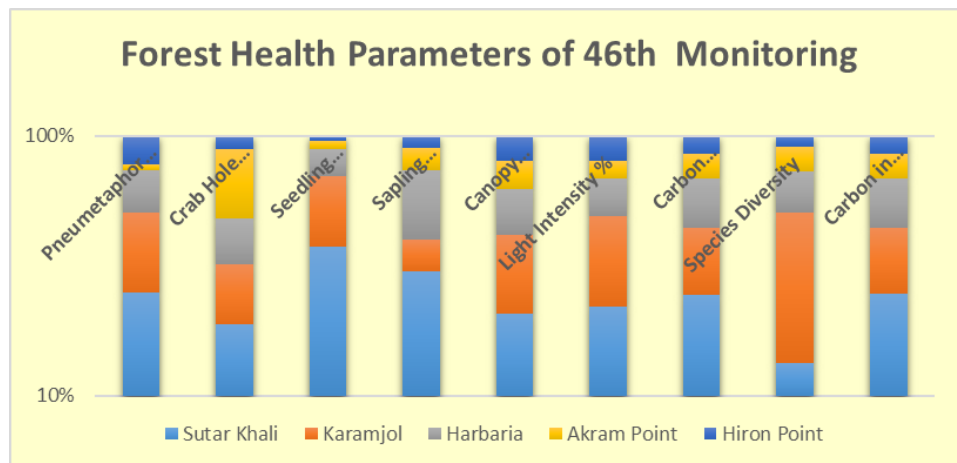


Figure 3.31: Overall, forst health

4. Social Environment

4.1 Introduction

Social safeguards refer to the measures intended to mitigate unexpected negative impacts of the development projects. This safeguard monitoring is a follow-up study that conducted following the impose condition of DoE, and the measures of Environmental Management Plan (EMP), suggested in the Environmental Impact Assessment (EIA) Report.

The objective of the social safeguard monitoring is to ensure compliance during the project's operation phases. At this stage, the compliance status of the working environment, community safety and security, project support and impact on livelihoods, and status of Corporate Social Responsibility (CSR) has been checked/assessed. Additionally, the recommendation has been suggested in addressing the non-compliance or partial compliance issues based on the findings of the safeguard monitoring.

4.1.1 Methodology

This monitoring was conducted using basic social data collection methods i.e. informal or formal consultation, key informant interviews, group discussions and physical observation applied to collect data from the study area as well as from the project office. A format of checklist was used to collect necessary data from this survey/interviews. The local stakeholders, LGIs representatives, onsite project workers, MSTPP officers took part in the consultations/discussion and provided their necessary feedback in response to the issues of the checklists. The group discussion, informal interviews and physical observation were held within the project area and at different location near to the project area i.e. Zero Point, Kapasdanga, Barni, Kalikharber, Chalkgona, Shidamkhali and Kathamari villages.

4.1.2 Findings of Social Safeguard Monitoring

Impact on Livelihoods

At present, 245 employees worked in BFPCL project office at Rampal, in which 11% is NTPC employees, 5% BPDB and majority 84% is BIFPCL payroll staff those are directly recruited by the BIFPCL authority. About, 89% of the employees are Bangladeshi in the BIFPCL project office, in accordance with the skill and capacity few are recruited from Mongla and Rampal upazila also. Additionally, a number of third-party contractual employees (all are Bangladeshi Citizen) engaged in different potential activities in the project site. It is to be noted that some employees serve in in BIFPCL head office at Dhaka.

Table 4.1: Employment Distribution of BIFPCL Project Office at Rampal

Employee Status	NTPC (Indian)	BPDB Bangladeshi	BIFPCL permanent (Bangladeshi)
Male	27	13	201
Female	0	0	4
Total	27	13	205

Source: BIFPCL Office, November 2025.

According to the survey findings, there have limited scope of their employment directly in the project site as a worker or employee. However, employment opportunity related to the support service of the MSTPP employes has been generated for the local community. They claimed that in recruiting non-

technical/support service providers (i.e. gardener, cook, driver, cleaner etc.) through the third parties limited the scope of direct employment for the potential local inhabitants. They are unaware about the way they can get employed in the project site.

The MSTPP authority constructed shops in the market complexes at the residential area (1st week of November, 2023). In total 34 shops are constructed in the market complex in which 28 are already allotted. Under the allotted number, 9 are in operation and 19 are not yet operated. About 25% of the allotted shops are given to the PAPs (who were lost their land due to MSTPP) in priority basis.

It is to be noted that 3 shops (out of 6) outside 2nd gate of the BIFPCL premises are found to be operated in providing food-beverage, snacks and restaurant services. In the allotment of these shops, no such condition for the PAPs was applicable. The project authority has planned for constructing super shop and other services (i.e. communication service, banking, and post office-related services etc) in the remaining 6 unallotted shops in the market complex. Status of allotted shops in the market complex is given in the following **Table 4.2**.

Table 4.2: Status of Shops near BIFPCL Market Complex

Types	Nos
No of allotted shops	28
No of operated shops	9
No of unoperated shops	19

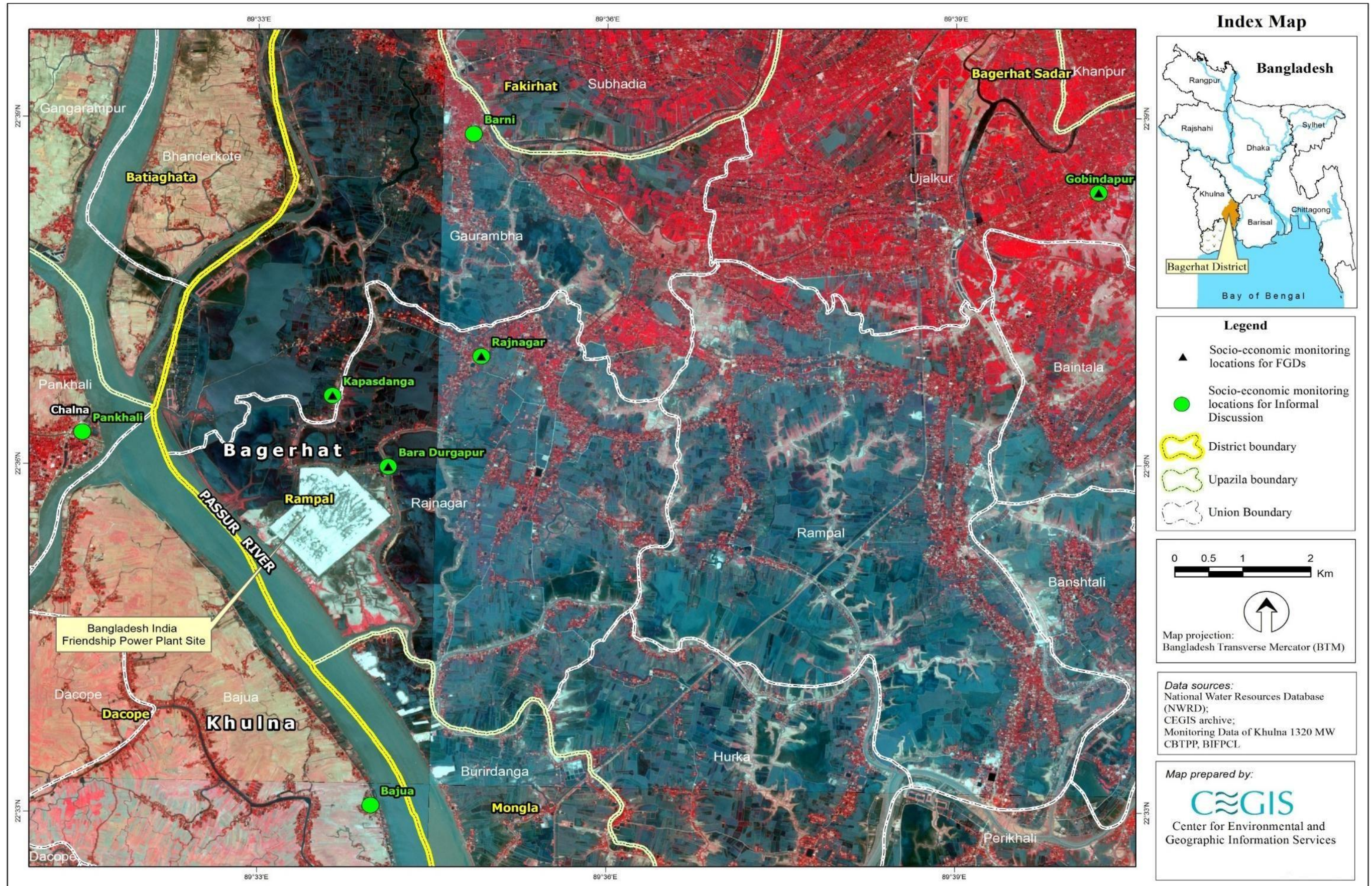
Source: BIFPCL Office, November 2025.

People engaged in different support services focused on the MSTPP (i.e. non-motorized vehicle operator, food and beverage supply, mobile recharge operator, vegetable/fish/meat supplier) are satisfied with their way of earnings due to the project.

The MSTPP authority stated that they are willing to support the local community in skill development under the CSR. There may have some administrative negotiation about allocation and arrangement of CSR, however according to the arrangement of the fund they are committed to do for the betterment of the community. In this regard, they expect comprehensive and participatory approach in design and module finalization of the skill development program, so that the outcome of the training can be functional.

Working Environment

The PMU arranged residential quarter for the officers of BIFPCL. That quarter is fully occupied so far, and some employees resided in the Khulna City and Mongla area. Some officers also applied for the residential quarter and still waiting for the allocation, if any. The MSTPP authority arranged transport support for the employees resided in outside the premises which is adequate according to the capacity. The environment friendly office admin building also designed with adequate space allocation for the officials and necessary amenities i.e., prayer room, dinning, meeting and conference room. The PMU regularly monitors the safety keeping issues for maintaining good, safety and friendly working environment in the project premises. Strict security system maintained in the 2 main gates of the project so that any unauthorized cannot get the access inside the plant and entire premises are under 24 hours surveillance through CCTV. The authority arranged different regular trainings and provide necessary safety equipment (Personal Protective Equipment - PPEs) according to the requirements.



In this monitoring phase, 2 induction trainings and 8 other trainings were arranged by the BIFPCL where internal official were trained in related topics. Initial medical check-up is obvious before confirming the recruitment of any employee in the premises so that spreading of out bringing communicable diseases can be checked. The MSTPP authority bears all necessary costs of this physical examinations and tests.

Even, the MSTPP authority arranged medical supports for their employees in most affordable price, and some services are provided in free of cost for the employees i.e., medicine, consultancy fees, ward/cabin charges, ambulance service. However, the employees have to pay discounted costs of medical tests, and ICU bed charge. Emergency and ordinary medicines are available in the medical center but the rare and costly medicines are mostly unavailable in the Maitree Hospital, and needed to be purchased from others. It is noted that the service and charges are almost same for both the BIFPCL employees and surrounding communities.

In considering the wellbeing of employees' family, the MSTPP authority have planned for setting up a school in their premises. In this regard, the authority communicates with different popular school in Dhaka for opening their branch in BIFPCL premises. Also, they are initiating to set up a super shop in their market complex and so far, 'Daily Shopping' brand have shown their interest in this regard. In case of handling any unavoidable circumstances, emergency firefighting system has been set up in the BIFPCL premises including 2 fire-fighting vehicles, rescue team consisting 36 officials, designated 11 assemble points etc.

Grievance Redress Mechanism

The grievance record and redressed mechanism have been formed for the BIFPCL workers at the very beginning of the construction works, but such mechanism was not developed for addressing community level grievance up to just three quarters before. Grievance box for the communities were installed inside the main gate before last two quarters which was suggested to install in the outside of the main gate. In considering the suggestion, the grievance box has found to be replaced in the outside of the main gate in this quarter.



Figure 4.2: Community Grievance Box outside the Main Gate of BIFPCL

Health and Safety

Health and safety issues are addressed in two different ways – one is within the project premises for the beneficiary of the workers and another is within periphery for both workers and community. Within the premises, the authority properly managed the solid wastes, and treated it for preparation of compost as well. In the last quarter (August 2025 to October 2025), the MSTPP authority collected 32,295 kg of solid waste from their premises and convert to 3200 kg of compost. The ETP and STP is also properly functioned and authority committed to discharge no operated water without treatment. For ensuring cleanliness in the premises, the authority set 150 dustbins in different locations of the premises, most of those are segregated for specific wastes/trash in different colors.

In the periphery, plantation program is continued to make the environment healthy, and in this phase around 26496 saplings have been planted with the coordination of BFD, Bagerhat. In line with this, plantation target of 2 lac have been met up in 2025. In addition, the authority also plants trees in different location of the project premises in special occasions. In previous, there found little leakage of coal dust during coal lifting in the jetty area, that was found to be improved in this phase. The existing coal grabbers have already been modified and enclosed to the extent possible to minimize coal droppings during unloading operations. The community did not raise any project induced health and safety issues during this phase.

Corporate Social Responsibility (CSR)

Corporate Social Responsibility (CSR)

The CSR activity induced on the basis of the profit of project operation. In previous, the MSTPP authority initiated some social welfare activities from the pre-construction phase to till now. At present, the authority formed a CSR committee consisting 5 members following the guideline of BPDB. One (1) member form LGIs, 1 member from local administration and 3 from the BIFPCL will include in the CSR committee. This committee will design and implement the CSR activities in this operation phase, subject to the scope, and CSR fund allocation under the negotiation between BIFPCL and BPDB.

So far, the authority arranged some activities in considering their responsibility towards the community and surrounding society, those are:

- Arrange regular free mobile medical camp for the people of project surrounding villages;
- Installed 11 water supply system for ensuring safe drinking water in the surrounding communities;
- Arranged rallies and programs on national days and special occasions both within and outside their premises; and
- Arrange necessary supports for the study tour group visited to oversee the operations and environmental management schemes in the MSTPP.

RO/Safe Water Supply Facilities

At the pre-construction phase of the BIFPCL project, acute safe water scarcity was observed in the project surrounding unions. Therefore, the project authority, initiated effort to supply safe water for the villagers of the project surrounding. In this regard, 11 ROs/safe water supply system have been constructed, and 9 of those are subsequently operated from few years ago. Two ROs at Shidamkhali village are currently out of service due to technical issues and are undergoing necessary maintenance, while at Proshadnagar village, additional community engagement and cooperation are required to support the effective operation and maintenance of the RO system. The BIFPCL have the responsibility of maintenance for a certain year (about 4 years) whereas the operation costs were managed by the

users which is sometimes difficult to arrange. According to the statement of the RO operators, one-fourth or one-third of the beneficiaries regularly pay the operational cost of the ROs which is insufficient to arrange even the electric bill of the ROs. Through this monitoring team, the RO operators requested to the project authority to take over the responsibility of operation and maintenance of these ROs. Also, requested to erase their name in the electric meter of the ROs that is remain as extra burden to their shoulder. The message conveyed to the authority and they replied that they already started to rethink about the alternate of this RO project in such way that no operational cost is needed to be bear by the community people.

Celebration of Ozone Day

The authority arranged rally, exhibition, quiz competitions and tree plantation in the world ozone day in the plant premises. BIFPCL officials and their family members attended the program and participate in different events.

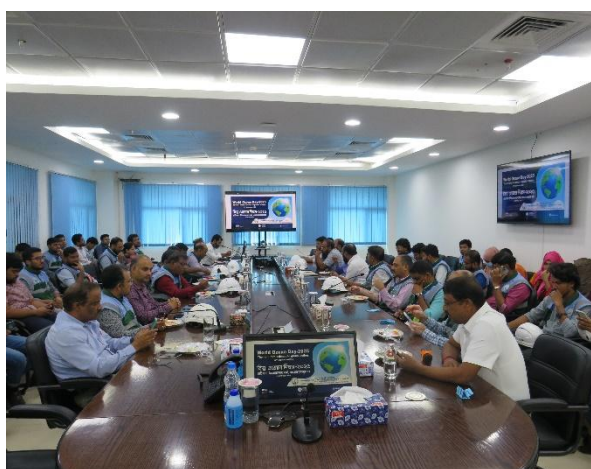


Figure 4.3: Seminar on World Ozone Day



Figure 4.4: Tree Plantation at the MSTPP Premises

Raising Day Celebration

In the 13th Raising Day of the BIFPCL, the authority organized wheelchair distribution program among the physically disabled across the project surroundings. Members of the Board of Directors & other esteemed guests were attended the program. They expressed their sincere gratitude to the BIFPCL management for arranging such welfare program for improving the quality of life for the project's neighboring residents. BIFPCL management also arranged a voluntary blood donation camp on this auspicious occasion. The enthusiastic participation from employees, reflecting the commitment and compassion in humanitarian values and social responsibilities. Total of 59 bags of blood were successfully collected and handed over to the Red Crescent Society, Jashore, (Ahad Blood Center) to support patients in critical need.



Figure 4.5: Wheel Chair Distribution



Figure 4.6: Blood Donation

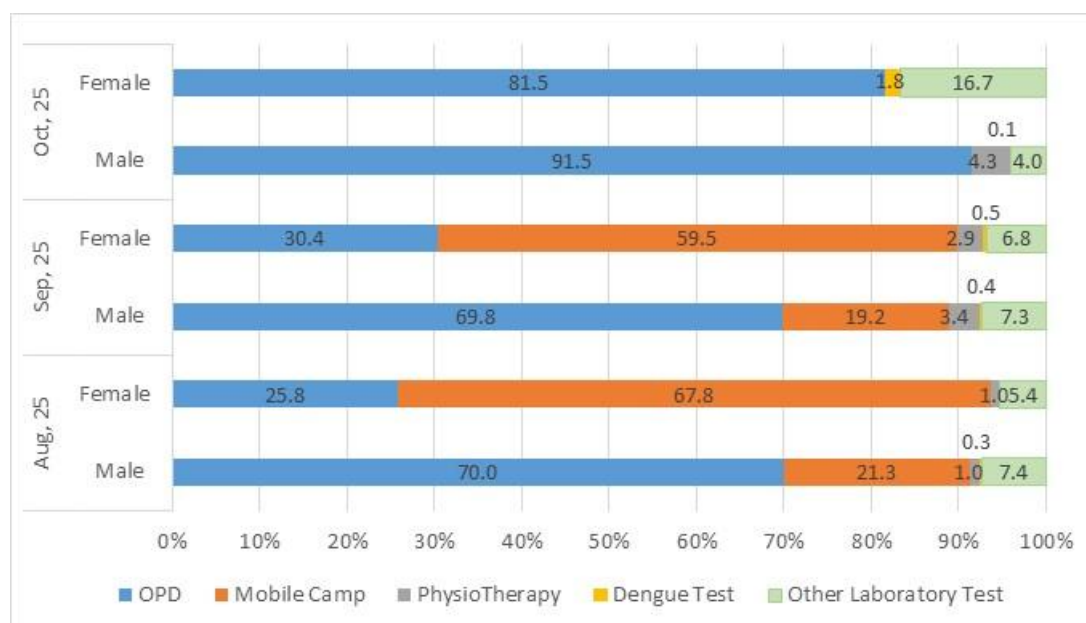
Support in Study Tour

Interns of Khulna University of Engineering and Technology (KUET) and Khulna Political Institutes visited the MSTPP site on September, 2025 and October, 2025 respectively. Students along with respective faculty member visit different sites of the plant and observe the process of Effluent Treatment Plant (ETP), Flue Gas Desulfurization (FGD), Sewage Treatment Plant (STP), Solid Waste Management, Colling mechanism etc. The MSTPP authority provided all kind of necessary support in this regard.

Medical Facilities

The MSTPP authority provided medical support through their own medical center named Maitree Hospital. OPD, medical camp, physiotherapy service, laboratory test including dengue test, and consultancy services are provided by the Maitree Hospital. Both the BIFPCL staff and community have been receiving all those services since its inception. The free medical camp services are not initiated in last few months which has been reinitiated from April, 2025 again. In this quarters, 1158 patients received medical service in free mobile medical camps. The consultancy service of Maitree Hospital is opened for all (workers and local community) in 24 hours a day. The hospital also provides free ambulance service and general surgical activities for all.

According to the database of the Maitree Hospital for last three months since October, 2025, in total, 4176 patients receive medical services, in which the highest 2,628 patients received services for the OPD followed by 1158 patients from mobile medical camp. Detail of the gender specific service receivers distribution is depicted in the following Figure.



Source: Maitree Hospital, November 2025

Figure 4.7: Medical Services from August 25 to October 2025

Autonomous Development People Expectation to MSTPP

The autonomous development scheme was same as previous. No such development project is found to be initiated in the project surrounding areas.

Recommendations

- Recruitment of local laborers is limited at this operation phase, but, whenever local labors are required then it should be recruited through a proper process, by direct recruit under an open circular system;
- Local people have limited technical knowledge align with scope of works in the MSTPP, therefore authority should train up the local potential work force in the align scopes of the MSTPP under CSR fund, if possible. Training on painting, cooking, mobile repair, interior designing and furniture, electrician, auto mobile mechanic etc. can be effective in this regard.;
- The communication officer of BIFPCL should maintain regular communication with the local people, and intensive network should be developed for better designing and planning of the CSRs in near future;
- The households resettled at Foyla Shelter Home should be preferred in the CSR program at coming future (if any), as they are seriously affected by the project, and no such welfare services is yet to be provided by the MSTPP;
- Monthly site visit and field note of the site visit in operated ROs should be recorded in BIFPCL project office. If possible, the authority should think about the alternative management/arrangement of the ROs which may not contain any operational cost for the community. The BIFPCL authority should think about ROs for it effective and sustainable use or should think some alternatives in this regard

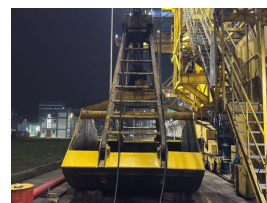
5. Environmental Compliance

5.1 Introduction

The Environmental Compliance Report has been prepared to fulfill the regulatory requirements of Bangladesh-India Friendship Power Company (Pvt.) Ltd. (BIFPCL) at the institutional level and Maitree Super Thermal Power Plant (MSTPP) at the field level. The purpose of this report is to highlight both actual and potential instances that demonstrate the efforts of MSTPP to comply with the standards, guidelines, and mitigation measures outlined in the Environmental Management Plan (EMP) of the EIA Report. This report will present the current level of compliance with the DoE conditions and the EMP's requirements outlined in the EIA Report, through an operational interpretation of applicable local laws, international standards, and company policies. An Environmental Health and Safety (EH&S) team from the Consultant comprised of diversified expertise paid a routine inspection to the plant site from 24 to 27 November, 2025 in order to gather necessary information and data, considering the bio-physical, Environmental Health and Safety and other relevant information. This was done through a thorough walk-in visit, meetings with Plant officials and general laborers, and physical observation of the ongoing activities at the Plant.

A set of theme-based comprehensive and detailed checklist was prepared to collect information on environmental and social compliance issues. The checklists have been prepared by reflecting the issues/indicators/parameters embedded in the following aspects e.g., Environmental and Social Management System (ESMS) and Action Plan; Laborer and Working Conditions; Community Health, Safety, and Security; Biodiversity and Sustainable Management of Living Natural Resources, waste management etc. The major findings during the 46th field visit are as follows:

- a) Maintenance dredging is being conducted using a dredger with a capacity of 500 cubic meters per hour to maintain the required draft for the navigability of the coal carrying ships and or barges (lighterage) for transporting coal to the Plant's jetty from the transshipment area in Harbaria. The dredged materials are disposed of in a 200-acre designated pond located at the southeast corner of the Plant's premises. The accompanying water from the dredged slurry is carefully managed to ensure that only silt-free water is discharged into the river, thereby preventing sedimentation and minimizing physical and environmental impacts.
- b) The Coal Supplier, under the strict directives of the Project Proponent, has implemented corrective measures given by the IMA includes net-fencing of the receiving ship/barge to control coal dust dispersion during ship-to-ship coal transfer operations at the jetty area. However, elongating the existing flexible coal chute to ensure more controlled and contained coal transfer has also been recommended to further minimize dust emissions to protect the local aquatic ecosystem.
- c) The existing coal grabbers have already been modified and enclosed to the extent possible to minimize coal droppings during unloading operations. Since, the modified grabbers were installed after the visit of this monitoring quarter, so physical observation on coal droppings is remote. However, such modification is expected to significantly reduce coal spillage and dust emissions from the grabbers during the unloading process.
- d) Sand and/or earth piles were found uncovered at a few places inside the plant premises and the authority has been trying to reduce the number of such piles as low as possible and at the



same time, they have been keeping the piles covered. Though minor, still this issue should be taken care properly due to health concern of the staff, workers and officials.

- e) The Proponent has already reached up the plantation target of two (02) lac saplings by the year 2025. During this quarter (August to October), 26,496 saplings have been planted which includes various species of mostly medicinal plants, coconut, Golpata jackfruits, etc. In total 2,01,496 saplings have been planted so far out of 300,000 saplings under this plantation program It is recommended to plant mangrove species in the course of fulfilling the target.
- f) The environmental control measures like Flue Gas Desulphurization (FGD), FGD Waste Water Treatment Plant, Electrostatic Precipitator (ESP), Effluent Treatment Plant (ETP), Sewage Treatment Plant (STP), Solid Waste Management Plant (SWMP), etc. are in operation and fully functional.
- g) The Proponent has installed a community grievance box outside the main entrance of the plant premises so that the affected community (if any) can easily drop their complaints or grievances in the box to be accounted and resolved the issues by the authority.



In general, the aim of this compliance checklists is to check the implementation and effectiveness of mitigation measures as stated in the EMP of EIA. The checklists are developed as a Compliance Data Sheet that contains both quantitative and qualitative data. The findings of the environmental compliance monitoring are summarized and presented in the following **Table 5.1, 5.2, 5.3 and 5.4.**

Table 5.1: Monitoring of Environmental and Social Management System Action Plan Implementation

Sl. No.	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
1	Generation of Noise within the BIFPCL's Plant construction premises.	- Switch off / throttle down all site machinery, vehicles, water vessels, and generator when not in use - No construction activities at night - Use noise damper within the project boundary, Limit vehicle speed and monitor it at every suitable point.	- Noise data are being monitored quarterly at different sensitive areas (Labor shed, township, nearby areas etc.) and are assessed against the Noise Pollution (Control) Rules 2006. No non-compliances have been recorded yet. - Aside from a faint sound during the walk-in visit inside the plant premises, no discernible noise was heard. Idle machineries / equipment / generators were kept switched off / throttled down. - Generators with acoustic enclosures were observed and operated only when required.	Complied	Limited noise is generated from the repairing works at this stage. It is suggested to maintain health and safety protocols and adopt relevant PPE (e.g., ear plug/noise muff, etc.) by the technicians and workers before appearing the repairing site.
2	Dust generation from construction/repairing works	- Limiting activities for producing fugitive dust particle within project area - Vegetation clearance and base stripping should be minimized. - Vehicle speed restriction must be enforced to control dust generation. - Earthen roads and undeveloped roads should be avoided to minimize dust generation - Construction materials must be covered to protect from wind action - Spray water regularly for suppressing fugitive dust - Dust particle generated from access road must be controlled by spraying water during dry season. - Stock piles of construction materials must be covered in order to protect from wind action.	- Although the construction works have been completed, routine repairing activities are the regular phenomena. Therefore, the quarterly air quality monitoring is being conducted in and around the project site to standardize the monitoring results in regard to the Air pollution (Control) Rules 2022. The results indicated that none of the monitored criteria pollutants have exceeded the prescribed limits to date. - Crushed materials, stone chips were well covered but a few stockpiles of sand and other loose materials were noticed uncovered at the repairment areas. - Continuous water spraying on the dusty road was noticed to suppress the fugitive dust. - No black smoke was observed as the plant and equipment are being maintained properly. Overhauling of the machineries are materialized at a regular interval.	Being Complied	- Suggested to cover all the Stockpiles of sand and other loose materials inside the plant premises. - Good housekeeping is strongly recommended

Sl. No.	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
		An appropriate freeboard must be maintained in trucks hauling construction materials.	- During the visual monitoring, no noticeable dust was observed. - Appropriate freeboard was observed in the loaded truck.		
3	Water Quality	- Surface water must be saved from any harmful effluent emission and waste dumping from project site. - Provide closed system facilities and wastewater treatment plant to minimize discharge of effluents from worker's colony. - Good housekeeping at workplace and construction site - Appropriate equipment with safety measures should be used for storage and handling of lubricant - Provide training and awareness building program to the workers during construction. The training and awareness programs are: - Arrange weekly consultation session among the workers through plant site managers. The duration of consultation is one hour according to ISO-14001 standard, - Arrange monthly Environmental meeting among the mid-level officers through top management when those issues will be discussed under guidance of ECR 2023.	- Wastewater is being treated in the ETP plant and sewage is being managed in the STP, and no contaminated discharge is allowed outside disposal. So, there is no chance of deteriorating the surface water of the nearby waterbody. - BIFPCL has a designated chemical lab for testing Temperature, pH, Conductivity, TDS, COD, Turbidity, FRC, E. Coli, TSS, Nitrogen, T. Phosphate, Oil and Grease etc. of the effluent before discharge in the open environment . - Training and awareness programs are being conducted at a regular interval through PEP talks, lectures, one to one meeting etc. During this quarter five (05) Mock drills were conducted on various topic like fire, electric hazard etc. - Very few Construction materials such as bricks from dismantled structures, and waste scraps are observed piled in designated areas like the ETP backyard and labor camp sites, reflecting good site management. However, these areas should be covered properly to ensure aesthetic value and safety from the accidental events.	Being Complied	Good housekeeping is strongly recommended
4	Waste Generation	Limiting site clearance and base stripping activities within the project boundary.	Waste generated from the repairing works need further attention to prevent accidents and improve aesthetical view. The removal	Partially Complied	Good housekeeping within the plant premises is strongly recommended.

Sl. No.	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
		- Gathering and stocking of construction materials and machinery must be within a limited area in the project boundary. - The project area has to be fenced prior to initiation of construction activities. - Stock piles of construction materials requiring cover up in order to protect them from wind and weathering action. - The existing right of way have to be used for material transportation without creating any block - Location of spoil stock pile ought to be located in safe area and protected from wind and rain action. - No spoil store on River bank/slope - Construction wastes must be reused or recycled as and where possible - Burning of waste material should be restricted - Quality housekeeping practice must be maintained by regular inspection and checking. - Keep onsite waste collection and disposal facilities - Keep provision of different colored waste bin for dumping biodegradable, reusable and recyclable wastes. - Keep provision of awareness building meeting and training for employees.	of the accumulated waste is being carried out actively. No chemical or gaseous waste noticed during the visit as Chemical wastes are properly stored and labelled. - Material transportation is being carried out by maintaining due diligence so that no block is created. - There are 150 colored waste bins set at the different places which is adequate in number and labeled with Bengali language stickers for source segregation of the waste. - Burning of waste materials is strictly prohibited inside the plant premises. - No construction residuals and other waste observed by the side of the river bank. - Development of environment friendly waste collection and disposal system like Solid Waste Management plant is under operation.		
5	Compensation and Resettlement	Proper resettlement action plan (RAP) and compensation plan if the Project needs any land acquisition addressing compensation, livelihood restoration,	Compensation issue has been dealt by Bangladesh Power Development Board (BPDB). It was known from Deputy Commissioner (DC) Office, Bagerhat that BPDB deposited the stipulated compensation to them to disburse to	Resettlement issue is settled by BPDB; BIFPCL is the lessee only.	

Sl. No.	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
		living standards etc. in assessing the socio-economic status of the PAPs. • Resettlement of the PAPs. • Cash Compensation under Law (CCL) before resettlement formal agreement with the affected people prior to migration/resettlement • Sufficient standing crop compensation • Compensation for movable structures • Retention of salvageable materials • Compensation for loss of trading income one-time moving assistance grant to cover loss of regular wage income • Has a resettlement plan been developed which includes compensation, livelihood restoration, living standards etc. based on proper socio-economic studies? • Provision of monitoring the compensation and resettlement process Provision of monitoring the compensation and resettlement process	the rightful owners of the land as per the laws of Bangladesh e.g., 'Acquisition and Requisition of Immovable Property Ordinance, 1982. BIFPCL was not involved in this process of land acquisition as it is only the lease holder to construct and operate the MSTPP.		
		Human provide/take extra care/caution for the disadvantaged/vulnerable groups (women, children, ethnic minorities, indigenous people etc.)	• The proponent has been conducting Corporate Social Responsibility (CSR) activities regularly, where the target beneficiaries are mostly the affected people. • They have been planning to expand the CSR activities in a larger extent to involve direct and indirect stakeholders living around the power plant. The plan also involves rigorous CSR activities so that manpower is generated in the area to be eligible to work at the greater horizon of the employment market home and abroad. In this regard, they have formed a committee involving local		• It is recommended that MSTPP should continue its ongoing livelihood enhancement initiatives as part of its social responsibility efforts. • The households/people around the power plant who are passively affected,

Sl. No.	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
			administration and Local Government Institutes (LGIs). • BIFPCL prioritizes the directly affected local people for employment in the MSTPP and trains them to make them eligible and adaptable to the working environment. • The power plant induced marginal level employment generated in this area includes- ○ Movement of about 300 motorized vehicles using the approach road of the MSTPP daily. ○ Evolvment of dry market related small trading like tea stalls, mobile recharge services, mobile banking services, food and beverages, restaurants, etc. at and around the power plant. ○ Evolvment of wet market related small trading like vegetable selling shops, fish markets, butcher/meat shops, etc. at and around the power plant. • BIFPCL has established a market complex within the plant premises consisting of 34 shops. Out of these, 28 shops have been allocated, of which 79% of shops (≈22 shops) are distributed among the local villagers. Of the allocated shops, 9 are currently in operation, while the remaining 19 shops are yet to commence operations.		should be included in CSR packages.
6	Livelihood and living condition	• The labor recruitment policy must be formulated in such a way that the local laborers can easily get the chance of employment in the project work force.	• BIFPCL has been recruiting local people who were the PAPs with the cooperation of the local government (UP Chairman and Members) since its inception. • At present, a sum of 245 employees is engaged in MSTPP, of which 218 are Bangladeshi and 27 are Indians. In addition	Mostly complied	• Campaigning within the local community should be continued to let them informed for any job opportunities created by the plant.

Sl. No.	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
		- Govt./NGOs need to provide support the skill development program and income generation activities to local people; - For the increased movement of people and heavy vehicles, the road networks must be developed. - Keep provision of sanitary toilet, one toilet for 10 persons.	to this, required day-laborers are involved from the nearby community. - The wage of the labor was found compatible with the national standards. - The Khulna-Mongla Road and the approach road seem well-developed. Roads inside the plant premises are paved with concrete. - The toilet facilities in the labor shed seems sufficient to the remaining laborers to maintain cleanliness and hygienic conditions.		Capacity building program should be continued and expanded to involve more direct and indirect stakeholders living around the power plant to facilitate them to explore a wide horizon of employment market.

Table 5.2: Monitoring of Labor and Working Condition

Sl. No	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
1	Working Conditions and Management of Worker Relationship	- Preparation of Human Resources Policies and Procedures for Direct workers; - Defined Working condition and Terms of Employment for direct worker; - Sustainably equivalent terms and condition for migrant workers; - Compliance to national law of forming workers' organization; - No discrimination and equal opportunity for all.	- BIFPCL maintains the HR policies for the recruitment of new manpower as per their requirements. - No discrimination to the workers was recorded in terms of gender, equal opportunity, laborer level (local and migrated), etc. - The proponent has ensured minimum wage and working hours for the laborer as per GoB rules and regulations. - GRM procedure is being followed for the project workers and officials.	Complied	There should be a mechanism of record keeping if any GRM is applied.
2	Protecting Work Force	The client will not employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child health or physical,	The BIFPCL has been maintaining the Bangladesh Labour Act 2006 and the amendments in engaging laborers for the construction and other works without involving any child laborer even in the operation stage.	Complied	This should be continued throughout the project life cycle.

Sl. No	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
		- mental, spiritual, moral, or social development. - No Forced Labor	- No forced laborers are recorded during the monitoring. - Proper documentation of contract with the worker is being maintained which includes age limit, working hour, wage, work scope and benefit.		
3	Safety at site	- Installation/Construction of Safety Fence around the Project area - Use of Personnel Protective Equipment's (i.e., safety vest, safety goggles, ear plug, safety shoes, gloves, dust mask, etc.); - Safety trainings for workers (i.e., fire control, working at height, working in heat, first aid etc.); - Practice of Tool box meeting, safety talks - Safe Storage of Hazardous Chemicals (e.g., fuel, flammable chemical, toxic chemicals, etc.); - Maintaining Material Safety Data Sheet (MSDS); - Provision of Health care facilities such as doctor, hospital etc. available at/nearby the Plant construction site; - Availability of First Aid at work place; - Preparation and Follow of Emergency Response Plan (ERP); - Adequate fire precautions in place (e. g., fire extinguishers, escape routes etc.); - Documentation and reporting of occupational accidents, diseases, and incidents; - Policies and procedures for managing and monitoring the performance of	- The authority has demarcated the specific construction site with an appropriate warning sign, though most of the construction work has already been finished. - The Laborers and Project personnel have been maintaining safety protocol by wearing safety shoes, safety vest, helmet and other appropriate PPEs, like face masks while they are in the plant site. . - Fire-fighting system installed in the project premises to combat the fire related unwanted situation includes fire extinguisher of following types: – - Foam type - 17 nos., - DCP type - 502 nos., - CO2 type - 364 nos., and - water – 129 In addition to the above, there are two (02) firefighting vehicles, and an ambulance with doctors available at the sites. - Induction training and awareness programs have been providing batch by batch to the employees at regular intervals as recruitments are the recurrent phenomena.	Complied	This should be practiced throughout the entire project life cycle.

Sl. No	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
		third-party employers in relation to OHS	- During this quarter, the following accident/incident happened: August 2025: Two (02) near miss occurred; no major, minor and first aid recorded. September 2025: One (01) first aid, and no near miss major or minor accident/incident recorded. October 2025: Four (04) near miss occurred while no major, minor and first aid were recorded; - Regular safety talks and safety training are usually organized at the site and in the classrooms. Training was provided on 22 different items. The following safety trainings were recorded during this quarter: August 2025: 522 participants of which 30 were rewarded. Tool-box training/PEP talk were given to 513 workers. September 2025: Training was given to 499 participants of which 30 were given reward; Tool-box training was given to 747 workers. October 2025: Training was given to 411 participants of which 05 were given reward; Tool-box training was given to 379 workers. - Along with the training, five (05) Mock Drills were conducted on various topic		

Sl. No	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
			like fire, electric hazard etc. during this quarter - Emergency contact details have been displayed on the board at the site to take prompt action in the event of sudden incident. In addition, various awareness posters have been placed at different locations within the site premises to promote safety awareness. . - Warning signs, speed limit, and convex mirror are installed at site to avoid accidental events.		
4	Occupational Health and Safety procedure	- Provision of complete EHS division in the Human Resources Planning/ Organogram - Preparation of Safety Policy to be adopted during Plant operation	- Adequate number of safety officers are engaged who are working on OHS issues. - MSTPP Authority has adopted a Safety Policy for plant operation in compliance with national and international standards. Key measures include an HSE management system, mandatory PPE, SOP-based operations, and regular safety training. Fire protection systems, emergency response plans, and incident reporting mechanisms are in place to ensure safe operations.	Being Complied	OHS should be a Continuous process
5	Workers Well Being	- Provision of Welfare facilities for Worker/Labor such as, timely bonuses, wage, overtime, sick leaves, vacations etc.; - Routine medical check-up and emergency medical care for the sick and injured; - Appointment of a leader amongst the labor group, who will look into workers' well- being.	Workers expressed their satisfaction with the residential facilities, sick leave provisions, overtime arrangements, wages, timely payment, and bonuses provided by the Proponent, and no instances of dissatisfaction were observed. The Proponent has ensured the benevolent grant developed by the Contractor for the victim's family, as per the Government's rule.	Complied	

Sl. No	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
			• Basic Medical care with free medicine and counseling is being provided to workers on a regular basis. • Grievance Redress Mechanism (GRM) is available for workers by which safety issues are usually addressed.		

Table 5.3: Monitoring of Community Health, Safety and Security

Sl. no	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
1	Disturbance to nearby community due to dust from developed land and Noise from construction activities	• Construction of boundary wall around the Project area; • Installed water spraying system to control dusts; • Conducting dust monitoring and visual inspection around the site boundary; • Adopted noise management plan.	• Boundary wall construction around the entire plant is completed. • Some loose materials were found uncovered that barely a concern for the local communities. • No significant complaints were recorded from the communities in connection with dust and noise while visiting them during monitoring. Noise levels at and around the project site is monitored regularly and presented in the report. No exceedance was observed.	Mostly complied	Complaints are addressed immediately and recorded accordingly in the register.
2	Grievance of local people	• Availability and operation of Grievance Redress Mechanism; • Maintaining open communication channel with the local community.	• A community Liaison Officer (CLO) has been working for maintaining relation with the local communities. The MSTPP authority/BIFPCL displays the regular development through their website (https://www.bifpcl.com/) and conduct disclosure meeting with the local government • BIFPCL has been receiving grievance from local community through local government institutes (LGIs) like Union Parishad Chairman or Local Administration. • The Proponent has installed a community grievance box at the main entrance of the plant premises so that the affected community members (if any) can easily drop their grievances.	complied	The authority is advised to address the grievances of one and all.

Sl. no	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
3	Risk of breaching Community Safety	- Construction of boundary wall/safety fence around the Project area; - Practicing Risk Assessment and Evaluation Process; - Practicing safe management for hazardous materials which may pose threat to the community; - Availability and operation of Emergency Response Plan; - Maintaining open communication channel with the local community; - Training and instruction to the security personnel about their behavior and communication with the local people; - Aware the security personnel about the right of the community people.	- Boundary wall construction around the entire plant is completed. - Initiated a set of pollution mitigating measures to protect outgoing dust and other pollutants from the Project site. - The Project authority has been maintaining the exit and entry strictly even for the employees. If required, the entry pass is checked by the security guard to enter the project site area. - No conflict has been noticed between local communities and project authorities or workers. - Project Security personnel is well trained and instructed by the authority to demonstrate a decent behavior and attitude to the local communities. - Though BIFPCL receives grievances from the local community through local government institutes (LGIs), such as the Union Parishad Chairman or Local Administration, the Proponent has hung a community grievance box at the main entrance of the plant premises so that the affected community members (if any) can easily drop their grievances.	Complied	
4	Community Health and Risk	- Provision of providing health service facilities to community if the Project poses any health risk like sexually transmitted disease, contract disease, vector-borne diseases; - Implement all pollution mitigation measures to ensure safeguarding to community.	- Continued the medical facilities (consisting medical officer, medical assistant, office assistant) at Plant site for checkup the communicable diseases of the workers and staffs; - Out Patient Department (OPD), laboratory test, physiotherapy service and medical check-up services are found to be continued in this quarter. - BIFPCL arrange regular weekly health service program (medical consultation and free medicine) for the local community including the Dengue issue. - Pollution control measures like FGD, ESP, ETP, STP, SWMP and other facilities are now functioning properly. Routine water sprinkler is being conducted to suppress the dust dispersion.	Complied	BIFPCL is advised to conduct awareness program for STD and other transmitted diseases from workers to the community or vice-versa.

Sl. no	Potential Impacts	EMP measures as proposed in the EIA	Actual measures already Implemented	Compliance Status	Recommended Action
			Adequate training is being provided to the laborers to prevent transmission of vector borne diseases, HIV positives and any kind of pandemic to the local community.		
5	Youth Employment (Local)	Providing training / awareness program for the local youth to let them aware about the required qualification to get involved in the Project related activities Emphasis to recruit local labors according to their skills and capacities.	- Regular communication is being maintained with the local government and community representatives for labor recruitment; - The proponent took initiatives and provided computer training for generating ICT skill and sewing training for generating alternative income source among the local people. Besides, BIFPCL have also plan to initiate skill development trainings on electric and electronics, painting, welding, health and hazard safety, fittings, etc.	Being Complied	Before planning training program in future, local interest and demand should be assessed and addressed.
6	Public Communication, Consultation and Awareness	- Arranging public communication / consultation meeting; - Sharing of Project information with local people; - Organizing environmental and social awareness programs /meetings.	- One social liaison officer is assigned to work continuously to develop relations with local communities and inform them about the project activities and environmental protection measures, but the local people stated that sometimes they felt difficulties to reach him. - A social expert from IMA also used to visit the nearby community quarterly to obtain their opinions. Regular consultation meetings are being carried out with the local government and administration. The proponent regularly displays the progress (through Video) of the development through their website (https://www.bifpcl.com/) and disclosure meetings at the local government. The local people are aware of the project activities through multiple sources, such as public communication, consultation with the monitoring team, display board, website, etc.	Mostly Complied	BIFPCL may use local print media, social media, and digital media to disclose and spread the updated project information.

Table 5.4: Monitoring of Biodiversity and Sustainable Management of Living Natural Resources

Sl No	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
1	Rainfall runoff from the construction site would cause deterioration of aquatic ecosystem.	• Installation of proper runoff drains; • Use of sediment fences, traps and basins for trapping the sediment, if required.	• A well-designed runoff drainage system has been installed • There are two (02) silt traps at the Project site to settle sediments coming along with the stormwater and discharges sediment-free stormwater from the traps in the open environment.	Mostly complied	The drainage channel should be cleaned regularly to avoid unexpected drainage congestion in the plant premises.
2	Disturbance to nearby ecosystem due to different construction activities	• No cutting/ felling of trees along the river bank; • Implementation of onsite waste and air quality management plan; • Limiting soil extraction activities within the defined area; • Limiting the vegetation clearance and base stripping process within the Project boundary; • Safety fence around the construction site; • Limiting the use of night light; • Using shade (directed downwards) around the outdoor lights; • Provision of cut-off time to switch off unnecessary lights at night; • Initiate Green plantation; • No plantation of non-native species;	• As the construction work is now completed, the risk of tree felling and disturbance to the dependent ecosystem is out of questions, rather plantation is going on its full phase creating new ecosystem and becoming an abode for wildlife. • An MoU was signed between BIFPCL and Forest Dept., Bangladesh on 24.02.2015 for implementation of the Afforestation Program. The initial target was to plant 3 lac saplings. The Proponent has successfully achieved the target of planting two (02) lakh saplings by 2025. During the August–October quarter, a total of 26,496 saplings of various species were planted includes medicinal plants, coconut, Golpata, jackfruits etc. In total 2,01,496 saplings have been planted so far out of 300,000 saplings under this plantation program. The species of the plantation program along the rivers (the Passur and the Maidara) are dominated by the mangrove plant species, such as Keora (<i>Sonneratia apetala</i>), Gewa (<i>Excoecaria agallocha</i>), Golpata (<i>Nypa fruticans</i>) and Baen (<i>Avicennia spp.</i>). The highland of the plant premises is planted with various fruit-bearing plants like coconut (<i>Cocos nucifera</i>), mango (<i>Mangifera indica</i>), etc. and the medicinal plants like Bahera (<i>Terminalia bellirica</i>), Horitaki (<i>Terminalia chebula</i>), Tulsi (<i>Ocimum tenuiflorum</i>), Arjun (<i>Terminalia arjuna</i>), Neem (<i>Azadirachta indica</i>), .	Being Complied	• It is strongly recommended to accomplish the plantation program within a limited time frame. • It is also advised to monitor regularly to reduce the mortality rate at the sapling stages. • Topsoil management should be strictly followed.

SI No	Potential Impacts	EMP measures as proposed in the EIA	Actual condition/ Measures already Implemented	Compliance Status	Recommended Action
		- Retaining top soil for future habitat restoration; - No degradation of sensitive habitat.	- No alien species has been recorded. - Wild species like avifauna and mammals were observed and recorded in the project site greenery areas. - Employees are aware of rescuing of species if any got injured and harming to wildlife is strictly prohibited.		
3	Disturbance to river, inter-tidal areas and wet lands	- No encroachment of inter-tidal flood plain area; - No disturbance to Dolphin community; - Monitoring of Ecosystem Health and Monitoring of Sundarbans Forest Health; - If required, embankment should be constructed considering a setback distance from river/canal bank; - Slope protection work along the Maidara River should be completed on an urgent basis before rainy season come, and; - BIFPCL may take initiatives of excavating of silted reach of Maidara river near proposed township area to facilitate proper functioning of River for maintaining tidal flow dynamics	- Monitoring of ecosystem health of the Sundarbans, and around the Project site is being continued. - Slope protection works from jetty area to North-Western side and township area has completed. - Ecological monitoring is being continued and no disturbance has been observed. - No impact or disturbance observed on dolphin community.	Complied	Monitoring needs to be continued throughout the entire operation stage.

Table 5.5: Status of Compliance to the Conditions of DoE

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
1	This EIA Report is approved only for 1320 MW Khulna Coal Based Power Plant. Any expansion or extension of this Power Plant will require obtaining further Environmental Clearance with additional EIA Study.	The proponent does not have any plan to expand or extend the 2x660 MW Maitree Super Thermal Power Plant.	Complied.
2	The Coal Specification and Power Plant technology should be maintained as per EIA report. In case any change in design the proponent must obtain consent from DoE.	- The Coal Specification is being maintained as per EIA report. - The Power Plant has been built by maintaining the technology mentioned in the EIA Report, and this is under operation.	Complied.
3	Project Proponent may undertake activities for land development and infrastructural development of the Project.	Land development and infrastructural development of the power plant has already completed. Both units are in operating condition. Commercialization started for Unit -1 on 23 December 2022 and Unit-2 on 12 March 2024.	Complied.
4	Project Proponent may open L/C (Letter of Credit) for importing machineries for the Project, which shall also include machineries relating to waste treatment plant and other pollution control devices.	The Proponent opened L/C and imported the required machineries including waste treatment plants and other pollution control devices. Civil structures for all of these facilities have already completed and under operation.	Complied.
5	The activity under Proposed Khulna 1320 MW Coal based Thermal Power Plant Construction and operation shall not release any pollutant that affect human health or will have damaging impact on the environment or natural resources.	The Proponent has been trying to avoid releasing pollutants from construction to operation phases affecting human health and natural environment with some minor exceptions. CEGIS, a third-party monitoring agency, has been conducting quarterly environmental and social impact monitoring along with compliance monitoring as per EMP since 2014. No significant impact during construction and operation so far was recorded on the surrounding environment or on the natural resources. Moreover, to control the emissions, pollutants and contaminants, ETP, STP, ESP, FGD, FGD waste water treatment plant, SWMP etc. have been installed and operationalized. Furthermore, an online air quality monitoring machine has been installed by DoE and four (04) machines by the proponent to monitor air quality at the plant premises. The air quality monitoring parameters include PM _{2.5} , PM ₁₀ , SO ₂ , CO, NO ₂ , O ₃ , etc.	Being Complied.
6	Proper and adequate mitigation measures shall be ensured throughout preparation, construction and operation period of	BIFPCL has taken appropriate mitigation measures conforming EMP and technical specification of main Plant at each of the stages of Project Development.	Complied.

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
	the proposed Khulna 1320 MW Coal based Thermal Power Plant Project activities.	Proper safeguard measures for the safety of the workers were very satisfactory.	
7	Any heritage sight, ecologically critical area, and other environmentally, religious and archaeologically sensitive places shall be kept protected during Project construction phase.	In the monitoring corridor, there is no religious and archaeological sites. However, the Southeast Sundarbans World Heritage Site (WHS) and the Sundarbans Ecologically Critical Area (ECA) are fallen in this corridor. Considering the sensitivity of these environmentally and ecologically important areas, a regular quarterly monitoring is being done at the close proximity of the WHS and ECA	Complied
8	Environment friendly construction and development practices shall be followed that minimize loss of habitats and fish breeding, feeding & nursery sites.	Construction work is almost finished. Still, if there are any construction activities need to be done, it is suggested to follow the best practices and according to the EMPs of EIA Report.	Being Complied.
9	Construction works shall be restricted to daytime hours so as to avoid/mitigate the disturbance of local lives as well as implementation schedules of the works shall be notified in advance to nearby residents.	As Construction work is already finished, there is no major construction related disturbance noticed to the community. Moreover, the authority has appointed one social liaison officer who is working closely for developing relation with local communities. Quarterly community visit is also being conducted by a IMA's social expert. Regular consultation meetings are carried out with the local government and administration in order to receive and realize the grievances and accordingly to redress those. There is no grievances related to the noise effect registered yet from the nearby communities.	Being Complied.
10	Proper and adequate sanitation facilities shall be ensured in labor camps throughout the proposed Project period.	Most of the labor shed has been demolished. Adequate toilet facilities are there for the maintenance of workers who are staying presently	Being Complied
11	In order to control noise pollution, vehicles & equipment shall undergo regular maintenance; working during sensitive hours and locating machinery close to sensitive receptor shall be avoided.	All vehicles & equipment used at site are under regular maintenance and registration process. Working during sensitive hours like night time (if necessary) and operating machinery close to sensitive receptor like near the labor shed and residential areas are being avoided.	Being Complied
12	No solid waste can be burnt in the Project area. An environment friendly solid waste management should be in place during the whole period of the Project in the field.	- Burning of waste materials is strictly prohibited inside the project boundary. - Solid Waste Management Plant (SWMP) is under operation where the solid waste is being managed properly and compost is being prepared in this plant. This compost is being used in the horticulture and gardens located in the plant premises. In the process of compost preparation from the solid waste, leachate is generated which is being	Being complied

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
		managed by depositing in the scientifically made leachate pond to avoid unexpected water contamination.	
13	Proper and adequate on-site precautionary measures and safety measures shall be ensured so that no habitat of any flora and fauna would be endangered or destroyed.	Quarterly monitoring activities are being carried out to examine the potential impacts on habitat of flora and fauna. As construction works have been finished, no detectable impact on flora and fauna observed.	Being Complied
14	All the required mitigation measures suggested in the EIA report along with the emergency response plan are to be strictly implemented and kept operative / functioning on a continuous basis.	The proponent is giving top priorities and trying to follow mitigation measures against the impacts on environmental and social segments including occupational and community health and safety issues. To keep the workers and the plant safe, plenty of precautionary measures has identified during the physical visit of the plant. • Mitigation measures for the impacts on environmental quality (Air, Water and Noise) and biodiversity/ecosystem are being implemented and monitored by the IMA. • In case of medical emergency, the Proponent has signed a contract with a private hospital (GAZI medical, Khulna) for emergency services for both BIFPCL officials and staff, and also the daily or contracted workers. Also, an ICU-rich hospital with an experienced medical team and ambulance has kept ready to provide the instant and emergency services; • Emergency fire exit, assembling point, fire extinguisher, fire alarm has observed available and well-functioning. • As a part of emergency response plan, laminated posters of emergency contact numbers were noticed hung inside the plant premises.	Being Complied
15	To control dust, spraying of water over the earthen materials should be carried out from time to time.	Quarterly air quality monitoring in and around the project sites is being conducted and recorded data checked with Air Pollution Control Rules 2022 standards. Though the construction activities have almost completed, the water sprinkling is still continuing at the designated places for suppressing dust.	Being Complied
16	Storage area for soils and other construction materials shall be carefully selected to avoid disturbance of the natural drainage.	• Construction materials and wastes (i.e., scraps) observed piled up at the designated areas like backyard of the ETP, laborer camp areas, etc. which seems a good practice but these areas need to be fenced/covered to avoid unexpected events and enhance aesthetic value. The removal of the piled-up waste materials is underway emphatically.	Mostly complied.

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
		Sand piles and other heaps of loose materials were generally found to be covered, with only a few exceptions.	
17	Adequate considerations should be given to facilitate drainage system for runoff water from rain/tidal surge.	Adequate attempt has been adopted to facilitate drainage system for runoff water from rain/tidal surge as BIFPCL has already constructed the permanent drainage system for discharging water from the project area.	Being Complied.
18	Adequate facilities should be ensured for silt trap to avoid clogging of drain/canal/water bodies	There are two (02) silt traps at the Project site to settle sediments coming with the storm water and discharges sediment-free storm water in the open environment.	Being Complied.
19	The entire coal handling system should be designed as an enclosed (and not only covered) conveyor system. There should be integrated dust control system with dust extraction and bag filters at unloading areas and at each transfer points on the conveyor system.	Entire coal handling system is designed and constructed as an enclosed conveyor system as per DoE requirement. Integrated dust control system with dust extraction system/bag filter and dust suppression system at crusher house, unloading points, transfer points are being maintained as stated in the contract package. Due to the technical reason 25 m of the conveyor system at the jetty site was kept uncovered. This facilitates the Ship Unloader (SUL) movement and Coal Loading into the belt.	Mostly Complied
20	Coal Plant should have high-efficiency bag filter for arresting dust emissions.	Integrated dust control system with dust extraction system/bag filter and dust suppression system has installed as per the technical specification. In addition, high-efficient ESP (with 99.99% efficiency) for both units are now under operation that will control the coal dust and fly ash.	Being complied
21	Coal should be stored in a covered storage yard.	04 no of coal cover shed construction has already finished. Out of them two (02) are in operation and rest two (02) are ready to be operated as and when required.	Being complied
22	The entire coal stockyard should be covered with water sprinkler provided with automated moisture sensor to control self-combustion.	The entire coal stockyard is fully covered and automated moisture sensor has been provisioned to protect coal self-combustion.	Being complied
23	100% utilization of fly ash and bottom ash should be planned and implemented throughout the operation of the Plant. There should only be a provision of small ash dyke that will not exceed 25 (twenty-five) acres of land to store residual ash.	100% utilization of fly ash and bottom ash have been planned throughout the operation of this Plant and accordingly, it is being implemented. The ash dykes are in operation but no ash is being deposited in the ash pond. Fly ashes are loaded to the vendor's barges directly through conveyor belt and the bottom ashes are transported through dump trucks to the vendors.	Being complied
24	Integrated dry ash handling, loading, unloading and transportation system should be established.	Integrated dry ash handling, loading, unloading and transportation system are being followed Erection of Ash silo structures has done beside the jetty in order to transport the dry ash through ships/cargo.	Being complied

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
25	There should be adequate and properly sized and designed dry ash silo with appropriate conveyor system.	Ash silos with the proper conveyor system are now under operation.	Being complied
26	Bottom ash should be extracted, crashed and stored in silos for utilization with proper collection and conveyor system.	- Bottom Ash Intermediate Silo structural erection completed and is under operation. - The pneumatic technology of fly ash (FA) collection using pipeline and transferring to the hooded and confined vessels for a take away was observed functioning well.	Being complied
27	Resettlement and rehabilitation of the displaced population (including those who do not own land) should be done properly.	The land has been acquired by BPDB by following the Acquisition and Requisition of Immovable Property Ordinance, 1982 (ARIPO). Moreover, a Livelihood Restoration Plan (LRP) has been conducted by BPDB to resettle and rehabilitate properly the people who do not own land in the site. The BIFPCL has been given lease by BPDB to construct a 2X660 MW Coal-based Power Plant. As a lessee, BIFPCL is not liable to address any resettlement related issues except the livelihood improvement initiatives. In this regard, the Proponent has been conducting Corporate Social Responsibility (CSR) activities with a large section of people living around the site to skill up the capacities of the local people.	Being complied
28	Resettlement plan should be properly implemented and people should be adequately compensated.	BPDB has conducted an assessment (Livelihood Restoration Plan) regarding the rehabilitees, including those who do not own land in the power plant area, but whose livelihood depends on that land. Based on the recommendation of the LRP, the local NGO conducted the training and other tasks for the PAPs. Some poor of the livelihood-dependent households were resettled in the Foyla Cluster Village and compensated as well.	Complied
29	Construction material should be properly disposed-off after construction work is over.	The piled-up construction materials and wastes (i.e., scraps) observed at the designated areas are being removed gradually but emphatically. However, Solid Waste Management plant (SWMP) is under operation where the solid waste is being managed properly and compost is produced as a by-product. This compost is used in the horticulture and gardens located in the plant premises.	Being complied
30	As described in the report environmental monitoring should be strictly followed and monitoring report should be shared with DoE to ensure the environmental management properly.	The Proponent has engaged CEGIS as an IMA for conducting environmental monitoring on a quarterly basis in February 2014. Accordingly, each quarterly monitoring report has been prepared,	Being Complied.

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
		submitted and shared with DoE, which are also available at BIFPCL web site.	
31	All activities (pre-construction, construction and post-construction stage) should be implemented according to EMP clearly listed in the EIA report.	The proponent has adopted the EMP suggestions applicable at construction stages. BIFPCL is taking appropriate actions based on EMP monitoring report. The proponent regularly updates the EMP and OHAS which assist to reduce the risk of accidental events further. From the preconstruction stage till now BIFPCL has been following the guideline of EMP stated in the EIA report and we have suggested to follow the EMP strictly for the rest of the work.	Being Complied
32	A third party/independent monitoring bodies excluding JVC/BPDB should be engaged immediately for monitoring of all activities during pre-construction, construction and operation phases as per monitoring plan of EIA report and monitoring report must be submitted to Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously.	The proponent engaged an Independent Monitoring Agency (IMA) for conducting environmental monitoring on a quarterly basis since February 2014. Since the contract, CEGIS has been conducting the monitoring programs quarterly and producing monitoring reports on quarterly basis which are submitted by CEGIS to BIFPCL for onward submission to the Bagerhat District Office, Khulna Divisional Office and headquarters of the Department of Environment as directed by DoE.	Being Complied
33	Regular monitoring of the susceptible places of Sundarbans for protecting ecosystem, biodiversity and forest coverage should be made using latest high-resolution image for keeping ambient environment.	The Monitoring activities of IMA includes monitoring of the susceptible places of Sundarbans. The monitoring report contains analysis of biodiversity and forest coverage. However, in addition to this, Forest Department has also suggested some survey & analysis which have also been monitored and reported by CEGIS through the quarterly monitoring report and submitted to the concerned authorities.	Being Complied.
34	Air, water, soil, biological and social data should be monitored regularly with a network monitoring system with a view to assess the natural quality of the Sundarbans and other fragile ecosystem and report of monitoring results should be submitted to Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously.	Air, water, soil and biological components are regularly monitored as per recommendation of EMP. Each of the monitored environmental data has been incorporated in the Monitoring report and displayed on the BIFPCL website at present.	Being Complied.
35	There should be regularly disclosure of the report through workshops and websites and responses should be taken care accordingly.	All the monitoring reports are being kept available on the website of BIFPCL (www.bifpcl.com)	Being Complied.
36	Online air and water quality monitoring system should be made functional throughout the life of the Plant.	Water quality analysis system has already been developed. As a part of air monitoring system, DoE has already installed one device to monitor the online air quality data at the Project Site (Padma Abashan) area which is	Compliance action initiated

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
		now functional and four (04) other devices has installed by the Proponent around the plant premises where PM _{2.5} , PM ₁₀ , SO ₂ , CO, NO ₂ , O ₃ etc. are being monitored.	
37	Management Information System (MIS) is to be developed for this coal-based Power Plant. The scope of MIS services will obviously include representing the real time monitored data especially environmental parameters displaying at Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment, BPDB and other concerned agencies/Ministries. The MIS should be web based for accessing every individual to show the real time monitored records.	- Findings of the real-time ambient air quality monitoring and data are displaying at Gate No. 02 of MSTPP for mass people's understanding on the environment quality issues. To fulfill the condition, it is suggested to onboard the web-based MIS of real-time monitoring data with accessibility to every individual. - DoE has set up an AAQMS placed in Project Area (Padma Abashan) and real time monitoring data of environmental parameters displaying at the Department of Environment. - Water quality monitoring data are portraying in the Quarterly Monitoring Report (QMR) on a regular basis.	Under progress
38	JVC should provide all sort of logistics support to DoE and other relevant agencies for monitoring environment related items/events.	The Proponent is providing all sorts of logistic support to DoE as and when required along with other relevant agencies for monitoring of Plant construction activities and environmental items/events maintain the health and safety protocol of the construction site.	Being complied
39	No ground water should be allowed to use for plant purposes.	The Power Plant has been designed considering withdrawn of surface water for all stages of project development and operation. In this regard, two (02) RO plants have been constructed and operated to fulfill the requirement of plant and potable water. There is no provision of withdrawing ground water for any purposes of the Plant, However, there is a deep tube-well installed for construction purposes, which being pertained purely for testing.	Being complied
40	Conduct stakeholder meetings on regular basis for better performance of the Project as a whole.	One Community Liaison Officer (CLO) is assigned to work continuously to develop relations with local communities and inform them about the project activities and environmental protection measures, Besides, a third-party monitoring body is also carrying out consultation with the local people with interviews on regular basis for better performance of the Project as a whole.	Complied and will continue
41	Additional Environmental baseline data to be collected as suggested in the EIA report and conveyed to DoE and other concern authorities.	All quarterly monitoring reports containing the contemporary data are being collected as suggested in the EIA study and are disseminating to DoE and other concerned authorities as instructed. The baseline data	Being Complied

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
		refer to the information collected during the pre-construction phase of the project.	
42	The Environmental Management Plan under the EIA study shall strictly be implemented and kept functioning on a continuous basis.	BIFPCL has been implementing all the EMP measures realistically phase by phase as suggested in EIA report and DoE condition. The status of EMP implementation is also regularly monitored. Based on the monitoring, proponent updates the site specific EMP to manage the potential impacts.	Being Complied
43	The Project authority shall submit a detail work plan with time schedule of development activities at least 7 (seven) days ahead of the work commences in the field to the Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously.	Though most of the construction works is now finished, BIFPCL is still committed to follow the practice of submitting the detailed work plan to the prescribed offices of DoE, seven (7) days before starting any construction activities (if there is any). This practice will be continued till the end of the project.	Being complied
44	Environmental Monitoring Reports according to specific format specified in the EIA Report shall be made available simultaneously to DoE Bagerhat District Office, Khulna Divisional Office and Headquarters on a monthly basis during the construction period of the Project.	Environmental Monitoring Reports as per specific format provided in the EIA Report made available by BIFPCL and submitted to DoE Bagerhat District Office, Khulna Divisional Office and Headquarters accordingly.	Being Complied
45	The following records must be kept in respect if any samples required to be collected for the purpose of environmental monitoring activities: • The date(s) on which the sample was taken; • The time(s) at which the sample was collected; • The point at which the sample was taken; and • The name of the person who collected the sample.	The Monitoring report keeps all the records as suggested.	Being Complied
46	The results of any monitoring, required to be conducted under this EIA report must be recorded.	BIFPCL has been collecting all the monitoring data and submitting with proper documentation and accordingly sharing with DoE on regular basis.	Being Complied

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
47	In case of any emergency, the following information shall be immediately reported to Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment (DoE) simultaneously. Nature of incident (oil spill, fire, accident. Collision, land slide, etc.). Personnel affected (injured, missing, fatalities, etc.). Emergency support available and its location (standby transport, medical facilities, etc.). Weather conditions Current operations (abandoning the site, firefighting, etc.)	- To improve the safety system, the Proponent used to practice immediate sharing of the information to Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment (DoE) simultaneously in case of any emergency. - The recent dengue outbreak has been considered a top priority by the authorities. To prevent the dengue outbreak, the proponent has taken some precautionary measures, like fogging for mosquito control, admonishing all project personnel to close their windows after sunset, using mosquito nets, etc.	Mostly Complied Suggested to take initiatives to control Dengue outbreak
48	The Project authority or its employees must notify the department of Environment of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident.	BIFPCL has established a proper mechanism for recording such incident as suggested and notify the department of Environment regarding incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident.	Being complied
49	All pollution incidents shall be reported immediately and simultaneously to the Bagerhat District Office, Khulna Divisional Office and Headquarters of DoE.	BIFPCL has established a proper mechanism for recording such incident as suggested in the ERP	Being complied
50	Appropriate permission would require to be obtained from the Forest Department in favor of cutting/felling on any plant/tree/sapling forested by any individual or government before doing such type of activity.	There is no need of cutting/felling down of any trees outside the project boundary. However, in future, if any such case arises, BIFPCL is committed to obtain appropriate permission from the Bangladesh Forest Department (BFD).	Being complied
51	Re-vegetation and re-plantation under green belt activities shall be undertaken in consultation with the Forest Department according to those mentioned in the EIA report.	The Proponent has successfully achieved the target of planting two (02) lakh saplings by 2025. During this quarter (August to October), 26,496 saplings have been planted which includes various species of mostly medicinal plants, coconut, Golpata jackfruits etc. In total 2,01,496 saplings have been planted so far out of 300,000 saplings under this plantation program.	Being Complied
52	Climate Change impacts and maximum storm surge height shall have to consider at the design and construction phase.	The design level (elevation) of the land and earthen embankment has designed and constructed considering the climate change impact and maximum storm surge height.	Being Complied
53	A separate EIA/morphological study shall have to be conducted for coal transportation and river dredging to develop sound	Coal transportation activities is done through the existing maritime route, which is controlled by Mongla Port Authority (MPA). M/s. Institute of Water Modelling (IWM) has already completed the EIA study for the	Being Complied.

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
	environmental management plan towards conservation of ecosystem and biodiversity.	dredging activity and submitted the report to MPA. A separate EIA study for Coal Transportation was conducted by M/s. Center for Environment and Geographic Information Services (CEGIS) which has approved by DoE.	
54	A full-fledged institutional setup for EHS and CSR must be put in place before operation of the Power Plant.	• Due to a full-fledged institutional setup for EHS activities, no major incident has been occurred since April, 2021. • The proponent has been conducting Corporate Social Responsibility (CSR) activities regularly, where the target beneficiaries are the affected people along with other destitute people. • They have been planning to expand the CSR activities in larger extent to involve active and passive stakeholders living around the power plant. The plan also involves rigorous CSR activities so that manpower is generated in the area to be eligible to work at the greater horizon of the employment market home and abroad.	Being complied
55	The Project authority shall extend active cooperation to DoE officials to facilitate their visit to the site as and when necessary.	BIFPCL is extending its all-out cooperation to DoE.	Being Complied
56	Violation of any of the above conditions shall render this approval void.	Noted by BIFPCL	Being Complied
57	Any injunction on this Project from the Honorable Supreme Court/High Court Division shall render this approval void.	Noted by BIFPCL	Being Complied
58	Without installation of 275 Meter Height Chimney, Effluent Treatment Plant (ETP), Waste Water Treatment Plant (WWTP), Settling Pond, Desalinization Plant, API Oil Water Separator, High Efficiency Electro Static Precipitator (ESP), 'closed-loop' Flue Gas Desulfurization (FGD), Low NOx Burner, online air and water quality monitoring system and other pollution control equipment and obtaining Environmental Clearance Certificate, the proponent shall not start operation of the Project.	<u>Current status:</u> • Chimney: Under operation. • DM water plant: Under operation. • Effluent Treatment Plant (ETP): ETP is under operation • API Oil Water Separator: This is a part of ETP which is under operation. • The Sewage Treatment Plant (STP): Under Operation • Electro Static Precipitator (ESP): Both units are Under operation • Flue Gas Desulfurization (FGD): Both units are under operation. • Solid Waste Management Plant (SWMP): Under operation	Compliance action initiated

Sl. No	Condition of DoE	Status Narratives/Descriptions	Compliance Status
		• Desalinization plant: Under operation • Low NOx burner: Under operation • Online air and water quality monitoring system: A water quality analysis system has already been installed and is operational. For air quality monitoring, the Department of Environment (DoE) has installed an online air quality monitoring device at the Project Site (Padma Abashan) area, while BIFPCL has installed four (04) Ambient Air Quality Monitoring System (AAQMS) devices around the plant premises, all of which are fully functional. In addition, a stack emission monitoring system has been installed at the chimney and is currently operational. • Settling pond: Two (02) settling ponds have already been constructed to allow silt to settle prior to discharge into the river.	
59	This EIA Approval has been issued with the approval of the appropriate authority.	BPDB and BIFPCL are thankful to DoE.	Complied

Compliance to the conditions of DoE (EIA study of Coal Transportation)

However, with reference to the approval of EIA study of coal transportation for 2x660 MWMSTPP having (Memo no: DoE/clearance/5532 /2016/50, dated 31/01/2018), Department of Environment has set some specific conditions to be followed as a fulfillment of the condition no.53 of the EIA approval letter of 2x660 MWMSTPP.

Table 5.6: Compliance conditions of DoE (EIA study of Coal transportation)

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
1	This EIA Report is approved only for Coal Transportation for the Proposed 2x660 MW Maitree Super Thermal Power Plant Project. Any modification of this project as well as Coal Transportation will require further EIA approval with additional EIA Study.	BIFPCL will notify to DoE prior to initiation of any modification, expansion or extension of the Power Plant and the alteration of coal transportation route.	Suggested to comply as and when required.
2	The route of coal Transportation should be maintained as per EIA Report. In case of any changes the proponent must obtain consent from DoE.	The route of coal Transportation is maintained as stated in the EIA report. In case of any changes in the transportation route, the proponent shall obtain consent from DoE.	Suggested to comply as and when required.
3	Project Proponent may open L/C (Letter of Credit) for importing machineries for the project which shall also include machineries relating to waste treatment plant and plant and other pollution control devices.	All the Power Plant related equipment and machineries including the waste management treatment plant and other pollution control devices have already been imported and installed in the MSTPP premises.	Complied.
4	The activity under Coal Transportation for the Proposed 2x660 MW Maitree Super Thermal Power Plant Project shall not release any pollutant that affect human health or will have damaging impact on the environment or natural resources.	- Conventionally, the coal carrying mother vessels are IMO certified vessel. So, as per the compliance of IMO regulation, no untreated waste/pollutant is released into the open environment that may affect human health or will have damaging impact on the environment or natural resources. - As per the EIA, the lighterages are IMO regulated vessels and supposed to maintain with the national rules and regulations. However, the vessels observed anchoring sometimes found uncovered. according to the vessel crews, the vessels need to keep uncovered due to the following reasons: - While they measure the coal draft, they keep the vessels uncovered for a while. - To reduce time for unloading activities, they usually uncover the vessels prior approaching to the jetty.	- Suggested to use IMO regulated vessels or maintain the specifications of lighterage stringently. - Recommended to limit the duration of uncovered situation to prevent dispersion of coal dust.

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
5	Proper and adequate mitigation measures shall be ensured throughout the operation period of the Project	The project proponent has included all the mitigation measures in the BID document of Coal Transportation as suggested in the EIA study. In this regard, MSTPP authority has set up an Environment and Fire & Safety Wing to ensure the EMP implementation for the project life span.	Complied
6	Any heritage site, ecologically critical areas, and other environmentally, religious and archaeologically sensitive places shall be kept protected during project operation.	In the monitoring corridor, there is no religious and archaeological sites. However, the Southeast Sundarbans World Heritage Site (WHS) and the Sundarbans Ecologically Critical Area (ECA) are fallen in this corridor. Considering the sensitivity of these environmentally and ecologically important areas, a regular quarterly monitoring is being done at the close proximity of the WHS and ECA. The changes in environmental quality if any will be apparent in the quarterly monitoring data, which in turn will support in undertaking corrective measures in protecting the WHS and ECA in future during the operation of coal transportation.	Being complied.
7	Environment friendly construction and development practices shall be followed that minimize loss of habitats and fish breeding, feeding and nursery sites.	The installations related to the coal transportation system were the site slope protection and jetty at the project site. The site slope protection is considered for protecting sliding of land. During the installation of jetty, the authority followed the best practices, EMPs of EIA of Coal Transportation Report, national and international rules and guidelines. Since, the environmental monitoring indicators did not show any visualized anomalies, it can be concluded that the construction work was accomplished in an environment friendly manner.	Complied
8	Proper and adequate sanitation facilities shall be ensured in labor camps throughout the proposed project period.	The sanitation facilities in the laborer Shed have been meeting the sanitation requirements adequately.	Complied
9	Proper and adequate on-site precautionary Measures and safety measures shall be ensured so that no habitat of any flora and fauna would be endangered or destructed.	All the completed construction works including the Jetty has conducted in accordance with the EMP guidelines stated in the EIA report. As a part of the on-site precautionary measures, scraps were kept organized without hampering any floral and faunal biodiversity at the jetty site. However, it is under a clearing process.	Being Complied
10	All the required mitigation measures Suggested in the EIA report along with the emergency	The mitigation measures for environment health and safety are being followed according to the EMP	Being complied

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
	response plan are to be Strictly implemented and kept operative/functioning on a continuous basis.	recommendations stated in the EIA Report. An Emergency Response Plan (ERP) prepared under this project is being implemented.	
11	To control dust, spraying of water over the earthen materials should be carried out from time to time	An external company has been engaged to spray water to suppress fugitive dust from the earthen materials at the jetty site along with the whole plant premises. A quarterly air quality monitoring in and around the project sites including the jetty site is being conducted and compared with standards as per Air Pollution (Control) Rules, 2022.	Being Complied
12	The entire coal handling system should be designed as an enclosed (and not only covered) conveyor system. There should be integrated dust control system with dust extraction and bag filters at unloading areas and at each transfer points on the conveyor system.	The entire coal handling system is designed and constructed as an enclosed conveyor system as per the guidance of the EMP and DoE requirements. Integrated dust control system with dust extraction system/bag filter and dust suppression system at crusher house, unloading points, transfer points are being maintained as stated in the contract package. Due to the technical reason, though 25 m of the conveyor system at the jetty site was found kept uncovered. This facilitates the Ship Unloader (SUL) movement and Coal Loading into the belt. The Proponent is committed to suggest the vessel owner to abstain from ship-to-ship transfer without taking proper measures for arresting fugitive dust. Among the observations, the important ones are as follows: • Fringe: The coal delivery pipe of the conveyor belt when transship coal from one barge to another should be equipped with fringe. • Water spraying: Water is being sprayed at the beginning of the conveyor belt to limit the dispersion of the coal dust in the open environment. • Netting: Fine-meshed netting around the conveyor belt at the dump barge should be installed covering the sides to the extent possible so that no or limited dust is dispersed outside.	Among the measures suggested by the proponent, the netting around the conveyor belt at the dump barge has already installed. Being complied
13	Coal should be stored in a covered storage yard.	There are four (04) coal stockyards for storing coal having Coal Stacker and Reclaimer facilities.	Complied
14	The entire coal stockyard should be Covered with water sprinkler provided with automated	The entire coal stockyard is fully covered and automated moisture sensor has been provisioned to	Complied

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
	moisture sensor to control self-combustion.	protect coal self-combustion, which is under operation.	
15	Construction material should be properly disposed of after the construction work is over.	Except scraps, construction materials are already removed from the site. Whatever materials are observed those are coming from the repairing sites.	Being Complied.
16	As described in the report environmental monitoring should be strictly followed and monitoring report should be shared with DOE to ensure the environmental management properly.	The Plant Authority engaged an Independent Monitoring Agency (IMA) as per the suggestion of EIA Report to conduct environmental and social monitoring from February 2014. For ensuring the environmental management properly, the Department of Environment (DoE) has been kept informed by sharing quarterly monitoring report, which is also available at BIFPCL's website.	Being Complied.
17	A third party / independent monitoring bodies excluding BIFPCL should be engaged immediately for monitoring of all the activities during pre-construction, construction and operation phases as per monitoring plan of EIA report and monitoring report must be submitted to Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously.	The Proponent has engaged an IMA from February 2014 for covering all phases of the project. From then on, Consultant has been conducting the monitoring programs quarterly and producing monitoring reports on regular basis which are submitted to BIFPCL for onward submission to the Bagerhat District Office, Khulna Divisional Office and Headquarters of DoE as directed.	Being Complied
18	Regular monitoring of the susceptible places of the Sundarbans for protecting ecosystem, biodiversity and forest coverage should be made using latest high-resolution image for keeping ambient environment.	The monitoring team has been conducting analysis of ecosystem, habitat, and biodiversity and forest coverage at the susceptible sites of the Sundarbans in connection with the project. The habitat and forest coverage analyses have been conducting using high resolution (10m) Sentinel satellite image. This analysis will help in understanding the forest coverage condition and taking necessary measures for keeping up the ambient environment of the forest. In addition to this, Forest Department has also suggested some survey & analysis of Sundarbans ecosystem along with the quarterly compliance monitoring report.	Being Complied.
19	Air, water, soil, biological and social data should be monitored regularly with a network monitoring system with a view to assess the natural quality of the Sundarbans and other fragile ecosystem and report of monitoring results should be	The IMA has been conducting quarterly monitoring involving environmental quality (i.e., air, water, noise and soil), biological and social resources with a view to assess the natural quality of the Sundarbans and other associated fragile ecosystem.	Being Complied.

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
	submitted to Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously.	DoE has installed an online air quality monitoring device at the Township area to monitor air quality continuously. The proponent has installed four (04) air quality monitoring devices around the plant premises, which measure PM _{2.5} , PM ₁₀ , SO ₂ , CO, NO ₂ , O ₃ etc. are being monitored. The quarterly environmental and social monitoring reports are shared with Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously. The reports are also available on the BIFPCL website.	
20	There should be regular disclosure of the report through workshops and websites and responses should be taken care accordingly.	The quarterly environmental monitoring reports are disclosed to a wider group people by making available on the website of BIFPCL (www.bifpcl.com). The IMA and BIFPCL are regularly carrying out public consultations at local level severally to get the responses of the community.	Being Complied.
21	BIFPCL should provide all sorts of logistics support to DOE and other relevant agencies for monitoring environment related items / events.	The proponent through IMA has been facilitating DoE and other relevant agencies quarterly by providing logistics support to monitor the coal transportation route along with the susceptibility and fragility of the Sundarbans. The Proponent is committed to provide any kind of relevant support to DoE as and when required.	Being complied.
22	In order to control noise pollution, vessels and equipment shall undergo regular maintenance; working during sensitive hours and locating machinery close to sensitive receptor shall be avoided.	The rotatory machinery uses in the jetty are under regular maintenance. Being the IMO regulated vessels, they usually practice all kinds of environment friendly compliances including avoiding sensitive hours and locating them close to the sensitive receptors.	Being complied.
23	Vessels of this project should follow the MPA guidelines and protocol to ensure no hindrance to other vessels.	All the project related vessels and coal carrying ships are abiding by the MPA guidelines and no issues so far raised regarding hindrance to other regular vessels.	Being complied.
24	The vessels used for this project should maintain IMO criteria to enable identification of substances harmful to the marine environment.	Being the IMO regulated vessels, they usually identify and sort out the substances harmful to the marine environment and manage them maintaining the guidelines of IMO.	Being complied
25	All the vessels should follow applicable MARPOL Convention, Appendix V on the prevention of pollution by garbage from ships.	The vessels used in coal transportation are IMO regulated and strictly maintain MARPOL Convention to handle the garbage of the ships.	Being complied.

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
26	Additional Environmental baseline data to be collected as suggested in the EIA report and conveyed to DoE and other concern authorities.	The data collected during the quarterly monitoring held in the preconstruction period are considered as the additional environmental baseline data. The collected data were analyzed, standardized and conveyed to DoE quarterly.	Complied
27	The Environmental Management Plan under the EIA study shall strictly be implemented and kept functioning on a continuous basis.	The Proponent has so far been implementing the EMP measures in phases as suggested in the EIA Report and conditions imposed by DoE. The status of EMP implementation is also regularly monitored by CEGIS as the IMA so that it can be maintained strictly.	Being Complied
28	The project authority shall submit a detail work plan with time schedule of development activities at least 7 (seven) days ahead of the work commences in the field to the Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously.	The Project Authority has been sharing the detailed work plan with time schedule of development activities as per the suggested timeline before starting of any construction activities to the Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment simultaneously. This is to be noted that, the facilities established/installed are in operation now in full-fledged.	Being complied
29	Environmental Monitoring Reports According to specific format specified in the EIA Report shall be made available simultaneously to DOE Bagerhat District Office, Khulna Divisional Office and Headquarters on a quarterly basis during the project period.	Environmental Monitoring Reports are being generated as per the specific format suggested in the EIA from the beginning till now. The contents of the reports are disclosed by the Proponent at their website regularly and submitted to DoE Bagerhat District Office, Khulna Divisional Office and Headquarters as well.	Complied
30	The following records must be kept in respect of any samples required to be collected for the purposes of environmental monitoring activities: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) The name of the person who collected the sample.	The IMA has been maintaining all the records as suggested.	Being Complied
31	The results of any monitoring required to be conducted under this EIA report must be recorded.	The IMA has been maintaining a database for preserving all monitoring data and analysis results and submitting to the Proponent through proper documentations.	Being Complied

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
32	In case of any emergency, the following information shall immediately be reported to Bagerhat District Office, Khulna Divisional office and Headquarters of the Department of Environment (DOE) simultaneously: a. Nature of incident (oil spill, fire, accident, collision, land slide etc.) b. Personnel affected (injured, missing, fatalities, etc.) c. Emergency support available and its location (standby transport, medical facilities, etc.) d. Weather conditions e. Current operations (abandoning the site, firefighting, etc.)	The incidents, as mentioned in the conditions if happen, are addressed in the Quarterly Monitoring Report. The concerned authorities are usually informed about the incidents once reports are submitted to them.	Being complied
33	National Oil Spill Contingency Plan (NOSCOP) should be followed to establish an organizational structure to combat marine pollution	The Proponent is much aware about NOSCOP and committed to follow the plan strictly to protect the marine pollution.	Being complied
34	The project authority or its employees must notify the Department of Environment of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident.	The proponent has formed an E&S Wing to strengthen the mechanism to notify DoE regarding incidents causing or threatening material harm to the environment as soon as possible once the concerned person(s) becomes aware of the incident. As mentioned above, the IMA also flags the incident if happen in the quarterly monitoring report.	Being complied
35	All pollution incidents shall be reported immediately and simultaneously to the Bagerhat District Office, Khulna Divisional Office and Headquarters of the Department of Environment (DOE) in Dhaka.	As above.	Being complied.
36	Climate Change impacts and maximum storm surge height shall have to consider at the design and construction phase of the jetty.	The maximum storm surge height has been considered in designing and constructing the jetty.	Complied
37	The transshipment point Faraway Buoy at the Bay should be used from November to March, and Mazhar point should be used from April to October every year for transporting coal which has been mentioned in the EIA Report.	The Proponent is abiding by the guidance of the EIA Report except for transshipping at Harbaria and sometimes at Kutubdia (in rough weather) instead of Mazhar Point. However, since the Passur River Route is under the jurisdiction of the Mongla Port Authority, so coal	Mostly complied.

Sl. No.	Conditions	Status Narratives/Descriptions	Compliance Status
		transshipment should be conducted with their guidance.	
38	Violation of any of the above conditions shall render this approval void.	The Proponent is much aware about the conditions.	--
39	Any injunction on this project from the Honorable Supreme Court/High Court Division shall render this approval void.	Noted by the Proponent.	--
40	This EIA approval is valid for one year from the date of issuance and the project authority shall apply for renewal to the Bagerhat District Office of DoE at Bagerhat with a copy to Head Office of DOE in Dhaka.	The authority is maintaining the renewal process as suggested.	Being complied

5.2 Evidence based Environmental and Social responsibility

Along with meeting all regulatory compliance requirements, including implementing the Environmental Management Plan (EMP) and fulfilling the conditions set by the Department of Environment (DoE), the Maitree Super Thermal Power Plant (MSTPP) has also undertaken several voluntary initiatives that go beyond statutory obligations. These voluntary activities demonstrate MSTPP's commitment to the society through a proactive approach for promoting environmental awareness and education and boldness in exposing such a Key Point Installation (KPI) to the public as it bears the slogan of safeguarding environment.

Plant Visit and Industrial training

To dispel misconceptions and promote transparency, MSTPP encourages environmental organizations, journalists, and academic institutions to conduct on-site inspections at any time, subject to prior permission from the plant authority. In line with this open-door approach, several academic groups have already visited the facility for educational and research purposes, including the Department of Geography and Environment, University of Dhaka (2 May 2025); the Department of Mechanical Engineering, KUET (24 June 2025); the Department of Oceanography, University of Dhaka (24 June 2025); and two groups from the Department of Environmental Impact Assessment, North South University (10 and 12 July 2025). The Department of Environment unit at MSTPP warmly received the visitors and guided them through the entire plant, showcasing operational systems and key environmental control technologies such as the Flue Gas Desulphurization (FGD), Low NO_x Burner, Electrostatic Precipitator (ESP), Effluent Treatment Plant (ETP), Sewage Treatment Plant (STP), and Solid Waste Management Plant (SWMP), FGD Water Treatment Plant (FWTP), etc. The visiting teams shared positive feedback with the plant authority, noting that MSTPP's operations appeared well-managed and environmentally compliant.

Creative Writing Contest

To celebrate World Environment Day (5 June) and International Ozone Day (16 September), MSTPP organized a series of awareness-focused activities, including essay, slogan, poster, and painting competitions for BIFPCL employees and their children on 23 June 2025 and 13 September 2025, respectively. These initiatives were designed to engage participants in understanding the significance of environmental protection and to inspire a sense of responsibility toward conserving natural resources. Through these competitions, participants gained greater awareness of the importance of

safeguarding the environment that supports and foster the proponent's commitment to operating the plant responsibly and in an environmentally conscious manner.

Certifications

MSTPP has recently achieved certification under ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018, demonstrating its commitment to quality management, environmental stewardship, and occupational health and safety. The certification process confirms that the plant has established and running in a structured systems for operational control, documentation, monitoring, training, and continual improvement. As part of the compliance assessment, relevant manuals, standard operating procedures, risk assessments, and monitoring records were examined and verified to be in effective implementation. Internal audits, corrective actions, and management reviews have been conducted as required, indicating the existence of a functioning and matured management system. Overall, MSTPP's recent ISO certifications provide assurance that the plant is operating in accordance with internationally recognized best practices for quality, environmental management, and occupational health and safety performance.



Environmental Impact Assessment Department, NSU



Environmental Department, University of Dhaka



ISO certification

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Appendices

Appendix I: Checklist of Monitoring Environmental Compliances

Table A: Checklist of Monitoring for ESMP Implementation (During Construction Phase)

SI No	Potential Impacts	Proposed EMP	Actual Implementation	Recommended Action	Compliance Status
1	Generation of Noise within the BIFPCL's Plant premises	• Conduct noise survey around and inside the site boundary • Reducing Noise and Vibrations to country's ambient standards, and occupational health and safety standards • Introducing vehicle speed limit and speed limit monitoring system • Green Plantation around the Project boundary • Switching off/ throttling down of machines/equipment's/generators which are not in use			
2	Dust Generation from Land development activities and other construction works	• Conducting dust monitoring and visual inspection around the site boundary • No use of earthen and undeveloped roads by vehicles related to the Project use • Installation of water spraying system to control fugitive dusts • Introducing vehicle speed limit and speed limit monitoring system • If yes, do they monitor vehicle speed regularly?			
3	Water Quality	• Fencing the construction site by drum sheet or Tarjja of any other fencing • Arrangement of runoff drainage for reducing any water logging • Location of backfilling stockpile in safe area and protected from wind and rain action • No storing of backfilling materials/spoil stored on river bank/slope • No disposal of waste and wastewater to river or canal.			
4	Waste Management System	• Provision of onsite waste management system			
5	Compensation and Resettlement	• Prepare Proper resettlement action plan and compensation plan if the Project needs any land acquisition addressing compensation, restoration, livelihood, living standards etc. based on proper socio-economic studies • Resettlement of the PAPs • cash for compensation of land (CCL) before resettlement			

Sl No	Potential Impacts	Proposed EMP	Actual Implementation	Recommended Action	Compliance Status
		• formal agreement with the affected people prior to migration/resettlement • Sufficient standing crop compensation • Compensation for shift able structures? • Retention of salvageable materials? • Compensation for loss of trading income? • one-time moving assistance • grant to cover loss of regular wage income • Has a resettlement plan been developed which includes compensation, restoration, livelihood, living standards etc. based on proper socio-economic studies? • Provide/take extra care/caution for the disadvantaged/vulnerable group(s) (i.e., women, children, ethnic minorities, indigenous people etc.) • Provision of monitoring the compensation and resettlement process			
6	Livelihood and living	• Does the Project pose any threat to the livelihood/living standards of the local people? • If yes, are adequate steps taken to reduce the impacts? • Has the company developed any policy which prioritizes the local laborers in employment opportunities? • Is there any possibility that large vehicle related to the Project will cause traffic induced disturbance/s to the local dwellers? • If yes, are there any mitigative steps taken to decrease the disturbance/s? • Has the road network been developed after the Project being proposed and during the construction phase? • Are there separate water and sanitation facilities for the construction workers in the Project area?			
7	Green House Gas Controlling Measures	• Use of efficient generator in the construction activities • Regular maintenance of vehicles, generator and machinery in accordance with manufacturer's specifications • Use of approved pollution control devices fitted in the equipment's and machineries • Switching off and throttling down the machines/equipment's/generators which are not in use			

Table B: Checklist of Monitoring ESMP Implementation (During Construction Phase)
(Labor and Working Condition)

Basic Data

SI No	Description	Values
1	Direct Workers	
2	Contracted Workers	
3	Supply Chain Workers	
4	Child labor	
5	0 - 12	
6	13 - 14	
7	14 - 18	

Checklist for Labor and Working Condition

SI No	Potential Impacts	Proposed EMP	Actual Implementation	Recommended Action	Compliance Status
1	Working Conditions and Management of Worker Relationship	- Preparation of Human Resources Policies and Procedures for Direct workers - Defined Working condition and Terms of Employment for direct worker - Sustainably equivalent terms and condition for migrant workers - Compliance to national law of forming workers' organization - No discrimination and equal opportunity for all - Measures for diminishing past discrimination - Grievance Mechanism			
	Protecting Workforce	- The client will not employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. - No Force Labor			

Sl No	Potential Impacts	Proposed EMP	Actual Implementation	Recommended Action	Compliance Status
2	Safety at site	• Installation/Construction of Safety Fence around the Project area • Use of Personnel Protective Equipment (i.e. safety suit, safety goggles, ear plug, safety shoes, gloves, dust mask, etc.) • Safety trainings for workers (i.e. fire control, working at height, working in heat, first aid etc.) • Practice of Tool box meeting, safety talks, • Safe Storage of Hazardous Chemicals (e.g. fuel, flammable chemical, toxic chemicals, etc.) • Maintaining Material Safety Data Sheet (MSDS) • Provision of Health care facilities such as doctor, hospital etc. available at/nearby the plant construction site • Availability of First Aid at work place • Preparation and Follow of Emergency Response Plan • Adequate fire precautions in place (for example, fire extinguishers, escape routes etc.) • Documentation and reporting of occupational accidents, diseases, and incidents • Policies and procedures for managing and monitoring the performance of third-party employers in relation to OHS			
3	Occupational Health and Safety Procedure	• Provision of complete EHS division in the Human Resources Planning/Organogram • Preparation of Safety Policy to be adopted during plant operation			
4	Worker's Well Being	• Establishment Grievance Mechanisms • Ensuring fair treatment, non-discrimination and equal opportunity • Compliance of Project's labor policy with the national labor law • No Child Labor • No incident of forced labor • Provision of Welfare facilities for Worker/Labor			

Table C: Checklist of Monitoring ESMP Implementation (During Construction phase)
(Community Health, Safety and Security)

SI No	Potential Impacts	Proposed EMP	Actual Implementation	Recommended Action	Compliance Status
1	Disturbance to nearby community due to dust from newly developed land and Noise from construction activities	• Construction of boundary wall around the Project are • Installation of water spraying system to control dusts • Conducting dust monitoring and visual inspection around the site boundary • Adoption of Noise management plan			
2	Grievance of local people	• Availability and operation of Grievance Redress Mechanism • Maintaining open communication channel with the local community			
3	Risk of breaching Community Safety	• Construction of boundary wall/safety fence around the Project area • Practicing Risk Assessment and Evaluation Process • Practicing safe management for hazardous materials which may pose threat to the community • Availability and operation of Emergency Response Plan • Maintaining open communication channel with the local community • Training and instruction to the security personnel about their behaviour and communication with the local people • Aware the security personnel about the right of the community people			
4	Community Health Risk	• Provision of providing health service facilities to community if the Project possess any health risk like sexually transmitted disease, communicable disease, vector-borne diseases • Implement all pollution mitigation measures to ensure safeguarding to community			<i>(Continued)</i>
5	Youth Employment	• Providing training/awareness program for the local youth to let them aware about the required qualification to get involved in the Project related activities			
6	Public Communication, Consultation and Awareness	• Arranging public communication/consultation meeting • Sharing of Project information with local people • Organizing environmental and social awareness programs/meetings			

Table D: Checklist of Monitoring ESMP Implementation (During Construction phase)
(Biodiversity and Sustainable Management of Living Natural Resources)

Sl No	Potential Impacts	Proposed EMP	Actual Implementation	Recommended Action	Compliance Status
1	Runoff (contain mostly sediment load) from newly developed land falls into nearby river and channel.	• Installation of proper run on/runoff drains • Use of sediment fences, traps and basins for trapping the sediment, if required			
2	Disturbance to nearby ecosystem due to different construction activities	• No cutting/ felling of trees along the river bank • Implementation of on-site waste and air quality management plan • Limiting soil extraction activities limited within the defined area • Limiting the vegetation clearance and base stripping process within the Project boundary • Safety fence around the construction site • Limiting the use of night light • Using shade (directed downwards) around the outdoor lights • Provision of cut-off time to switch off unnecessary lights at night • Initiate Green plantation • No plantation of non-native species • Retaining top soil for future habitat restoration • No degradation of critical habitat?			
3	Occupation of river, inter-tidal areas and wetlands	• No encroachment of inter-tidal flood plain area • No disturbance to Dolphin community • Monitoring of Ecosystem Health and Monitoring of Sundarbans Forest Health • If required, embankment should be constructed considering a setback distance from river/canal bank • Slope protection work along the Maidara River should be completed on an urgent basis before rainy season come and			

Sl No	Potential Impacts	Proposed EMP	Actual Implementation	Recommended Action	Compliance Status
		BIFPCL may take initiatives of excavating of silted reach of Maidara river near proposed township area to facilitate proper functioning of River for maintaining tidal dynamics			

Appendix II: Photo Album

Environmental and Socio-economic Monitoring of Khulna 2×660 MW Power Plant for 46th Monitoring Program (October-November, 2025)



Monitoring Team



Fisheries Monitoring Activities



In-situ Water Quality monitoring



Conducting Noise level monitoring



Conducting Air Quality monitoring



Collecting soil Samples



Collecting Groundwater samples



Compliance Monitoring Team



Coal Shade



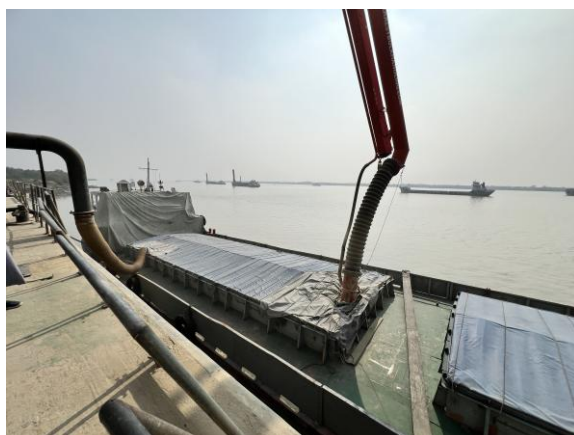
Modified Coal grabber



Fine Meshed Netting Around the Coal Barge



Fly Ash Barge Loader



Collecting Fly Ash



Sewage Treatment Plant



Chemical Laboratory

Appendix III: Terms of References (ToR)

Background

Bangladesh-India Friendship Power Company (Pvt.) Ltd. (BIFPCL), a 50:50 Joint Venture Company of Bangladesh Power Development Board (BPDB) of Bangladesh & NTPC Limited of India, is implementing a coal-based thermal power plant named 2X660 MW Maitree Super Thermal Power Project at Rampal in Bagerghat District of Khulna Division of Bangladesh. The plant is envisaged to be based on super-critical technology and operated as Base Load Plant. The fuel envisaged is imported coal.

General Description of 2X660 MW Maitree Super Thermal Power Plant Project

Project Location:	Upazila: Rampal, District: Bagerhat Site is located at 23 kms Southward of Khulna City and 14 kms. North-Eastward from Mongla Port. 
Project Capacity:	1320 MW (2x660 MW), based on Ultra Super-critical Technology
Mode of Operation:	Base Load
Fuel:	Imported Coal

Fuel Transportation:	It is envisaged that imported coal from countries like Indonesia, Australia shall be transported through bigger ships, up to trans-shipment point, from where the coal shall be transported through barges to the coal unloading jetty at the plant end. From jetty to the power plant coal shall be transported through coal conveyor system.
Land& Land Development:	Based on the layout in the FR, it is estimated that approx. 575 acres of land will be required for the project. (375 Acres for Main Plant, 50 Acres for Township, 50 Acres for Jetty).
Evacuation of power:	Provision of line bays in generation switchyard for one no. 400 kV Double Circuit line and one no. 230 kV Double Circuit line have been kept. The Power evacuation (transmission line) system from the Project shall be at 400 kV level and will be outside the scope of the Project. 400 kV is being introduced for the first time in Bangladesh.
Expected Timeline for project implementation	The first unit of capacity 660 MW is scheduled to be synchronised in 41 months from the date of NTP to the EPC contractor for the Power project. Commissioning of the first unit of capacity 660 MW is envisaged at an interval of 5 months thereafter.

Broad Scope of Works

The study covers quarterly monitoring of different environmental and social parameters, and implementation of EMP (Environment Management Plan) during implementation phases as per DoE approval/requirement. The monitoring locations were selected based on physical activities, wind direction, sensitive receptors, etc. and were finalized through the consultation with DoE, Department of Fisheries (DoF), MPA and Forest Department (FD).

The Broad objectives of independent monitoring cover the following activities

- Monitoring implementation of EMP and environmental compliance;
- Monitoring of ambient air quality, noise level and water quality;
- Monitoring of cropping pattern and soil quality;
- Monitoring of fisheries resources covering fish habitats, biodiversity, migration and production;
- Monitoring of ecosystem and biodiversity;
- Monitoring of the Sundarbans Forest Health; and
- Monitoring of socio-economic condition and livelihoods.
- To evaluate the project environmental performance as due to construction activities.

The main objectives of this works are

- Monitoring of Social and Environmental parameters to update the baseline.
- Monitoring of Social and Environmental parameters during Implementation of the Project.
- Assistance to BIFPCL for implementation of Environmental Management Plan (EMP) during construction period.
- The scope of work of the Independent Monitoring will include the following specific tasks
- Develop specific monitoring indicators, checklists, and questionnaires to undertake independent monitoring (a preliminary list of monitoring indicators has been given in the EMP) in consultation with BIFPCL, DoE, Forest Department and the Financer;
- Review and verify the implementation progress of various EMP elements, particularly, mitigation plan, compliance monitoring, environmental trainings, documentation, and grievance redress mechanism;
- Physical aspects would cover air quality, noise level, water quality and land resources;
- Biological environment includes fisheries resources, ecological resources, Sundarbans Reserve Forest (SRF) health conditions including WHS;
- Environmental compliance monitoring includes Monitoring of Environmental and Social Management System Action Plan Implementation, monitoring of labour and working conditions, monitoring of community health, safety and security and monitoring of biodiversity and sustainable management of living natural resources.
- To establish baseline environmental conditions;
- Provide and monitor the environmental parameter during construction activities.
- To detect adverse environmental impacts for river dredging and other activities of site development;
- Provide technical assistance to the client for implementation of the EMP during the power plant construction at different sector of construction activities.
- To demonstrate whether the environmental control measures are operating as per designed;
- To provide data for emission inventories;
- To provide data at regular intervals for dissemination to the stakeholders
- To provide data for improvement and updating of the monitoring program;
- To assist in investigating the event of a trigger level or emission limit value being crossed.
- Update baseline data as per monitoring schedule and location.
- Provide technical assistance to the client for implementation of the EMP during power plant construction.
- Review the EIA document to evaluate the EMP measures incorporated in the contract to mitigate different social and environmental hazards and risks during construction of the Project
- Submit progress reports to the client.
- Physical observation to assess that all mitigation measures mentioned in EMP are carried out in all place.

- Sampling and carrying out necessary analysis of Environmental parameter such as surface & ground water quality, air quality, noise, Biological Environment, Socio-economic environment, Sundarbans Forest health etc. according to the monitoring framework in construction phase.
- Morphological changes of the adjacent river of the project will be influenced by the constructional activities. River bank erosion-accretion, drainage system, tidal inundation etc. will be investigate after regular intervals in the study area as per monitoring location of the EIA. The procedure of investigation and methodologies of analysis will be the same as pre-construction phases. River bed pollution will be identified though this study during construction of the power plant.
- Monitoring of floral resources will be performed quarterly. The indicators and procedures of flora monitoring will be relatively same as earlier studies of this projects. Plant composition, canopy coverage, indigenous and exotic species, plant intensities will be the main monitoring indicators during construction phases.
- Monitoring of faunal resources will be performed quarterly at the construction period. Faunal resources survey will coincide with floral resources survey as it will provide more insight about the inter-dependency between flora and fauna in an ecosystem.
- Render any other related services as and when requested.
- Conduct community level consultation in a regular interval and disclose project level information.
- Keep liaison with different organization like Govt department, NGOs, and relevant stakeholders.

The Monitoring Parameter & Associated Indicator are Given Below

Monitoring Parameter	Indicators
Socio-economy	Livelihood and Occupation
	Income and expenditure
	Displacement and Migration
	Cultural and heritage
	Health and sanitation
	Risks and accidental assessment
	Transportation and communication
	Public and private Infrastructure development
Ecology and Biodiversity	Bio-indicator Assessment
	Movement of indigenous/ native species
	Envision of exotic species and regime dominance
	Species composition (Flora and Fauna)
	Assessment the services of dependent ecosystem
Agriculture	Land use and canopy coverage

Monitoring Parameter	Indicators
	Soil quality (Salinity, pH, OM,)
	Cropping pattern and crop intensities
	Irrigation and crop production
	Farmers survey result
Fisheries	Fish diversity and specification
	Fish production and availability
	Fisher survey result
Noise level	Sound level at the sensitive zone
Water resources	DO, BOD, COD, Salinity, TDS, TS, pH, Hg, Pb
	Total Hardness, Hg, NO ₃ and PO ₄
	River Morphology,
	Tidal inundation
	Drainage Network
	Erosion and Accretion
	Ground water quality
Air quality	SO _x
	NO _x
	SPM (PM ₁₀ and PM _{2.5})
	CO

Air Quality Monitoring Progress

The most commonly used method for automatically monitoring air pollutant such as those above are:

- SO_x: measured by Fluorescent signal generated by exiting SO₂ with UV light
- NO_x: measured by Chemilumiscent reaction between NO_x & O₃
- O₃: measured by ultra violet absorption analyzer, this determines the Ozone concentration by the attenuation of 254 nm UV light along this signal fixed path cell
- Particulate matter (SPM, PM₁₀, PM_{2.5}): measured by gravimetric methods including true micro weighing technology for automatic monitoring & instrument named 'Tapered element oscillating micro balance (TOEM)' has been most frequently used. Measurement on filter tape using the principles of beta attenuation for estimating 30 mnt or 1 hr average concentrations of PM₁₀ or PM_{2.5} has also been used.
- CO: In urban air pollution studies, a non-disruptive infrared photo meter utilizing a gas filter co relation technology & state of the art optical & electronic technology is used to measure low concentration of CO accurately & reliably.

Expected Output

- A breach of a trigger level or emission limit values may indicate a significant increase of a contaminate concentration in an environmental medium.
- Baseline Monitoring is monitoring in and around the location of a proposed site so as to establish background environmental conditions prior to any development of the proposed site. In case of existing facilities, baseline-monitoring serves as a reference point

to which later monitoring results are compared. The information will be used to evaluate in future compliance monitoring.

- Compliance monitoring is periodic monitoring and is to determine whether there is any release of contaminants to the environment and to demonstrate compliance within the project area. It includes measurements of process conditions, process emissions and levels in receiving environments and the reporting of the results of such measurements to demonstrate compliance with limits specified in the legislation.
- The information provided by compliance monitoring is also valuable for other environmental and management activities (e.g. for optimizing process, protecting sensitive ecosystems and informing the public of the effectiveness of environmental protection measures).
- Assessment monitoring is investigative monitoring which is initiated after detection of the impacts to the environment or on attaining a trigger level. The assessment monitoring will:
 - ✓ Identify the source of release materials;
 - ✓ Characterize the nature, extent and rate of releases;
 - ✓ Evaluate the risk to the environment and to human health;
 - ✓ Evaluate measures to prevent or minimize future releases;
 - ✓ Provide information for the design and implementation of corrective measures and
 - ✓ Express the residual environmental impacts for proper compensation.

Reporting Requirements

As it is proposed to carry out the monitoring program for two quarters and the proposed deliverables are scheduled below:

SL	Name	No. of copies
1	Monitoring Report after each monitoring mission (each in one quarter) with complete data, analysis, lab. Results, discussion etc. as intended in the scope of work.	12
2	CD-ROM in respect of documents/datasheets	2

Appendix IV: Monitoring Data

(A) Air Quality Data

Table A1: Ambient Air Quality Monitoring Results

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
1 st QM Apr, 2014	PM _{2.5}	33	39	37	39	35	47	47	19	17	15	54	NM	NM	65(24hr)
	PM ₁₀	78	814.6	67	103	77	119	139	41	39	44	139			150(24hr)
	SPM	207	2156	234	233	117	297	288	111	114	101	301			200(8hr-ECR, 1997)
	SO ₂	21	19	19	21	19	28	27	9	7	8	33			80(24hr)
	NO ₂	26	29	23	25	23	41	44	19	17	18	49			80(24hr)
	CO	120	165	110	175	190	230	230	65	49	52	330			5000 (8hr)
	O ₃	27	33	25	26	27	49	57	13	11	14	59			100(8hr)
2 nd QM, Jul 2014	PM _{2.5}	37	48	44	47	39	49	55	22	19	23	39	NM	NM	65(24hr)
	PM ₁₀	77	90	78	122	86	127	174	39	44	38	117			150(24hr)
	SPM	239	263	217	244	113	266	303	117	133	119	287			200(8hr-ECR, 1997)
	SO ₂	24	28	22	23	24	31	28	10	9	7	29			80(24hr)
	NO ₂	29	39	28	28	26	39	39	22	19	18	41			80(24hr)
	CO	188	210	178	210	205	217	320	58	60	62	370			5000 (8hr)
	O ₃	26	26	19	29	24	38	52	12	14	13	67			100(8hr)
3 rd QM, Oct 2014	PM _{2.5}	25	48	19	57	46	57	39	33	23	19	52	NM	NM	65(24hr)
	PM ₁₀	53	74	56	67	69	139	77	59	32	34	91			150(24hr)
	SPM	190	217	157	183	162	254	197	129	97	107	239			200(8hr-ECR, 1997)
	SO ₂	19	22	18	17	21	31	26	14	12	13	33			80(24hr)
	NO ₂	27	27	22	22	27	36	33	27	22	19	39			80(24hr)
	CO	140	230	110	190	170	250	220	70	50	65	330			5000 (8hr)
	O ₃	19	26	17	22	18	36	37	13	9	11	57			100(8hr)
4 th QM, Jan 2015	PM _{2.5}	33	39	42	39	37	41	41	27	18	17	42	NM	NM	65(24hr)
	PM ₁₀	79	102	98	97	68	101	82	56	39	41	84			150(24hr)
	SPM	200	274	310	277	183	208	217	139	88	97	219			200(8hr-ECR, 1997)
	SO ₂	23	21	27	22	18	24	24	12	13	14	28			80(24hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
	NO ₂	31	26	32	26	24	26	27	18	17	22	36			80(24hr)
	CO	190	164	210	150	170	188	211	64	46	60	296			5000 (8hr)
	O ₃	22	23	36	19	22	27	26	11	10	9	39			100(8hr)
5 th QM, Apr 2015	PM _{2.5}	47	34	59	41	33	39	26	24	49	28	55	NM	NM	65(24hr)
	PM ₁₀	83	97	91	82	61	105	35	49	77	60	75			150(24hr)
	SPM	177	266	244	236	188	299	214	109	102	110	222			200(8hr-ECR, 1997)
	SO ₂	15	22	21	25	11	30	14	16	21	15	31			80(24hr)
	NO ₂	29	24	39	27	18	27	17	22	27	20	33			80(24hr)
	CO	144	136	140	196	33	177	24	56	163	60	101			5000 (8hr)
	O ₃	26	21	44	15	41	11	9	14	27	23	21			100(8hr)
6 th QM, Jul2015	PM _{2.5}	25	18	28	34	35	34	33	27	NO	NO	46	NM	NM	65(24hr)
	PM ₁₀	35	31	96	65	109	144	52	42	NO	NO	89			150(24hr)
	SPM	42	47	321	79	175	339	118	70	NO	NO	181			200(8hr-ECR, 1997)
	SO ₂	52	58	56	41	55	58	45	51	NO	NO	59			80(24hr)
	NO ₂	35	46	43	44	49	47	40	34	NO	NO	38			80(24hr)
	CO	146	127	133	96	133	125	110	112	NO	NO	89			5000 (8hr)
	O ₃	12	16	11	9	21	13	15	12	NO	NO	7			100(8hr)
7 th QM, Oct 2015	PM _{2.5}	22	17	19	11	28	25	19	24	25	27	19	NM	NM	65(24hr)
	PM ₁₀	52	48	29	26	49	62	33	50	32	45	49			150(24hr)
	SPM	91	79	66	112	94	183	65	73	51	88	101			200(8hr-ECR, 1997)
	SO ₂	35	27	32	31	33	36	36	34	27	28	28			80(24hr)
	NO ₂	29	25	21	32	23	23	20	22	19	23	26			80(24hr)
	CO	88	102	87	96	75	105	84	81	92	93	94			5000 (8hr)
	O ₃	5	1	8	6	2	5	8	4	8	2	4			100(8hr)
8 th QM, Jan 2016	PM _{2.5}	34	35	24	29	31	47	34	26	18	NO	35	NM	NM	65(24hr)
	PM ₁₀	135	116	125	97	98	128	132	82	77	NO	112			150(24hr)
	SPM	175	192	187	176	167	198	189	159	128	NO	181			200(8hr-ECR, 1997)
	SO ₂	14	13	13	16	21	18	16	15	14	NO	16			80(24hr)
	NO ₂	18	16	18	21	16	15	13	14	15	NO	16			80(24hr)
	CO	74	77	77	81	70	101	71	62	64	NO	98			5000 (8hr)
	O ₃	4	1	2	4	1	2	3	2	1	NO	2			100(8hr)
	PM _{2.5}	19	25	11	23	25	15	21	13	9	17	11	NM	NM	65(24hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
9 th QM, Apr 2016	PM ₁₀	117	44	29	82	60	46	45	42	31	40	69			150(24hr)
	SPM	332	187	115	268	167	114	144	91	46	132	112			200(8hr-ECR, 1997)
	SO ₂	18	11	17	20	13	9	10	11	9	15	11			80(24hr)
	NO ₂	18	22	16	16	25	19	14	16	10	19	15			80(24hr)
	CO	57	22	38	73	33	55	29	47	21	40	68			5000 (8hr)
	O ₃	1	1	0	0	1	2	1	2	0	0	1			100(8hr)
10 th QM, Jul 2016	PM _{2.5}	5	3	3	9	7	8	9	6	4	NO	16	NM	NM	65(24hr)
	PM ₁₀	32	11	24	45	23	42	29	20	15	NO	68			150(24hr)
	SPM	51	27	31	69	31	78	50	43	23	NO	107			200(8hr-ECR, 1997)
	SO ₂	9	4	4	10	7	8	8	6	4	NO	10			80(24hr)
	NO ₂	12	6	5	12	10	9	10	8	5	NO	15			80(24hr)
	CO	35	31	47	41	38	29	31	32	37	NO	36			5000 (8hr)
	O ₃	1	0	1	0	0	0	2	0	0	NO	0			100(8hr)
11 th QM, Oct 2016	PM _{2.5}	9	8	10	10	5	10	11	10	4	9	9	NM	NM	65(24hr)
	PM ₁₀	22	11	14	13	20	18	15	14	14	14	24			150(24hr)
	SPM	53	23	35	30	48	34	6	44	27	26	64			200(8hr-ECR, 1997)
	SO ₂	8	6	8	7	9	8	7	7	6	9	10			80(24hr)
	NO ₂	10	8	11	9	8	9	8	10	6	9	14			80(24hr)
	CO	119	108	127	98	79	112	97	110	101	121	104			5000 (8hr)
	O ₃	1	0	1	3	2	0	1	1	2	0	2			100(8hr)
12 th QM, Jan 2017	PM _{2.5}	24.8	25	29	21.7	25.2	38.7	25.7	19.2	14.3	21.7	34.6	NM	NM	65(24hr)
	PM ₁₀	79	99.5	108.7	105.4	74.4	141.6	119.3	85.2	85.5	104.5	145.9			150(24hr)
	SPM	115.7	154.2	168	167.8	162	194.6	172.3	93.5	90.9	111.4	189.7			200(8hr-ECR, 1997)
	SO ₂	9.5	12.9	12.2	12.2	18.9	16.1	16.8	11.9	8.4	13.5	17.1			80(24hr)
	NO ₂	11.3	15.7	14.7	19.3	18	19	15.3	13	12.7	15.9	18.6			80(24hr)
	CO	59	66	31	63	36	48	44	67	58	43	66			5000 (8hr)
	O ₃	5	1	3	5	2	3	4	4	3	4	3			100(8hr)
13 th QM, April, 2017	PM _{2.5}	8.12	14.6	10.3	7.9	8.7	15.8	22.6	10.5	13.2	No	23.1	NM	NM	65(24hr)
	PM ₁₀	43.8	56.9	31.3	30.5	44.4	105	93.6	36.7	96	NO	99.5			150(24hr)
	SPM	122.4	136.7	91.7	95.6	110.6	179	196	103.7	137	NO	187.2			200(8hr-ECR, 1997)
	SO ₂	9	10	5.8	5.5	8.2	12.9	10.5	5.7	6	NO	7.2			80(24hr)
	NO ₂	10.7	11.8	7.1	9.8	11.2	18.7	15.1	7.7	10.1	NO	11.7			80(24hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
	CO	91	78	74	85	94	83	72	73	79	NO	79			5000 (8hr)
	O ₃	3	8	5	8	3	6	4	8	0	NO	7			100(8hr)
14 th QM, Jul, 2017	PM _{2.5}	28.2	8.5	15.2	13.8	17.3	17	33.2	28.3	7.5	17	19.5	NM	NM	65(24hr)
	PM ₁₀	73.6	40.4	49.9	30.2	100.2	63.4	97	89.9	37.8	92.1	39.6			150(24hr)
	SPM	169.4	45.3	63.9	57.2	127.8	87.5	187.2	107	41.8	102	127.9			200(8hr-ECR, 1997)
	SO ₂	7.2	4.3	7.5	4.1	7.9	8	8.2	7.6	5.8	6	7.1			80(24hr)
	NO ₂	7.5	6	9.2	5	8.4	10.2	10.7	9.3	5.9	7.8	8.8			80(24hr)
	CO	73	79	80	77	69	87	79	84	69	72	81			5000 (8hr)
	O ₃	10	25	10	6	5	0	9	0	0	0	7			100(8hr)
15 th QM Jan, 2018	PM _{2.5}	32.9	31.5	40.7	52.3	33.4	72.3	70.1	43.5	35.4	40.5	78.7	NM	NM	65(24hr)
	PM ₁₀	133	147.8	136.3	140	157.1	208.9	209.1	152.4	150.6	149.8	213.9			150(24hr)
	SPM	145.6	181.4	161.7	171.9	200	223.9	242	189.9	175.1	173.7	243.4			200(8hr-ECR, 1997)
	SO ₂	14.3	15	9.6	13.8	19	16.3	15.5	13.2	14	15.8	21			80(24hr)
	NO ₂	17.7	18.6	11.7	16.7	20.7	17.7	18.4	15.2	15.1	18.1	25			80(24hr)
	CO	61	69	45	59	58	49	52	57	52	71	69			5000 (8hr)
	O ₃	3	4	5	4	5	6	2	2	3	4	9			100(8hr)
16 th QM April, 2018	PM _{2.5}	28.4	26.7	27.7	18	11.4	15.9	23.2	11.6	13.7	NO	12.4	29.1	33.1	65(24hr)
	PM ₁₀	70	52	100.1	30.5	40.6	74.3	89.9	29.1	36.4	NO	38.8	70.3	118.1	150(24hr)
	SPM	121.5	138.7	116.2	90.6	108	154.1	144.7	72.4	90.3	NO	78.9	120.6	142.5	200(8hr-ECR, 1997)
	SO ₂	11.4	9.6	13.2	6.1	10.4	12.2	11.8	7.9	8.3	NO	7.5	13.1	12.2	80(24hr)
	NO ₂	12.8	10.2	14.3	7.3	11.6	13.7	13.2	8.3	9.9	NO	8.4	14	14.8	80(24hr)
	CO	32	27	43	24	42	34	29	31	21	NO	36	46	38	5000 (8hr)
	O ₃	9	4	7	6	2	6	3	2	3	NO	9	9	5	100(8hr)
17 th QM, Jul 2018	PM _{2.5}	15.2	15.8	12.9	11.9	10.2	11.1	13.2	11.4	14	NO	12.5	13.7	20.9	65(24hr)
	PM ₁₀	15.8	64.4	44.3	20.5	30.6	58.4	47.5	24.3	41.6	NO	45.4	60.8	83.7	150(24hr)
	SPM	12.9	113.4	76.3	5.2	78.6	98.4	73.7	47.6	58	NO	69.9	98.1	106.2	200(8hr-ECR, 1997)
	SO ₂	11.9	10.8	5.8	6.1	7.5	9.4	6.5	4.9	6.3	NO	7.5	8.4	10.9	80(24hr)
	NO ₂	10.2	13.1	5.9	7.4	8.4	12.1	7.2	5.4	9.3	NO	11.1	9	13.4	80(24hr)
	CO	11.1	25	21	20	23	29	20	20	25	NO	28	32	34	5000 (8hr)
	O ₃	13.2	8	6	6	4	8	1	6	4	NO	7	4	7	100(8hr)
18 th QM, Nov, 2018	PM _{2.5}	31.1	35.7	32.3	15.4	26.8	24.8	30.3	20.6	29.1	23.4	21.3	28.6	40.9	65(24hr)
	PM ₁₀	106	109.9	117.4	50.1	105.9	92	103.7	80.5	100.2	86.7	57.9	111.7	128.3	150(24hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
	SPM	137.4	143.9	156.2	113.5	128.5	139	161.9	90.3	121.4	107.9	102.9	144.6	177.8	200(8hr-ECR, 1997)
	SO ₂	12.7	12.2	13.4	9.5	12.1	10.4	12	11.6	10.8	10.6	8.7	10.2	13.4	80(24hr)
	NO ₂	14.8	13.6	15	10.7	14	13.4	16.8	13	11.7	12.5	9.7	11.6	15	80(24hr)
	CO	28	30	32	20	27	30	33	20	28	22	121	30	32	5000 (8hr)
	O ₃	7	6	8	2	5	8	9	4	5	6	4	9	9	100(8hr)
19 th QM, Feb, 2019	PM _{2.5}	27.3	30.6	20.3	19.3	22.8	28.6	26.6	15.4	16.2	18.2	20.8	21.2	26.9	65(24hr)
	PM ₁₀	105.4	126.3	93.6	102	126.7	125.8	109.3	92.6	93.2	96.1	91.3	88.7	112.9	150(24hr)
	SPM	151.6	168	125.5	127.5	146.6	178.2	157.1	118.3	117.8	127.8	158	129.4	168.2	200(8hr-ECR, 1997)
	SO ₂	11.6	12.3	10.7	11.5	12.4	13.3	10.8	9.5	10.1	10.7	10.4	11.3	12.5	80(24hr)
	NO ₂	12.4	13.8	11.3	13.8	13.8	14.9	12.6	10.1	11.3	10.9	11.1	12.1	13	80(24hr)
	CO	15	21	20	17	25	14	28	25	17	21	19	18	23	5000 (8hr)
	O ₃	9	4	1	3	9	8	7	3	3	6	5	1	6	100(8hr)
20 th QM, Apr, 2019	PM _{2.5}	21.7	18.9	14.2	19.7	15	15.8	35	14.2	13	NO	33	17.2	36.1	65(24hr)
	PM ₁₀	98.2	106.1	58.7	69.9	72.7	92.7	131	63.9	51.9	NO	125.9	61.6	137	150(24hr)
	SPM	128.6	150.8	119.2	92.2	117.6	141.1	183.1	90.9	71.1	NO	173.4	102.5	163.2	200(8hr-ECR, 1997)
	SO ₂	13.9	12.1	11.6	12.6	11.2	10.4	16.8	11.6	8.9	NO	15.3	7.9	15.7	80(24hr)
	NO ₂	16	13.9	13.5	13.8	13.7	11.7	17.8	13	9.4	NO	17.1	11.9	17.6	80(24hr)
	CO	18	20	16	18	20	14	17	16	14	NO	23	21	21	5000 (8hr)
	O ₃	6	1	5	4	8	3	3	5	1	NO	6	5	7	100(8hr)
21 st QM, Jul, 2019	PM _{2.5}	37.76	50.24	37.27	57.51	19.46	24.03	56.67	28.03	19.68	NO	38.59	21.24	39.65	65(24hr)
	PM ₁₀	67.15	63.94	42.99	33.25	46.37	56.56	119	21.85	43	NO	47.05	96.71	142.8	150(24hr)
	SPM	109.3	123.6	60.45	75.13	80.31	93.5	192.2	48.09	83.9	NO	101	127.8	171.2	200(8hr-ECR, 1997)
	SO ₂	56.5	31.53	60.26	54.02	45.81	59.41	59.33	49.72	57.24	NO	35.42	9.32	17.37	80(24hr)
	NO ₂	55.08	24.97	58.39	43.45	44.92	51.09	57.02	41.91	46.58	NO	40.09	15.63	21.32	80(24hr)
	CO	4	4	7	6	10	9	15	16	38	NO	11	9	8	5000 (8hr)
	O ₃	25	34	18	7	2	22	5	8	9	NO	6	19	6	100(8hr)
22 nd QM, Jul, 2019	PM _{2.5}	51.32	19.34	33.2	31.28	33.74	24.03	39.69	39.69	36.67	27.76	18.65	29.64	14.65	65(24hr)
	PM ₁₀	127.6	82.27	1119.3	69.32	78.27	119.3	64.12	64.12	87.15	67.89	59.19	98.15	79.92	150(24hr)
	SPM	183.6	120.5	175.13	102.2	101	101	83.9	83.9	122.6	90.31	78.09	127.8	109.3	200(8hr-ECR, 1997)
	SO ₂	31.53	60.26	54.02	59.33	35.42	44.29	57.24	57.24	35.23	45.81	49.72	19.32	56.5	80(24hr)
	NO ₂	24.97	58.39	43.45	57.02	40.09	17.72	46.58	46.58	31.26	44.92	41.91	15.63	55.08	80(24hr)
	CO	16	11	0	0	0	0	48	48	24	2	24	0	0	5000 (8hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
	O ₃	10	22	2	52	38	26	40	40	90	16	18	11	6	100(8hr)
23 rd QM, Feb, 2020	PM _{2.5}	27.12	19.14	21.61	26.66	39.44	33.26	38.92	17.81	23.04	17.39	40.22	44.26	26.26	65(24hr)
	PM ₁₀	68.1	83.22	77.69	61.11	100.1	127.5	119.6	63.27	82.91	72.45	116.2	122.7	91.39	150(24hr)
	SPM	108.4	106.3	100.04	98.74	146.7	160	173.4	87.51	121.7	94.28	157.3	171.3	126.1	200(8hr-ECR, 1997)
	SO ₂	18.35	27.41	19.68	18.88	36.14	30.89	31.33	16.47	24.21	13.33	28.31	34.12	16.16	80(24hr)
	NO ₂	12.12	18.77	17.53	11.58	20.04	19.02	13.34	9.9	16.74	8.65	24.14	21.72	9.04	80(24hr)
	CO	28	44	30	32	18	11	29	30	20	36	32	18	22	5000 (8hr)
	O ₃	8	9	9	12	22	2	4	12	2	7	10	4	6	100(8hr)
25 th QM, July, 2020	PM _{2.5}	18.71	20.35	21.93	18.04	18.22	16.63	41.33	20.11	13.16	NO	46.73	22.08	20.16	65(24hr)
	PM ₁₀	80.28	71.06	76.76	59.02	59.91	55.78	126.1	62.24	58.82	NO	119.1	86.26	78.69	150(24hr)
	SPM	98.26	95.24	101.33	82.02	146.7	70.23	166.2	87.71	78.8	NO	167.2	111.7	102	200(8hr-ECR, 1997)
	SO ₂	19.91	17.44	16.21	24.29	18.74	16.73	22.04	13.31	15.06	NO	30.73	20.61	18.82	80(24hr)
	NO ₂	8.82	10.17	10.55	10.62	10.19	10.52	11.29	8.13	10.47	NO	24.24	11.17	9.22	80(24hr)
	CO	0	4	2	0	10	0	24	8	14	NO	18	2	0	5000 (8hr)
	O ₃	8	6	8	8	8	2	2	22	4	NO	4	2	8	100(8hr)
26 th QM, Oct 2020	PM _{2.5}	44.18	29.17	46.73	38.69	43.91	33.32	40.75	34.42	22.74	28.15	48.32	41.29	38.72	65(24hr)
	PM ₁₀	107.2	84.3	110.43	91.79	88.93	74.83	114.6	79.38	56.74	59.31	109.6	97.16	93.48	150(24hr)
	SPM	149.7	119.2	160.3	128.5	139	112	152.8	122.9	80.31	91.06	157.4	142.4	136.7	200(8hr-ECR, 1997)
	SO ₂	26.63	14.15	25.82	20.17	29.94	21.39	20.06	19.74	12.74	11.36	29.58	21.73	18.11	80(24hr)
	NO ₂	16.62	14.18	18.91	14.47	18.32	12.12	9.69	10.16	6.64	9.74	20.44	13.36	9.92	80(24hr)
	CO	2	0.013	0.012	0	0	0	0	0	0	0	0.7	0	0	5000 (8hr)
	O ₃	8	2	8	0	0	4	1	3	6	1	0	0	2	100(8hr)
27 th QM, Jan, 2021	PM _{2.5}	55.35	52.74	68.26	61.29	59.18	66.31	74.19	53.28	48.2	55.71	88.71	166.7	94.23	65(24hr)
	PM ₁₀	106.1	112	131.84	93.36	117.4	102.7	118.7	100.1	90.12	99.64	159.2	234.4	188.6	150(24hr)
	SPM	163.5	170.3	180.43	159.8	188.3	156.6	201.2	146.2	145	155.4	240.2	347.4	269.3	200(8hr-ECR, 1997)
	SO ₂	14.74	18.32	16.19	16.47	16.45	16.16	12.26	14.66	15.05	16.2	18.8	18.61	20.23	80(24hr)
	NO ₂	37.16	29.9	34.1	21.18	26.14	28.54	19.25	21.44	20.6	23.53	34.2	33.48	26.3	80(24hr)
	CO	0	0	0	0	0.1	1	2	0	0.2	0	2	3	0.8	5000 (8hr)
	O ₃	9	6	12	6	23	20	66	6	8	11	80	212	68	100(8hr)
28 th QM, April, 2021	PM _{2.5}	49.13	48.64	58.81	62.29	53.36	42.62	65.37	46.13	41.33	NO	71.2	67.82	64.73	65(24hr)
	PM ₁₀	103.9	83.1	97.61	103.4	86.44	73.29	129.7	82.83	84.16	NO	120.4	108.2	119.7	150(24hr)
	SPM	155.1	139.3	161.8	154.4	128.4	116.7	180.2	133.1	131.5	NO	193.6	170.4	173.9	200(8hr-ECR, 1997)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
	SO ₂	16.26	14.06	16.58	13.52	19.66	13.1	18.91	16.58	17.44	NO	20.64	23.72	19.16	80(24hr)
	NO ₂	22.31	21.65	27.42	19.37	24.21	17.18	30.2	0	23.5	NO	28.35	34.49	23.74	80(24hr)
	CO	0	0	0.2	0	0.1	0	0.9	3	0	NO	3	1	0.2	5000 (8hr)
	O ₃	16	9	14	2	28	2	91	46.13	8	NO	63	108	46	100(8hr)
29 th QM, Aug, 2021	PM _{2.5}	38.25	41.2	22.66	21.8	33.27	32.45	22.54	34.94	39.16	25.3	29.47	59.2	52.2	65(24hr)
	PM ₁₀	59.17	64.28	48.19	50.26	61.9	74.89	64.44	61.53	76.18	59.7	64.44	94.6	96.1	150(24hr)
	SPM	99.44	116.5	77.149	83.2	104.3	118.4	85.2	108.7	123.6	94.7	101.9	158	151	200(8hr-ECR, 1997)
	SO ₂	14.49	11.77	13.58	14.44	15.98	14.61	10.28	14.75	16.55	13.92	12.73	19.7	13.3	80(24hr)
	NO ₂	19.87	21.39	20.49	19.48	18.66	20.27	19.73	23.28	21.28	20.06	20.45	27.3	20.1	80(24hr)
	CO	1	1	1	0	0.8	1	2	1	2	0	4	1	2	5000 (8hr)
	O ₃	42	28	17	19	11	10	23	9	11	14	21	92	16	100(8hr)
30 th QM, Nov, 2021	PM _{2.5}	56.83	44.65	41.98	58.34	29.61	42.59	51.83	31.2	23.6	38.51	65.66	79.64	55.31	65(24hr)
	PM ₁₀	83.46	71.35	61.48	73.17	44.28	64.71	72.4	49.07	51.88	49.27	124.6	102.3	69.4	150(24hr)
	SPM	144.5	118.5	104.73	134.6	77.88	107.3	128.3	83.16	79.47	89.36	195.2	193.4	129.5	200(8hr-ECR, 1997)
	SO ₂	16.28	14.55	12.19	21.39	10.59	12.8	17.44	12.68	15.89	14.33	26.18	16.92	20.76	80(24hr)
	NO ₂	21.64	20.85	18.39	38.46	17.21	19.33	29.16	22.27	21.39	16.27	38.58	48.41	31.69	80(24hr)
	CO	0	1.1	1.4	0	1	1.1	2.4	1	1	0	4.9	1	1	5000 (8hr)
	O ₃	11	41	34	28	9	19	43	11	8	22	59	68	29	100(8hr)
31 st QM, Jan, 2022	PM _{2.5}	46.83	39.86	42.81	29.22	45.3	47.51	26.39	41.58	29.65	36.88	61.57	56.26	57.29	65(24hr)
	PM ₁₀	91.25	58.29	73.42	43.88	66.54	81.84	61.63	58.92	53.69	58.45	100.3	104.7	69.89	150(24hr)
	SPM	159.5	128.3	123.76	92.38	134.7	148.9	100.5	118.8	98.47	106.9	198.2	178.6	137.5	200(8hr-ECR, 1997)
	SO ₂	21.54	14.48	11.79	14.36	12.84	21.4	12.54	22	15.53	12.76	28.52	38.36	16.93	80(24hr)
	NO ₂	39.5	20.44	20.25	21.92	16.73	38.27	18.43	27.2	19.38	19.66	41.59	44.77	21.62	80(24hr)
	CO	1	1	1	0.1	1	2.8	2	1	1.4	0.3	1.4	3.3	1	5000 (8hr)
	O ₃	12	49	12	6	8	48	20	41	16	22	53	93	72	100(8hr)
32 nd QM, May, 2022	PM _{2.5}	41.78	36.71	54.16	31.43	48.94	42.57	28.19	43.27	58.43	39.62	67.33	69.23	31.28	65(24hr)
	PM ₁₀	74.32	68.79	63.26	46.29	86.48	71.22	51.66	51.04	77.69	48.81	92.36	94.28	59.15	150(24hr)
	SPM	139.4	158.1	132.77	98.15	165.6	129	92	110.3	141.4	96.23	178.3	181.9	98.74	200(8hr-ECR, 1997)
	SO ₂	15.22	13.96	10.47	18.42	14.82	19.71	20.33	13.76	21.81	15.38	19.29	27.45	19.3	80(24hr)
	NO ₂	22.49	20.47	23.96	40.28	26.42	29.44	31.63	39.23	38.3	39.72	37.91	39.56	33.62	80(24hr)
	CO	1	1	0.6	1	1	2	0.2	1	0.3	0.7	0.2	4	1	5000 (8hr)
	O ₃	18	8	8	10	13	39	13	24	41	38	36	59	31	100(8hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
33 rd QM, July, 2022	PM _{2.5}	34.84	41.2	39.36	27.55	38.48	42.85	43.8	49.15	30.22	NO	69.28	51.29	28.43	65(24hr)
	PM ₁₀	56.18	64.29	58.03	51.98	53.19	69.02	62.53	74.7	60.21	NO	100.3	69.28	53.42	150(24hr)
	SPM	106.3	118.6	108.2	93.44	103.7	127.4	120.3	141.5	103.5	NO	189.4	134.3	89.45	200(8hr-ECR, 1997)
	SO ₂	11.04	12.58	13.29	10.57	11.08	12.71	14.55	14.9	12.59	NO	23.66	14.56	11.39	80(24hr)
	NO ₂	23.18	18.4	20.63	16.4	21.94	23.16	22.3	20.82	19.69	NO	39.12	20.23	20.47	80(24hr)
	CO	0.3	1	0.4	0.8	0.2	0.4	0.1	0.4	0.9	NO	2.1	1.3	2	5000 (8hr)
	O ₃	12	16	11	14	29	37	29	31	24	NO	66	38	23	100(8hr)
34 th QM, Oct, 2022	PM _{2.5}	39.63	49.63	46.32	41.59	30.22	48.3	58.46	53.98	35.35	57.2	63.57	61.47	42.84	65(24hr)
	PM ₁₀	57.26	58.48	64.18	64.71	39.66	74.05	93.43	76.18	50.14	89.22	92.2	84.89	71.49	150(24hr)
	SPM	109.3	123.6	139.24	111.4	77.36	138.5	170.3	142.1	99.42	164.2	169.5	158.3	127.8	200(8hr-ECR, 1997)
	SO ₂	10.18	16.71	14.66	13.88	10.52	15.42	21.41	12.37	11.06	16.82	21.71	23.49	13.27	80(24hr)
	NO ₂	17.64	25.45	21.43	20.31	18.03	22.14	34	20.41	18.2	27.87	36.56	39.35	20.63	80(24hr)
	CO	0.6	0.4	0.2	0.1	0.1	0.6	1.9	0.3	1	0.5	1.6	1	1.1	5000 (8hr)
	O ₃	19	14	13	33	14	24	59	41	19	28	64	49	14	100(8hr)
35 th QM, Jan, 2022	PM _{2.5}	56.81	43.95	55.86	37.86	57.36	50.11	53.71	35.19	54.94	47.31	51.17	59.24	40.29	65(24hr)
	PM ₁₀	81.45	58.71	81.08	57.94	96.94	74.37	69.26	42.07	97.62	70.5	64.49	91.3	74.81	150(24hr)
	SPM	144.2	111.6	146.79	102.3	161.5	133.7	130.5	85.63	159.4	124.5	124.9	155.9	121.2	200(8hr-ECR, 1997)
	SO ₂	19.56	17.48	19.51	12.69	26.24	16.42	12.51	13.27	25.7	14.26	17.32	16.26	11.09	80(24hr)
	NO ₂	18.61	15.72	29.29	15.78	31.89	23.94	18.59	20.18	27.24	21.67	23.09	31.49	23.25	80(24hr)
	CO	0.8	0.8	0.7	0.7	0.9	0.5	0.2	0.3	0.8	0.1	0.3	0.8	0.8	5000 (8hr)
	O ₃	20	21	25	16	56	37	14	11	63	35	12	38	17	100(8hr)
36 th QM, May, 2023	PM _{2.5}	44.72	53.16	52.33	39.81	58.71	58.35	51.81	39.51	47.74	NO	53.57	57.73	42.34	65(24hr)
	PM ₁₀	66.62	80.42	70.84	59.5	79.6	92.53	72.55	58.55	71.27	NO	70.49	95.63	78.77	150(24hr)
	SPM	112.8	142.8	140.73	107.1	147.8	169.5	138	109.9	137.6	NO	134.7	160.3	126.6	200(8hr-ECR, 1997)
	SO ₂	18.62	16.51	18.19	13.91	18.22	24.74	14.74	15.36	17.2	NO	14.05	18.34	15.88	80(24hr)
	NO ₂	13.32	27.41	24.64	14.18	19.01	28.77	19.99	24.22	23.83	NO	21.89	32.53	22.67	80(24hr)
	CO	0.7	0.9	0.8	0.6	0.6	0.7	0.3	0.4	0.2	NO	0.4	0.7	0.5	5000 (8hr)
	O ₃	22	28	34	19	25	61	12	13	32	NO	15	36	18	100(8hr)
37 th QM, Aug, 2023	PM _{2.5}	53.38	44.65	46.66	52.33	59.21	45.44	49.15	13.93	2.63	2.28	86.08	25.7	28.36	65(24hr)
	PM ₁₀	67.47	54.76	58.91	65.17	73.88	54.87	74.7	15.28	3.07	2.61	99.54	28.3	33.23	150(24hr)
	SPM	52.28	43.17	45.76	50.75	57.88	43.77	47.16	13.43	2.59	2.26	81.37	24.23	27.24	200(8hr-ECR, 1997)
	SO ₂	3.04	7.21	6.6	8.82	19.42	12.22	14.9	7.7	1.08	1.27	22.14	7.57	4.64	80(24hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
	NO ₂	30.46	33	41.6	34.68	38.37	28.75	20.8	35.17	17.88	17.53	34.49	30.51	26.49	80(24hr)
	CO	0.438	0.282	0.234	0.22	0.442	0.37	0.4	0.614	0.204	0.138	0.57	0.162	0.213	5000 (8hr)
	O ₃	21.77	21.83	20.39	22.45	22.38	18.41	21.85	17.73	8.32	9.17	22.91	18.58	18.65	100(8hr)
38 th QM, Oct, 2023	PM _{2.5}	44.24	44.52	49.92	52.21	42.24	42.01	59.68	70.29	87.94	73.6	50.49	26.24	28.84	65(24hr)
	PM ₁₀	55.03	55.74	59.62	61.03	51.93	51.57	66.93	76.43	96.99	79.96	58.75	30.67	33.53	150(24hr)
	SPM	58.69	58.85	64.79	67.19	55.81	55.55	76.21	87.85	108.3	91.21	64.35	77.4	84.84	200(8hr-ECR, 1997)
	SO ₂	16.17	10.16	9.9	4.41	19.56	23.14	12.79	9.17	4.67	2.87	8.1	24.35	18.54	80(24hr)
	NO ₂	28.11	30.16	27.13	26.83	27.38	29.58	28.35	26.33	21.64	15.8	30.13	25.52	25.56	80(24hr)
	CO	0.21	0.5	0.17	0.37	0.36	0.519	0.35	0.39	0.47	0.16	0.17	0.175	0.522	5000 (8hr)
	O ₃	22.53	25.87	24.96	25.83	25.23	24.85	24.88	20.56	26.81	12.23	23.4	16.95	18.85	100(8hr)
39 th QM, Feb 2024	PM _{2.5}	203.6	87.2	90.71	62.03	97.4	102.5	63.62	91.28	70.5	65.11	69.09	184.5	121	65(24hr)
	PM ₁₀	233.7	109.3	106.2	73.22	112.2	115.9	77.71	104.7	85.8	75.76	82.9	246.2	135	150(24hr)
	SPM	362.3	196	174	113.2	185	178.3	123.5	156.2	134.2	122.6	129.7	358	209.2	200(8hr-ECR, 1997)
	SO ₂	36.39	9.97	10.78	5.2	19.81	10.17	9.57	6.61	0.85	2.9	8.67	52.47	32.43	80(24hr)
	NO ₂	17.38	21.77	34.75	22.49	27.23	28.04	18.96	17.63	18.9	18.49	19.27	19.59	16.61	80(24hr)
	CO	1.1	0.38	0.44	0.32	0.81	0.48	0.3	0.25	0.28	0.11	0.34	1.15	0.22	5000 (8hr)
	O ₃	19.91	25.75	27.05	22.8	22.62	28.12	22.14	19.27	19.4	10.23	24.06	18.28	20.74	100(8hr)
40 th QM, May, 2024	PM _{2.5}	29.95	16.27	24.2	21.84	27.12	32.59	38.82	40.28	45.66	45.66	35.53	23.74	51.28	65(24hr)
	PM ₁₀	31.73	17.25	25.71	23.75	29.1	36.28	44.75	52.71	55.85	38.3	39.56	21.63	42.88	150(24hr)
	SPM	49.18	27.6	37.28	39.18	43.65	58.04	71.6	76.43	83.77	50.65	62.1	33.23	73.84	200(8hr-ECR, 1997)
	SO ₂	1.97	1.11	6.94	5.02	5.24	5.93	11.06	9.61	10.2	73.2	2.45	0.501	0.036	80(24hr)
	NO ₂	16.28	17.03	18.57	19.67	17.16	17.13	16.38	18.73	16.52	8.5	16.78	7	6.79	80(24hr)
	CO	0.11	0.188	0.18	0.215	0.253	0.219	0.254	0.54	0.4	17.2	0.432	18.19	17.53	5000 (8hr)
	O ₃	22.95	24.63	26.9	23.05	24.55	20.58	19.81	20.27	21	0.435	20.76	20.18	24.66	100(8hr)
41 st QM, July, 2024	PM _{2.5}	4.87	5.4	14.82	6.4	12.06	8.13	6	12.11	16.85	NO	14.48	5.79	2.86	65(24hr)
	PM ₁₀	8.13	9.82	21.18	8.53	15.07	13.69	10	26.92	28.09	NO	29.53	7.18	4.4	150(24hr)
	SPM	13	15.22	36.01	14.92	27.13	21.22	16	39.03	44.94	NO	44.29	11.22	7.26	200(8hr-ECR, 1997)
	SO ₂	6.08	13.76	3.5	9.01	16.15	13.79	7.39	8.43	3.16	NO	5.23	15.81	8.18	80(24hr)
	NO ₂	13.12	13.12	6.78	13.06	11.47	12.71	12.98	13.73	6.87	NO	10.92	9.81	14.24	80(24hr)
	CO	0.44	0.21	0.22	0.23	0.22	0.22	0.16	0.9	0.16	NO	0.21	0.49	0.22	5000 (8hr)
	O ₃	18.53	19.05	8.75	19.3	15.24	18.06	16.56	16.5	8.97	NO	13.01	22.4	20.27	100(8hr)
	PM _{2.5}	12.77	15.45	69.76	30.33	22.62	27.32	43.93	35.97	56.73	63.16	89.65	41.88	22.74	65(24hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
42 nd QM, Oct, 2024	PM ₁₀	15.5	19.32	86.82	41.88	30.42	37.88	54.94	48.14	70.43	77.79	112.8	55.95	30.77	150(24hr)
	SPM	28.27	34.78	156.58	72.21	53.04	65.2	98.87	84.11	127.2	141	202.5	97.82	53.07	200(8hr-ECR, 1997)
	SO ₂	9.88	9.95	52.84	14.65	156	27.57	11.73	8.82	11.65	10.82	40.75	17.04	5.52	80(24hr)
	NO ₂	1.29	0.9	2.78	2.41	4.37	2.69	2.01	1.96	2.12	1.73	3.82	3.44	0.86	80(24hr)
	CO	1.09	1.14	1.26	1.25	1.2	1.56	1.18	1.07	1.16	1.13	1.63	1.1	1.04	5000 (8hr)
	O ₃	18.05	22.81	30.73	24.35	25.62	18.03	21.35	11.22	13.18	19.81	30.85	19.25	20.21	100(8hr)
43 rd QM, Jan, 2025	PM _{2.5}	46.73	46.7	41.3	47.95	44.94	89.19	68.39	37.91	63.69	47.3	68.56	119	35.94	65(24hr)
	PM ₁₀	52.96	52.61	50.8	55.38	50.88	97.12	74.45	47.74	7.56	55.41	75.25	132.4	45.11	150(24hr)
	SPM	99.69	99.31	92.1	103.3	95.81	186.3	142.8	85.66	134.2	102.7	143.8	251.4	81.06	200(8hr-ECR, 1997)
	SO ₂	8.34	8.31	9.59	14.8	10.26	9.91	27.13	12.42	9.87	15.42	14.58	21.3	10.73	80(24hr)
	NO ₂	1.44	1.43	1.33	1.8	1.07	0.85	2.66	2.42	1.99	1.98	1.99	3.81	1.5	80(24hr)
	CO	1.08	1.1	1.14	1.27	1.02	1.16	1.47	1	1.23	1.11	1.19	1.47	1.15	5000 (8hr)
	O ₃	28.34	26.88	33.95	18.86	20.02	19.48	17.17	14.33	14.42	6.5	18.35	19.2	28.31	100(8hr)
44 th QM, May 2025	PM _{2.5}	18.42	15.45	10.51	14.01	15.64	13.21	16.79	6.04	5.44	5.71	17.74	24.24	25.05	65(24hr)
	PM ₁₀	25.89	20.72	12.81	17.78	20.92	16.77	22.45	7.97	7.47	7.72	25.33	34.35	17.89	150(24hr)
	SPM	44.32	36.16	23.32	31.79	36.56	29.98	39.24	14.01	12.91	13.42	43.07	58.59	42.94	200(8hr-ECR, 1997)
	SO ₂	6.02	6.4	5.05	5.18	6.29	5.53	8.58	6.52	5.72	6.09	7.79	11.2	4.35	80(24hr)
	NO ₂	1.99	1.39	1.71	1.7	1.01	1.72	2.96	2.68	1.6	1.98	0.87	2.01	1.6	80(24hr)
	CO	0.18	0.2	0.13	0.16	0.205	0.15	0.25	0.22	0.2	0.22	0.2	0.226	0.12	5000 (8hr)
	O ₃	8.39	8.64	8.29	6.99	6.91	5.98	3.65	5.15	5.95	6.49	3.42	4.98	3.8	100(8hr)
45 th QM, July 2025	PM _{2.5}	15.48	12.32	13.73	18.2	11.34	21.52	20.61	1.44	1.72	0.93	21.69	5.2	10.12	65(24hr)
	PM ₁₀	21.2	16.32	17.92	24.49	14.76	35.08	29.06	2.04	3.39	1.22	31.55	6.77	13.12	150(24hr)
	SPM	36.67	28.64	31.65	42.69	26.1	56.6	49.67	3.48	5.11	2.15	53.24	11.97	23.23	200(8hr-ECR, 1997)
	SO ₂	2.36	0.68	2.02	3.77	1.91	2.63	3.26	1.91	6.72	7.01	2.19	3.65	2.54	80(24hr)
	NO ₂	5.21	4.31	4.79	4.83	4.01	4.63	5.46	4.37	2.47	3.7	5.98	7.24	5.21	80(24hr)
	CO	0.15	0.21	0.13	0.24	0.15	0.21	0.22	0.11	0.58	0.65	0.27	0.11	0.12	5000 (8hr)
	O ₃	8.03	8.35	5.47	7.43	5.75	7.8	6.11	2.5	2.42	2.93	6.9	4.16	5.02	100(8hr)
46 th QM	PM _{2.5}	7.14	4.05	12.05	17.45	10.07	19.76	12.69	2.02	2.24	2.1	22.98	5.15	4.05	65(24hr)
	PM ₁₀	9.15	6.51	15.56	24.47	13.2	27.64	16.12	2.78	3.04	2.87	33.63	6.94	5.23	150(24hr)
	SPM	16.29	10.56	27.61	41.91	23.28	47.41	28.81	4.8	5.28	4.97	56.61	12.09	9.28	200(8hr-ECR, 1997)
	SO ₂	8.51	9.46	4.07	3.14	2.07	2.35	8.48	2.51	3.13	2.53	2.66	10.23	8.28	80(24hr)
	NO ₂	9.39	7.34	4.68	5.94	2.83	4.73	7.23	5.12	4.99	5.15	6.26	11.47	7.93	80(24hr)

Quarters	Parameters	Monitoring locations													Standard (Air pollution control Rules, 2022)
		ML-1	ML-2	ML-3	ML-4	ML-5	ML-6	ML-7	ML-8	ML-9	ML-10	ML-11	ML-12	ML-13	
	CO	0.18	0.17	0.15	0.24	0.11	0.18	0.2	0.12	0.21	0.12	0.29	0.16	0.17	5000 (8hr)
	O ₃	16.35	13.38	5.05	7.33	2.51	7.53	11.52	3.69	3.62	3.77	6.63	12	13.97	100(8hr)

Note(s): Concentrations are in µg/m³; CEGIS field survey from April 2014 to October 2025.

- DoE- Department of Environment, NF- Not found; NO-Not observed; x-not measured at pre-construction stage.
- Fine Particulate Matter (PM_{2.5}), Respirable Dust Content (PM₁₀), Suspended Particulate Matter (SPM), Oxides of Nitrogen (NO_x). Sulfur dioxide (SO₂), Carbone Monoxide (CO) & Ozone (O₃);
- Standards for 1hr, 24hr or Annual are indicated using superscript;
- This monitoring was carried out by - Respirable Dust Sampler (Model-Envirotech India APM-460BL) and Fine Particulate Sampler (Model-Envirotech India APM-550). All data presented here are 8 hrs. Monitoring data.

Table A.2: Baseline conditions of emission of different infrastructures and sources

Sampling Locations	Criteria Pollutant	Cement Industry	Condensate Fractionating Plant	LPG Bottling Plant	Brick Field	Road Traffic	Small vessels, engine boat	Inland Water Cargo vessel	Sea going Mother Vessel (MV)	Fly ash Carrier	Clinkers Carrier	Clinker, Fly Ash Handling	Coal Carrier (MV)	Coal Ash Carrier (MV)	Coal Carrier (Lighter Vessel)	Coal Ash Carrier (Lighter Vessel)	Coal Loading and Unloading	Coal Handling (Stock Yard, Conveyor belt, etc)	BIF Power Plant (PP)	Other Coal Based PP	Other Fuel Based PP	Dredging and Land Filling	Earth excavation	Other Construction Activities	Residential sources
SW Corner of the PP area	PM	√	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	√	X	√	√
	SOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
Township area of the PP	PM	√	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	√	X	X	√
	SOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
NW Corner of the PP area	PM	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	√	X	X	√
	SOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
Barni, Gaurambha	PM	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√	√
	SOx	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
Chunkuri-2, Dacope	PM	√	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	SOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
Pankhali, Dacope	PM	√	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√	√
	SOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
Mongla Port area	PM	√	√	√	X	√	√	√	√	√	√	√	X	X	X	X	X	X	X	X	√	X	X	X	√
	SOx	X	√	X	X	√	√	√	√	√	√	X	X	X	X	X	X	X	X	X	√	X	X	√	√
	NOx	X	√	X	X	√	√	√	√	√	√	X	X	X	X	X	X	X	X	X	√	X	X	X	√
	GHGs	X	√	X	X	√	√	√	√	√	√	X	X	X	X	X	X	X	X	X	√	X	X	X	√
	PM	X	X	X	X	X	√	√	√	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X

Sampling Locations	Criteria Pollutant	Cement Industry	Condensate Fractionating Plant	LPG Bottling Plant	Brick Field	Road Traffic	Small vessels, engine boat	Inland Water Cargo vessel	Sea going Mother Vessel (MV)	Fly ash Carrier	Clinkers Carrier	Clinker, Fly Ash Handling	Coal Carrier (MV)	Coal Ash Carrier (MV)	Coal Carrier (Lighter Vessel)	Coal Ash Carrier (Lighter Vessel)	Coal Loading and Unloading	Coal Handling (Stock Yard, Conveyor belt, etc)	BIF Power Plant (PP)	Other Coal Based PP	Other Fuel Based PP	Dredging and Land Filling	Earth excavation	Other Construction Activities	Residential sources
Harbaria, Sundarbans	SOx	X	X	X	X	X	√	√	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	NOx	X	X	X	X	X	√	√	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	X	√	√	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	√
Akram Point Sundarbans	PM	X	X	X	X	X	√	√	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X
	SOx	X	X	X	X	X	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	X	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	X	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
Hiron Point Sundarbans	PM	X	X	X	X	X	√	√	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	√
	SOx	X	X	X	X	X	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	X	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	X	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Khulna City, near Khan Jahan Ali Bridge	PM	√	X	X	√	√	√	√	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	√	√
	SOx	X	X	X	√	√	√	√	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	√	√	√	√	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	√	√	√	√	X	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	√
Township area	PM	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√	√	√	√
	SOx	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	NOx	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√
	GHGs	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√	√	√	√
Access road bridge area	PM	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	√	√	√	√
	SOx	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	√	X	X	X	X	X	√
	NOx	X	X	X	X	√	X	X	X	X	X	X	X	X	X	X	X	X	√	X	X	X	X	X	√
	GHGs	√	√	X	√	√	X	X	X	X	X	√	X	X	X	X	X	X	√	X	X	√	√	√	√

Legend: X-Absence of source or no emission; √-Presence of source, emission of pollutant.

(B) Water Quality Data
Surface Water Quality Monitoring Data
Table B.1: pH Values of Passur River Water

Monitoring period	Sampling Locations ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	7.2	7.2	7.2	7.9	7.1	7.1	7.4	7.4	7.3	7.4	7.4	7.3	7.9	7.2	7.2
2 nd QM	7	7	6.9	7.1	6.9	6.9	7	6.9	6.8	6.9	6.8	6.8	6.9	6.9	7
3 rd QM	8.1	8.2	8	8.1	8.1	8.2	8.1	8	8	8.1	8.1	7.4	8	7.9	7
4 th QM	7.9	8	8.1	7.9	7.9	7.9	7.6	7.5	7.8	7.7	7.3	8.2	8.1	8.1	8.1
5 th QM	7.6	7.7	7.8	7.5	7.6	7.7	7.5	7.2	7.3	7.5	7.6	7.5	7.7	7.7	7.7
6 th QM	7.8	7.9	7.8	7.9	8	8	8.1	8	8.1	8.1	6.9	7.9	7.9	NS	NS
7 th QM	7.6	7.58	7.64	7.6	7.58	7.62	7.78	7.6	7.64	7.3	7.56	7.1	7.8	7.63	7.39
8 th QM	7.1	7.3	7.3	7.1	7.5	7.6	8.1	8	7.9	7.3	7.1	7.4	8.2	8	NS
9 th QM	7.5	7.8	7.2	7.4	7.8	7.4	7.6	7.1	7.2	7.1	7.4	7.3	7.3	7.9	7.8
10 th QM	7.27	7.3	7.93	7.56	7.6	7.9	7.94	8.04	8.2	8.1	7.8	7.3	7.63	7.67	NS
11 th QM	6.9	7	7.2	7.3	7	6.9	7.2	7.5	7.3	6.8	7.1	6.9	7.4	7.1	7.6
12 th QM	7.6	7.5	7.8	8.2	8.5	8.7	8.1	8.6	8.9	8.1	7.6	7.2	7.8	8.2	8.5
13 th QM	7.2	7.3	7.3	7.2	7.8	7.4	6.9	6.8	7.1	7.2	7.4	6.9	6.9	7.2	NS
14 th QM	7.1	6.9	6.9	6.9	7.2	7.2	7.2	7.1	7	7.1	7	6.8	7.1	7.1	6.8
15 th QM	8.28	8.25	8.17	8.2	8.21	8.2	8.39	8.15	8.16	8.4	7.92	7.48	8.19	8.22	8.2
16 th QM	8.1	8.1	8.1	8.1	8.1	8.1	8	8.1	8.1	8.1	7.6	7.3	8.1	8.2	NS
17 th QM	8.4	8.4	8.4	8.3	8.3	8.2	8.4	8.5	8.5	8.6	7.3	8.3	8.4	8.2	NS
18 th QM	7.9	6.04	8.09	7.65	8.2	7.87	8.11	7.44	7.07	7.94	7.63	7.02	7.19	8	7.18
19 th QM	8.18	8.03	8.06	7.78	7.97	8.04	7.89	7.85	8.06	8.05	7.8	8.65	7.71	7.77	7.79
20 th QM	9	9.9	8.7	8.9	8.4	8.5	9.3	8.7	8.4	9.3	8.2	8.1	8.2	7.9	NS
21 st QM	6.8	6.8	7.1	7.5	7.2	6.7	7.4	6.5	7.3	7.2	7	7	7.2	7.1	NS
22 nd QM	7.9	7.8	7.8	7.5	7.4	7.4	7.3	7.2	7.2	7.4	7.3	8	8	7.8	7.8
23 rd QM	8.4	8.3	8.8	8.3	8.3	8	8.6	8.2	8.3	8	7.9	8.3	8.4	8.2	8.2
25 th QM	6.9	7	7.1	7	7.2	7.2	7.4	7.6	7.8	7.1	6.9	7.1	7.4	7.7	NS
26 th QM	6.9	6.66	6.59	6.6	6.77	6.88	7.13	6.82	6.8	6.85	6.83	7.06	6.1	6.6	6.7
27 th QM	8.5	7.8	8	7.7	7.7	7.8	7.8	8	7.8	7.4	7.5	7.8	8.2	7.7	7.6
28 th QM	8.3	8.1	8	8.6	8	8.9	8.2	8.4	8.3	8	8.3	8.6	7.8	8.2	NS
29 th QM	5.5	6.5	8.5	7.4	8.4	5.8	6.7	8.6	8.5	5.9	6.9	7.3	6.6	6	8
30 th QM	7.8	7.5	6.5	6.8	7.6	7.6	8.2	8.2	7.9	7.8	8.5	8.1	7.3	6.9	6.7
31 st QM	8	7.6	7.7	8.1	7.7	7.8	7.9	7.8	7.7	8	7.7	7.9	7.7	7.6	7.5
32 nd QM	7.77	7.8	7.7	7.63	7.72	7.81	7.63	7.64	7.8	7.61	7.5	7.9	7.7	7.69	NS
33 rd QM	8.02	8	7.94	7.58	7.95	7.98	7.99	7.99	8.03	8.5	7.74	8.1	8.07	7.83	NS
34 th QM	7.67	7.59	7.6	7.55	7.44	7.42	7.58	7.5	7.4	7.79	7.66	8.4	8.2	7.71	7.28

Monitoring period	Sampling Locations ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
35 th QM	8.3	8.25	8.2	8.24	8.23	8.18	8.2	8.27	8.2	8.3	8.35	8.01	8.13	7.2	8.1
36 th QM	7.86	8.02	8.07	8.1	8.05	7.95	8.08	8.04	8.1	7.84	8.2	7.51	7.8	7.79	NS
37 th QM	7.21	7.84	7.68	7.98	7.81	7.3	7.84	8.1	8.3	7.9	7.8	7.4	7.4	7.8	7.9
38 th QM	7.78	7.83	7.81	7.62	7.63	7.61	7.67	7.69	7.62	7.5	8.02	8.27	7.9	7.6	7.86
39 th QM	7.9	7.8	7.6	7.9	7.6	7.7	7.8	7.8	7.9	7.6	7.4	7.6	8.2	8.1	7.9
40 th QM	7.8	7.81	7.7	7.6	7.79	7.7	7.8	7.81	7.8	7.75	7.8	7.5	7.7	7.4	7.5
41 st QM	7.89	8.08	8.1	8	7.9	8	8.19	7.9	7.8	8.1	8.1	7.79	8.66	8.1	NS
42 nd QM	8.7	8.07	8.23	8.03	8.06	8.03	8.07	8.01	8.04	8.01	8.1	9.29	8.6	8.43	8.4
43 rd QM	8.2	8.5	8.4	8.1	8.2	8.1	8.1	8.1	8.5	8.6	8.3	8.68	8.76	8.9	8.6
44 th QM	7	7.4	7.5	7.7	7.7	7.7	7.8	7.7	7.7	7.7	7.4	7.6	7.8	7.7	8.1
45 th QM	7.8	7.9	7.9	7.8	8.2	8.15	8.02	8.02	8	8	7.5	7.93	7.99	8.07	7.34
46 th QM	7.26	7.2	7.18	6.83	6.7	6.88	7.2	6.96	6.91	6.92	7.6	7.37	7.42	7.09	7.1
Standard (ECR'2023)	6.5 - 9.0 (Coastal Industrial and others)												6.5- 8.5 (Coastal Reserved Natural area)		

Source: Field Survey; from April 2014 up to October 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL=Sampling location.

Table B.2: Surface Water Temperature (°C) in Passur River

Monitoring period	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	31	31	31	31	30	30	31	31	31	30	30	29	30	29	29
2 nd QM	33	33	33	33	32	32	32	31	31	31	32	30	30	29	30
3 rd QM	31	31	30	31	31	31	30	29	29	28	27	32	27	30	29
4 th QM	19	20	20	19	19	19	20	19	19	19	20	19	22	21	21
5 th QM	30	30	30	31	30	30	31	30	31	30	30	30	30	30	30
6 th QM	31.8	30.5	30.5	30.8	30.6	30.4	30.5	30.8	30.6	30.8	31.6	29.8	29	NS	NS
7 th QM	31.2	31.8	30.9	31.3	31.6	31.1	30.3	30.5	30.8	31.8	31.2	30.7	30.8	30.2	30.4
8 th QM	22	21	21	22	22	21	23	22	21	22	23	21	22	21	NS
9 th QM	31.2	31.1	30.8	31.4	30.9	31	30.7	30.4	30.1	31.2	30.6	31.3	31.5	30.8	31.4
10 th QM	29.6	29.1	29.4	30.1	30.5	30.5	30.7	29.8	29.8	30.4	30.7	30.7	30.9	30.4	NS
11 th QM	30.1	30.8	30.4	30.1	31	31.1	30.4	30.2	31.1	31.1	31.2	30.38	29.9	30.4	31.3
12 th QM	22.8	22.5	22.1	22.8	21.8	21.9	22.1	22	22.1	21.9	21.8	22.1	23.1	22.5	21.4
13 th QM	30	30	29.8	31.3	30	30	29.9	29.8	30.1	30.3	30.1	30.2	30.2	30.8	NS
14 th QM	29.8	30.1	30.2	30.1	29.8	29.9	30	30.1	30.1	29.9	30	30	29.8	29.9	29.4
15 th QM	19.7	19.8	20.2	20.3	20.3	20.3	20.6	20.2	20.3	19.1	21.1	20.8	21	21.2	21.2
16 th QM	30	30	31	28	29	28	28	28	28	28	31	30	30	32	NS

Monitoring period	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
17 th QM	30	30	30	30	30	31	31	31	31	31	31	29	29	30	NS
18 th QM	28	26.9	27.5	28.4	28	28.1	27.9	28	28	27.62	30.2	26.82	27.62	27.21	28.66
19 th QM	22	22	21.8	22.6	22.6	22.4	22.2	22.3	22.5	22.06	21	21.89	21.81	22.42	23.78
20 th QM	31	31	31	31	31	31	33	31	32	33	32	31	31	31	NS
21 st QM	30	30	30	30	31	30	30	30	30	30	30	30	31	31	NS
22 nd QM	27	27	27	28	28	28	27	27	27	27	27	28	30	29	31
23 rd QM	25	25	24	24	24	24	25	25	25	25	23	22	24	24	23
25 th QM	30	30	31	30	30	30	30	30	30	30	30	30	31	31	NS
26 th QM	27.7	27.7	27.7	27.8	27.8	27.7	28.4	27.9	27.8	28.67	28	28.07	28.35	29.48	29.02
27 th QM	20	20	20	20	20	20	21	20	21	22	21	21	21	22	22
28 th QM	31	30	30	30	30	30	30	30	30	31	31	29	30	30	NS
29 th QM	30.3	30.5	30.5	30.6	30.4	30.5	30.4	30.5	30.5	30.39	30.5	30.15	29.6	29.75	30.66
30 th QM	26	26	26	28	27	30	27	27	27	27	29	27	27	28	28
31 st QM	22	22	22	21	22	22	23	22	22	23	22	22	24	21	22
32 nd QM	30	30.2	30.2	30.1	30.3	30.2	30.1	30.2	30.2	30.45	29.2	31.63	30.13	31.36	NS
33 rd QM	31.2	30.9	30.8	30.9	31	31.1	31.2	31	31.1	31.77	32.5	31.05	31.76	32.34	NS
34 th QM	27.8	28	27.9	28.2	28.1	28.1	28.4	28.1	28.3	29.27	29.2	26.3	27.59	28.25	28.59
35 th QM	25.29	24.3	23.6	24.2	23.86	24.4	24.8	23.95	24.57	26.54	28.1	21.91	25.38	22.28	23.6
36 th QM	31.86	31.9	31.28	31.59	31.95	33.02	32.8	32.18	31.94	34.53	32.98	29.86	31.25	31.35	NS
37 th QM	31.7	31.1	30.8	30.9	30.4	30.9	30.7	31	30.8	30.8	31.4	31.4	30.5	31.1	30.3
38 th QM	28.0	28.3	28.5	28.0	28.5	28.0	28.4	28.5	28.6	28.2	29.3	30.6	31.1	29.5	29.4
39 th QM	22	23	23	21	22	21	23	21	22	22	23	20	21	20	21
40 th QM	34.2	33.41	33.2	33.5	33.65	33.7	33.9	34.1	33.06	34.89	30.58	31.39	30.37	32.07	31.72
41 st QM	30	30	30	29.7	30	30.1	30.3	29.8	30	30.1	28.4	28.9	29.7	30	NS
42 nd QM	30.6	29.97	29.55	30	30.06	29.72	29.2	29.87	29.5	29.31	28.41	30.55	31.1	29.25	30.34
43 rd QM	23.9	23.4	23.8	24.1	23.6	23.2	23.9	23.6	23.8	24.5	25.1	23.25	23.6	22.52	24.5
44 th QM	29.4	29.6	29.3	29.7	30.1	29.7	28.8	29.7	29.4	29.3	32.6	30.8	30.8	30.3	30.2
45 th QM	30.4	30.6	30.9	30.4	30.3	30.4	30.4	30.4	30.5	30.4	30	28.9	28.9	30.3	31.3
46 th QM	25.8	26	26	26.3	26.4	26.4	26.6	26.7	26.4	27.4	26.4	29.8	28.8	28.5	29.1
Standard (ECR*2023)	N/A														

Source: Field Survey; from April 2014 up to October 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL=Sampling location.

Table B.3: Salinity (ppt.) in Passur River

Monitoring Periods	Sampling location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	11.5	11.5	11.5	12	12	12	9.5	9	10	10	9	10	12	19	23
2 nd QM	2.5	0.3	0.2	2.2	0.3	0.5	4	0	2.5	0.5	4.5	9.5	10	15	19.5
3 rd QM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
4 th QM	4.5	4.1	4.5	4.7	5.1	5	5.2	5.2	5.1	5.2	4.5	5	6	16	23
5 th QM	13	15	16	9	13	14	14	13	12	10	9	14	15	20	25
6 th QM	0	0	0	0	0	0	0	0	0	0	0	0	0	NS	NS
7 th QM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6.2
8 th QM	4.1	4.3	4.3	4.4	5.1	5	5.2	4.9	5.5	3.8	2.5	4.8	5.3	11.3	NS
9 th QM	8	7.4	7	6	6.2	9	8	7	6.8	7.1	6.3	6	8.9	9.4	14
10 th QM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	NS
11 th QM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.8
12 th QM	3.7	3.8	3.6	4	3.9	4.2	4.2	4.1	4.1	3.9	3.8	6.7	8.9	16.3	21.4
13 th QM	6.3	5.9	6.2	6.8	6.9	6.1	6.5	7.1	7	7	6.9	10.4	10.4	16	NS
14 th QM	0	0	0	0	0	0	0	0	0	0	0	1.2	2.3	3.6	5.1
15 th QM	2	2	2	2.6	2.6	2.7	2.8	2.8	2.8	2.6	2.52	10.8	2.8	13.1	16.45
16 th QM	11.5	11.5	11.5	12	12	12	9.5	9	10	10	9	10	12	19	23
17 th QM	0.2	0.2	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.6	2.2	2.8	NS
18 th QM	0.9	0.1	0.8	0.9	0.8	0.8	1	0.2	0.3	0.9	0.02	1	1.8	9.1	13.9
19 th QM	11.1	11.1	10.6	10.8	10.8	11	9.9	11.5	11.1	11.3	9.9	7.9	11.9	16.7	22.7
20 th QM	16.6	16.2	16.5	16.6	16.9	16.9	12	16.7	16.9	16.5	8	14.9	15.6	22.9	NS
21 st QM	0.5	0.2	0.3	0.2	0.2	1.2	0.3	0.2	0.3	0.3	1	0.4	0.3	0.9	NS
22 nd QM	0.4	0.3	0.3	0.5	0.3	0.3	2.1	0.1	0.4	0.3	0.3	0.5	0.7	6.6	9.2
23 rd QM	3.8	3.9	4	3.8	3.9	3.9	3.7	0.1	3.5	4	4	3.6	3.7	8.9	11
25 th QM	0.2	0.3	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.5	0.4	1.5	4	NS
26 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	2	0.2	0.2	1.6	2.6
27 th QM	2.4	2.7	2.7	2.5	2.7	2.4	2.6	2.5	2.7	2.5	2.5	1.8	2.6	7.1	8.2
28 th QM	7.1	7.5	7.2	7.2	7.3	7.3	7	7.3	7.4	7	6.5	6.9	7	10.9	NS
29 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.1	1	0.9
30 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.2	2.2	2.6
31 st QM	0.8	0.7	0.7	0.7	0.8	0.8	1	0.9	0.9	0.9	0.2	0.9	2.1	6.4	8
32 nd QM	2.6	2.5	2.3	2.6	2.3	2.1	2.6	2.7	2.4	2.7	2.5	4	6.3	8.3	NS
33 rd QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.6	0.3	0.6	3.2	NS
34 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.7	2.9
35 th QM	3.2	3.7	3.7	3.5	3.9	4	3.8	4.2	4	3.5	3.3	2.9	3	8.4	9.5
36 th QM	8.8	9.1	9.2	8.9	9	9	8.9	9	9.1	8.8	9.2	8.8	8.6	10.8	NS
37 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.19	0.11	1.14	0.3	0.9	1.5	2.8

Monitoring Periods	Sampling location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
38 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.2	2.5	3.5
39 th QM	3.8	4.1	3.9	4	3.9	4	4.1	4	3.9	4.1	4.1	6.8	8.9	9.1	10.8
40 th QM	8.5	8.1	8.6	8.5	8.5	8.5	8.7	8.8	8.7	8.5	8.8	8.7	7.5	10.6	11.7
41 st QM	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.9	0.3	0.9	NS
42 nd QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	2	3.4
43 rd QM	6.1	8.2	5.5	6.1	8	6.9	5.9	8	8.1	8.2	8.1	6.62	6.36	5.48	6.93
44 th QM	7.7	7.8	8	8.5	8.6	8.3	8.3	8.6	8.4	8.5	6.7	7.8	8.3	11.1	12.2
45 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2	0.1	0.2	1.4	2.5
46 th QM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.3	2.5	5.4
Standard (ECR*2023)	N/A														

Source: Field Survey; from April 2014 up to October 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL=Sampling location

Table B.4: Dissolve Oxygen (DO) in Passur River

Monitoring Period	Sampling Locations ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	5.9	4.9	5.2	5.7	5.9	5.8	6.6	6.5	6.5	6	6.7	5.3	5.4	7.9	7.5
2 nd QM	6.1	6.8	6.7	6.8	6.9	6.6	7.3	7.1	7.2	6.5	6.8	6.2	5.9	6.4	6.5
3 rd QM	5.6	7.7	7.7	7.6	7.2	8	5.6	5.6	5.8	8	8	7	7	7.7	7.8
4 th QM	5.5	6.6	6.7	5.8	5.9	6.8	6.1	6.9	6.6	6	6.2	6.5	6.6	6.7	6.5
5 th QM	6.2	6.4	6.2	6.2	6.6	6.4	6.3	6.5	6.4	6.2	6.5	6.3	5.8	6	5.8
6 th QM	5.3	5	5	6.7	6.6	6	7.5	7.4	7.3	6	6.4	7	7.5	NS	NS
7 th QM	6.8	6.4	7.1	6.8	7.2	7.6	6.4	6.1	6.3	7.1	7.1	6.6	7.1	7.3	7
8 th QM	5.1	5.1	6.2	5.9	5.3	5.4	6	6.1	5.8	4.1	5.2	5.4	5.2	6.2	NS
9 th QM	7.1	6.4	6.9	5.8	6.1	6.6	6.9	7.1	6.8	6.4	5.9	5.8	6.4	6.1	7.1
10 th QM	6.2	5.7	5.6	6.1	6.3	5.8	6.3	6.4	5.6	5.2	5.4	5.4	5.4	6.2	6.8
11 th QM	6	6.1	6	6.3	5.9	6.1	5.9	6	6	6.1	6.4	5.6	5.8	6.7	6.9
12 th QM	6.1	5.9	6.1	6.2	5.9	5.9	6.3	6.4	6.4	6.7	6.7	5.9	6.1	6.5	6.8
13 th QM	7.1	7.2	6.8	6.9	7.4	7.5	6.4	7.2	6.8	6.8	7.1	6.4	6.4	7.2	NS
14 th QM	6.3	6.4	6.5	6.3	6.3	6.5	6.5	7.1	6.5	6.3	6.2	6.4	6.2	6.8	7.3
15 th QM	5.19	5.03	5.06	5.1	5.03	4.9	5	4.98	5.11	5.17	5.11	5.23	5.03	5.4	5.4
16 th QM	6.575	6.225	6.275	6.15	6.5	6.575	6.55	6.825	6.625	6.35	6.7	5.95	5.8	6	NS
17 th QM	6	6.2	6.1	5.5	6	6.5	6.8	6.2	6	6.7	6.3	5.8	6.9	6.8	NS
18 th QM	6.4	6.2	6.3	6	6.2	6	6.1	6.3	6.2	5.8	6	6	8.21	6.9	7.2
19 th QM	8.7	7.9	7.3	8.7	7.3	7.4	7.8	7.1	6.9	7.5	6	6.9	7.5	7.7	8
20 th QM	5.9	6.5	6.3	6.1	6.5	6	6.1	6.5	6.1	6.3	6.2	6.5	6.9	7	NS
21 st QM	6	6	6.1	6.5	6.3	6.4	6.2	6.2	6.3	6.4	6	6.2	6	6.6	NS
22 nd QM	7.7	7.8	7.8	8.6	8	8.2	9.9	10	10.5	7.1	7.7	7.9	8.4	7.7	8.6

Monitoring Period	Sampling Locations ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
23 rd QM	8.4	8.6	7.6	8.1	8.2	7	6.9	7.2	7.8	9.7	7.5	8.6	6.9	9.7	6.7
25 th QM	6.1	6.1	6	6	6.4	6.2	6.6	6.5	6.3	6.4	6.1	6	6.1	6.5	NS
26 th QM	6.4	7.64	6.3	8.2	8.89	7.8	9.7	9.76	9.76	9.7		8.14	7.65	6.61	8.2
27 th QM	9.2	9.6	7.8	9	8.9	9.3	9.6	7	6.4	8.1	8	9.2	7.6	7.2	9
28 th QM	6.5	6	6.8	8.4	8	8.5	5.4	6.3	5.9	7.5	7	5.9	5.5	6.8	NS
29 th QM	5.8	6	6.3	6.6	6.2	6.8	7.2	6.2	6.7	6.8	5.5	6.2	6.6	6.1	6.2
30 th QM	7.8	7.5	6.5	6.7	5.6	6.5	6.7	6.5	6.1	6.7	6.2	5.8	6.8	6.5	6.9
31 st QM	6.5	6.7	6.5	7.1	5.5	6.7	6.4	6.6	6.5	6.5	6.5	6.9	5.9	6.2	6.2
32 nd QM	7.3	7.8	7.5	7.5	6	5	6.2	7.2	6.7	6.1	7	6.8	7.8	7.1	NS
33 rd QM	8.1	8.5	7.8	7.5	8.8	8.1	7.5	8	8.1	8.5	7.6	7.1	7.6	7.6	NS
34 th QM	6.2	8.4	8.5	7.7	5.7	5.8	7.5	8.2	5.9	5.7	7.5	8.1	8.4	8.2	7.5
35 th QM	6.1	6.2	5.9	5.8	5.8	6.2	6	6.1	6.7	5.9	5.8	7.2	6.5	7.6	6.6
36 th QM	5.3	6	5.2	4.9	5.4	5.6	5	5.3	5.2	5.75	6.1	6.7	5.8	6.8	NS
37 th QM	6.7	6.8	6.7	6.4	6.6	6.7	6.6	6.8	6.7	6.3	7.2	7.4	7.8	7.6	7.9
38 th QM	6.3	5.9	5.6	6.3	6.5	7	7	7.2	5.9	7.8	6.79	7.36	7.9	7.6	7.8
39 th QM	6.9	7.1	7.2	7.2	7.1	6.9	7.3	7.3	7.4	7.1	7.2	7.4	7.5	7.7	8.0
40 th QM	5.42	5.64	5.64	5.39	5.54	5.75	5.2	5.63	5.63	5.85	8.7	6.34	6.06	5.69	7.2
41 st QM	5.96	5.43	5.16	5.62	5.49	6.5	5.66	5.82	5.51	6.2	8.1	8.78	7.1	5.9	NS
42 nd QM	6.6	5.98	6.3	5.88	5.95	5.83	5.77	6.36	5.82	8.38	9.1	8.29	8.2	8.43	7.2
43 rd QM	6.1	8.2	5.5	6.1	8	6.9	5.9	8	8.1	8.2	8.1	6.6	6.4	5.5	6.9
44 th QM	5.3	5.9	5.8	6.8	7	6.1	5.7	5.4	5	4.6	8.1	8.2	7.5	6.3	7.4
45 th QM	5.53	5.44	8.6	5.53	5.83	6.7	6.7	5.80	5.70	7.10	6.30	6.3	6.96	6.91	6.57
46 th QM	6.8	7	5.99	6.15	6.00	6.67	7.88	6.08	8.2	7.51	6.4	7	6.52	4.75	7.6
Standard (ECR*2023)	≥4 (Coastal Industrial and others)												≥ 5 mg/l (Coastal Reserved Natural area)		

Source: Field Survey from April 2014 up to October 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location

Table B.5: COD (mg/l) of Passur River System

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	288	284	328	376	400	364	364	400	408	276	284	408	372	536	540
2 nd QM	24	20	56	28	60	496	108	40	120	32	96	172	216	520	416
3 rd QM	6	30	14	18	14	18	10	22	10	10	26	14	14	54	122
4 th QM	128	68	92	84	116	108	104	16	100	116	84	96	96	316	472
5 th QM	87	58	132	102	110	88	96	18	106	88	94	92	102	302	470
6 th QM	42	43	18	26	21	24	32	25	25	51	36	30	26	NS	NS

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
7 th QM	32	36	28	36	36	40	42	28	48	40	42	46	36	84	96
8 th QM	124	100	96	100	108	80	100	100	124	100	108	88	100	96	NS
9 th QM	220	240	280	280	240	260	240	180	200	160	210	220	140	156	160
10 th QM	8	8	8	8	12	8	12	8	12	8	30	12	16	4	NS
11 th QM	12	8	8	12	16	12	8	8	12	8	8	16	12	68	56
12 th QM	56	40	44	48	52	42	56	52	44	36	48	40	40	56	196
13 th QM	52	48	56	40	36	48	42	36	52	44	40	64	216	240	NS
14 th QM	24	8	40	32	40	16	48	8	4	16	32	40	32	16	4
15 th QM	48	28	40	36	32	28	40	44	36	40	32	48	40	72	88
16 th QM	276	240	230	232	254	252	212	218	230	180	252	260	280	296	NS
17 th QM	20	24	12	30	16	12	10	24	16	40	20	10	16	110	NS
18 th QM	56	44	48	60	36	42	48	32	28	36	42	20	58	44	76
19 th QM	72	60	48	44	56	64	88	36	68	72	68	32	56	180	140
20 th QM	188	180	176	192	180	172	200	160	180	160	172	178	184	160	NS
21 st QM	36	24	32	20	28	24	28	20	32	24	20	24	32	220	NS
22 nd QM	56	40	26	40	28	24	20	32	20	24	36	40	32	92	72
23 rd QM	24	28	32	24	40	24	26	20	28	44	36	36	40	56	64
25 th QM	32	36	28	24	36	40	48	36	42	32	48	72	80	108	NS
26 th QM	16	12	8	28	16	20	8	12	20	12	28	56	76	60	40
27 th QM	56	32	20	48	20	56	48	56	8	12	24	32	12	28	NS
28 th QM	508	404	400	304	412	390	408	424	448	400	380	472	424	392	NS
29 th QM	4	4	4	4	4	12	8	8	12	16	48	32	16	80	32
30 th QM	44	52	40	20	40	4	4	24	4	48	4	12	4	192	180
31 st QM	24	12	8	40	32	12	16	36	12	12	32	16	60	36	40
32 nd QM	24	28	48	36	24	20	24	48	52	56	96	96	240	36	NS
33 rd QM	4	12	4	8	36	20	4	36	48	4	12	0.03	4	84	NS
34 th QM	4	8	4	12	4	4	8	8	4	8	12	8	16	8	8
35 th QM	144	256	148	212	188	264	220	144	192	112	144	148	188	112	120
36 th QM	436	236	248	288	412	296	416	412	496	348	480	248	236	436	NS
37 th QM	36	48	20	52	56	4	12	4	20	16	16	12	8	20	124
38 th QM	36	24	48	36	20	28	48	36	48	92	56	48	52	56	36
39 th QM	164	148	156	96	200	24	200	164	248	164	216	248	324	112	148

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
40 th QM	464	412	484	436	436	416	480	424	400	480	400	416	420	400	448
41 st QM	12	4	8	8	4	8	4	12	24	8	12	16	40	12	NS
42 nd QM	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
43 rd QM	56	80	40	48	96	72	96	48	36	80	40	96	112	480	96
44 th QM	428	412	464	448	400	400	428	460	428	400	392	400	316	212	368
45 th QM	16	16	20	24	12	20	24	16	4	20	24	12	8	12	8
Standard (ECR*2023)	5 mg/l (Coastal Industrial and others)												8 mg/l (Coastal Reserved Natural area)		

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL=Sampling location

Table B.6: Oil and Grease (mg/l) Concentration of Passur River System

Monitoring periods	Sampling Location ID				
	SL-7	SL-12	SL-13	SL-14	SL-15
1 st QM	<5	<5	<5	<5	<5
2 nd QM	<5	<5	6.3	<5	<5
3 rd QM	<5	<5	<5	<5	<5
4 th QM	>15	>15	>20	>20	>20
5 th QM	16.9	13	39.1	<5	<5
6 th QM	9	7.63	10.1	NS	NS
7 th QM	<5	9.87	<5	10.8	9.73
8 th QM	39	21	14	ND	36
9 th QM	61	30.3	26	31	82
10 th QM	5	13.5	5.73	NS	5.87
11 th QM	<5	<5	<5	10.1	<5
12 th QM	9.2	15.6	<5	13.8	14.2
13 th QM	5.73	<5	<5	7.71	ND
14 th QM	<5	<5	<5	<5	<5
15 th QM	16.6	<5	<5	<5	<5
16 th QM	<5	<5	<5	<5	<5
17 th QM	<1	<5	<1	NS	<1
18 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
19 th QM	<2.0	<2.0	<2.0	<2.0	<2.0

Monitoring periods	Sampling Location ID				
	SL-7	SL-12	SL-13	SL-14	SL-15
20 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
21 st QM	<2.0	<2.0	<2.0	<2.0	<2.0
22 nd QM	<2.0	<2.0	<2.0	<2.0	<2.0
23 rd QM	2.3	<2.0	<2.0	4.4	2.3
25 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
26 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
27 th QM	2.93	<2.0	<2.0	<2.0	NS
28 th QM	<2.0	<2.0	<2.0	<2.0	3.2
29 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
30 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
31 st QM	<2.0	<2.0	<2.0	<2.0	<2.0
32 nd QM	<2.0	<2.0	<2.0	<2.0	<2.0
33 rd QM	<2.0	<2.0	<2.0	<2.0	NS
34 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
35 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
36 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
37 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
38 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
39 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
40 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
41 st QM	<2.0	<2.0	<2.0	<2.0	<2.0
42 nd QM	<2.0	<2.0	<2.0	<2.0	<2.0
43 rd QM	<2.0	<2.0	<2.0	<2.0	<2.0
44 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
45 th QM	<2.0	<2.0	<2.0	<2.0	<2.0
Standard (ECR*2023)	5 mg/l (Coastal Industrial and others)		0.01 mg/l (Coastal Reserved area)		

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL=Sampling location

Table B.7: TDS (mg/l) of Passur River System

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	13060	12630	12900	13190	13330	13380	13180	13390	13240	12400	10970	12800	12280	21500	21500
2 nd QM	251	246	383	445	353	402	655	587	916	455	2510	6410	9360	15960	14050
3 rd QM	176	162	153	169	156	152	162	153	154	214	257	209	285	3400	5720
4 th QM	4360	3950	4330	4750	4920	4870	5040	5050	5130	5050	4390	5130	4780	12350	17900
5 th QM	14400	14700	14900	14600	14500	14200	14500	14600	14250	14000	13900	14050	13900	13600	25300
6 th QM	937	941	127	175	132	156	336	158	160	2320	355	298	683	NS	NS
7 th QM	158	169	152	172	162	160	192	164	164	183	176	227	205	4220	5830
8 th QM	5570	5910	5490	5720	5850	5480	5650	5740	5650	5450	4420	4540	4940	13330	NS
9 th QM	13400	13280	13560	12830	13100	13460	12820	12960	13590	13340	11700	11330	13580	20720	25500
10 th QM	179	112	125	162	185	143	205	195	140	165	5170	893	1321	7330	NS
11 th QM	138	106	108	147	110	112	113	108	146	196	238	162	301	2550	4120
12 th QM	3100	3140	3330	3630	3600	3520	3470	3790	3770	2920	3960	3370	3370	3580	12210
13 th QM	13400	13480	13400	13560	13490	13330	13640	13680	13360	13490	13110	12340	13600	19370	NS
14 th QM	496	122	123	172	125	125	160	126	127	1616	1200	204	245	3270	4450
15 th QM	1913	1919	1915	2500	2520	2500	2840	2710	2720	2500	2970	2570	2690	11390	14190
16 th QM	14500	14420	14650	14300	14450	14540	14400	14500	14610	14160	14450	14500	15350	20600	NS
17 th QM	315	224	232	328	235	208	205	286	296	265	340	580	2190	7680	NS
18 th QM	855	733	722	824	716	732	945	784	786	992	827	940	1715	8100	12500
19 th QM	9940	9950	9730	9860	9980	9800	10190	10280	10080	10040	8860	8350	10950	17200	21110
20 th QM	15800	15600	15500	15700	16000	16100	15640	16000	15800	15700	15100	15722	15400	14800	NS
21 st QM	290	150	152	205	142	150	208	145	154	940	365	172	560	12500	NS
22 nd QM	480	175	170	190	175	174	325	180	172	1405	875	350	474	3950	5750
23 rd QM	6800	6950	7300	6760	6760	6900	6740	6450	6700	7250	5800	6240	6430	16300	20400
25 th QM	134	114	116	221	125	132	195	128	114	229	2893	740	489	4188	NS
26 th QM	122	96	94	102	179	105	181	98	92	206	164	148	2260	1472	490
27 th QM	3770	4410	4390	4150	4170	4060	4100	4210	4450	4170	2320	3010	4060	11400	14600
28 th QM	12500	12700	12300	12800	13100	13200	13100	13300	13200	12500	11800	12100	12400	18500	NS
29 th QM	58	105	106	74	97	110	158	110	100	216	1270	180	240	1700	1610
30 th QM	160	150	147	158	150	153	155	153	156	160	780	203	275	3850	6300
31 st QM	1380	1300	1210	1230	1510	1380	1850	1680	1650	1540	1350	1580	3850	11600	15500
32 nd QM	4870	4800	4350	5250	4920	4060	5150	5070	4750	5100	8900	7820	12200	16400	NS

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
33 rd QM	190	125	122	140	115	135	150	127	125	134	2850	460	1020	6200	
34 th QM	155	150	136	158	135	133	235	136	132	210	140	210	315	2890	5300
35 th QM	5700	6900	6850	6300	7400	7500	6800	7700	7600	5500	5600	5300	6100	15300	18100
36 th QM	16900	17500	18000	17400	17800	17900	17600	17500	17800	17600	15200	16700	16800	21000	NS
37 th QM	146	132	146	109	136	135	160	132	142	218	297	320	675	4200	5800
38 th QM	280	195	190	210	192	190	525	215	192	950	350	226	430	4700	6800
39 th QM	4100	4170	4200	5800	5300	5350	5500	5680	560	4150	5200	4900	6500	16100	14000
40 th QM	16700	15800	16800	17100	16900	17000	16900	17300	17200	16800	17000	16800	14300	21100	22800
41 st QM	507	230	165	168	164	157	215	153	148	870	446	1415	520	1610	507
42 nd QM	100	163	160	167	164.00	173	203	170	166	200	870	205	344	3700	6400
43 rd QM	3900	4100	4800	5000	5100	5050	4700	4900	4950	5100	4200	3800	7100	14100	17000
44 th QM	14600	14400	15500	16100	16500	16000	15600	16400	16100	16150	12900	15000	15700	21400	23700
45 th QM	150	250	220	240	170	170	170	160	160	190	2320	190	360	2570	4650
Standard (ECR*2023)	N/A														

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL=Sampling location

Table B.8: TH (mg/l) Passur River System

Monitoring ID	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	2900	2500	2650	2550	2600	2625	2550	2800	2500	2500	2400	3150	2625	4500	4850
2 nd QM	250	180	170	175	275	350	325	350	475	450	725	1400	2150	3625	3050
3 rd QM	216	218	335	390	340	355	330	345	325	350	330	377	345	980	1440
4 th QM	930	870	870	940	990	970	1045	1125	975	980	970	1000	970	2380	2690
5 th QM	3000	3050	3250	3450	3250	3200	3600	3670	3540	3260	3190	3210	3080	3420	3640
6 th QM	245	110	105	118	103	105	153	105	165	470	130	135	200	NS	NS
7 th QM	250	330	360	365	355	350	345	390	445	183	340	410	430	1090	1460
8 th QM	1270	1380	1240	1220	1300	1260	1370	1340	1270	950	1075	1090	1100	2850	NS
9 th QM	3130	3090	3140	3010	3070	3100	3060	3130	3110	3180	3080	3060	3050	4520	5050
10 th QM	240	205	205	220	232	218	235	242	224	220	875	405	415	1750	NS
11 th QM	255	250	190	265	237	242	205	217	238	250	240	245	282	670	810
12 th QM	1090	980	1030	1020	915	1070	935	1100	1110	1040	1170	1070	1070	1130	2870
13 th QM	3640	3420	3300	3400	3440	3380	3540	3480	3600	1960	2300	2450	3560	4300	NS
14 th QM	200	150	155	160	145	140	150	155	175	165	320	220	200	640	905

Monitoring ID	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
15 th QM	430	510	498	570	590	480	505	530	512	505	478	1070	610	1475	1740
16 th QM	3100	1040	1030	1060	1040	1085	1080	1110	1100	1300	1120	1410	1330	1440	NS
17 th QM	210	205	185	200	210	215	205	212	205	210	220	245	530	2030	NS
18 th QM	335	310	313	285	255	275	295	265	325	295	315	325	2550	2750	4200
19 th QM	2050	3900	4100	4600	4200	4400	4400	4300	4600	4000	4100	4000	4500	5900	6900
20 th QM	3000	5000	5000	5200	5000	4800	4400	5100	4900	5200	5000	4782	4500	4500	NS
21 st QM	2100	1950	1900	1850	2500	2550	1700	1850	2000	2000	2200	1800	1400	4300	NS
22 nd QM	215	125	190	175	178	155	175	150	115	350	285	200	185	830	1225
23 rd QM	1540	1485	1530	1580	1560	1490	1530	1560	1485	1460	1440	1510	1390	3470	3850
25 th QM	205	200	187	217	215	202	195	210	207	310	742	250	280	1000	NS
26 th QM	272	195	225	210	235	200	240	235	243	198	217	265	225	210	230
27 th QM	2800	2700	2750	3000	3100	2500	2550	3200	2800	1400	1200	2850	2870	5050	5600
28 th QM	4500	4200	4300	4100	4500	4000	4400	4100	4400	4200	4100	4200	4400	4300	NS
29 th QM	140	200	180	200	175	175	140	130	100	145	400	150	160	480	470
30 th QM	145	125	130	175	140	145	160	170	155	165	265	190	170	1000	1450
31 st QM	370	385	310	375	325	340	375	420	430	380	435	500	680	6500	5300
32 nd QM	2500	2400	2250	2500	2350	2100	2550	2400	2460	2450	3100	2300	4000	5000	NS
33 rd QM	140	110	115	120	110	120	125	120	130	140	1000	215	930	2500	NS
34 th QM	190	140	150	130	125	115	152	140	130	155	140	115	110	2000	2500
35 th QM	2600	2800	2800	2900	3100	3200	3100	3300	3500	2500	2500	2600	2800	4500	5000
36 th QM	4700	4800	4700	4500	4650	4750	4600	4850	4800	4550	4400	4600	4650	5250	NS
37 th QM	110	120	125	90	120	110	125	110	125	170	185	190	800	1500	1900
38 th QM	185	145	160	190	170	160	190	140	120	315	225	165	210	1400	1600
39 th QM	2550	2600	3250	3300	2850	2950	3350	3200	2900	3000	3100	2200	3300	5450	4950
40 th QM	4500	4400	4500	4600	4600	4600	4700	4700	4500	4600	4500	4500	3800	5500	5950
41 st QM	415	190	110	130	135	125	160	135	125	430	220	1300	300	1400	NS
42 nd QM	140	125	135	125	130	140	150	150	140	145	215	160	185	1000	1200
43 rd QM	2500	2450	2900	3000	2800	2800	2400	2900	3100	3300	2400	2300	3300	4900	5400
44 th QM	4300	4200	4400	4500	4500	4500	4100	4300	4400	4400	3600	4100	4100	5500	5600
45 th QM	140	150	140	150	150	150	145	150	150	135	140	145	145	150	140
Standard (ECR*2023)	N/A														

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location

Table B.9: TSS (mg/l) Passur River System

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	598	45	53	54	60	55	24	27	67	7	9	50	65	115	91
2 nd QM	126	92	112	99	100	105	116	112	37	65	24	310	90	99	72
3 rd QM	234	193	174	227	232	186	185	536	459	798	389	203	869	28	267
4 th QM	180	210	230	450	250	200	300	530	450	280	206	280	400	103	200
5 th QM	160	167	170	160	165	155	150	147	155	148	160	165	160	150	180
6 th QM	26	25	127	30	27	40	32	40	44	36	28	24	42	NS	NS
7 th QM	76	80	65	92	85	97	104	90	82	96	92	60	74	110	144
8 th QM	14	12	14	17	18	22	20	7	18	11	10	15	22	16	NS
9 th QM	8	7	10	10	8	7	12	10	11	7	6	13	18	23	15
10 th QM	61	48	56	62	45	49	51	43	39	42	11	47	31	16	NS
11 th QM	20	18	16	20	24	19	20	18	16	24	30	27	18	41	33
12 th QM	46	52	48	42	54	46	61	58	63	55	66	61	61	34	49
13 th QM	51	42	48	52	43	38	32	44	40	37	49	38	33	28	NS
14 th QM	18	15	22	16	20	17	15	16	14	26	30	25	27	22	16
15 th QM	14	15	14	13	13	14	15	17	12	14	15	13	17	14	13
16 th QM	18	17	22	20	19	21	17	19	18	23	32	14	15	18	NS
17 th QM	17	16	15	18	16	15	16	14	20	13	12	17	13	14	NS
18 th QM	14	11	15	11	13	12	14	13	15	11	42	27	22	15	6
19 th QM	15	12	14	12	13	15	16	13	14	14	8	15	12	11	9
20 th QM	12	14	13	11	12	15	12	11	13	14	12	13	11	10	NS
21 st QM	14	11	13	12	13	14	13	12	13	15	12	13	12	7	NS
22 nd QM	8	7	6	8	7	6	7	6	5	9	7	15	11	7	5
23 rd QM	11	8	7	8	9	6	7	8	6	13	12	14	11	10	10
25 th QM	14	6	11	12	9	12	14	13	8	11	5	9	17	18	NS
26 th QM	7	11	8	7	6	9	15	8	6	8	7	8	5	8	6
27 th QM	11	6	7	7	6	8	7	6	6	7	8	6	8	11	6
28 th QM	15	23	20	13	12	16	14	15	13	17	12	3	14	11	NS
29 th QM	12	14	9	12	11	8	12	9	15	13	3	7	9	16	13
30 th QM	13	12	10	14	9	13	17	4	15	11	8	13	15	12	13
31 st QM	15	14	17	12	13	11	14	12	15	13	13	14	15	16	13
32 nd QM	7	10	11	12	9	11	18	13	12	19	16	15	13	17	NS
33 rd QM	27	23	24	31	27	26	29	26	24	30	15	64	21	32	NS
34 th QM	16	15	19	18	14	16	21	18	14	15	18	25	20	23	21
35 th QM	11	14	12	11	8	13	12	7	11	8	7	8	6	7	9
36 th QM	25	20	16	18	12	13	10	7	6	8	6	7	6	11	NS
37 th QM	15	12	17	14	12	13	11	12	9	13	16	14	10	13	9

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
38 th QM	5	4	5	4	5	3	6	4	3	7	13	11	7	4	3
39 th QM	3	3	6	4	3	3	4	4	4	5	4	13	3	3	3
40 th QM	3	4	3	3	4	7	5	3	4	9	8	12	5	3	3
41 st QM	8	3	4	7	8	6	8	9	7	8	12	22	7	15	NS
42 nd QM	11	8	9	7	6	8	12	5	6	8	6	9	12	27	8
43 rd QM	4	5	4	3	7	5	6	4	3	4	4	13	6	18	5
44 th QM	133	26	135	146	27	95	31	35	212	225	16	43	38	70	82
45 th QM	148	288	282	298	228	228	628	720	720	430	254	310	344	278	342
Standard (ECR'2023)	100 mg/l (Coastal Industrial and others)												25 mg/l (Coastal Reserved area)		

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location.

Table B.10: Nitrate (NO₃²⁻) (mg/l) concentration of Passur River System

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	0.9	0.7	0.1	1.3	1.4	1.1	0.75	1.1	1.2	0.3	0.5	0.6	1.4	2.7	0.8
2 nd QM	2.89	2.4	3.2	0.76	2.69	2.98	2.13	2.43	2.05	2.18	0.88	1.52	1.75	3.32	2.84
3 rd QM	0.32	1.57	1.84	1.64	1.42	1.33	1.85	2.09	2.21	2.26	1.98	1.64	1.67	0.59	0.4
4 th QM	3	1.5	4.3	3.1	2.2	8.5	2.7	1.8	1.9	6	4	4.5	2.7	1.5	2
5 th QM	33	13	39	48	69	8	87	48	128	62	48	29	18	25	28
6 th QM	9.1	7.5	6.2	6.6	6.1	6.6	14.9	4	4.9	7	3.1	7.8	4.4	NS	NS
7 th QM	4	7.1	5	5.7	3.3	4.7	4.4	6.2	4.4	4.9	2.9	3.1	4.4	3.2	11.5
8 th QM	6.3	4.3	3.9	3.1	5.2	4.1	4.9	3.7	4.4	5.6	3.9	3.7	5.1	4.9	NS
9 th QM	3	2.9	2.5	2	3.1	3.6	2.6	2.9	2.6	2.7	3.1	3	3.4	2.9	3.5
10 th QM	3.9	6.2	4.3	5.1	2.7	3.9	3.6	5.1	4.9	5.2	5.3	5.2	5.1	5.4	NS
11 th QM	0.25	0.39	0.42	0.76	0.52	0.31	0.2	0.41	0.63	0.4	0.32	0.27	0.39	0.25	0.38
12 th QM	3.62	2.89	1.87	2.25	2.46	3.01	3.64	1.93	2.17	2.46	3.1	2.78	2.78	3.08	2.28
13 th QM	4.35	5.05	4.55	6.11	3.4	3.16	3.14	3.34	2	3.61	1.6	2.49	2.46	3.69	NS
14 th QM	5.8	6.8	4.5	7.1	3.1	5	4.1	3.4	3.1	2.3	3.2	3.5	4.2	2.2	2.6
15 th QM	3	4.2	3.6	3	4.7	7.6	8.8	8.5	2.8	1.6	3.4	4.5	4.6	1.8	6.1
16 th QM	6.8	4.9	5.1	2.8	5.2	5.5	2.6	4.5	5.3	5.9	3.9	4.7	5.2	5.5	NS
17 th QM	0.8	1.7	2.1	2.8	1.8	3.2	4	3.7	3.8	4.4	3.1	2.4	2.7	4.2	NS
18 th QM	2.8	0.1	0.11	1.7	0.9	0.1	0.1	3.4	0.7	2.3	0.12	1.6	0.1	0.1	0.9
19 th QM	3.5	2.6	1.9	2.1	2.2	3.5	4.2	3	3.1	2.1	1.3	3.7	4.7	1.8	2.6
20 th QM	0.3	0.3	3.7	3	1.2	4.8	0.5	3.4	4.1	5	2.9	2.7	4.4	2.7	NS
21 st QM	0.1	1.1	1.2	1.5	1.5	2.1	1.5	1.7	0.5	3.1	2.5	1.8	1.7	1.3	NS
22 nd QM	3.5	2.7	3.4	3	1.7	2.1	2	1.3	2.2	2.9	1.6	2	2.1	1.6	2.5

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
23 rd QM	1.3	1.7	3.2	4.5	2.7	5.1	7.4	3.9	4.1	4.7	4.9	3.3	3.2	2.6	4.1
25 th QM	3	3.3	9.5	2.9	1.9	1.8	1	1.5	1.3	3.9	2.1	1.5	5.7	4	NS
26 th QM	3.2	1.3	4.7	2.5	2.6	1	0.5	2.1	3	1.5	1.3	2.6	2.6	2.6	2.6
27 th QM	4.3	2.2	1.2	0.7	3.1	2.7	1.8	3	1.9	3	4.9	0.5	0.5	2.9	3.9
28 th QM	3.3	2.1	1.3	2.1	3	1.5	1.7	2	2.3	4.2	1	1.7	2.6	2.8	NS
29 th QM	2.1	2.2	1.3	1.4	1.6	1.4	1.9	2.1	2.5	3.1	2.1	3.8	3.9	4.1	3.2
30 th QM	3.5	3.8	6.7	12.6	0.3	7.4	0.7	9.2	1.7	0.5	0.1	0.4	1	0	0.5
31 st QM	2.06	1.43	2	15.9	1.5	6.8	1.1	ND	1.5	16.2	5.7	9.4	4.06	24.7	1.8
32 nd QM	8.41	13.52	12.75	10.8	8.71	9.39	11.15	8.5	11	14.42	6.41	8.05	15.35	10.85	NS
33 rd QM	3.85	6.47	10.43	8.83	13.06	12.26	8.2	8.18	11.82	11.52	13.14	15.7	15.96	11.29	NS
34 th QM	0.03	0.09	0.23	3.79	2.06	3.6	5.18	5.01	4.71	5.74	1.62	5.97	5.72	3.49	5.76
35 th QM	1.13	1.45	2.06	1.3	1.7	1.7	1.8	1.3	2.4	2.2	2.2	1.3	2.2	2.7	2.1
36 th QM	2.27	1.94	0.68	2.44	1.1	4.19	2	4.44	5.32	3.57	1.2	13.96	1.53	0.52	NS
37 th QM	ND	0.276	0.128	ND	0.654	0.843	0.591	1.243	0.675	1.117	7.1	1.916	3.640	1.117	4.187
38 th QM	1.54	1.39	0.93	1.41	0.42	0.61	0.99	0.13	0.1	3.98	0.11	0.42	0.1	0.51	0.72
39 th QM	2.9	3.38	2.75	1.51	1.32	3.34	2.35	1.57	0.45	2.17	2.11	0.97	2.01	2.87	1.61
40 th QM	5.2	4.9	4.9	3.7	4.8	5.1	3.4	2.5	3.5	4.7	2.6	4.7	5.3	5.4	5.9
41 st QM	3.9	4.1	3.8	2.9	2.7	4.50	5.9	6.5	9.6	2.8	6.2	15.2	7.3	9	NS
42 nd QM	2	0.68	1.3	1.58	1.45	3.35	8.71	3.26	4.08	1.033	1.769	2.3758	0.7387	6.7534	3.0937
43 rd QM	1.8	1.51	2.08	2.6	2	1.49	1.32	2.34	7.69	9.88	2.42	6.12	1.32	0.46	0.67
44 th QM	3.2	2.6	3.5	4.1	3.5	2.8	2.9	3.1	3.4	4.3	2.42	7.3	3.5	2.8	4.8
45 th QM	4.75	2.95	2.0	0.53	0.19	0.15	0.74	0.26	0.13	0.76	0.26	7.17	0.79	1.03	0.73
Standard (ECR'2023)	1.0 mg/l (Coastal Industrial and others)												0.3 mg/l (Coastal Reserved area)		

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location.

Table B.11: Sulphate (SO₄²⁻) (mg/l) Concentration of Passur River System

Monitoring periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	1840	1320	1280	1360	1040	1320	1640	1520	1280	1120	1320	1360	1560	2600	2080
2 nd QM	20	23	36	45	32	20	60	40	80	20	210	620	860	1400	1160
3 rd QM	26	28	34	33	30	27	40	35	64	63	63	44	69	1390	2360
4 th QM	580	450	480	550	520	540	630	560	620	570	460	630	590	850	1500
5 th QM	1360	1260	1240	1240	1120	820	880	1180	900	1220	840	980	900	1540	1920
6 th QM	67	11	9	26	6	8	9	19	12	72	27	39	51	NS	NS
7 th QM	7	8	11	10	8	9	12	8	6	11	9	13	7	84	97
8 th QM	570	590	560	550	580	565	640	560	550	96	480	482	500	760	NS

Monitoring periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
9 th QM	1080	1040	1020	1060	980	1100	1060	1020	1080	1040	1020	1100	1080	1650	2100
10 th QM	18	10	13	15	17	14	15	18	12	11	480	42	60	620	NS
11 th QM	5	3	4	4	6	5	6	5	8	14	14	14	19	190	320
12 th QM	230	210	200	230	280	230	230	231	250	160	200	220	220	230	1090
13 th QM	422	460	1340	1380	1280	1400	880	1440	1340	1220	1340	1220	1300	1420	NS
14 th QM	29	3	5	2	1	2	2	1	3	120	76	5	13	30	2
15 th QM	630	370	410	310	310	490	700	340	340	270	350	280	220	760	510
16 th QM	1400	1320	1440	1260	1200	1400	1300	1380	1240	1200	1250	1260	1300	1460	NS
17 th QM	24	18	20	22	21	16	10	24	22	21	18	28	35	620	NS
18 th QM	51	49	46	52	38	42	56	52	39	65	46	30	20	250	780
19 th QM	760	756	764	748	760	762	768	760	770	758	760	765	756	764	769
20 th QM	1460	1380	1420	1410	1440	1400	1500	1450	1460	1500	1490	1446	1500	1500	NS
21 st QM	23	19	21	16	17	19	15	16	14	18	12	14	16	980	NS
22 nd QM	37	6	6	5	4	8	25	9	6	71	55	33	38	370	540
23 rd QM	490	510	560	530	640	490	520	470	510	490	565	580	470	410	445
25 th QM	4	3	5	8	10	13	16	8	16	16	21	12	34	60	NS
26 th QM	3	6	11	5	3	8	6	4	12	31	26	21	540	430	30
27 th QM	270	420	460	410	420	430	450	440	450	420	190	260	410	580	1240
28 th QM	1	5	2	1	3	2	3	1	2	3	15	13	5	5	NS
29 th QM	21	20	24	18	15	18	19	13	14	17	39	39	41	410	598
30 th QM	99.4	90.3	92.6	89.3	108.4	98	118.7	118	118.7	115	91.1	106.8	243.8	183.3	230.8
31 st QM	185.5	188.6	197.8	198.1	186.2	180.8	191.3	189.4	185	199.7	218	212.37	227.53	245.62	985
32 nd QM	36.32	33.65	46.92	41.55	22.28	29.53	37.16	45.68	52.04	36.65	158.9	111.28	200.6	517.86	NS
33 rd QM	28.35	19.51	21.31	23.56	21.32	22.27	30.07	14.26	21.18	35.24	33.71	92.53	79.75	172.39	NS
34 th QM	200.77	206.51	200.31	202.27	208.03	211.48	198.41	202.02	211.53	199.39	193.21	198.8	185.87	232.06	236.27
35 th QM	240	244	243	244	241	246.5	245	246.1	238.7	247.5	243	247	246	248	246
36 th QM	20.7	13.22	33.64	20.52	24.94	17.49	24.13	36.43	12	39.89	38.22	54.14	59.7	194.84	NS
37 th QM	15.47	7.93	7.26	6.70	7.65	8.73	28.83	9.22	7.99	43.73	41.95	24.84	35.06	103.85	211.27
38 th QM	136.6	174.08	148.8	189.5	191.5	197.3	195.8	199.1	159.1	154.1	172.4	177.4	197.2	224	219.1
39 th QM	242.8	237.3	242.6	243.7	238	247.6	234.7	241.1	243.4	242.6	242.9	245.1	227.6	240.4	246
40 th QM	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32	51.32
41 st QM	50.9	39	36.7	33.1	37.1	40.4	33	22.2	33.3	69.6	59.6	191.7	60.8	130.3	NS
42 nd QM	108.95	170.59	187.53	177.8	188.3	184.16	108.95	170.59	187.53	177.8	188.3	184.16	108.95	170.59	187.53
43 rd QM	234.55	223.22	228.15	229.55	235.48	216.29	231	232.22	232.72	277.3	228.9	227.04	227.33	224.92	234.6
44 th QM	280.12	247.31	258.38	265.36	248.37	270.84	264	244.39	249.96	289.61	287.6	227.14	229.35	221.3	258.34
45 th QM	61.87	50.72	70.86	67.6	55.87	46.2	59.25	66.46	64.97	79.65	123.8	35.95	52.31	145.8	193.2
Standard (ECR'2023)	N/A														

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location

Table B.12: Phosphate (PO_4^{3-}) (mg/l) concentration of Passur River System

Monitoring periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	0.52	0.5	1.1	2.1	2.2	2	0.57	1.2	1.5	0.55	1.1	1.3	1.1	1.3	7.51
2 nd QM	2.23	1.99	2.55	0.45	2.13	2.42	1.25	1.51	1.1	2.1	0.53	0.35	0.56	0.29	0.29
3 rd QM	0.67	1.12	0.95	0.92	1.11	0.99	1.18	1.25	1	1.27	1.04	0.86	1.22	0.8	1.09
4 th QM	0.32	0.61	0.7	0.43	0.41	0.55	0.76	0.85	0.53	0.59	0.64	0.42	0.61	0.42	0.44
5 th QM	0.86	0.53	0.72	0.49	0.68	0.61	0.65	0.53	0.6	0.7	0.55	0.71	0.59	0.61	0.47
6 th QM	10	0.23	0.67	0.27	0.59	0.13	0.1	0.18	0.1	0.5	0.29	0.59	0.89	NS	NS
7 th QM	1.27	1.97	1.94	2.53	1.3	1.32	0.99	1.02	1.39	1.27	1.28	0.95	0.35	0.43	0.45
8 th QM	0.269	0.269	0.179	0.357	0.536	0.269	0.536	0.625	0.536	0.351	0.269	0.179	0.269	0.357	NS
9 th QM	0.22	0.36	0.27	0.31	0.3	0.43	0.63	0.21	0.33	0.19	0.13	0.31	0.42	0.26	0.36
10 th QM	1.14	1.76	1.77	2.31	0.98	1.01	0.87	0.96	1.123	1.06	1	0.78	0.53	0.47	NS
11 th QM	3.39	4.11	4.58	2.76	3.2	2.48	4.16	2.76	2.71	2.836	5.23	4.01	1.16	9.08	5.9
12 th QM	0.67	0.31	0.09	0.07	0.12	0.16	0.09	0.04	0.07	0.07	0.2	0.09	0.09	0.1	0.23
13 th QM	1.31	1.72	2.73	2.77	0.66	0.62	0.65	0.37	0.45	0.61	0.47	0.18	0.21	0.19	NS
14 th QM	0.49	2.5	2.8	3.3	3.9	3.9	4.6	0.41	0.63	0.51	15.3	1.3	3.15	0.36	0.55
15 th QM	0.21	0.16	0.3	0.19	0.17	0.47	1.31	0.39	0.62	0.38	0.71	0.63	0.81	0.97	1.45
16 th QM	0.38	0.25	0.29	0.38	0.34	0.27	0.29	0.29	0.42	0.24	0.28	0.37	0.26	0.2	NS
17 th QM	1.03	0.83	0.76	0.88	1.07	0.67	1.16	0.86	1.03	0.83	1.2	0.86	0.5	0.67	NS
18 th QM	0.25	0.3	0.22	0.24	0.4	0.53	0.32	0.43	0.57	0.27	0.22	0.33	0.25	0.5	0.61
19 th QM	0.25	0.3	0.17	0.2	0.35	0.27	0.2	0.2	0.37	0.4	0.28	0.29	0.3	0.19	0.18
20 th QM	0.25	0.32	0.4	0.3	0.27	0.25	0.41	0.35	0.27	0.28	0.3	0.31	0.52	0.63	NS
21 st QM	10.1	0.6	0.5	0.6	0.6	0.9	11.1	0.8	0.8	0.5	0.8	0.6	0.6	0.5	NS
22 nd QM	0.3	0.3	0.4	0.2	0.3	0.4	0.5	0.7	0.5	0.6	0.4	0.6	0.7	0.3	0.3
23 rd QM	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.5	0.3	0.4	0.2	0.1	0.2
25 th QM	0.25	0.27	0.3	0.35	0.29	0.36	0.4	0.43	0.52	0.25	0.56	0.53	0.4	0.37	NS
26 th QM	0.5	0.5	0.5	0.7	0.5	0.8	0.7	0.4	1.3	1.2	0.7	0.8	0.3	0.4	0.4
27 th QM	5.3	3.5	3.2	2.9	3	5.4	3	2.5	3.2	13.1	4.1	9.6	2.6	7.1	1.1
28 th QM	4.9	2	1.9	2.3	5.7	4	1.2	2.4	6.3	8	0.76	0.79	0.6	3	NS
29 th QM	4.2	0.6	0.54	4.5	2.1	3.4	5.4	3.7	2.7	3.4	0.2	0.27	1.9	0.87	0.5
30 th QM	1.5	0.9	1.3	0	0	0	0.3	0.4	0.1	0.2	0.4	0.2	0.7	0.4	0.2
31 st QM	0.19	0.33	0.13	0.46	0.1	0.4	0.04	0.03	0.14	0.59	0.35	0.3	0.48	0.45	1.03
32 nd QM	0.048	0.025	0.069	0.051	0.02	0.021	0.02	0.061	0.008	0.006	0.003	0.0572	0.228	0.125	NS
33 rd QM	1.02	0.67	1.2	1.74	0.49	0.4	0.44	0.3	0.5	0.71	0.68	2.53	1.7	1.04	NS
34 th QM	2.14	1.2	0	0.08	0.04	0.07	0.07	0.13	0.11	0.08	0.08	0.61	0.6	0.02	0.03
35 th QM	1.01	0.56	0.62	0.45	0.08	0.08	0.06	0.06	0.03	0.1	0.09	0.14	0.5	0.07	0.52
36 th QM	0.97	1.42	1.25	2.53	0.01	0.09	0.002	0.0235	0.001	0.044	0.037	0.543	0.004	0.07	NS
37 th QM	0.08	0.1046	0.1147	0.0285	0.1829	0.0964	0.0468	0.0838	0.0415	0.0733	0.9322	0.4559	0.4183	0.1134	0.2034

Monitoring periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
38 th QM	0.12	0.06	0.04	0.08	0.09	0.07	0.09	0.08	0.78	0.05	0.02	0.08	0.05	0.08	0.1
39 th QM	0.222	0.211	0.31	0.189	0.241	0.458	0.085	0.175	0.142	0.277	0.163	1.05	0.249	0.12	0.08
40 th QM	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
41 st QM	0.50	2.10	1.10	0.60	0.20	0.30	0.20	0.05	0.10	0.05	0.50	1.50	0.20	0.95	NS
42 nd QM	0.0847	0.0869	0.1115	0.12	0.01	0.18	0.01	0.05	UD	0.06	0.0746	0.221	0.1497	0.4423	0.1857
43 rd QM	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
44 th QM	0.2	0.2	0.2	0.1	0.1	0.2	0.14	0.1	0.1	0.14	0.19	0.2	0.087	0.09	0.074
45 th QM	0.018	0.032	0.011	0.044	0.008	0.012	0.01	0.023	0.02	0.018	0.07	0.05	0.004	0.013	0.018
Standard (ECR'2023)	0.1 mg/l (Coastal Industrial and others)											0.05 mg/l (Coastal Reserved area)			

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location; UD-Undetectable.

Table B.13: Arsenic (As) (mg/l) concentration of Passur River System

Monitoring Periods	Sampling Location ID														
	SI-1	SI-2	SI-3	SI-4	SI-5	SI-6	SI-7	SI-8	SI-9	SI-10	SI-11	SI-12	SI-13	SI-14	SI-15
1 st QM	0.002	0.002	0.001	0.002	0.002	0.002	<0.001	<0.002	0.002	<0.001	0.002	0.002	0.004	0.004	0.003
2 nd QM	0.003	0.003	0.003	0.004	0.004	0.003	0.003	0.004	0.003	0.003	0.002	0.004	0.003	0.002	0.002
3 rd QM	0.004	0.004	0.004	0.004	0.004	0.003	0.006	0.004	0.006	0.006	0.003	0.003	0.004	0.002	0.003
4 th QM	0.003	0.003	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.004	0.003	0.003	0.004	0.003	0.002
5 th QM	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.002	0.002
6 th QM	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	NS	NS
7 th QM	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
8 th QM	0.001	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.001	0.002	0.001	0.002	0.002	0.002	NS
9 th QM	0.001	0.003	0.003	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.005	0.006	0.004
10 th QM	0.002	0.003	0.005	0.004	0.002	0.002	0.003	0.003	0.004	0.005	0.002	0.004	0.002	0.001	NS
11 th QM	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.003	0.003	0.003	0.002
12 th QM	0.002	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.002
13 th QM	0.002	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002	0.001	0.002	NS
14 th QM	0.002	0.001	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.003	0.001	0.002	0.003	0.002	0.002
15 th QM	0.002	0.002	0.003	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.001	0.001
16 th QM	0.001	0.001	0.001	0.002	0.001	0.002	0.002	0.001	0.001	0.002	0.001	0.002	0.001	0.002	NS
17 th QM	0.004	0.005	0.004	0.005	0.003	0.002	0.005	0.003	0.004	0.004	0.003	0.003	0.003	0.002	NS
18 th QM	0.003	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.001	0.001
19 th QM	0.002	0.001	0.003	0.001	0.001	0.002	0.003	0.001	0.001	0.002	0.005	0.007	0.001	0.002	0.001
20 th QM	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.003	0.002	0.002	NS
21 st QM	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.003	0.004	0.002	0.001	0.001	NS
22 nd QM	0.002	0.003	0.002	0.003	0.003	0.002	0.003	0.002	0.002	0.003	0.004	0.004	0.002	0.002	0.002

Monitoring Periods	Sampling Location ID														
	SI-1	SI-2	SI-3	SI-4	SI-5	SI-6	SI-7	SI-8	SI-9	SI-10	SI-11	SI-12	SI-13	SI-14	SI-15
23 rd QM	0.002	0.003	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.002	0.002
25 th QM	0.003	0.003	0.003	0.002	0.002	0.002	0.005	0.003	0.003	0.004	0.002	0.002	0.002	0.003	NS
26 th QM	0.003	0.003	0.003	0.003	0.004	0.003	0.004	0.003	0.003	0.004	0.004	0.002	0.002	0.002	0.009
27 th QM	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002	0.003	0.002	0.003	0.002	0.002	0.002
28 th QM	0.003	0.004	0.003	0.002	0.002	0.004	0.003	0.003	0.003	0.003	0.004	0.002	0.002	0.002	NS
29 th QM	0.003	0.002	0.003	0.003	0.002	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003
30 th QM	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.003	0.003	0.002
31 st QM	0.003	0.003	0.003	0.002	0.002	0.002	0.003	0.002	0.002	0.003	0.003	0.003	0.002	0.002	0.002
32 nd QM	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.003	0.003	0.004	0.003	0.003	0.003	0.003	NS
33 rd QM	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.003	0.002	0.003	0.002	0.002	0.003	NS
34 th QM	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
35 th QM	0.003	0.003	0.004	0.003	0.003	0.003	0.004	0.003	0.003	0.004	0.001	0.002	0.002	0.002	0.002
36 th QM	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.001	0.001	0.002	0.002	NS
37 th QM	0.003	0.003	0.003	0.002	0.001	0.003	0.003	0.002	0.002	0.004	0.003	0.003	0.003	0.004	0.003
38 th QM	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.003	0.002	0.002
39 th QM	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002	0.003	0.003	0.001	0.003	0.002	0.002
40 th QM	0.003	0.002	0.002	0.003	0.003	0.003	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002	0.002
41 st QM	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.002	NS
42 nd QM	0.002	0.003	0.002	0.003	0.002	0.003	0.004	0.002	0.002	0.002	0.004	0.003	0.002	0.003	0.002
43 rd QM	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.005	0.002
44 th QM	0.005	0.003	0.004	0.005	0.003	0.003	0.003	0.004	0.006	0.004	0.003	0.003	0.003	0.003	0.004
45 th QM	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.003	0.004	0.004	0.004
Standard (ECR'2023)	0.003 mg/l (Coastal Industrial and others)												0.001 mg/l (Coastal Reserved area)		

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location

Table B.14: Pb (mg/l) concentration of Passur River System

Monitoring Periods	Sampling Locations ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
1 st QM	0.053	0.055	0.055	0.057	0.06	0.058	0.053	0.054	0.056	0.053	0.048	0.05	0.043	0.194	0.224
2 nd QM	0.004	0.002	0.005	0.002	0.002	0.002	0.002	0.003	0.005	0.004	0.004	0.032	0.044	0.071	0.05
3 rd QM	0.002	0.003	0.002	0.003	0.002	0.002	0.003	0.004	0.004	0.004	<0.002	<0.002	0.004	0.032	0.07
4 th QM	0.104	0.104	0.111	0.154	0.139	0.138	0.16	0.153	0.139	0.143	0.133	0.141	0.137	0.309	0.309
5 th QM	0.098	0.102	0.138	0.142	0.135	0.156	0.142	0.148	0.163	0.135	0.14	0.14	0.13	0.297	0.291
6 th QM	0.0059	0.0038	0.0058	0.011	0.002	0.0021	0.0076	0.002	0.002	0.002	0.002	0.002	0.002	NS	NS
7 th QM	0.007	0.006	0.008	0.01	0.009	0.007	0.01	0.011	0.009	0.07	0.008	0.009	0.012	0.084	0.073
8 th QM	0.168	0.092	0.176	0.115	0.148	0.112	0.134	0.099	0.093	0.023	0.067	0.078	0.135	0.302	NS
9 th QM	0.203	0.302	0.347	0.336	0.317	0.298	0.396	0.323	0.331	0.35	0.275	0.258	0.228	0.359	0.607

Monitoring Periods	Sampling Locations ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
10 th QM	0.01	0.009	0.017	0.014	0.006	0.01	0.007	0.006	0.012	0.008	0.015	0.098	0.02	0.142	NS
11 th QM	0.009	0.007	0.01	0.007	0.006	0.005	0.006	0.007	0.007	0.008	0.007	0.011	0.01	0.126	0.151
12 th QM	0.024	0.034	0.03	0.036	0.046	0.041	0.048	0.044	0.056	0.038	0.056	0.05	0.05	0.033	0.129
13 th QM	0.002	0.001	0.003	0.001	0.003	0.002	0.003	0.009	0.003	<LOQ	0.001	0.0001	0.001	0.009	NS
14 th QM	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.002	0.002	0.003	0.011	0.011	0.005	0.004	0.019
15 th QM	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.003	0.169	0.175
16 th QM	0.002	0.001	0.004	0.001	0.003	0.001	0.007	0.003	0.005	0.002	0.003	0.002	0.003	0.001	NS
17 th QM	0.002	0.001	0.02	0.018	0.008	0.041	0.012	0.015	0.03	0.01	0.016	0.015	0.017	0.062	NS
18 th QM	0.003	0.007	0.017	0.013	0.01	0.012	0.011	0.014	0.019	0.008	0.017	0.009	0.009	0.018	0.014
19 th QM	0.004	0.005	0.007	0.005	0.003	0.007	0.003	0.004	0.006	0.004	0.005	0.007	0.015	0.013	0.017
20 th QM	0.003	0.002	0.004	0.003	0.003	0.002	0.002	0.003	0.002	0.002	0.003	0.003	0.002	0.002	NS
21 st QM	0.001	0.003	0.002	0.009	0.003	0.009	0.12	0.006	0.004	0.003	0.004	0.002	0.006	0.001	NS
22 nd QM	0.001	0.002	0.001	0.001	0.001	0.003	0.001	0.002	0.001	0.002	0.003	0.002	0.014	0.019	0.008
23 rd QM	0.008	0.007	0.009	0.008	0.006	0.004	0.006	0.008	0.007	0.008	0.006	0.005	0.007	0.043	0.056
25 th QM	0.006	0.004	0.007	0.005	0.007	0.008	0.019	0.009	0.01	0.013	0.005	0.003	0.009	0.011	NS
26 th QM	0.002	0.005	0.006	0.008	0.006	0.005	0.018	0.008	0.004	0.003	0.006	0.007	0.004	0.02	0.013
27 th QM	0.016	0.017	0.018	0.015	0.017	0.019	0.019	0.017	0.022	0.019	0.007	0.015	0.002	0.001	0.001
28 th QM	0.029	0.029	0.036	0.016	0.014	0.012	0.0140.	0.003	0.014	0.013	0.015	0.014	0.014	0.018	NS
29 th QM	0.017	0.019	0.019	0.012	0.012	0.016	0.022	0.015	0.016	0.022	0.002	0.023	0.011	0.005	0.5
30 th QM	0.009	0.019	0.002	0.003	0.002	0.002	0.003	0.004	0.005	0.004	0.005	0.008	0.019	0.004	0.005
31 st QM	0.013	0.01	0.011	0.009	0.007	0.011	0.014	0.006	0.007	0.008	0.01	0.013	0.01	0.011	0.009
32 nd QM	0.009	0.009	0.01	0.008	0.003	0.008	0.004	0.007	0.009	0.01	0.012	0.017	0.01	0.009	NS
33 rd QM	0.006	0.005	0.006	0.007	0.009	0.007	0.007	0.006	0.008	0.003	0.002	0.006	0.001	0.001	NS
34 th QM	0.004	0.003	0.004	0.006	0.002	0.003	0.005	0.005	0.004	0.007	0.006	0.024	0.01	0.012	0.003
35 th QM	0.006	0.007	0.007	0.006	0.007	0.005	0.007	0.008	0.006	0.004	0.006	0.005	0.006	0.008	0.007
36 th QM	0.008	0.009	0.007	0.01	0.012	0.007	0.006	0.01	0.009	0.003	0.004	0.007	0.004	0.005	NS
37 th QM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
38 th QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
39 th QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
40 th QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
41 st QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NS
42 nd QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
43 rd QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
44 th QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
45 th QM	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Standard (ECR'2023)	N/A												0.05 mg/l (Coastal Reserved area)		

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location

[illegible]

Monitoring Periods	Sampling Location ID														
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9	SL-10	SL-11	SL-12	SL-13	SL-14	SL-15
39 th QM	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
40 th QM	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
41 st QM	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NS
42 nd QM	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
43 rd QM	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
44 th QM	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
45 th QM	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Standards (ECR'2023)	0.0001 mg/l (Coastal Industrial and others)												0.0001 mg/l (Coastal Reserved area)		

Source: Field Survey; from 2014 up to July 2025; Note: QM= Quarterly Monitoring, NS – Not Surveyed; SL-Sampling location

Parameters for Ground Water Quality Monitoring

Table B.16: pH and Temperature (°C) of Ground Water

pH					Temperature (°C)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
1 st QM	7.6	7.6	7.6	6.3	1 st QM	27.3	29.6	29.2	27.5
2 nd QM	7.7	7.8	7.7	6.5	2 nd QM	28.5	29.9	28.9	28.7
3 rd QM	7.9	8	8	NF	3 rd QM	26	28	28	NF
4 th QM	8	8.2	8.1	NF	4 th QM	24.5	22.5	25.1	NF
5 th QM	TC	7.8	7.9	NF	5 th QM	TC	28.6	28.8	NF
6 th QM	8.1	8.3	8.3	NF	6 th QM	31	28	30	NF
7 th QM	7.49	7.93	7.7	NF	7 th QM	30	27.8	28.7	NF
8 th QM	7.6	8.1	7.9	NF	8 th QM	24	23	25	NF
9 th QM	7.8	8.3	8.2	NF	9 th QM	29.8	29.6	30.1	NF
10 th QM	7.8	8.1	7.9	NF	10 th QM	28.6	29.1	29.4	NF
11 th QM	8.4	7.9	7.9	NF	11 th QM	29.1	30.4	29.8	NF
12 th QM	8.1	7.5	7.6	NF	12 th QM	25.1	24.3	24	NF
13 th QM	7.4	7.8	7.4	NF	13 th QM	28.7	27.7	28.4	NF
14 th QM	8.2	8.1	7.8	NF	14 th QM	27.2	26.5	26.4	NF
15 th QM	6.9	7.4	7.2	NF	15 th QM	22.9	23.8	23.6	NF
16 th QM	NF	6.9	7.2	NF	16 th QM	NF	30.3	30.1	NF
17 th QM	NF	7.9	7.6	NF	17 th QM	NF	29.3	29.7	NF
18 th QM	NF	7.3	7.6	NF	18 th QM	NF	30	29	NF
19 th QM	7.1	6.9	6.5	NF	19 th QM	23.8	23.7	23.2	NF

pH					Temperature (°C)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
20 th QM	8.3	8.4	8.9	NF	20 th QM	29	30	30	NF
21 st QM	8.2	7.9	8.1	NF	21 st QM	31.4	30	31.2	NF
22 nd QM	7.2	7.6	7.4	NF	22 nd QM	27	27	26	NF
23 rd QM	7.8	7.3	7.5	NF	23 rd QM	24	23	23	NF
25 th QM	8.1	8	8	NF	25 th QM	31	30	30	NF
26 th QM	7.4	8	8	NF	26 th QM	27	28	27	NF
27 th QM	7.2	7.5	7.5	NF	27 th QM	22	25	25	NF
28 th QM	8	8.3	8.2	NF	28 th QM	23	23	24	NF
29 th QM	5.6	6.2	7.4	NF	29 th QM	31.3	30.45	30.72	NF
30 th QM	8	8.6	9.1	NF	30 th QM	28.89	27.7	28.04	NF
31 st QM	7.7	8.1	8.1	NF	31 st QM	23	24	25	NF
32 nd QM	7.7	7.4	8.2	NF	32 nd QM	29	31.48	29.37	NF
33 rd QM	7.26	7.8	7.7	NF	33 rd QM	32	30	29	NF
34 th QM	7.1	8.1	8	NF	34 th QM	26	26.69	26	NF
35 th QM	8.4	9.0	8.1	NF	35 th QM	31	27.3	26.9	NF
36 th QM	8.1	8.7	8.3	NF	36 th QM	29	30	30.13	NF
37 th QM	7.4	7.6	7.1	NF	37 th QM	29	30	30.1	NF
38 th QM	7.9	8.1	8.2	NF	38 th QM	31.5	30.86	28.1	NF
39 th QM	8.1	8.2	8.1	NF	39 th QM	28	29	28	NF
40 th QM	8.1	7.6	7.9	NF	40 th QM	30	28.28	26.9	NF
41 st QM	7.7	7.56	7.06	NF	41 st QM	28	29	29	NF
42 nd QM	7.7	7.56	7.06	NF	42 nd QM	28	28.95	28.5	NF
43 rd QM	8.6	8.33	9.2	NF	43 rd QM	29.2	26.28	26.6	NF
44 th QM	7.4	7.6	7.2	NF	44 th QM	7.4	7.6	7.2	NF
45 th QM	7.8	7.8	7.8	NF	45 th QM	29.43	32.08	29.06	NF
46 th QM	8.1	7.86	8	NF	46 th QM	28	29	30	NF
Standard (ECR'2023)	6.5-8.5				Standard (ECR'2023)	(20°C-30°C) mg/l			

Source: Field Survey; from April 2014 up to October 2025; Note: QM=Quarterly Monitoring, NF=Not Functional.

Table B.17: Salinity (ppt.) and DO (mg/l) in Groundwater

Salinity (ppt.)					DO (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
1 st QM	0	0	0	0	1 st QM	4.4	6	6.4	4.4
2 nd QM	0	0	0	0	2 nd QM	5.2	6.2	6.5	6
3 rd QM	0	0	0	NF	3 rd QM	6.5	7.7	6.1	NF
4 th QM	1	0	0	NF	4 th QM	6.7	6.3	6.5	NF
5 th QM	TC	0	0	NF	5 th QM	TC	6	6.6	NF
6 th QM	0	0	0	NF	6 th QM	6	5.9	6	NF
7 th QM	0	0	0	NF	7 th QM	5.4	6.1	5.6	NF
8 th QM	0	0	0	NF	8 th QM	4.9	5.2	4.8	NF
9 th QM	0	0	0	NF	9 th QM	6.1	5.8	5.6	NF
10 th QM	0	0	0	NF	10 th QM	5.8	6.1	5.7	NF
11 th QM	0	0	0	NF	11 th QM	6.3	5.8	6.1	NF
12 th QM	0	0	0	NF	12 th QM	4.5	4.8	4.6	NF
13 th QM	0	0	0	NF	13 th QM	5.1	5.3	5.7	NF
14 th QM	0	0	0	NF	14 th QM	6.2	5.8	6.2	NF
15 th QM	0	0.3	0.4	NF	15 th QM	5.2	4.47	4.26	NF
16 th QM	NF	0.3	0.2	NF	16 th QM	NF	6	5.4	NF
17 th QM	NF	0.1	0.1	NF	17 th QM	NF	6	5.9	NF
18 th QM	NF	0.1	0.1	NF	18 th QM	NF	5.9	6.1	NF
19 th QM	0.1	0.1	0.1	NF	19 th QM	6	6.1	6.2	NF
20 th QM	0.1	0.5	0.7	NF	20 th QM	6	6.5	6.2	NF
21 st QM	0.1	0.1	0.1	NF	21 st QM	6.1	6	6	NF
22 nd QM	0	0	0	NF	22 nd QM	6	6.2	6	NF
23 rd QM	0.1	0.1	0.1	NF	23 rd QM	6	6.1	6	NF
25 th QM	0.1	0.1	0.1	NF	25 th QM	6	6.1	6.1	NF
26 th QM	0.18	0.1	0.1	NF	26 th QM	6	6.2	6	NF
27 th QM	0.1	0.2	0.4	NF	27 th QM	6.4	6.7	4.9	NF
28 th QM	0.1	0.3	0.3	NF	28 th QM	6.4	6.3	6.3	NF
29 th QM	0.1	0.2	0.4	NF	29 th QM	6	6	5	NF
30 th QM	0	0	0	NF	30 th QM	6.5	7.7	6.1	NF
31 st QM	0.1	0.2	0.4	NF	31 st QM	6.2	4.7	3.5	NF
32 nd QM	0.3	0.2	0.4	NF	32 nd QM	4	2.99	3.8	NF
33 rd QM	0.4	0.2	0.1	NF	33 rd QM	2.6	5.9	6	NF
34 th QM	0.2	0.2	0.4	NF	34 th QM	3.2	5	3.8	NF

Salinity (ppt.)					DO (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
35 th QM	0.6	0.2	0.4	NF	35 th QM	5.99	5.8	3.8	NF
36 th QM	0.6	0.2	0.4	NF	36 th QM	3.1	2	2.2	NF
37 th QM	0.2	0.1	0.4	NF	37 th QM	4.1	4	3.8	NF
38 th QM	0.1	0.2	0.4	NF	38 th QM	5.15	4.8	3.6	NF
39 th QM	0.1	0.1	0.5	NF	39 th QM	4.5	4.6	4.8	NF
40 th QM	0.6	0.2	0.4	NF	40 th QM	3.91	7	2.5	NF
41 st QM	0.1	0.2	0.4	NF	41 st QM	6.2	3.19	3.5	NF
42 nd QM	0.1	0.2	0.4	NF	42 nd QM	6.2	3.19	3.5	NF
43 rd QM	0.2	0.2	0.4	NF	43 rd QM	2.65	3	4.6	NF
44 th QM	0.2	0.2	0.4	NF	44 th QM	5.1	2.8	2.8	NF
45 th QM	0.2	0.4	0.2	NF	45 th QM	4.66	4.66	4.66	NF
46 th QM	0.1	0.2	0.4	NF	46 th QM	5.72	5.58	2.5	NF
Standard (ECR'2023)	N/A				Standard (ECR'2023)	N/A			

Source: Field Survey; from April 2014 up to October 2025; Note: QM=Quarterly Monitoring, NF=Not Functional.

Table B.18: TDS (mg/l) and TSS (mg/l) in Groundwater

TDS (mg/l)					TSS (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
1 st QM	1113	4090	643	1055	1 st QM	-	-	-	-
2 nd QM	999	371	635	970	2 nd QM	6	6	8	48
3 rd QM	-	-	-	-	3 rd QM	19	2	6	NF
4 th QM	1021	378	600	NF	4 th QM	40	28	32	NF
5 th QM	NO	390	600	NF	5 th QM	NF**	4	6	NF
6 th QM	881	574	328	NF	6 th QM	23	16	14	NF
7 th QM	377	1007	611	NF	7 th QM	4	5	4	NF
8 th QM	447	491	284	NF	8 th QM	31	46	41	NF
9 th QM	1025	384	645	NF	9 th QM	3	4	3	NF
10 th QM	1000	408	607	NF	10 th QM	5	4	4	NF
11 th QM	617	382	636	NF	11 th QM	7	4	5	NF
12 th QM	623	401	998	NF	12 th QM	32	28	25	NF
13 th QM	395	617	558	NF	13 th QM	4	10	9	NF
14 th QM	602	996	390	NF	14 th QM	8	10	9	NF

TDS (mg/l)					TSS (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
15 th QM	405	602	994	NF	15 th QM	12	6	7	NF
16 th QM	NF	615	370	NF	16 th QM	NF	12	5	NF
17 th QM	NF	390	608	NF	17 th QM	NF	2	3	NF
18 th QM	NF	365	610	NF	18 th QM	NF	6	8	NF
19 th QM	1315	376	927	NF	19 th QM	3	3	4	NF
20 th QM	915	380	610	NF	20 th QM	3	2	4	NF
21 st QM	25	602	360	NF	21 st QM	2	1	4	NF
22 nd QM	900	385	603	NF	22 nd QM	4	3	4	Nf
23 rd QM	3080	660	370	NF	23 rd QM	2	3	2	NF
25 th QM	1196	701	316	NF	25 th QM	1	3	1	NF
26 th QM	139	335	202	NF	26 th QM	3	5	2	NF
27 th QM	200	350	610	NF	27 th QM	1	2	5	NF
28 th QM	810	450	570	NF	28 th QM	1	1	1	NF
29 th QM	890	360	610	NF	29 th QM	1	1	2	NF
30 th QM	350	615	860	NF	30 th QM	1	4	3	NF
31 st QM	0.86	350	620	NF	31 st QM	1	1	1	NF
32 nd QM	1150	360	620	NF	32 nd QM	2	1	2	NS
33 rd QM	350	620	900	NF	33 rd QM	1	2	1	NF
34 th QM	885	620	510	NF	34 th QM	1	1	3	NF
35 th QM	370	900	630	NF	35 th QM	1	1	1	NF
36 th QM	890	350	1300	NF	36 th QM	1	1	3	NF
37 th QM	272	392	650	NF	37 th QM	1	1	2	NF
38 th QM	240	500	670	NF	38 th QM	1	1	2	NF
39 th QM	960	615	370	NF	39 th QM	1	2	1	NF
40 th QM	940	410	620	NF	40 th QM	1	1	2	NF
41 st QM	190	365	650	NF	41 st QM	1	1	2	NF
42 nd QM	365	680	950	NF	42 nd QM	2	1	1	NF
43 rd QM	350	620	330	NF	43 rd QM	1	1	1	NF
44 th QM	400	400	400	NF	44 th QM	1.7	1.3	1	NF
45 th QM	320	410	690	NF	45 th QM	1	4	7	NF
Standard (ECR'2023)	1000				Standard (ECR'2023)	10 mg/l			

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NF=Not Functional.

Table B.19: TH (mg/l) and COD (mg/l) concentrations in Groundwater

TH (mg/l)					COD (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
1 st QM	425	220	190	780	1 st QM	32	28	48	32
2 nd QM	250	175	140	450	2 nd QM	32	28	32	36
3 rd QM	300	180	180	NF	3 rd QM	34	18	34	NF
4 th QM	235	110	125	NF	4 th QM	20	16	20	NF
5 th QM	NO	138	216	NF	5 th QM	NO	14	18	NF
6 th QM	225	125	115	NF	6 th QM	12	10	14	NF
7 th QM	325	450	480	NF	7 th QM	4	8	4	NF
8 th QM	295	195	225	NF	8 th QM	4	4	4	NF
9 th QM	305	263	163	NF	9 th QM	4	4	4	NF
10 th QM	320	248	28	NF	10 th QM	4	4	2	NF
11 th QM	175	295	183	NF	11 th QM	4	4	4	NF
12 th QM	550	510	620	NF	12 th QM	4	4	4	NF
13 th QM	720	420	654	NF	13 th QM	4	4	4	NF
14 th QM	145	240	215	NF	14 th QM	8	8	16	NF
15 th QM	NF	265	305	NF	15 th QM	NF	4	4	NF
16 th QM	NF	195	215	NF	16 th QM	NF	4	4	NF
17 th QM	NF	235	170	NF	17 th QM	NF	4	4	NF
18 th QM	NF	178	138	NF	18 th QM	NF	4	4	NF
19 th QM	355	215	270	NF	19 th QM	4	3	4	NF
20 th QM	235	182	167	NF	20 th QM	352	4	4	NF
21 st QM	97	167	212	NF	21 st QM	4	4	4	NF
22 nd QM	145	245	137	NF	22 nd QM	4	4	4	NF
23 rd QM	137	118	145	NF	23 rd QM	4	4	4	NF
25 th QM	625	210	237	NF	25 th QM	4	4	4	NF
26 th QM	232	185	207	NF	26 th QM	4	4	4	NF
27 th QM	160	145	130	NF	27 th QM	4	4	4	NF
28 th QM	1400	1600	1200	NF	28 th QM	16	32	8	NF
29 th QM	160	195	140	NF	29 th QM	32	28	36	NF
30 th QM	70	243	155	NF	30 th QM	4	20	28	NF
31 st QM	180	200	210	NF	31 st QM	12	8	28	NF
32 nd QM	320	165	275	NF	32 nd QM	32	28	32	NF
33 rd QM	225	415	515	NF	33 rd QM	4	4	4	NF
34 th QM	265	130	110	NF	34 th QM	4	4	4	NF

TH (mg/l)					COD (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
35 th QM	215	445	348	NF	35 th QM	16	12	8	NF
36 th QM	237	190	1200	NF	36 th QM	32	28	36	NF
37 th QM	160	185	190	NF	37 th QM	4	20	12	NF
38 th QM	170	170	185	NF	38 th QM	28	24	12	NF
39 th QM	1200	715	240	NF	39 th QM	72	48	64	NF
40 th QM	320	210	200	NF	40 th QM	28	39	48	NF
41 st QM	160	160	160	NF	41 st QM	4	4	4	NF
42 nd QM	225	315	415	NF	42 nd QM	4	4	4	NF
43 rd QM	250	550	270	NF	43 rd QM	16	64	12	NF
44 th QM	225	300	190	NF	44 th QM	12	48	12	NF
45 th QM	150	145	130	NF	45 th QM	8	4	4	NF
Standard (ECR'2023)	500				Standard (ECR'2023)	N/A			

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NF=Not Functional.

Table B.20: NO₃⁻ (mg/l) and SO₄²⁻ (mg/l) Concentrations in Groundwater

NO ₃ ⁻ (mg/l)					SO ₄ ²⁻ (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
1 st QM	0.2	0.6	0.8	0.4	1 st QM	-	-	-	NF
2 nd QM	0.48	0.68	0.4	0.56	2 nd QM	3	2	10	3
3 rd QM	<0.10	0.31	0.8	NF	3 rd QM	-	-	-	NF
4 th QM	28	26	13	NF	4 th QM	-	-	-	-
5 th QM	-	-	-	NF	5 th QM	-	-	-	-
6 th QM	7.6	2.2	4.7	NF	6 th QM	-	-	-	-
7 th QM	4.3	4.2	3.8	NF	7 th QM	1	2	2	-
8 th QM	2.1	1.9	2.8	NF	8 th QM	5	6	2	NF
9 th QM	1.7	2.3	1.9	NF	9 th QM	1	2	8	NF
10 th QM	3.8	3.3	3.7	NF	10 th QM	1	1	1	NF
11 th QM	6.1	7.51	10.16	NF	11 th QM	1	1	1	NF
12 th QM	4.65	7.02	4.65	NF	12 th QM	1	1		NF
13 th QM	9.32	14.7	10.2	NF	13 th QM	5	1	3	NF
14 th QM	3.3	2.5	4.6	NF	14 th QM	1	1	2	NF
15 th QM	5.9	7.2	1.7	NF	15 th QM	8	2	6	NF
16 th QM	NF	5.3	5.7	NF	16 th QM	NF	2	4	NF

NO ₃ ⁻ (mg/l)					SO ₄ ²⁻ (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
17 th QM	NF	8.6	7.8	NF	17 th QM	NF	4	6	NF
18 th QM	NF	0.9	1.4	NF	18 th QM	NF	1	1	NF
19 th QM	1.7	4.4	2.1	NF	19 th QM	1	2	1	NF
20 th QM	4.4	2.7	8.3	NF	20 th QM	4	1	4	NF
21 st QM	1.4	2.7	1.7	NF	21 st QM	1	2	1	NF
22 nd QM	1.8	3.1	1.6	NF	22 nd QM	2	2	1	NF
23 rd QM	1.9	1.4	2.7	NF	23 rd QM	2	3	2	NF
25 th QM	1.7	7.5	1.7	NF	25 th QM	4	3	4	NF
26 th QM	0.5	3.8	3.1	NF	26 th QM	9	3	3	NF
27 th QM	2.4	2.2	4.9	NF	27 th QM	1	1	7	NF
28 th QM	1	1	2	NF	28 th QM	1	1	1	NF
29 th QM	1.5	2.1	2.1	NF	29 th QM	1	4	3	NF
30 th QM	3.7	4.1	2.6	NF	30 th QM	2.2	6.3	2.6	NF
31 st QM	12.09	4.02	8.83	NF	31 st QM	14.94	4.22	9.51	NF
32 nd QM	4.331	12.304	1.9372	NF	32 nd QM	2.1054	6.83	1.76	NF
33 rd QM	4.88	0.801	4.33	NF	33 rd QM	1.41	1.36	3.31	NF
34 th QM	15.51	1.22	4.82	NF	34 th QM	0.2	1.9	1.0	NF
35 th QM	1.34	1.34	1.34	NF	35 th QM	5.25	5.57	11	NF
36 th QM	2.003	0.7807	6.31	NF	36 th QM	14.7	0.89	3.94	NF
37 th QM	ND	1.9	10.5	NF	37 th QM	5.4	1.8	5.0	NF
38 th QM	8.56	0.1	4	NF	38 th QM	1.34	3.11	3.03	NF
39 th QM	3.001	3.001	3.001	NF	39 th QM	2.39	143	5.68	NF
40 th QM	1	1	2	NF	40 th QM	3.5	5.8	0.65	NF
41 st QM	6	6	6	NF	41 st QM	3.50	5.80	0.65	NF
42 nd QM	0.4863	0.4863	0.4863	NF	42 nd QM	16.92	1.29	3.64	NF
43 rd QM	1.98	2.34	6.23	NF	43 rd QM	0.49	2.59	3.58	NF
44 th QM	1.1	1.4	1.1	NF	44 th QM	3.1	2.9	3.0	NF
45 th QM	4.1	1.7	0.3	NF	45 th QM	2.95	0.48	14.90	NF
Standard (ECR'2023)	45 mg/l				Standard (ECR'2023)	250 mg/l			

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NF=Not Functional.

Table B.21: PO₄³⁻ (mg/l) and as (mg/l) Concentrations in Groundwater

PO ₄ ³⁻ (mg/l)					As (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
1 st QM	NF	-	-	NF	1 st QM	0.013	0.006	0.036	0.376
2 nd QM	2.2	2.5	6.2	1.2	2 nd QM	0.02	0.009	0.033	0.407
3 rd QM	-	-	-	NF	3 rd QM	0.012	0.006	0.02	NF
4 th QM	0.74	0.44	0.48	NF	4 th QM	0.014	0.008	0.017	NF
5 th QM	NO	1.98	4.54	NF	5 th QM	NO	0.01	0.034	NF
6 th QM	1.4	1.6	4.1	NF	6 th QM	0.015	0.014	0.024	NF
7 th QM	0.31	0.27	0.48	NF	7 th QM	0.002	0.012	0.011	NF
8 th QM	0.267	0.179	0.179	NF	8 th QM	0.008	0.002	0.002	NF
9 th QM	1.08	1.53	3.26	NF	9 th QM	0.018	0.007	0.047	NF
10 th QM	0.17	0.29	0.31	NF	10 th QM	0.012	0.018	0.005	NF
11 th QM	0.167	0.67	0.6	NF	11 th QM	0.033	0.011	0.016	NF
12 th QM	1.18	1.21	1.18	NF	12 th QM	0.028	0.005	0.028	NF
13 th QM	2.18	1.8	2.1	NF	13 th QM	0.012	0.022	0.01	NF
14 th QM	1.68	3.5	4.7	NF	14 th QM	0.014	0.004	0.027	NF
15 th QM	0.13	0.17	0.18	NF	15 th QM	0.002	0.012	0.002	NF
16 th QM	NF	4.5	0.27	NF	16 th QM	0.001	0.022	0.001	NF
17 th QM	NF	2.9	4.8	NF	17 th QM	NF	0.012	0.004	NF
18 th QM	NF	0.15	0.26	NF	18 th QM	NF	0.007	0.05	NF
19 th QM	2.1	1.3	3.6	NF	19 th QM	0.014	0.003	0.004	NF
20 th QM	2.3	2.5	3.2	NF	20 th QM	0.012	0.012	0.012	NF
21 st QM	0.3	4	2	NF	21 st QM	0.014	0.006	0.022	NF
22 nd QM	1	0.5	1.5	NF	22 nd QM	0.001	0.027	0.001	NF
23 rd QM	1.1	0.4	0.9	NF	23 rd QM	0.018	0.006	0.033	NF
25 th QM	0.3	1.5	1.7	NF	25 th QM	0.02	0.068	0.003	NF
26 th QM	0.7	6.3	2.3	NF	26 th QM	0.022	0.045	0.004	NF
27 th QM	2	1.8	2.3	NF	27 th QM	0.003	0.053	0.006	NF
28 th QM	1.4	0.98	4	NF	28 th QM	0.002	0.004	0.049	NF
29 th QM	1.7	1.2	5	NF	29 th QM	0.002	0.003	0.008	NF
30 th QM	0.9	1.4	0.6	NF	30 th QM	0.012	0.003	0.061	NF
31 st QM	1	0.6	1.4	NF	31 st QM	0.003	0.063	0.014	NF
32 nd QM	0.8	1.4	0.3	NF	32 nd QM	0.016	0.003	0.048	NF
33 rd QM	1.2	0.5	1.36	NF	33 rd QM	0.008	0.003	0.064	NF
34 th QM	0.7548	0.5	1.5	NF	34 th QM	0.02	0.00	0.05	NF

PO ₄ ³⁻ (mg/l)					As (mg/l)				
Monitoring periods	Sampling location ID				Monitoring periods	Sampling location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
35 th QM	0.757	0.5	1.3	NF	35 th QM	0.019	0.003	0.056	NF
36 th QM	0.0	0.4	1.3	NF	36 th QM	0.005	0.002	0.042	NF
37 th QM	0.00	0.7	1.4	NF	37 th QM	0.00	0.00	0.1	NF
38 th QM	0	0.6	4.39	NF	38 th QM	0.001	0.002	0.056	NF
39 th QM	0.1	0.1	0.1	NF	39 th QM	0.004	0.004	0.004	NF
40 th QM	1.2	1.9	1.9	NF	40 th QM	0.001	0.003	0.048	NF
41 st QM	1.4	<0.0003	0.6	NF	41 st QM	0.003	0.002	0.050	NF
42 nd QM	0.0225	0.546	1.3771	NF	42 nd QM	0.001	0.047	0.002	NF
43 rd QM	0.02	0.02	0.02	NF	43 rd QM	0.003	0.043	0.002	NF
44 th QM	1.4	1.8	2.7	NF	44 th QM	0.005	0.055	0.001	NF
45 th QM	1.32	0.41	Undetectable	NF	45 th QM	0	0.005	0.053	NF
Standard (ECR'2023)					Standard (ECR'2023)				
N/A					0.05 mg/l				

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NF=Not Functional.

Table B.22: Pb (mg/l) and Hg (mg/l) Concentrations in Groundwater

PB (mg/l)					Hg (mg/l)				
Monitoring Periods	Sampling location ID				Monitoring Periods	Sampling Location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
1 st QM	0.002	<0.002	<0.002	0.002	1 st QM	<0.00015	<0.00015	<0.00015	<0.00015
2 nd QM	<0.002	<0.002	0.004	0.008	2 nd QM	<0.00015	<0.00015	<0.00015	<0.00015
3 rd QM	0.004	<0.002	<0.002	NF	3 rd QM	<0.0005	<0.0005	<0.0005	NF
4 th QM	0.023	0.016	0.013	NF	4 th QM	<0.0005	<0.0005	<0.0005	NF
5 th QM	NO	0.013	0.017	D	5 th QM	<0.0005	<0.00015	<0.00015	NF
6 th QM	0.002	0.0027	0.002	D	6 th QM	0.00015	0.00015	0.00015	NF
7 th QM	0.006	0.021	0.005	NF	7 th QM	<0.00015	<0.00015	<0.00015	NF
8 th QM	0.026	0.011	0.012	NF	8 th QM	<0.00015	<0.00015	<0.00015	NF
9 th QM	0.019	0.007	0.008	NF	9 th QM	<0.00015	<0.00015	<0.00015	NF
10 th QM	0.002	0.002	0.002	NF	10 th QM	<0.00015	<0.00015	<0.00015	NF
11 th QM	0.001	0.001	0.001	NF	11 th QM	<0.00015	<0.00015	<0.00015	NF
12 th QM	0.01	0.009	0.016	NF	12 th QM	<0.00015	<0.00015	<0.00015	NF
13 th QM	0.001	0.001	0.001	NF	13 th QM	0.001	0.001	0.001	NF
14 th QM	0.003	0.007	0.002	NF	14 th QM	<0.0001	<0.0001	<0.0001	NF
15 th QM	0.001	0.002	0.001	NF	15 th QM	<0.001	<0.001	<0.001	NF
16 th QM	0.001	0.001	0.001	NF	16 th QM	<0.001	<0.001		NF

PB (mg/l)					Hg (mg/l)				
Monitoring Periods	Sampling location ID				Monitoring Periods	Sampling Location ID			
	SL-1	SL-2	SL-3	SL-4		SL-1	SL-2	SL-3	SL-4
17 th QM	0.001	0.001	0.001	NF	17 th QM	<0.001	<0.001	<0.001	NF
18 th QM	NF	0.001	0.001	NF	18 th QM	<0.001	<0.001	<0.001	NF
19 th QM	NF	0.004	0.056	NF	19 th QM	<0.001	<0.001	<0.001	NF
20 th QM	0.008	0.003	0.004	NF	20 th QM	<0.001	<0.001	<0.001	NF
21 st QM	0.004	0.004	0.006	NF	21 st QM	0.001	0.003	0.001	NF
22 nd QM	0.018	0.002	0.001	NF	22 nd QM	<0.001	<0.001	<0.001	NF
23 rd QM	0.002	0.008	0.001	NF	23 rd QM	<0.001	<0.001	<0.001	NF
25 th QM	0.001	0.001	0.002	NF	25 th QM	<0.001	<0.001	<0.001	NF
26 th QM	0.001	0.001	0.001	NF	26 th QM	<0.001	<0.001	NF	NF
27 th QM	0.004	0.006	0.002	NF	27 th QM	<0.001	<0.001	<0.001	NF
28 th QM	0.048	0.016	0.056	NF	28 th QM	<0.001	<0.001	<0.001	NF
29 th QM	0.003	0.008	0.002	NF	29 th QM	<0.001	<0.001	<0.001	NF
30 th QM	0.009	0.002	0.001	NF	30 th QM	<0.001	<0.001	<0.001	NF
31 st QM	0.001	0.001	0.001	NF	31 st QM	<0.001	<0.001	<0.001	NF
32 nd QM	0.003	0.004	0.003	NF	32 nd QM	<0.001	<0.001	<0.001	NF
33 rd QM	0.8	1.4	0.3	NF	33 rd QM	0.008	0.003	0.064	NF
34 th QM	0.002	0.003	0.001	NF	34 th QM	<0.001	<0.001	<0.001	NF
35 th QM	0.002	0.002	0.003	NF	35 th QM	<0.001	<0.001	<0.001	NF
36 th QM	0.001	0.002	0.001	NF	36 th QM	<0.001	<0.001	<0.001	NF
37 th QM	<0.01	<0.02	<0.03	NF	37 th QM	<0.001	<0.001	<0.001	NF
38 th QM	<0.01	<0.01	<0.01	NF	38 th QM	<0.001	<0.001	<0.001	NF
39 th QM	<0.01	<0.01	<0.01	NF	39 th QM	<0.001	<0.001	<0.001	NF
40 th QM	<0.01	<0.01	<0.01	NF	40 th QM	<0.001	<0.001	<0.001	NF
41 st QM	<0.01	<0.01	<0.01	NF	41 st QM	<0.001	<0.001	<0.001	NF
42 nd QM	<0.01	<0.01	<0.01	NF	42 nd QM	<0.0001	<0.0001	<0.0001	NF
43 rd QM	<0.01	<0.01	<0.01	NF	43 rd QM	<0.0001	<0.0001	<0.0001	NF
44 th QM	<0.01	<0.01	<0.01	NF	44 th QM	<0.0001	<0.0001	<0.0001	NF
45 th QM	<0.01	<0.01	<0.01	NF	45 th QM	<0.0001	<0.0001	<0.0001	NF
Standard (ECR'2023)	0.01 mg/l				Standard (ECR'2023)	0.001 mg/l			

Source: Field Survey; from April 2014 up to July 2025; Note: QM= Quarterly Monitoring, NF=Not Functional.

Table B.23: PAH (mg/l) Concentrations of Monitored Locations

date		Acenaphthylene	Anthracene	Benzol (A) Anthracene	Benzol (A) Pyrene	Benzol (B) Fluoranthene	Benzol (G, H, I) Perilene	Benzol (K) Fluoranthene	Chrysene	Dibenzol (A, H) Anthracene	Fluorene	Phenanthrene	Pyrene
17 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
19 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
21 st QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
23 rd QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
25 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
31 st QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
33 rd QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
35 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
37 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
39 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

date		Acenaphthylene	Anthracene	Benzol (A) Anthracene	Benzol (A) Pyrene	Benzol (B) Fluoranthene	Benzol (G, H, I) Perilene	Benzol (K) Fluoranthene	Chrysene	Dibenzol (A, H) Anthracene	Fluorene	Phenanthrene	Pyrene
41 st QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
43 rd QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
45 th QM	Project Jetty	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Majhar point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Hiron point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Source: Field Survey; from April 2014 up to July 2025; Note: ND-not determined

Table B.24: TOC (mg/l) and TC (mg/l) Concentrations of Monitored Locations

Monitoring sites		Project jetty site	Majhar point	Hiron point
17 th QM	Total Carbon	21.8	21.9	NM
	Total Organic Carbon	19.5	25.1	NM
19 th QM	Total Carbon	20.7	24.8	6.8
	Total Organic Carbon	14.3	18.8	5.7
21 st QM	Total Carbon	17.2	21.7	NM
	Total Organic Carbon	13.6	18.1	NM
23 rd QM	Total Carbon	37.5	21.7	8.1
	Total Organic Carbon	26.4	18.1	6.7
25 th QM	Total Carbon	152	200	NM
	Total Organic Carbon	9.17	9.48	NM
27 th QM	Total Carbon	1302	1568	9241
	Total Organic Carbon	<5	<5	<5
29 th QM	Total Carbon	250	200	544
	Total Organic Carbon	<5	20.2	<5
31 st QM	Total Carbon	218	686	2901
	Total Organic Carbon	21.2	19.7	15.2
33 rd QM	Total Carbon	65	239	NM
	Total Organic Carbon	10.5	12.7	NM
35 th QM	Total Carbon	1403	1058	3759
	Total Organic Carbon	5	5	5

Monitoring sites		Project jetty site	Majhar point	Hiron point
37 th QM	Total Carbon	61	47	134
	Total Organic Carbon	<5	<5	<5
39 th QM	Total Carbon	Not Detectable	Not Detectable	Not Detectable
	Total Organic Carbon	9.38	5.1	5.38
41 st QM	Total Carbon	3.43	2.33	NS
	Total Organic Carbon	2.17	2.53	NS
43 rd QM	Total Carbon	2.11	1.28	2.17
	Total Organic Carbon	1.2	0.1	0.79
45 th QM	Total Carbon	2.38	1.09	1.55
	Total Organic Carbon	4.2	5.28	9.99

Source: Field Survey; from April 2014 up to July 2025

(C) Noise Level monitoring data

Table C.1: Ambient Noise Monitoring Status at the Monitored Locations

Sl No	Location	QM1 (Noise Level in dB (A)) Mar-14				QM2 (Noise Level in dB (A)) Jul-14				QM3 (Noise Level in dB (A)) Oct-14				QM4 (Noise Level in dB (A)) Jan-15				Standard (Noise Control Rules 2006)
		Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	80.32	60.86	63.22	68.13	52.71	55.62	50.27	52.87	53.37	53.52	57	54.63	51.92	53.7	54.21	53.28	70
2	NW Corner of the Project area	55.23	53	47.43	51.89	NM	NM	NM	NM	42.67	41.73	41.37	41.92	33.87	36.42	35.46	35.25	50
3	Chunkuri-2, Bajua	62.69	57.19	53.39	57.76	54.61	51.14	51.9	52.55	52.26	51.14	50.76	51.39	55.08	46.29	46.49	49.29	50
4	SW corner of the Project area	49.2	NM	NM	49.2	44.55	48.94	49.33	47.6	45.56	45.1	47.18	45.95	36.57	34.24	37.27	36.03	50
5	Township area, Project site	47.8	49.7	NM	48.75	46.15	47.21	NM	46.68	42.67	41.73	41.37	41.92	41.49	39.55	43.37	41.47	50
6	Barni, Gaurambha	64.95	50.93	60.65	58.84	48.73	50.37	50.75	49.95	50.18	50.89	48.27	49.78	43.36	38.56	48.86	43.6	50
7	Khan Jahan Ali Bridge, Khulna	76.12	66.72	72.25	71.7	55.97	64.68	61.75	60.8	72.24	58.3	68.3	66.28	61.34	63.4	60.41	61.72	70
8	Mongla Port area	69.38	54.55	59.79	61.24	54.75	54.2	52.58	53.84	66.8	55.2	59.5	60.5	40.26	35.04	40.76	38.69	75
9	Harbaria, Sundarbans	39.24	NM	42.51	40.88	59.25	60.52	48.62	56.13	54.08	56.51	NM	55.3	36.36	32.4	NM	34.38	45
10	Akram Point, Sundarbans	40.95	41.98	39.9	40.94	48.95	46.86	NM	47.9	45.27	42.69	NM	43.98	37.9	30.75	NM	34.32	45
11	Hiron Point, Sundarbans	35.99	40.75	39.16	38.63	51.29	NM	NM	51.29	47.98	39.42	NM	47.98	42.82	31.93	NM	37.37	45

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.2: Ambient Noise Monitoring Status at the Monitored Locations

Sl No	Location	QM 5 (Noise Level in dB (A)) Apr-15				QM 6 (Noise Level in dB (A)) Jul-15				QM 7 (Noise Level in dB (A)) Oct-15				QM 8 (Noise Level in dB (A)) Jan-16				Standard (Noise Control Rules 2006)
		Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	57.27	54.31	59.65	57.08	43.52	54.23	51.56	49.77	68.32	66.09	60.96	65.12	67.84	61.25	66.31	66.07	70
2	NW Corner of the Project area	45.05	42.15	46.8	44.67	37.58	40.91	46.18	41.56	41.51	39.58	44.74	41.94	53.91	49.02	49.95	50.96	50
3	Chunkuri-2, Bajua	45.9	48.19	NM	47.05	40.57	42.23	39.17	40.66	47.53	45.48	49.28	47.43	56.84	48.12	55.90	53.62	50
4	SW corner of the Project area	40.6	43.25	46.89	43.58	44.57	44.30	42.36	43.75	36.15	48.26	43.68	42.70	60.32	55.30	63.70	60.44	50
5	Township area, Project site	41.49	39.55	43.37	41.47	43.41	50.86	45.99	46.75	46.89	49.47	55.20	50.52	54.79	52.22	54.29	53.77	50
6	Barni, Gaurambha	58.23	50.11	NM	54.17	46.76	44.83	46.95	46.18	56.40	54.19	54.88	55.16	60.62	60.00	56.86	59.16	50
7	Khan Jahan Ali Bridge, Khulna	75.2	72.75	72.42	73.45	52.95	52.18	53.34	52.82	64.43	61.65	66.65	64.25	69.96	64.81	70.56	68.45	70
8	Mongla Port area	46.02	49.29	49.15	48.15	36.72	38.56	43.54	39.61	45.39	NM	48.63	47.01	54.15	51.82	52.14	52.70	75
9	Harbaria, Sundarbans	67.06	64.05	64.99	65.37	39.33	30.74	NM	35.03	54.97	46.54	NM	50.75	45.72	44.69	NM	45.20	45
10	Akram Point, Sundarbans	53.35	56.37	NM	54.86	NM	NM	NM	NM	45.28	53.92	NM	49.60	45.60	40.29	NM	42.95	45
11	Hiron Point, Sundarbans	47.48	48.2	NM	47.84	NM	NM	NM	NM	54.44	37.69	NM	46.06	NM	NM	NM	NM	45

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.3: Ambient Noise Monitoring Status at the Monitored Locations

Sl No	Location	QM9 (Noise Level in dB (A)) Apr-16				QM 10 (Noise Level in dB (A)) Jul-16				QM 11 (Noise Level in dB (A)) Oct-16				QM 12 (Noise Level in dB (A)) Jan-17				Standard (Noise Control Rules 2006)
		Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	67.71	61.23	66.31	65.08	50.92	50.04	52.3	51.42	60.1	68.6	67.8	65.5	54.4	61	61.46	58.95	70
2	NW Corner of the Project area	53.81	48.66	49.90	50.79	54.40	53.19	50.36	52.65	54.7	54.8	57.0	55.5	44.52	44.52	NM	44.52	50
3	Chunkuri-2, Bajua	43.30	43.35	46.84	44.49	56.29	49.4	54.51	53.4	50.4	47.7	56.6	51.6	55.73	56.2	NM	55.31	50
4	SW corner of the Project area	56.81	54.73	51.97	54.50	67.38	74.12	54.61	65.37	47.8	49.0	50.8	49.2	44.41	45.96	NM	45.19	50
5	Proposed Township area, Project site	55.02	52.41	52.69	53.37	62.71	52.98	51.67	55.79	45.8	41.6	48.7	45.4	NM	43.4	41.85	42.63	50
6	Barni, Gaurambha	50.63	54.19	57.09	53.97	51.2	59.54	59.53	56.75	52.4	57.3	55.0	54.9	49.75	48.35	NM	49.05	50
7	Khan Jahan Ali Bridge, Khulna	66.40	64.82	66.34	65.85	63.52	62.15	65.73	63.80	61.9	59.6	61.3	60.9	51.69	60.05	54.97	55.57	70
8	Mongla Port area	49.89	48.67	51.07	49.88	53.87	52.04	52.7	52.87	49.5	50.0	50.2	49.9	47.82	48.67	50.33	48.94	75
9	Harbaria, Sundarbans	44.40	44.69	NM	44.55	53.87	53.04	52.79	52.9	57.2	53.5	49.3	53.3	41.13	38.4	37.98	39.17	45
10	Akram Point, Sundarbans	45.60	40.29	NM	42.95	47.16	46.48	50.24	47.96	40.5	43.0	42.5	42.0	38.74	38.45	37.06	38.08	45
11	Hiron Point, Sundarbans	48.53	37.69	NM	43.11	NM	NM	NM	NM	46.1	42.08	41.9	44.0	43.62	40.96	42.29	42.29	45

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.4: Ambient Noise Monitoring Status at the Monitored Locations

Sl No	Location	QM13 (Noise Level in dB (A))				QM 14 (Noise Level in dB (A))				QM 15 (Noise Level in dB (A))				QM 16 (Noise Level in dB (A))				Standard (Noise Control Rules 2006)
		Apr-17				Oct-17				Jan-18				April-18				
		Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	58.21	59.00	66.57	61.62	47.65	51.06	50.27	49.66	60.2	60.2	60.5	60.3	64.09	59.30	65.43	62.94	70
2	NW Corner of the Project area	44.97	49.30	47.31	47.19	47.65	45.12	46.65	46.47	47.8	48.1	49.2	48.37	47.92	54.32	61.14	54.46	55
3	Chunkuri-2, Bajua	45.60	52.29	53.42	50.44	39.82	45.60	41.73	42.38	51.1	51.2	52.1	51.47	44.77	46	63.14	51.30	55
4	SW corner of the Project area	39.62	42.64	47.48	43.25	60.80	64.08	62.52	62.47	43.5	43.5	45.7	44.23	64.45	63.49	66.63	64.85	55
5	Project site near Shapmari area	41.40	43.09	43.45	42.65	43.05	48.52	45.01	45.53	53.2	54	52.82	53.34	51.95	59.66	56.8	56.13	55
6	Barni, Gaurambha	43.05	46.45	45.01	44.83	45.60	52.29	53.42	50.44	56.5	54.2	56.1	55.6	55.6	51.80	51.39	52.93	60
7	Khan Jahan Ali Bridge, Khulna	54.01	57.50	58.66	56.72	40.60	42.64	46.55	43.26	60.2	62.1	62.2	61.5	49.4	45.25	47.98	47.54	70
8	Mongla Port area	47.78	47.45	45.25	47.61	41.40	44.68	45.71	43.93	60.2	60.2	58.4	59.6	50.84	48.33	53.25	50.80	75
9	Harbaria, Sundarbans	50.79	53.67	57.84	54.10	44.25	46.67	47.31	46.08	45.8	44.7	43.8	44.7	50.23	45.55	65.43	53.73	50
10	Akram Point, Sundarbans	43.41	45.60	43.89	44.30	58.21	58.59	58.70	58.50	39.4	40.5	41.1	40.3	58.31	60.93	64.87	61.37	50
11	Hiron Point, Sundarbans	NM	NM	NM	NM	39.92	39.79	33.5	37.74	37.2	39	38.4	38.2	NM	NM	NM	NM	50

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.5: Ambient noise monitoring status at the monitored locations

Sl No	Location	QM 17 (Noise Level in dB (A))				QM 18 (Noise Level in dB (A))				QM 19 (Noise Level in dB (A))				QM 20 (Noise Level in dB (A))				Standard (Noise Control Rules 2006)
		July-18				Nov-18				Feb-19				Apr-19				
		Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	57.64	56.94	58.03	57.54	61.3	56.3	57.1	70	56.14	59.28	53.95	56.45	62.02	61.91	61.08	61.67	70
2	NW Corner of the Project area	42.80	47.51	46.57	45.63	56.5	60.1	59.85	55	45.15	54.11	53	50.75	53.70	58.92	57.92	56.85	55
3	Chunkuri-2, Bajua	46.23	49.02	47.34	47.53	45.8	48.9	51.3	55	50.19	49.35	51	50.18	49.66	54.02	51.35	51.68	55
4	SW corner of the Project area	58.84	48.00	51.03	52.63	64.5	60.6	60.2	55	53.50	58.01	55.88	55.79	58.08	54.79	55.27	56.05	55
5	Project site near Shapmari area	42.66	45.82	48.78	45.75	45.1	51.2	55.8	55	58.48	61.21	54.70	58.13	61.35	58.97	56.16	58.83	55
6	Barni, Gaurambha	42.67	47.95	45.90	45.51	58.3	50.6	50.2	60	54.32	57.65	45.75	52.57	58.58	51.05	49.92	53.18	60
7	Khan Jahan Ali Bridge, Khulna	64.1	64.06	61.90	63.35	64.6	60.9	60.9	70	65.72	69.04	66.03	66.93	67.95	63.09	69.82	66.95	70
8	Mongla Port area	63.12	59.00	60.77	60.96	55.8	53.1	59.0	75	64.33	63.37	70.85	66.18	64.12	62.41	65.45	63.99	75
9	Harbaria, Sundarbans	51.98	48.58	50.28	50.28	49.9	47.6	NM	50	51.43	47.90	NM	49.67	49.42	47.45	NM	48.43	50
10	Akram Point, Sundarbans	46.52	43.88	45.2	45.20	41.9	40.1	NM	50	47.35	45.55	NM	46.45	46.16	38.49	NM	42.33	50
11	Hiron Point, Sundarbans	NM	NM	NM	57.54	39.7	39.1	NM	50	33.8	44.62	NM	39.21	NM	NM	NM	-	50

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.6: Ambient noise monitoring status at the monitored locations

SI No	Location	QM 21 (Noise Level in dB (A)) July-19				QM 22 (Noise Level in dB (A)) November-19				QM 23 (Noise Level in dB (A)) February 20				QM 25 (Noise Level in dB (A)) July, 20				Standard (Noise Control Rules 2006)
		Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Day time	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	55.92	60.88	61.23	59.34	70	61.03	55.78	58.60	56.24	54.09	53.45	54.59	52.00	51.11	50.56	51.28	70
2	NW Corner of the Project area	56.44	53.21	55.88	55.18	55	53.45	50.97	51.11	40.96	43.33	51.98	45.42	43.9	42.95	43.26	43.37	55
3	Chunkuri-2, Bajua	56.15	63.34	58.60	59.36	55	52.92	54.51	55.27	59.78	51.59	54.96	55.44	49.42	48.52	48.32	48.75	55
4	SW corner of the Project area	66.94	58.41	65.65	63.66	55	49.98	42.05	46.57	56.35	54.05	56.40	55.60	49.91	49.78	50.85	50.18	55
5	Project site near Shapmari area	53.14	55.40	55.05	54.53	55	55.80	54.77	54.86	51.02	47.91	47.93	48.95	54.55	53.21	52.88	53.72	55
6	Barni, Gaurambha	51.36	57.98	NM	54.67	60	49.37	48.53	50.53	57.37	60.48	68.05	61.97	56.53	40.65	49.21	48.80	60
7	Khan Jahan Ali Bridge, Khulna	63.38	60.55	66.44	63.46	70	67.65	65.32	66.05	60.75	62.81	63.05	62.20	65.55	66.86	66.52	66.31	70
8	Mongla Port area	60.49	62.10	63.43	62.01	75	55.66	55.85	57.25	59.74	62.38	61.07	61.06	64.92	67.90	63.71	66.41	75
9	Harbaria, Sundarbans	47.62	42.18	NM	44.90	50	44.71	NM	44.10	45.59	42.29	41.35	43.94	47.80	52.15	41.2	49.97	50
10	Akram Point, Sundarbans	44.05	45.62	NM	44.84	50	42.60	NM	44.86	NM	36.59	40.46	36.59	51.04	45.11	43.1	51.04	50
11	Hiron Point, Sundarbans	NM	NM	NM	NM	50	41.34	NM	40.28	41.3	39.41	NM	40.34	NM	NM	NM	NM	50

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.7: Ambient noise monitoring status at the monitored locations

Sl No	Location	QM 26 (Noise Level in dB (A)) Oct, 2020				QM 27 (Noise Level in dB (A)) Jan, 2021				QM 28 (Noise Level in dB (A)) Apr, 2021				QM 29 (Noise Level in dB (A)) Jul, 2021				Standard (Noise Control Rules 2006)
		Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	65.91	51.62	56.93	58.15	58.33	NM	62.68	60.50	61.35	61.74	61.22	61.44	50.96	51.08	51.57	51.21	70
2	NW Corner of the Project area	47.82	50.15	47.45	48.48	45.00	52.75	56.51	51.42	50.65	48.34	NM	49.50	49.60	51.64	49.09	50.11	55
3	Chunkuri-2, Bajua	43.58	47.68	46.45	45.91	48.75	45.45	46.96	47.05	50.22	52.90	50.81	51.31	49.93	51.65	49.52	50.36	55
4	SW corner of the Project area	49.50	48.83	49.22	49.18	NM	50.88	53.84	52.36	55.41	54.85	55.45	55.24	49.82	54.82	51.07	51.90	55
5	Project site near Shapmari area	50.23	41.71	41.43	44.45	49.19	47.07	51.00	49.09	52.23	51.24	52.67	52.05	53.45	54.35	53.71	53.84	55
6	Barni, Gaurambha	67.71	51.76	55.51	58.33	51.69	51.99	55.60	53.09	54.16	51.69	51.15	52.34	52.73	NM	49.28	51.00	60
7	Khan Jahan Ali Bridge, Khulna	81.72	81.45	82.25	81.81	61.95	NM	61.93	61.94	56.08	54.09	53.79	54.65	52.78	51.29	53.05	52.38	70
8	Mongla Port area	74.72	75.67	80.37	76.92	55.16	56.85	57.53	56.52	54.01	52.41	54.48	53.63	55.26	55.54	55.68	54.49	75
9	Harbaria, Sundarbans	59.01	NM	50.06	54.54	46.98	41.82	NM	44.40	48.54	47.54	NM	48.04	NM	NM	NM	NM	50
10	Akram Point, Sundarbans	NM	42.23	NM	42.23	40.34	35.35	NM	37.85	45.95	40.89	NM	43.42	46.31	42.94	NM	44.62	50
11	Hiron Point, Sundarbans	52.40	49.01	NM	50.70	42.50	35.23	NM	38.85	NM	NM	NM	NM	49.70	51.2	NM	50.94	50

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.8: Ambient noise monitoring status at the monitored locations

SI No	Location	QM 30 (Noise Level in Db (A)) Oct, 2021				QM 31 (Noise Level in dB (A)) Jan, 2022				QM 32(Noise Level in dB (A)) May, 2022				QM 33(Noise Level in dB (A)) Jul, 2022				Standard (Noise Control Rules 2006)
		Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	68.9	52.08	58.3	64.57	56	59.05	64.08	59.71	56	61.25	59.97	59.08	52.71	52.62	53.30	52.88	70
2	NW Corner of the Project area	47.99	51.61	48.17	49.59	49	48.90	48.56	48.82	48.63	48.64	48.64	48.60	46.55	44.82	45.44	45.60	55
3	Chunkuri-2, Bajua	45.31	48.07	46.8	46.87	49.85	47.48	49.70	49.01	48.32	48.72	49.70	48.91	48.00	45.61	47.75	47.12	55
4	SW corner of the Project area	49.66	49.49	48.95	49.37	63.74	49.95	50.25	54.65	50.31	50.05	51.24	50.53	54.00	48.07	46.06	49.38	55
5	Project site near Shapmari area	50.94	42.29	41.88	47.17	50.05	50.57	49.45	50.03	49.70	49.34	50.24	49.76	44.50	45.75	43.49	44.58	55
6	Barni, Gaurambha	68.37	51.5	56.61	63.96	47.60	49.57	49.51	48.89	47.60	45.05	49.04	47.23	50.06	45.93	46.40	47.46	60
7	Khan Jahan Ali Bridge, Khulna	77.75	80.58	81.43	80.18	61.04	63.52	62.44	62.33	56.46	56.93	62.42	58.60	55.75	NM	NM	55.75	70
8	Mongla Port area	73.94	75.15	79.45	76.86	NM	53.89	58.02	55.95	55.95	56.99	59.19	57.38	55.41	55.09	54.75	55.08	75
9	Harbaria, Sundarbans	59.51	50.62	NM	57.02	49.85	44.77	NM	47.31	52.31	46.44	NM	49.37	42.95	38.59	NM	40.77	50
10	Akram Point, Sundarbans	44.22	42.12	NM	43.29	38.66	36.15	NM	37.41	46.22	39.94	NM	43.08	41.97	NM	41.01	41.49	50
11	Hiron Point, Sundarbans	53.99	49.41	NM	52.27	39.5	33.08	NM	36.29	NM	NM	NM	NM	NM	NM	NM	NM	50

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.9: Ambient noise monitoring status at the monitored locations

Sl. No	Location	QM 34 (Noise Level in dB (A)) Oct, 2022				QM 35 (Noise Level in dB (A)) Jan, 2023				QM 36 (Noise Level in dB (A)) Apr, 2023				QM 37 (Noise Level in dB (A)) Apr, 2023				Standard (Noise Control Rules 2006)
		Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	A. noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	78.1	72.2	76.2	75.5	69.5	67	62.7	66.4	62	55.2	57	58	57.69	55.83	57.87	57.13	70
2	NW Corner of the Project area	57	57.7	52.3	55.67	53.4	48.3	43.2	48.3	45.1	44.5	46	45.2	50.47	48.07	48.62	49.06	55
3	Chunkuri-2, Bajua	63.5	55.4	54.6	57.83	51.8	55.4	53.3	53.5	51.5	52.4	50.8	51.6	54.93	47.43	46.28	49.54	55
4	SW corner of the Project area	56.2	53.7	52.7	54.2	49.8	53.8	NM	51.8	58.7	49.7	50.9	54.2	50.55	55.53	53.87	53.32	55
5	Project site near Shapmari area	57.4	50.9	NM	54.15	56.3	53.8	46.4	52.2	46.7	46.4	51.2	48.1	47.07	45.4	47.54	46.67	55
6	Barni, Gaurambha	62.5	60.5	62.6	61.87	59.9	57	58.5	58.5	59.1	46.8	52.9	52.9	57.97	49.15	52.66	53.26	60
7	Khan Jahan Ali Bridge, Khulna	65.1	63.2	NM	64.15	70.2	68.9	75.9	71.7	65.9	62.1	NM	64	60.35	55.4	54.9	56.88	70
8	Mongla Port area	61.5	67.9	65.6	65	65.2	68.1	56.4	63.2	63.3	58.3	61.9	61.2	55.97	56.58	53.36	55.31	75
9	Harbaria, Sundarbans	49.6	50.4	NM	50	48.1	41.8	NM	44.9	48.7	51.4	NM	50	49.15	48.64	NM	48.89	50
10	Akram Point, Sundarbans	42.5	41.7	NM	42.1	42.9	37.6	NM	40.2	46.5	43.7	NM	45.1	40.49	55.69	NM	48.09	50
11	Hiron Point, Sundarbans	47.8	NM	NM	47.8	41.3	41.3	NM	41.3	NM	NM	NM	NM	55.8	52.51	NM	54.15	50

Source: CEGIS Field Survey; Note: NM-Not measured;

Table C.10: Ambient noise monitoring status at the monitored locations

Sl. No	Location	QM 38(Noise Level in dB (A)) Oct, 2022				QM 39(Noise Level in dB (A)) Jan, 2023				QM 40 (Noise Level in dB (A)) May, 2024				QM 41(Noise Level in dB (A)) July, 2024				Standard (Noise Control Rules 2006)
		Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	55.56	52.75	54.53	54.28	51.74	55.18	57.78	54.90	53.88	52.39	53.90	53.39	51.80	50.90	51.90	51.53	70
2	NW Corner of the Project area	48.92	45.19	50.22	48.11	49.15	42.96	46.73	46.28	43.41	60.26	52.09	51.92	52.40	53.80	49.70	51.97	55
3	Chunkuri-2, Bajua	57.15	57.35	53.24	55.91	50.09	52.87	54.18	52.36	52.86	44.24	47.59	48.23	47.90	48.10	47.10	47.70	55
4	SW corner of the Project area	53.93	58.77	61.45	58.05	49.69	54.55	50.58	51.61	49.55	55.10	48.25	50.97	51.80	51.20	49.20	50.73	55
5	Project site near Shapmari area	45.91	44.70	44.98	45.20	57.42	58.04	58.79	58.08	48.68	47.25	47.09	47.68	48.90	47.10	48.30	48.10	55
6	Barni, Gaurambha	56.59	54.05	60.79	57.14	54.77	58.06	66.85	59.90	60.16	53.38	58.09	57.21	59.70	58.40	59.60	59.23	60
7	Khan Jahan Ali Bridge, Khulna	67.89	62.10	65.13	65.04	61.93	61.14	64.05	62.37	64.96	58.36	65.02	62.78	59.20	57.50	60.70	59.13	70
8	Mongla Port area	53.95	50.79	56.02	53.59	61.33	57.55	59.56	59.48	58.60	54.00	59.13	57.24	61.40	57.10	57.80	58.77	75
9	Harbaria, Sundarbans	49.46	49.74	NM	49.60	41.17	32.40	NM	36.79	51.44	46.31	NM	48.87	42.30	41.50	45.20	43.00	50
10	Akram Point, Sundarbans	40.68	37.45	NM	39.07	33.10	38.36	NM	35.73	37.96	37.99	NM	37.98	41.60	42.50	40.90	41.67	50
11	Hiron Point, Sundarbans	40.90	39.75	NM	40.34	35.40	35.59	NM	35.49	41.20	43.78	NM	42.47	NM	NM	NM	NM	50

Source: CEGIS Field Survey; Note: NM-Not measured

Table C.11: Ambient noise monitoring status at the monitored locations

Sl. No	Location	QM 42 (Noise Level in dB (A)) October, 2024				QM 43 (Noise Level in dB (A)) January, 2025				QM 44 (Noise Level in dB (A)) April, 2025				QM 45 (Noise Level in dB (A)) July, 2025				Standard (Noise Control Rules 2006)
		Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG	
1	Chalna, Dacope	52.45	48.82	53.06	51.44	50.60	50.67	52.08	51.12	49.46	59.58	54.71	54.58	52.95	50.39	54.01	52.45	70
2	NW Corner of the Project area	51.04	48.72	50.61	50.12	48.11	44.37	55.67	49.38	46.33	44.54	49.86	46.91	55.43	51.95	55.84	54.41	55
3	Chunkuri-2, Bajua	61.95	59.77	62.75	61.49	58.12	47.10	51.48	52.23	62.45	55.68	66.94	61.69	48.44	47.70	59.34	51.83	55
4	SW corner of the Project area	44.87	44.50	46.42	45.26	48.65	44.50	47.51	46.89	45.80	44.50	54.16	48.15	45.80	44.50	47.50	45.93	55
5	Project site near Shapmari area	47.45	48.32	46.88	47.25	50.33	45.09	47.64	47.68	49.85	44.98	47.04	47.29	49.85	47.45	47.68	48.33	55
6	Barni, Gaurambha	59.23	57.13	63.56	59.97	57.35	55.65	50.28	54.42	62.10	49.70	59.72	57.14	54.03	49.09	61.57	54.90	60
7	Khan Jahan Ali Bridge, Khulna	62.58	57.89	61.50	60.66	62.18	60.35	61.27	61.27	66.73	63.50	64.23	64.82	65.03	65.29	65.56	65.29	70
8	Mongla Port area	61.00	56.28	59.68	58.99	55.05	58.10	61.70	58.28	60.04	56.33	56.61	57.66	60.18	57.96	59.65	59.26	75
9	Harbaria, Sundarbans	52.45	48.82	53.06	51.44	50.60	50.67	52.08	51.12	49.46	59.58	54.71	54.58	48.94	46.99	NM	47.96	50
10	Akram Point, Sundarbans	51.04	48.72	50.61	50.12	48.11	44.37	55.67	49.38	46.33	44.54	49.86	46.91	46.64	44.35	NM	45.50	50
11	Hiron Point, Sundarbans	61.95	59.77	62.75	61.49	58.12	47.10	51.48	52.23	62.45	55.68	66.94	61.69	47.77	50.37	NM	49.07	50

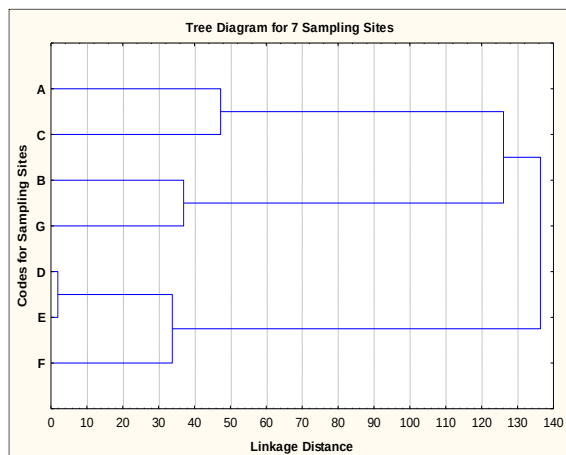
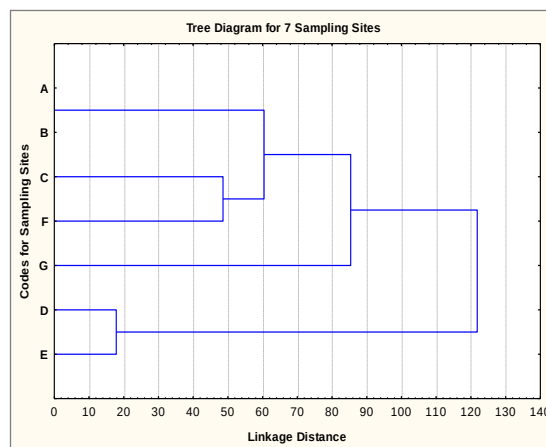
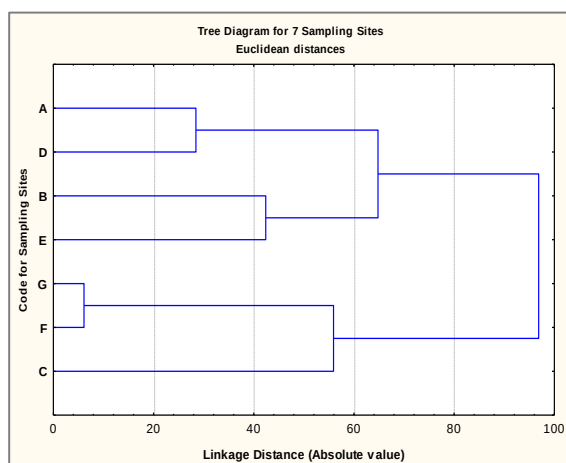
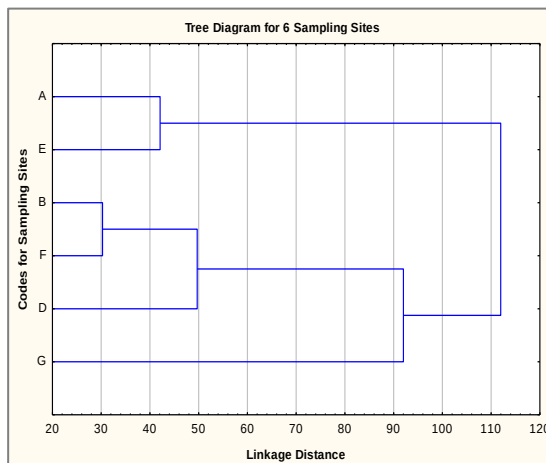
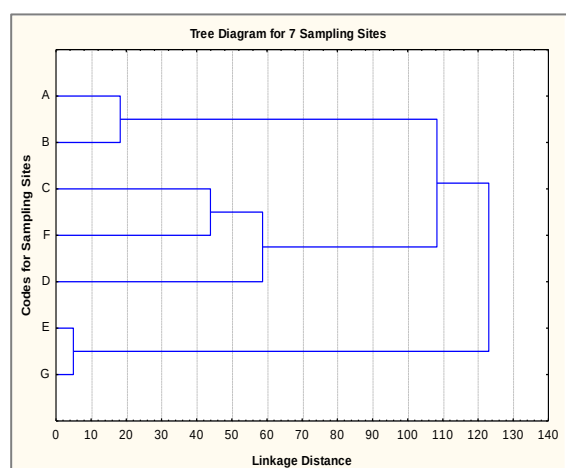
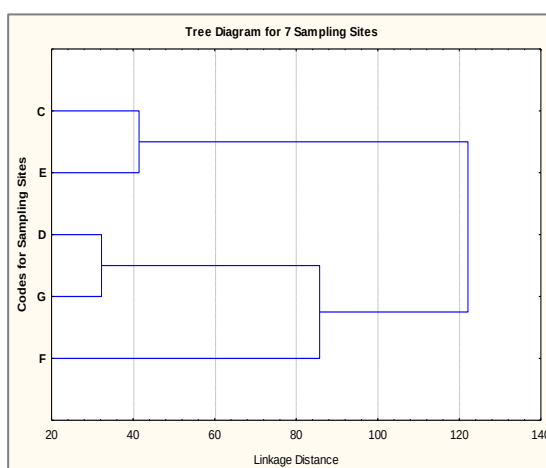
Source: CEGIS Field Survey; Note: NM-Not measured

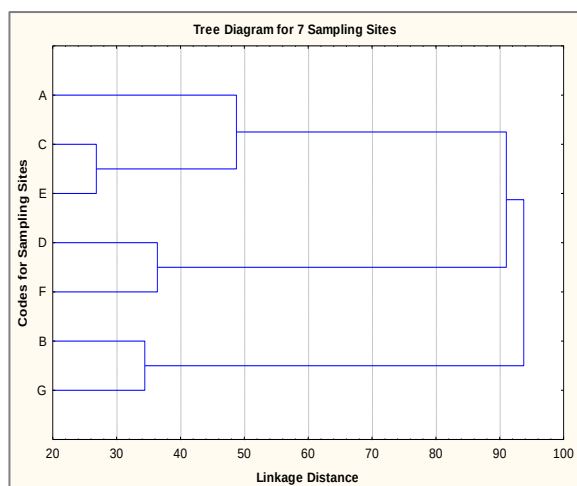
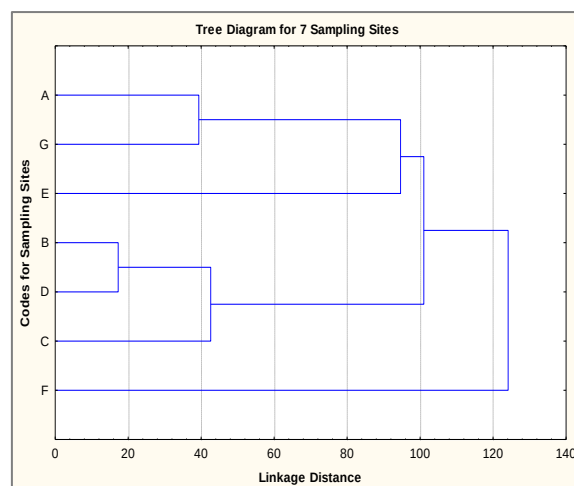
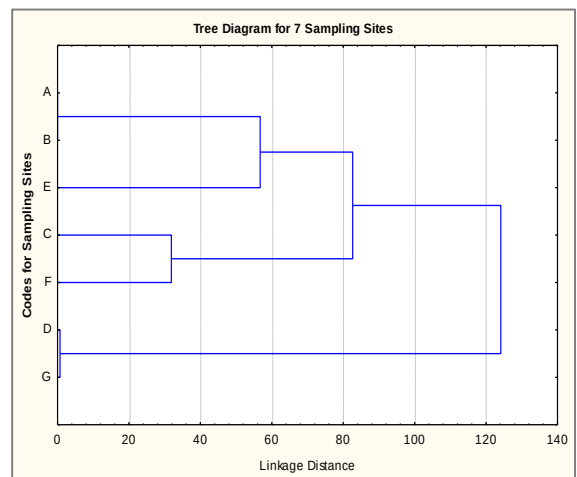
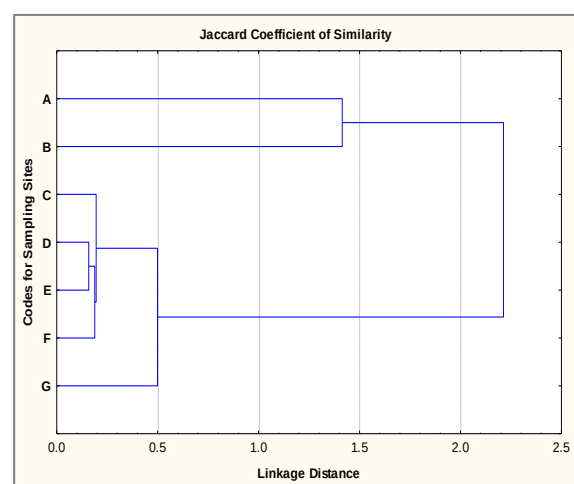
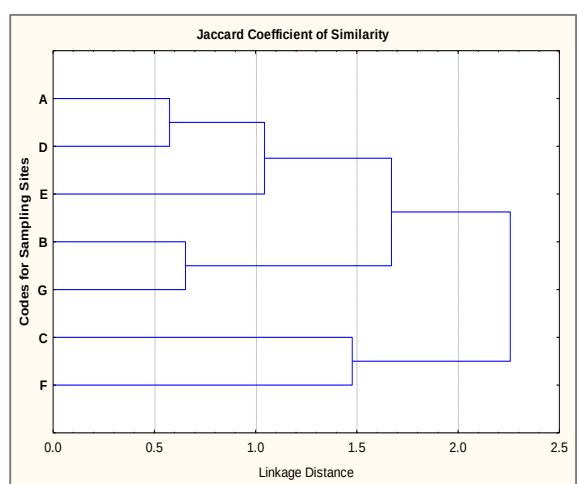
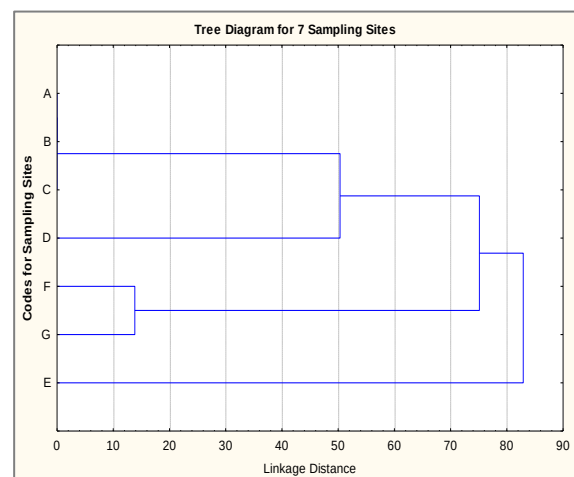
Table C.12: Ambient noise monitoring status at the monitored locations

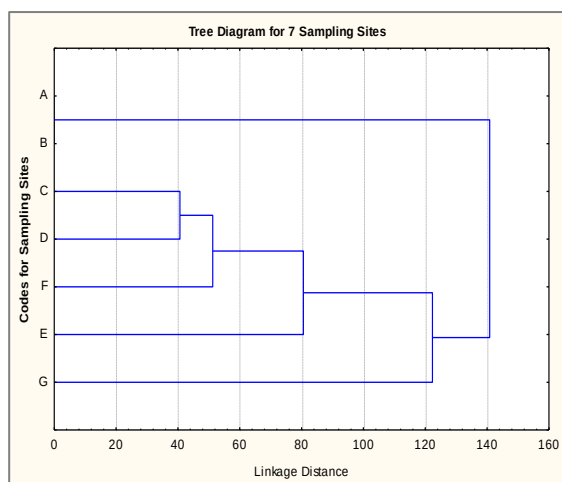
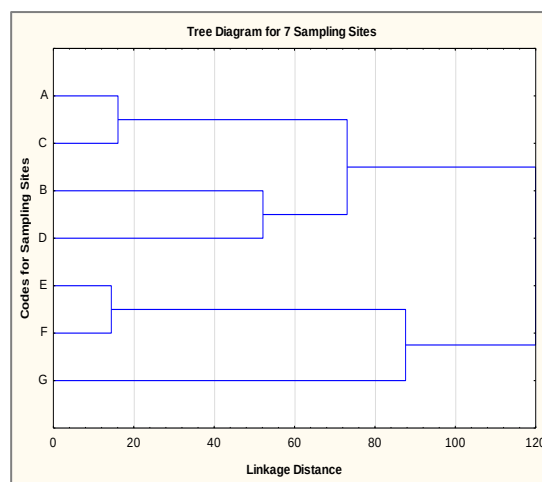
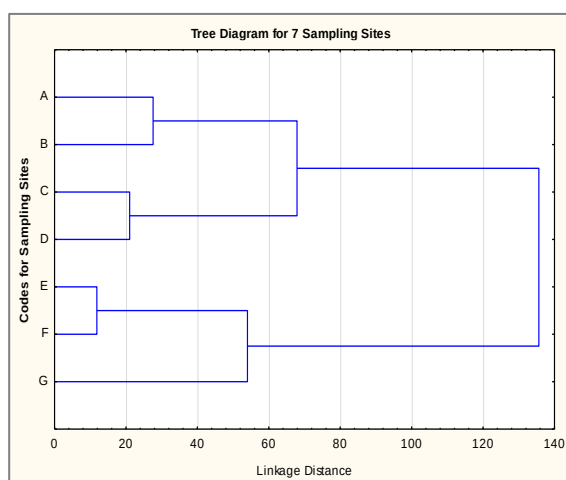
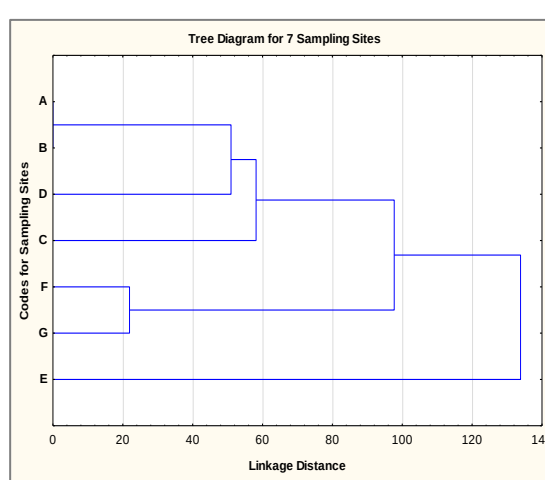
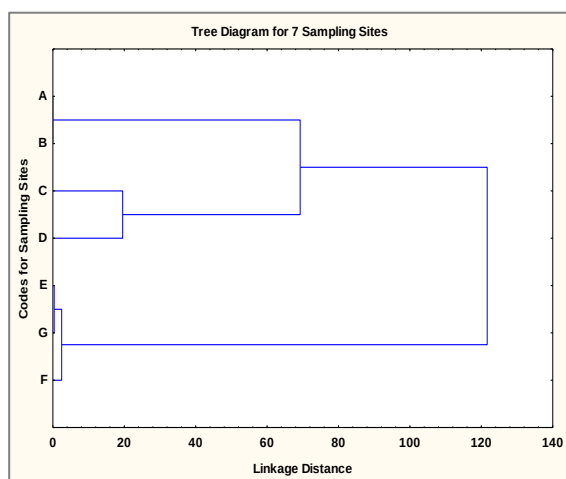
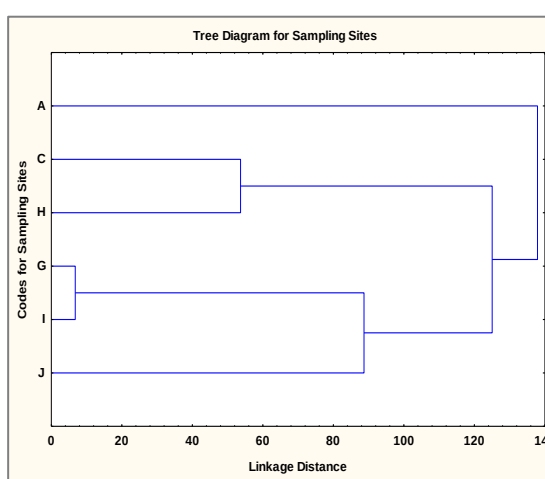
Sl. No	Location	QM 46 (Noise Level in dB (A)) October, 2025																Standard (Noise Control Rules 2006)
		Morning (9:00)	Noon (13:00)	Evening (18:00)	Day time AVG													
1	Chalna, Dacope	46.76	44.69	48.59	46.68													70
2	NW Corner of the Project area	52.91	51.01	54.01	52.64													55
3	Chunkuri-2, Bajua	47.85	47.14	48.59	47.86													55
4	SW corner of the Project area	45.80	44.50	45.70	45.33													55
5	Project site near Shapmari area	44.95	44.11	45.44	44.83													55
6	Barni, Gaurambha	48.62	51.20	60.09	53.30													60
7	Khan Jahan Ali Bridge, Khulna	61.38	60.40	60.80	60.86													70
8	Mongla Port area	60.18	57.96	59.65	59.26													75
9	Harbaria, Sundarbans	46.02	41.14	NM	43.58													50
10	Akram Point, Sundarbans	36.44	36.19	NM	36.31													50
11	Hiron Point, Sundarbans	40.12	41.29	NM	40.70													50

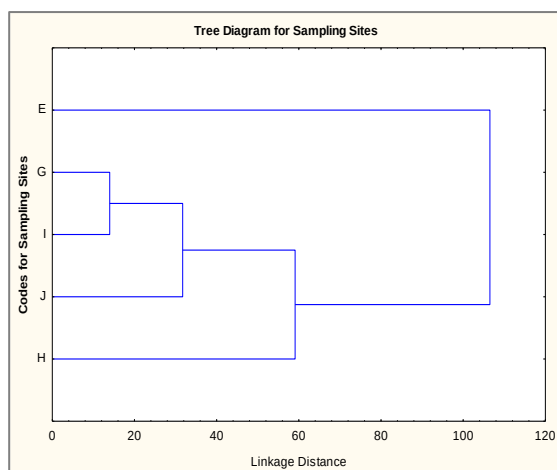
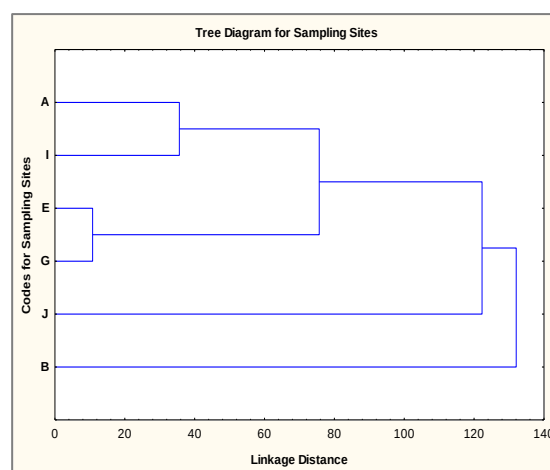
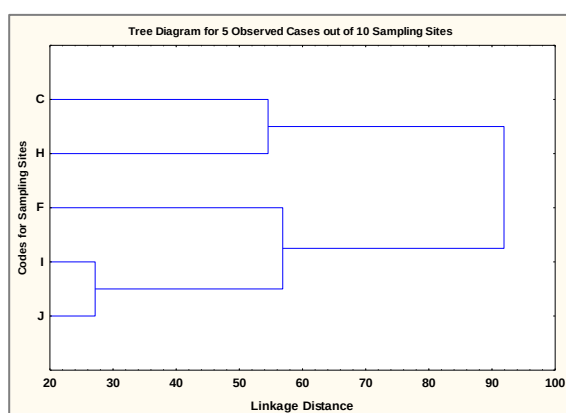
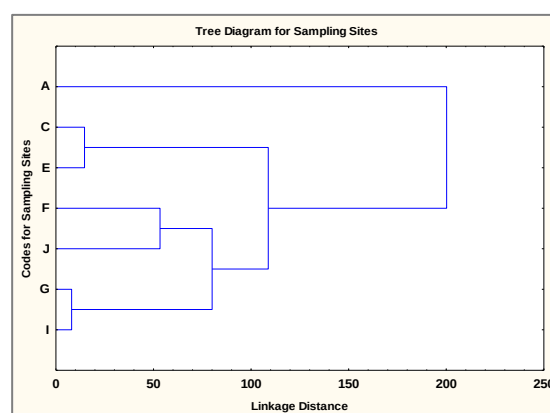
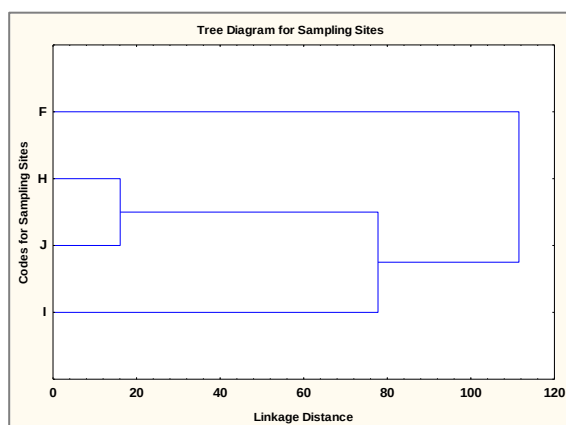
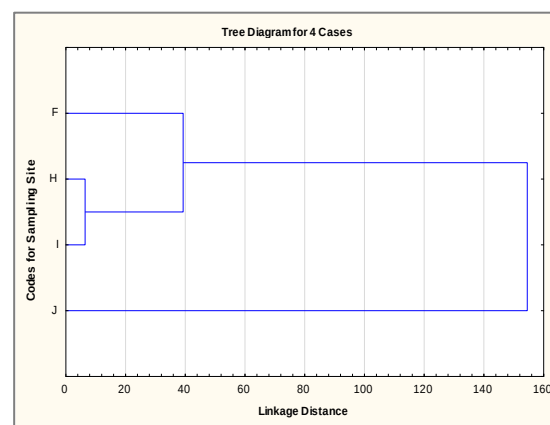
Source: CEGIS Field Survey; Note: NM-Not measured

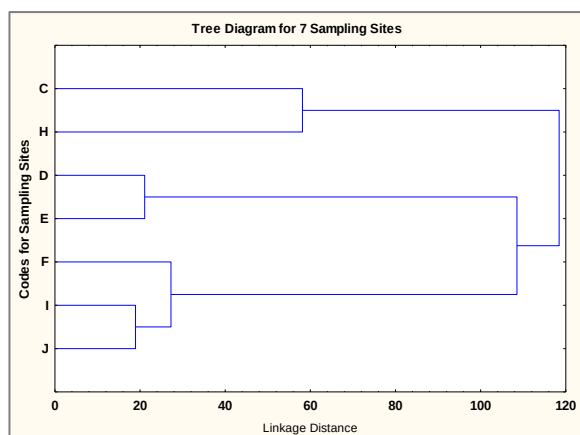
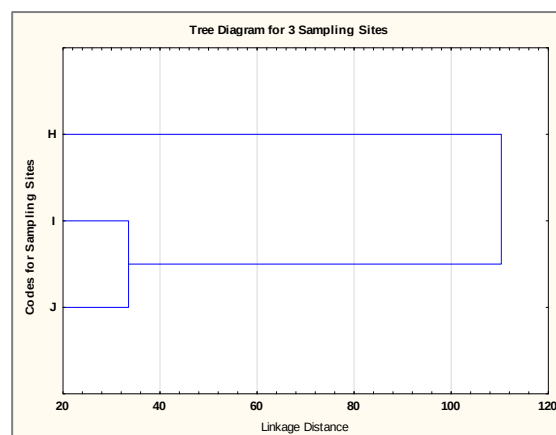
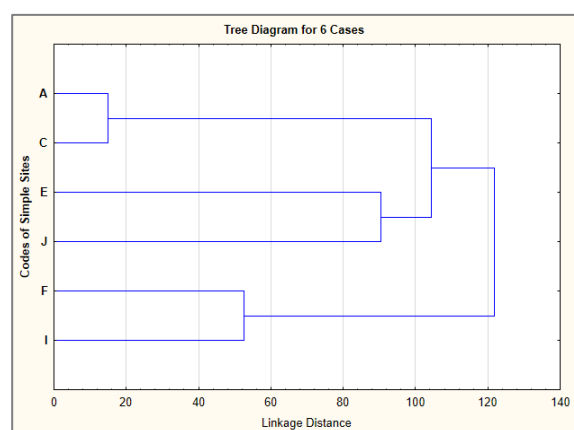
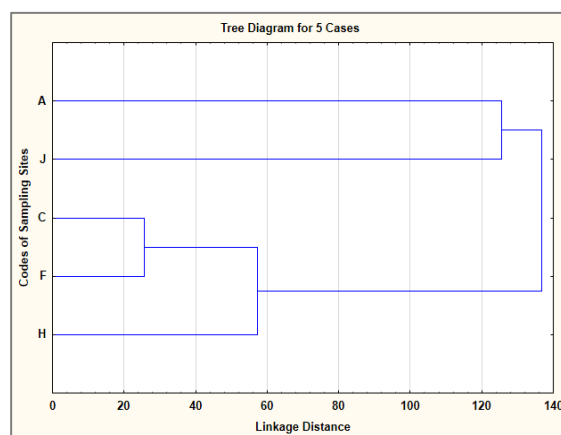
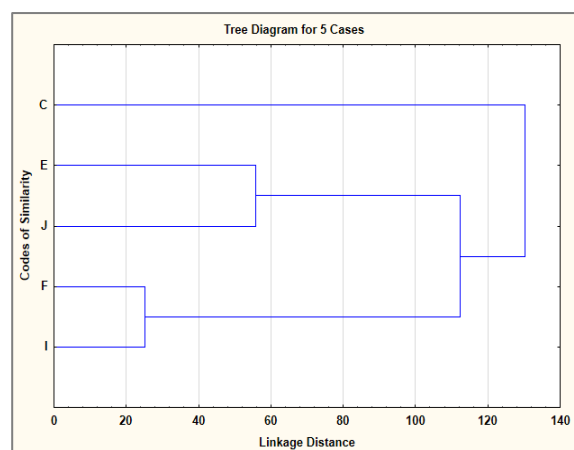
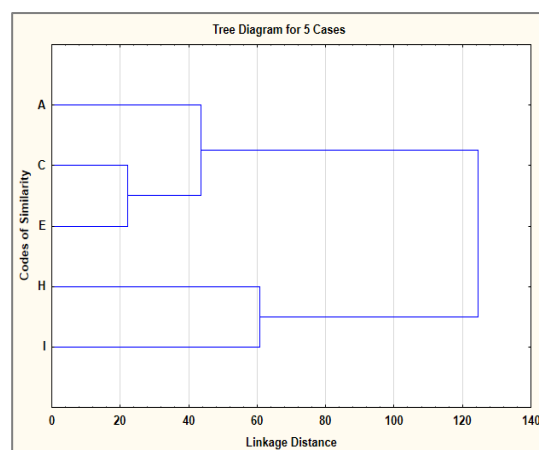
(D) Fisheries Resources Monitoring Data
Figure D1: Classification of Functional Habitats

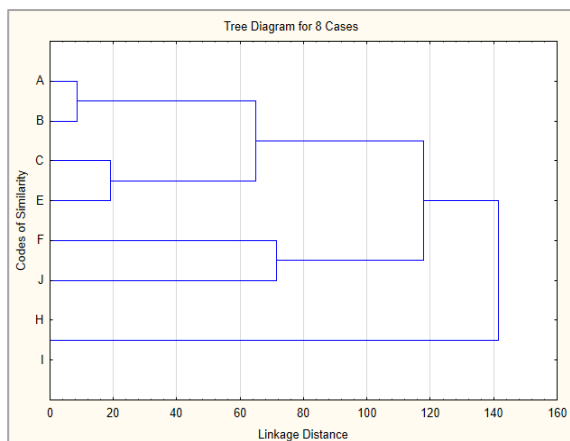
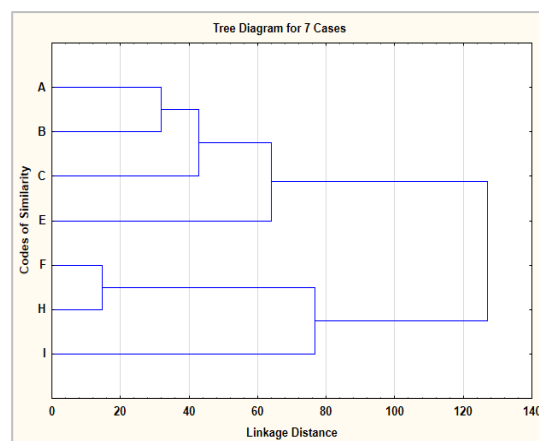
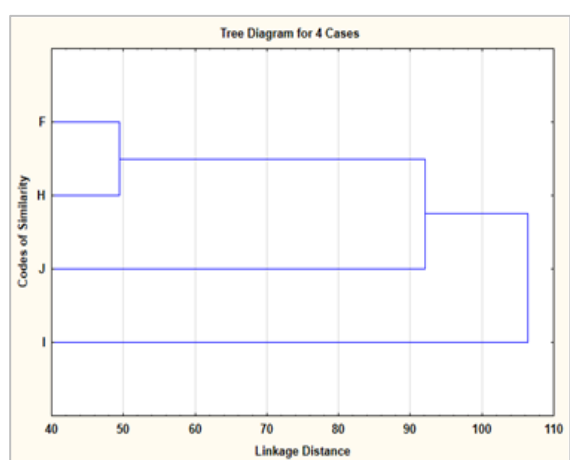
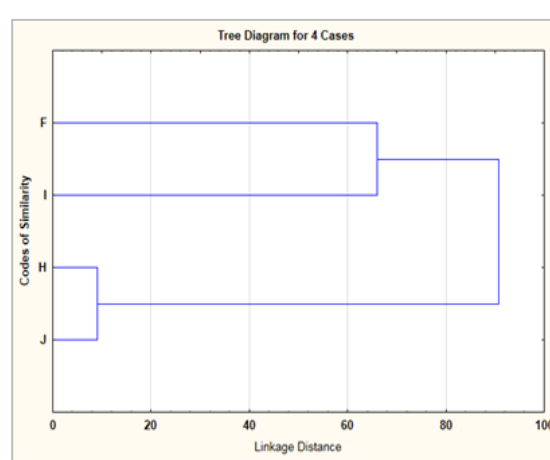
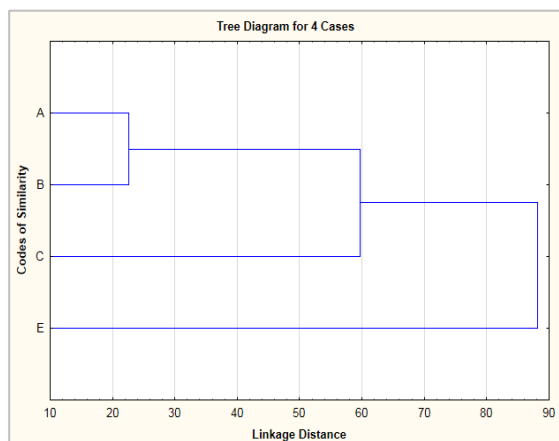
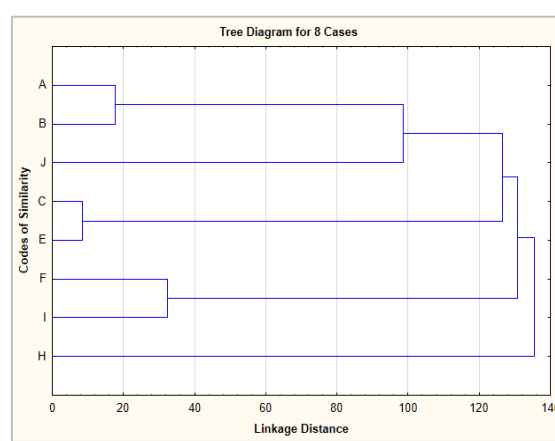
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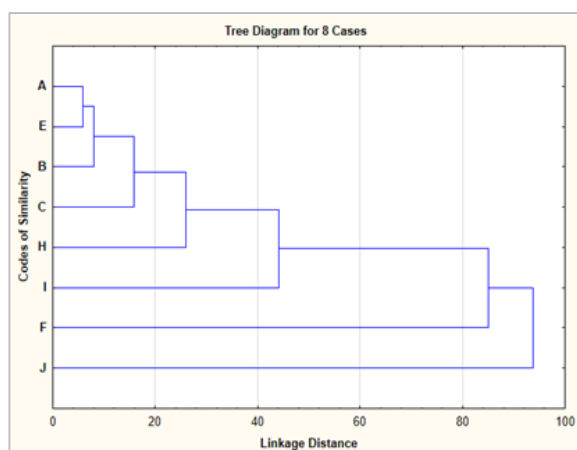
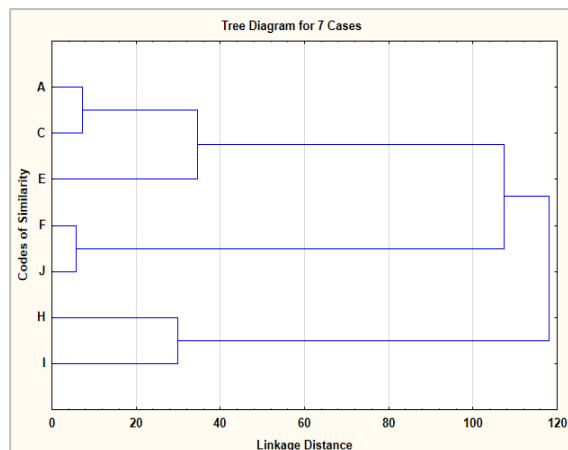
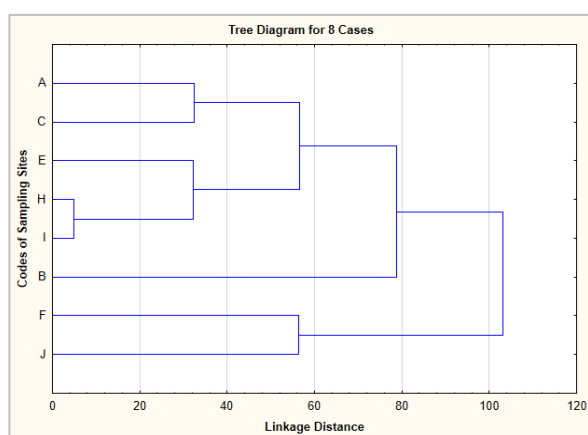
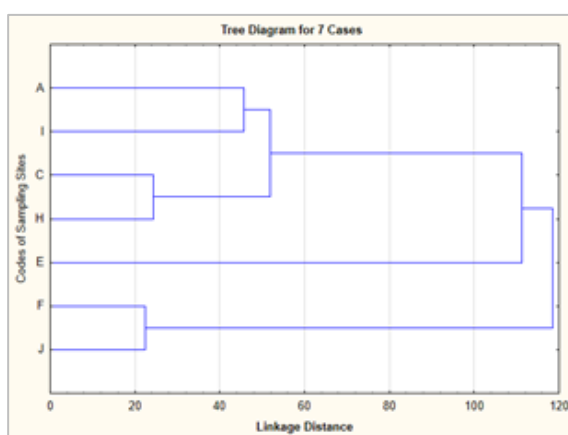
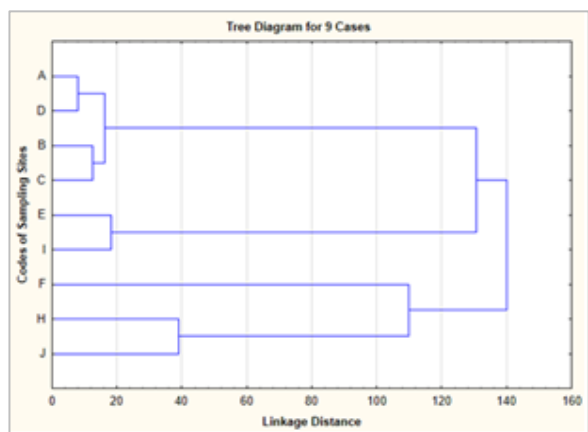
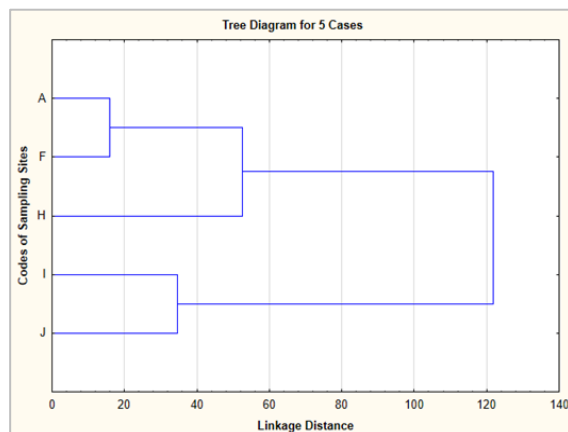
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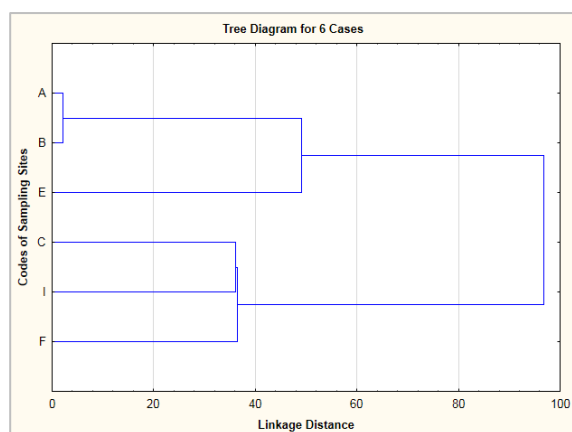
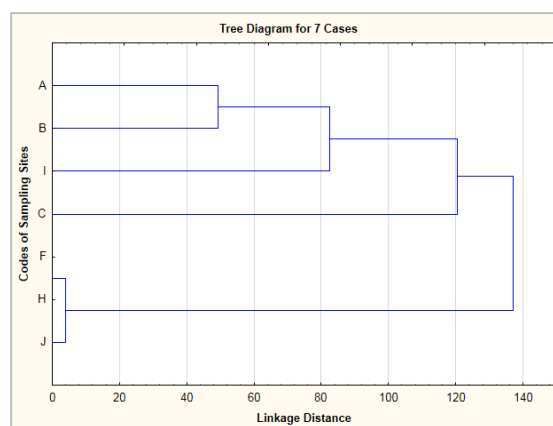
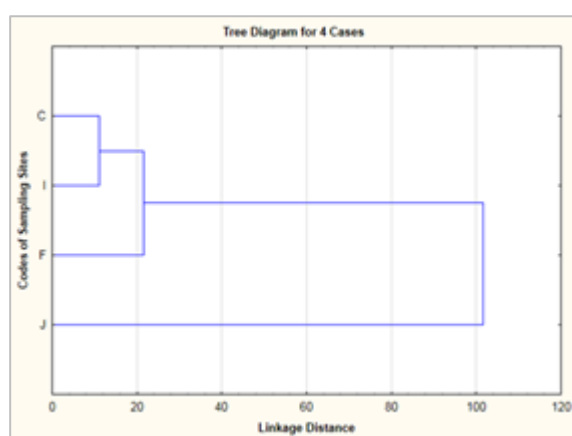
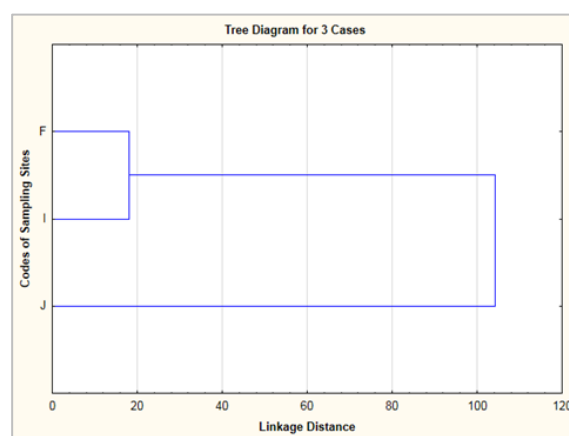
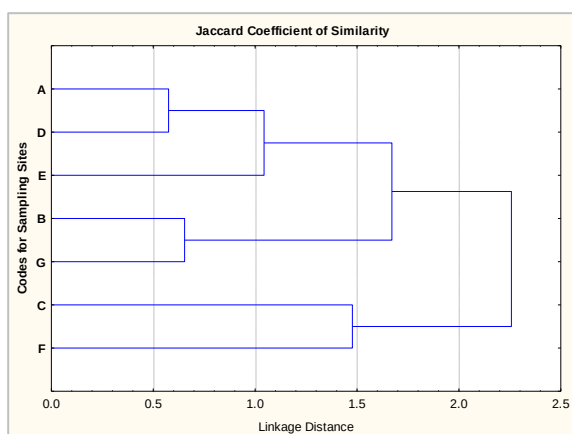
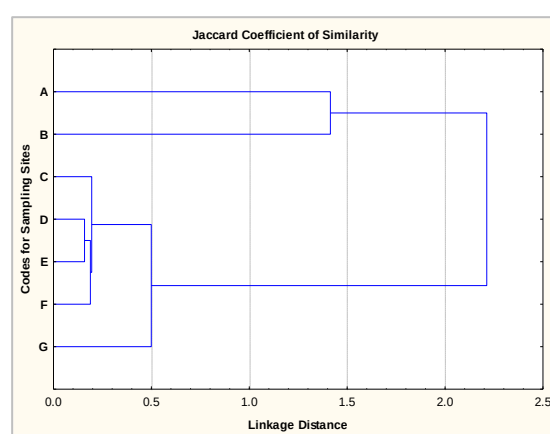
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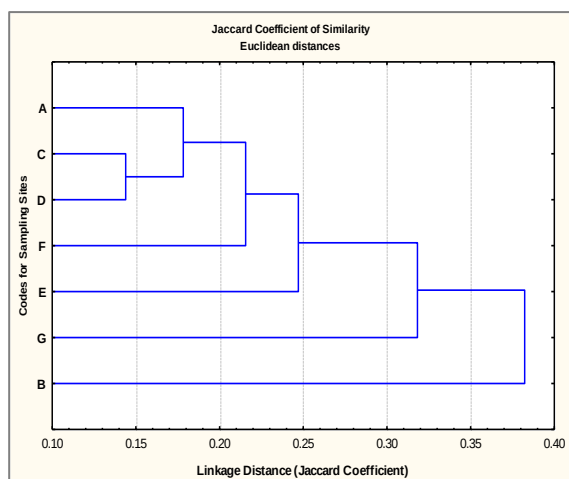
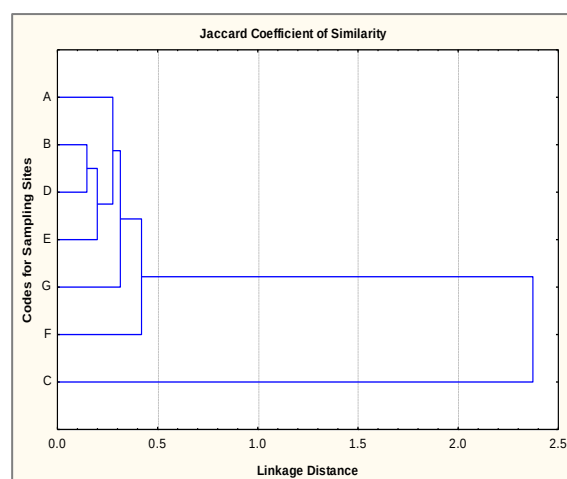
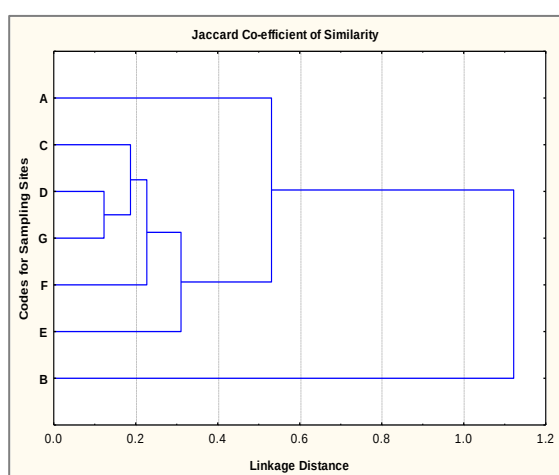
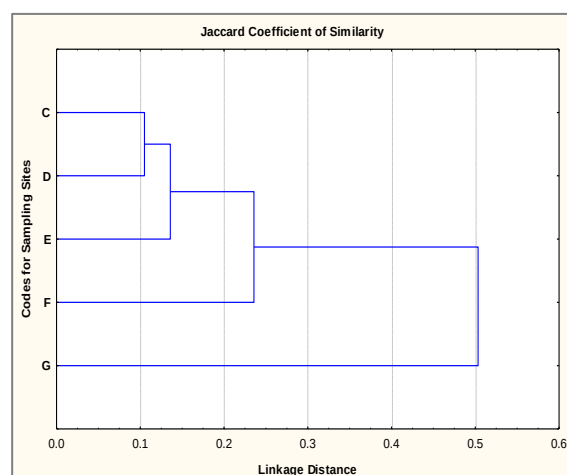
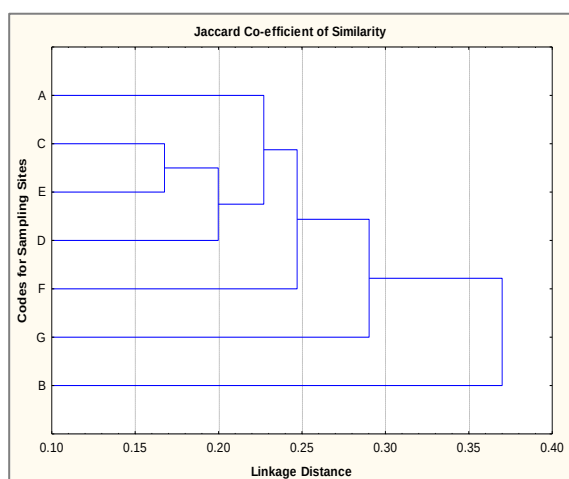
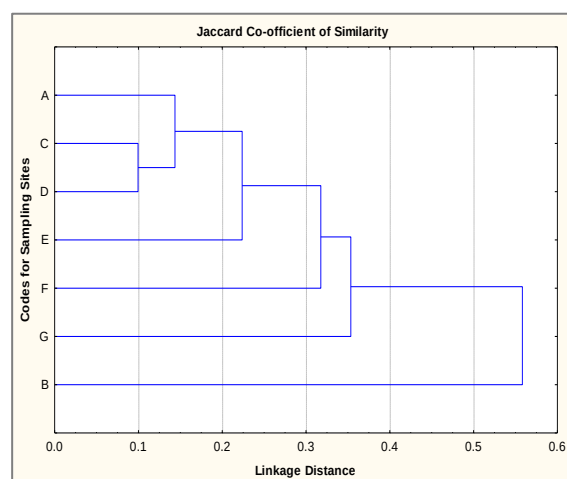
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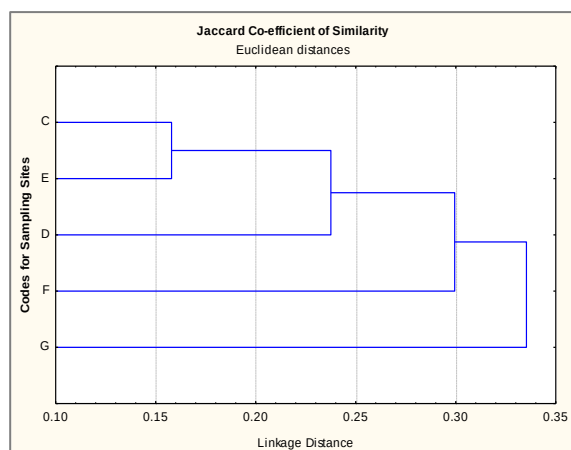
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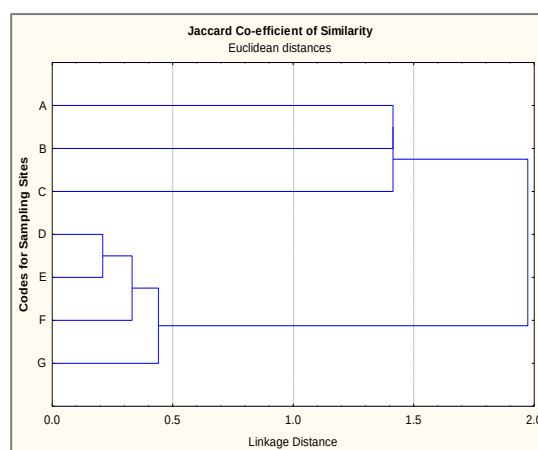
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42nd Monitoring, October 202443rd Monitoring, February 202544th Monitoring, April 202545th Monitoring October, 2025**Figure D2: Jaccard Co-efficient of Similarity of Habitats respecting fish species occurrence**1st Monitoring, April, 20142nd Monitoring, July 2014

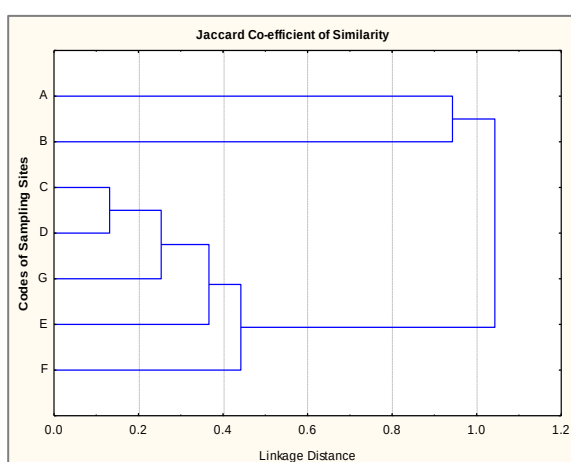
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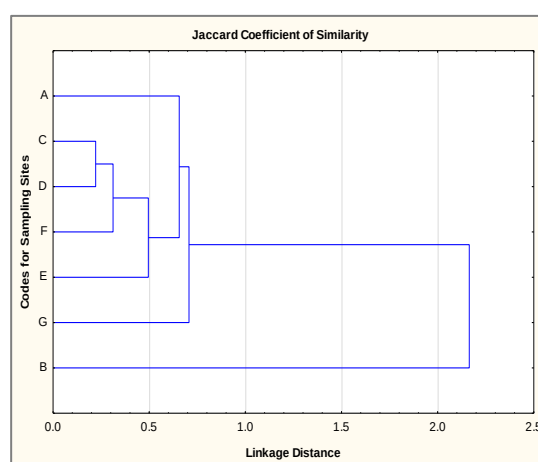
9th Monitoring, April, 2016



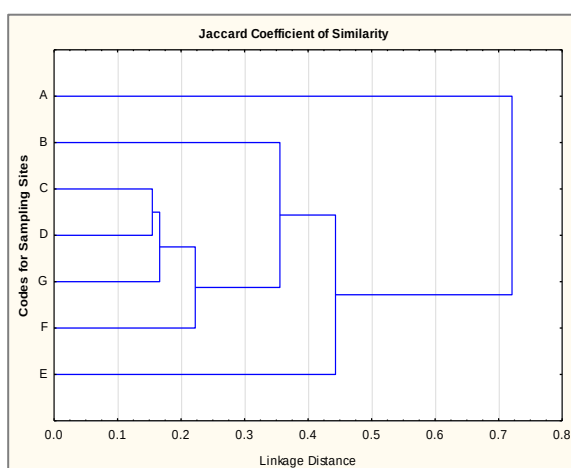
10th Monitoring, July, 2016



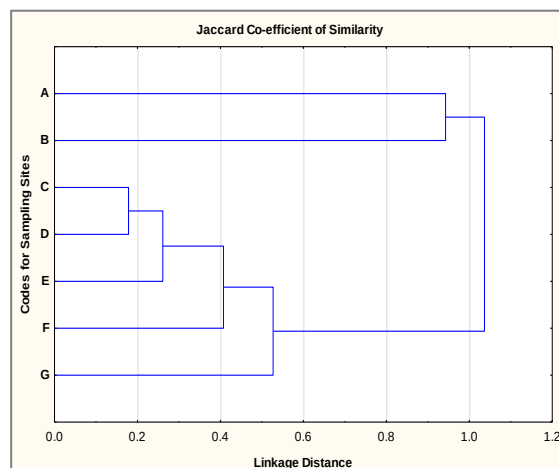
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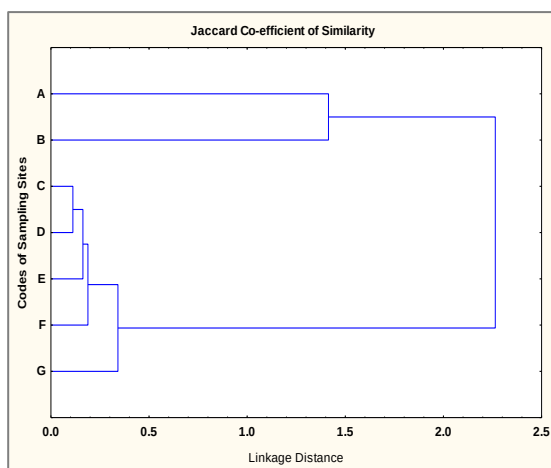
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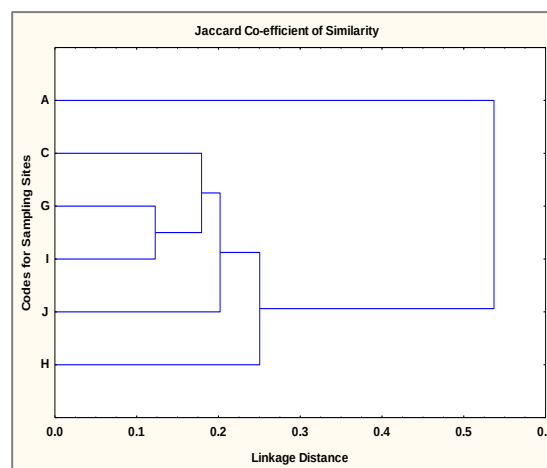
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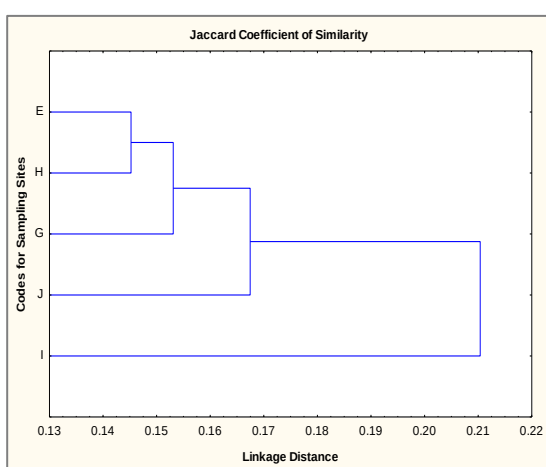
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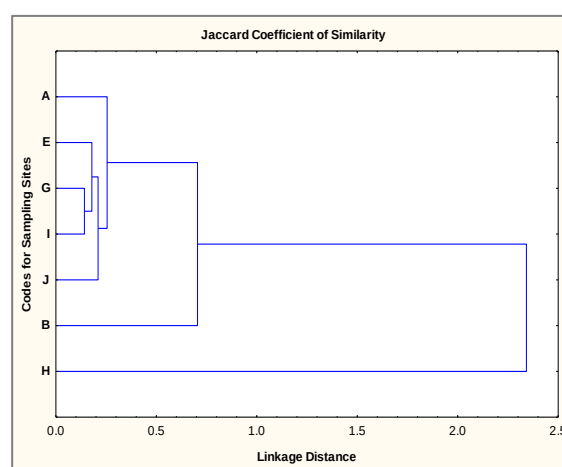
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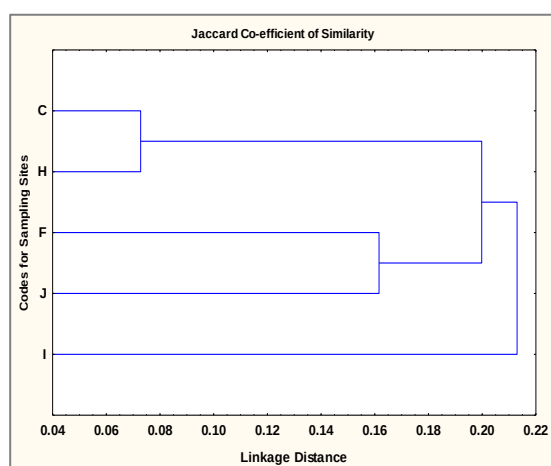
16th Monitoring, April, 2018



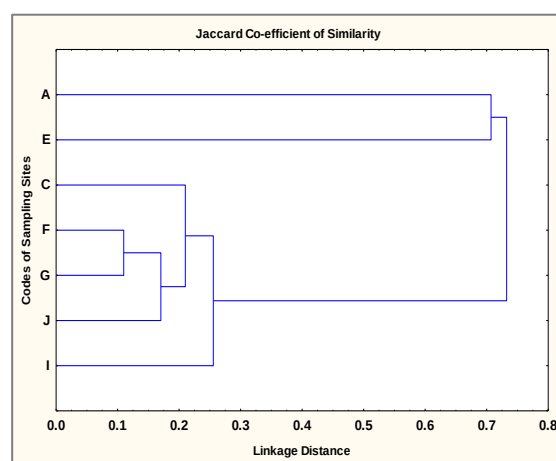
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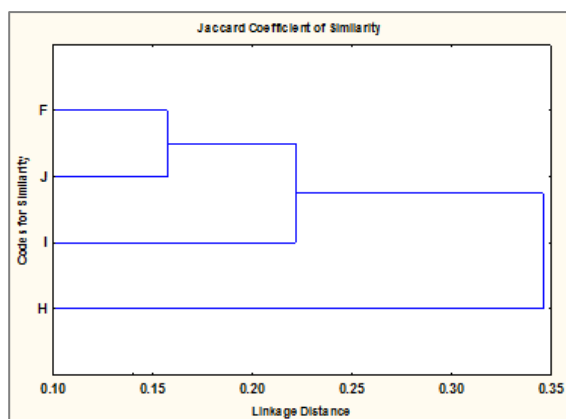
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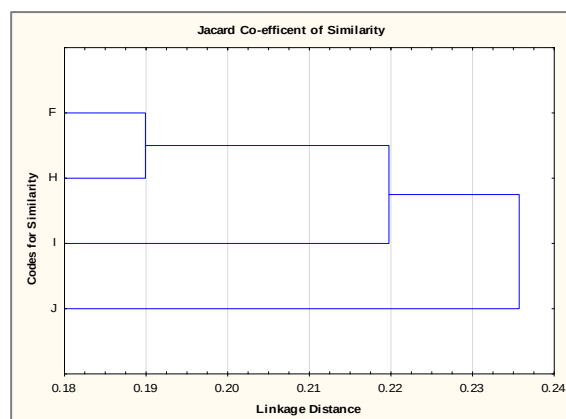
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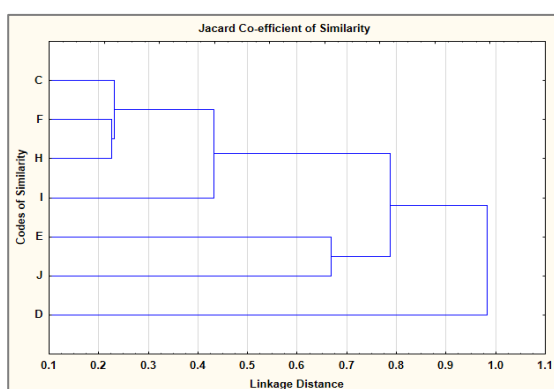
20th Monitoring, April, 2019



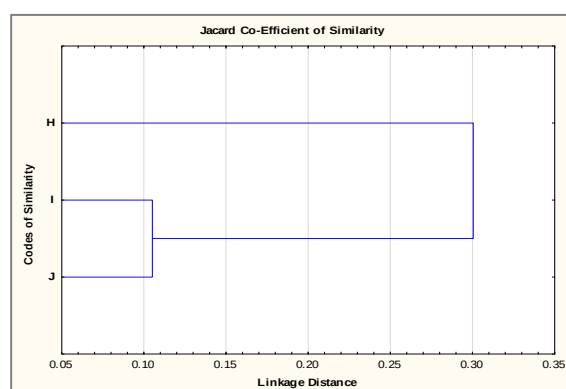
21st Monitoring, July 2019



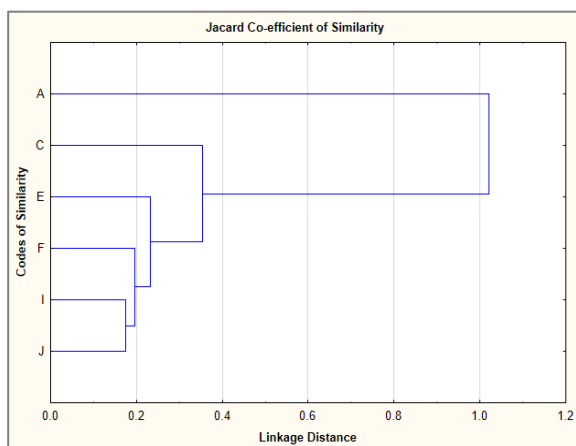
22nd Monitoring, November 2019



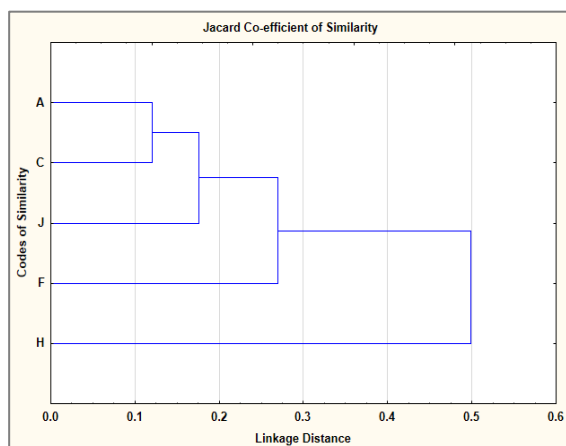
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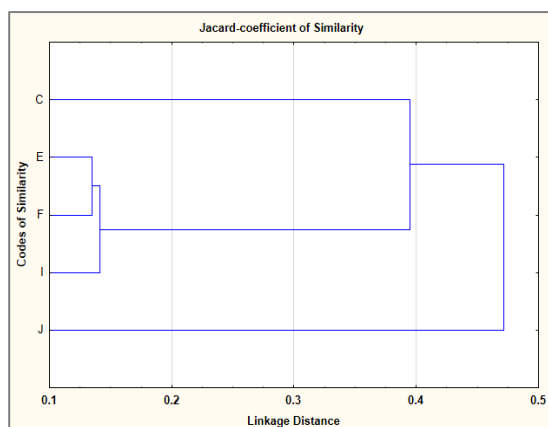
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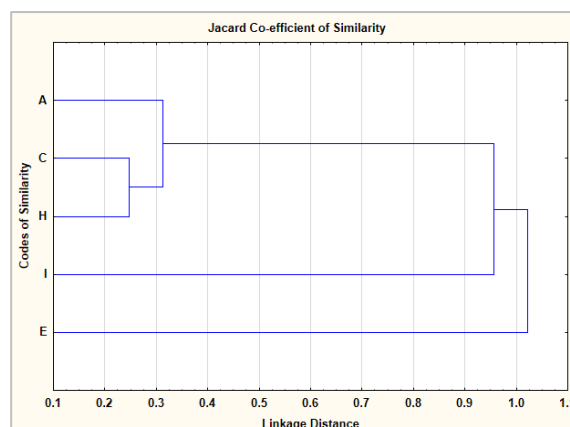
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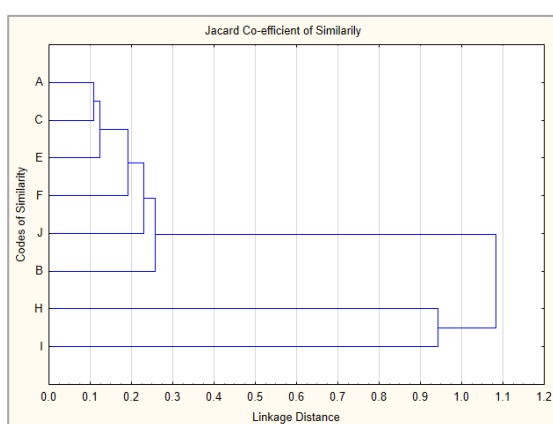
27th Monitoring, January, 2021



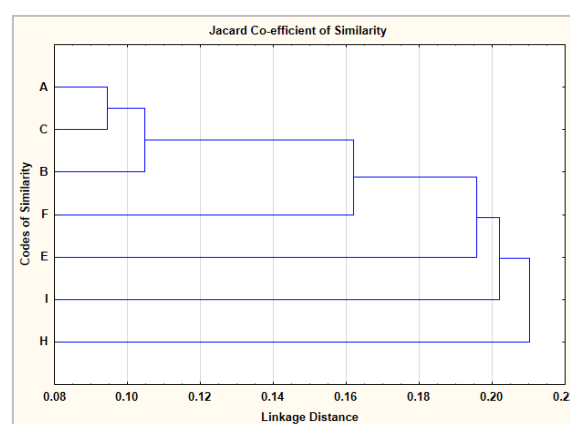
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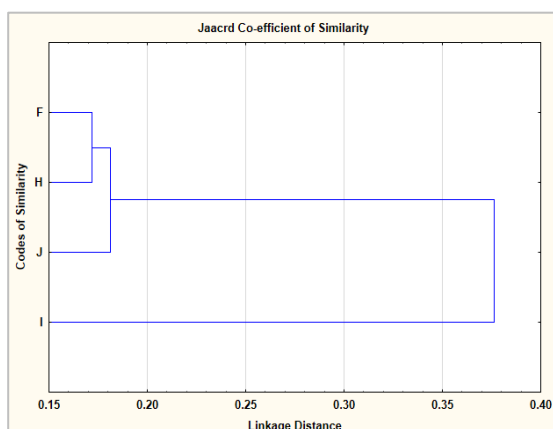
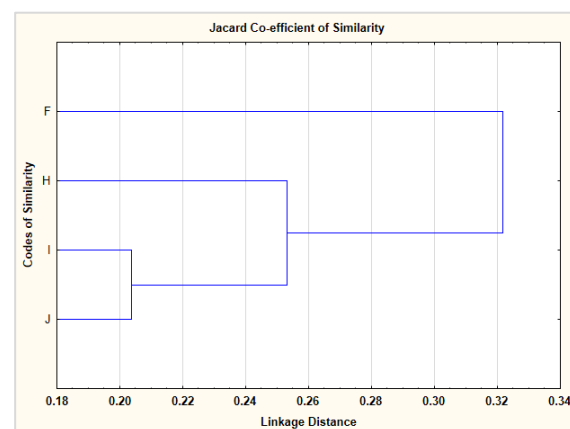
29th monitoring, August, 2021



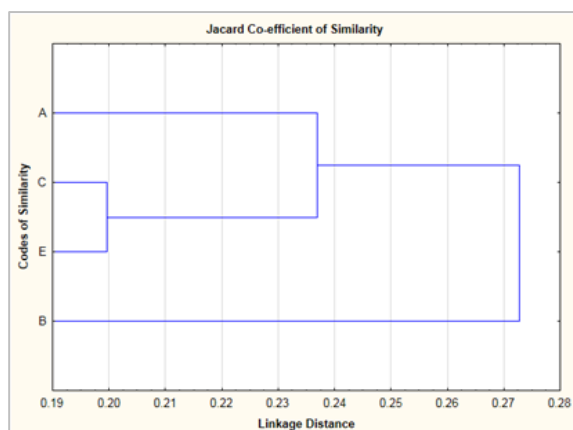
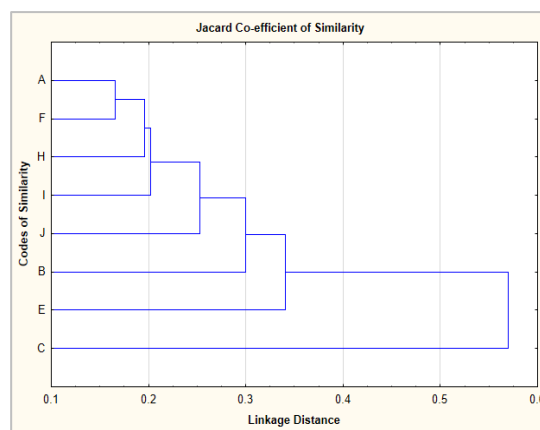
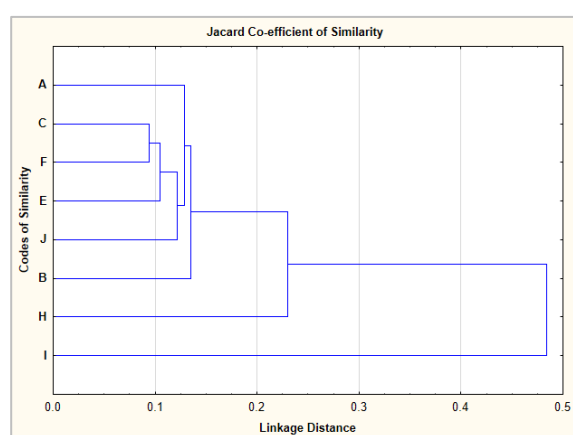
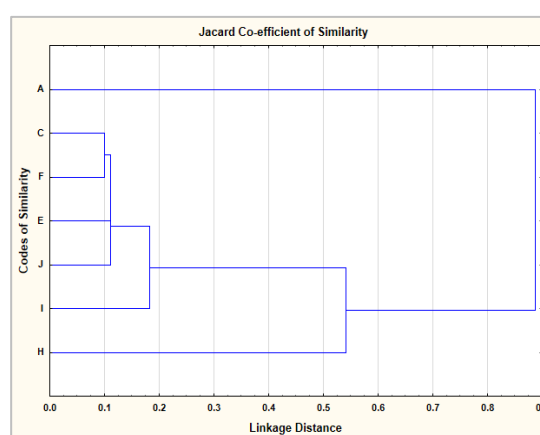
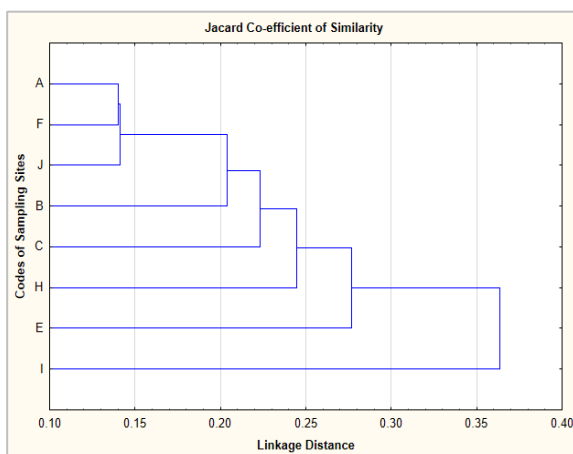
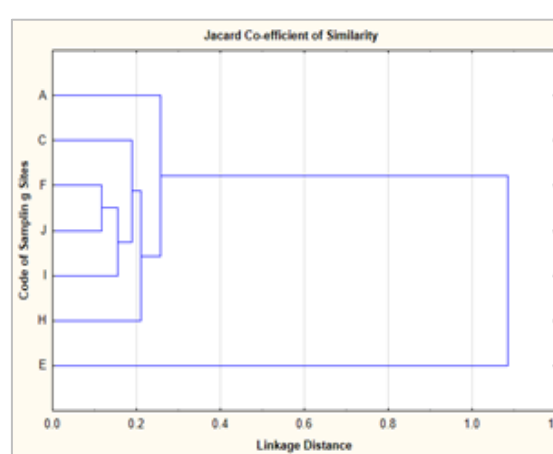
30th Monitoring, November 2021

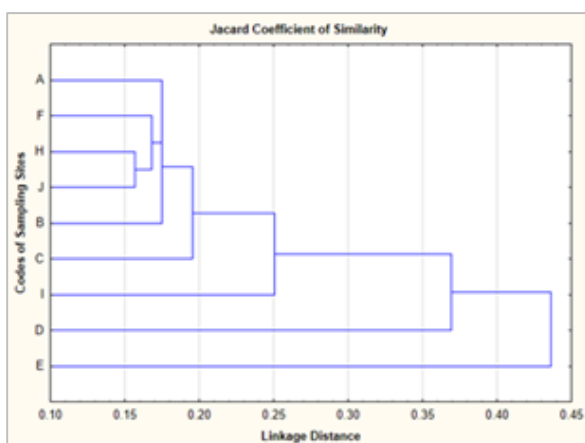
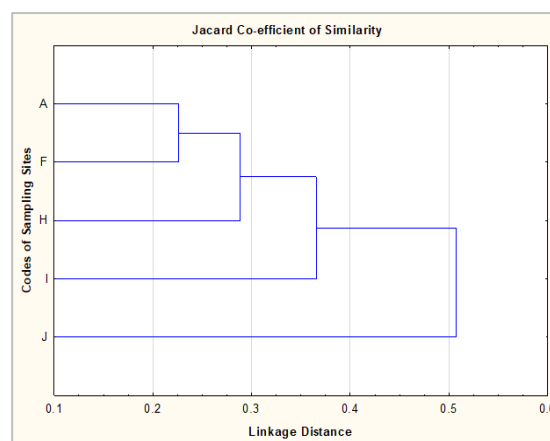
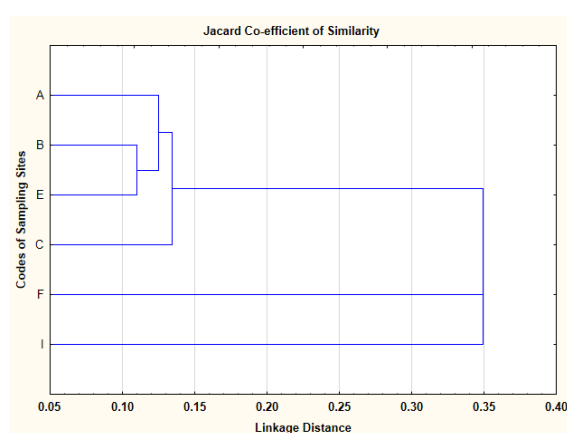
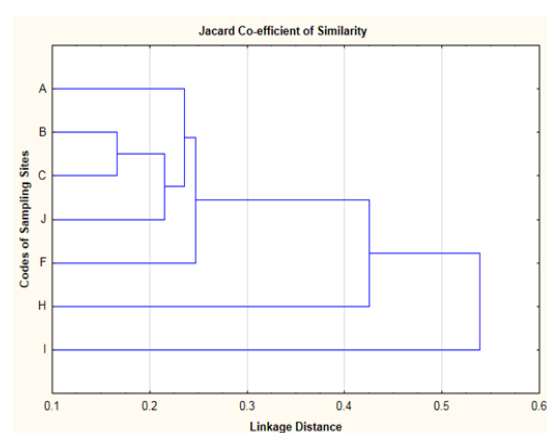
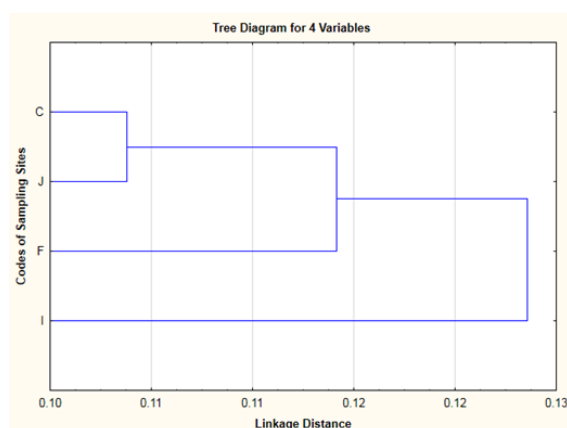
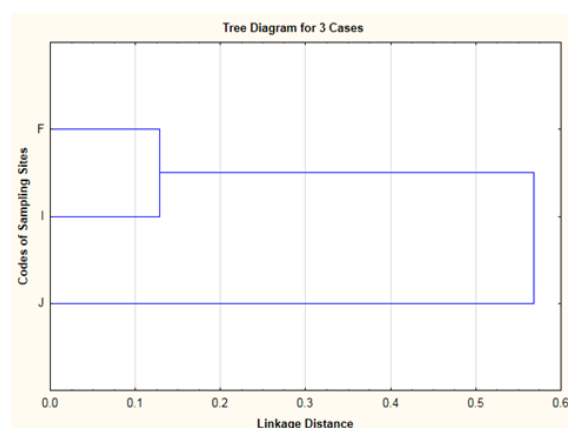


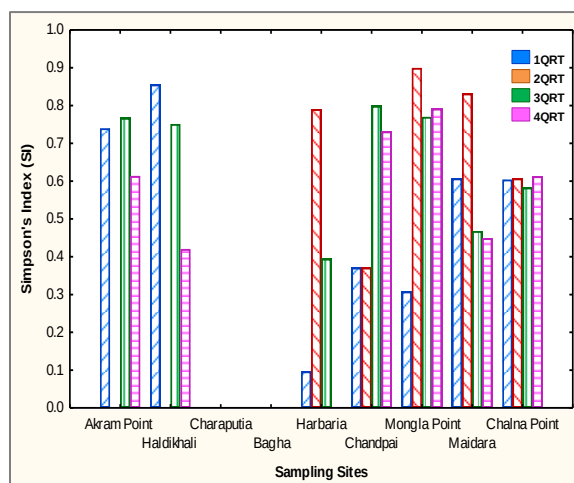
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32nd Monitoring, May 2022

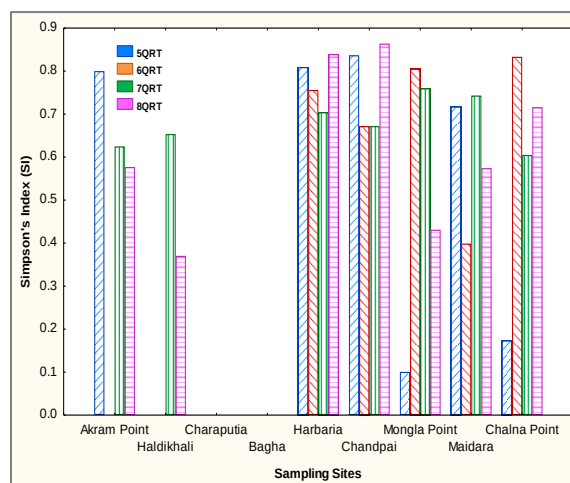
33rd Monitoring, July 2022

34th Monitoring, Oct 202235th Monitoring, Feb 202336th Monitoring, May 202337th Monitoring, September 202338th Monitoring, November 202339th Monitoring, February 2024

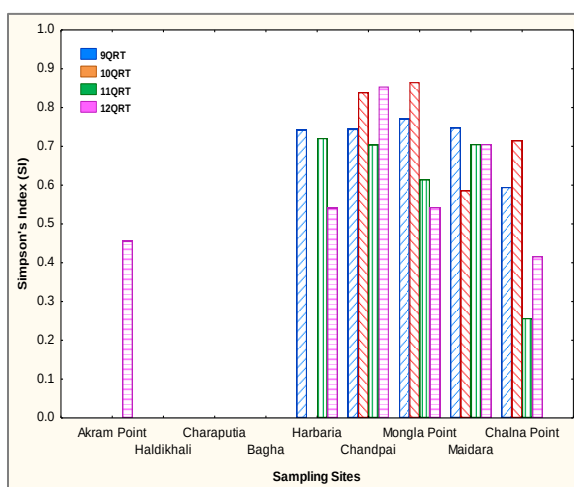
40th Monitoring, May 202441st Monitoring, August 202442nd Monitoring, November 202443rd Monitoring, February 202544th Monitoring, April 202545th Monitoring, July 2025**Figure D3: Site-wise fish species richness (FSR) in the Passur River System**



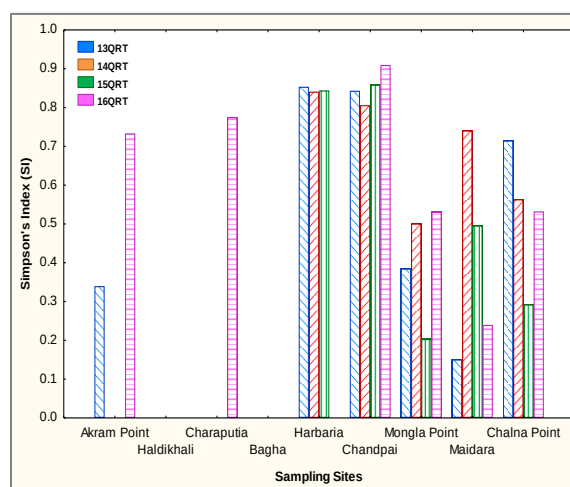
2014-2015



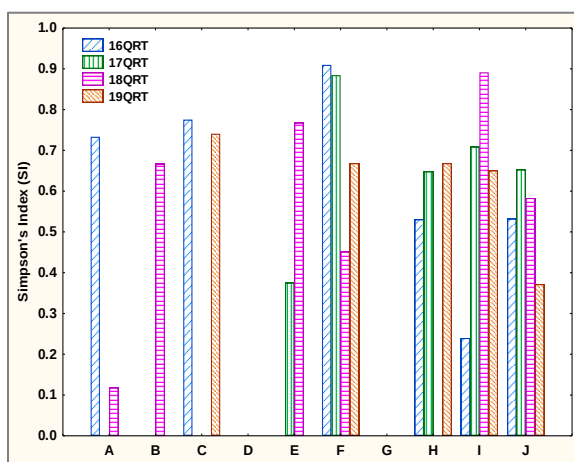
2015-2016



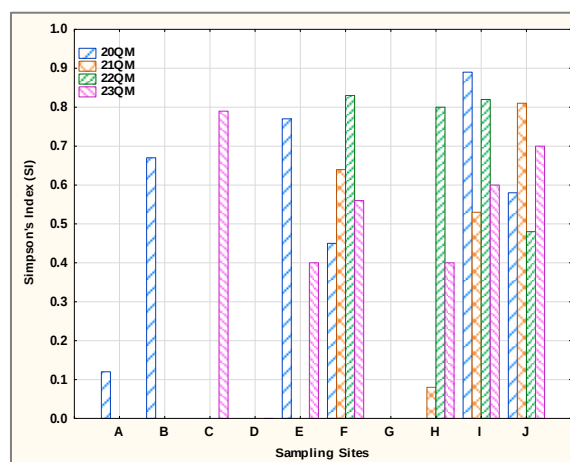
2016-2017



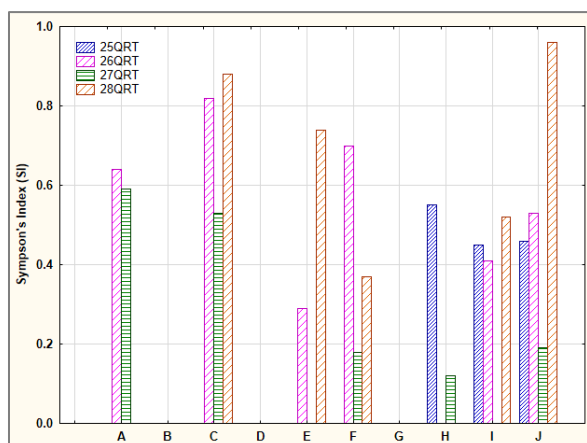
2017-18



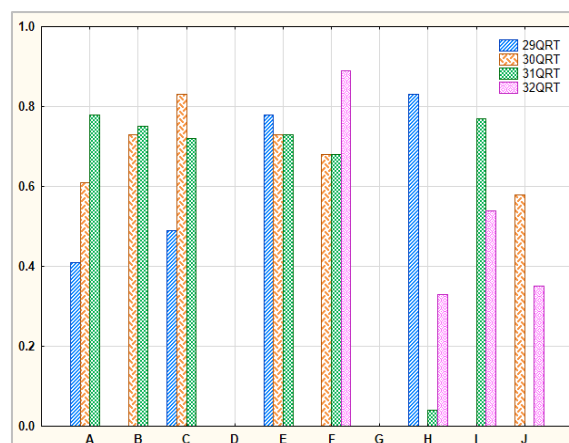
2018-19



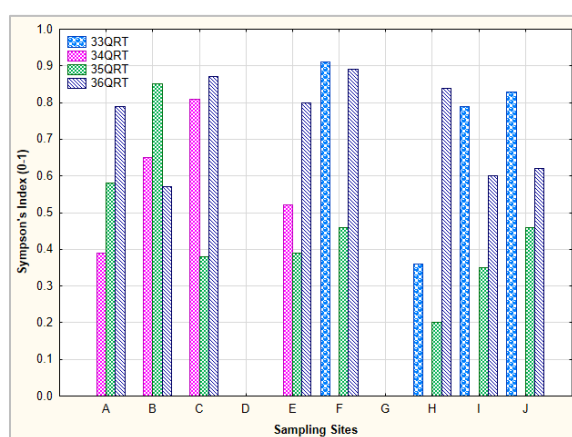
2019-20



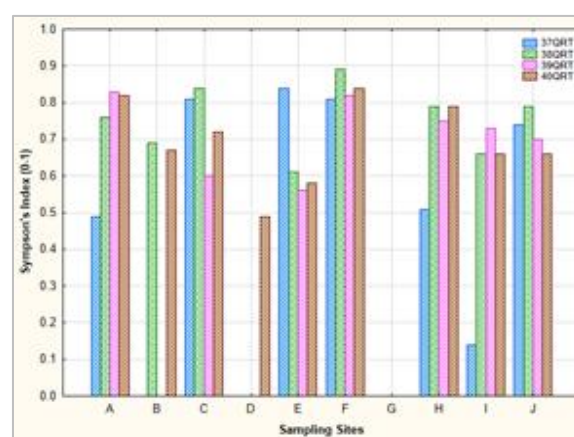
2020-21



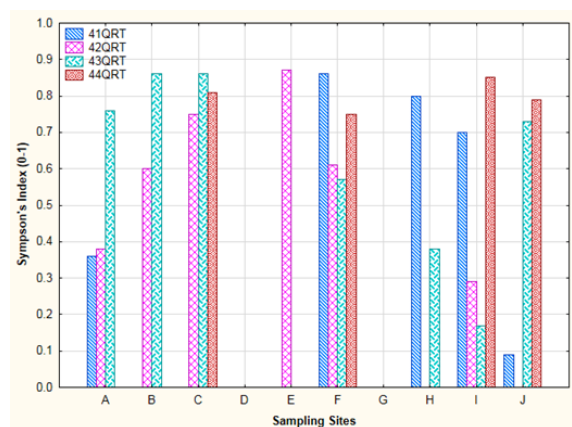
2021-22



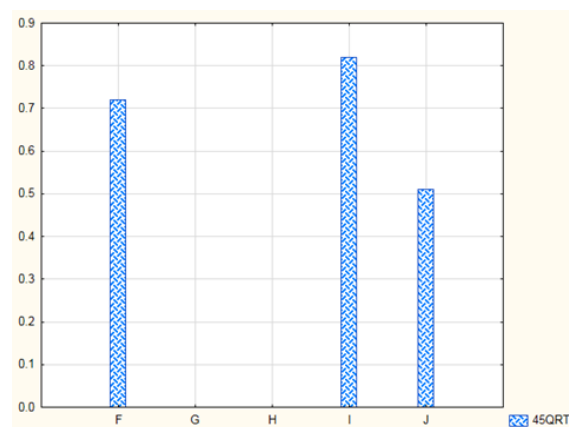
2022-23



2023-24

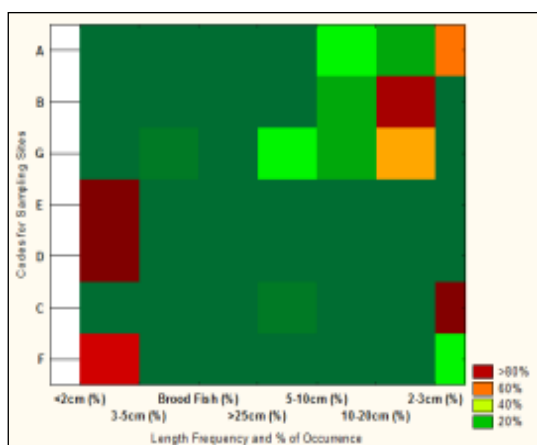
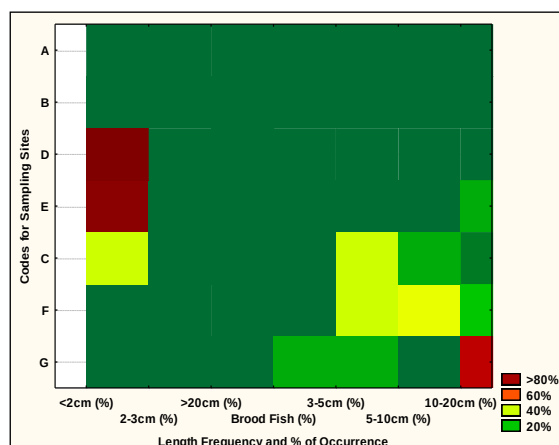
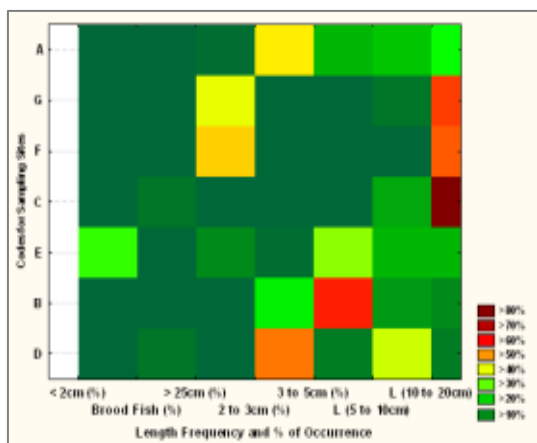
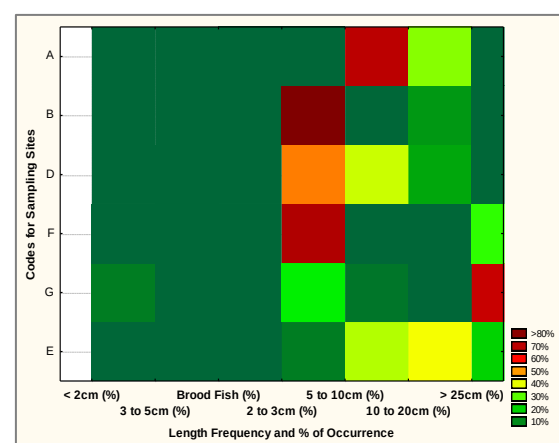
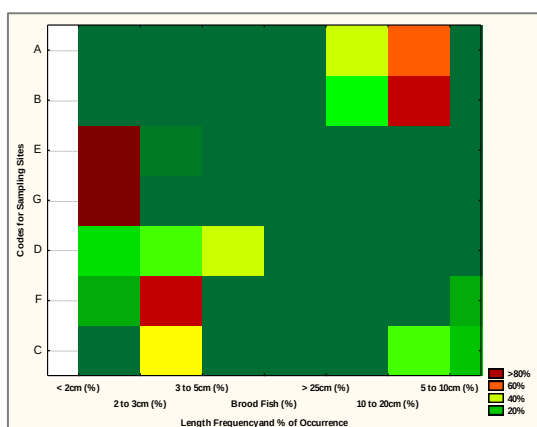
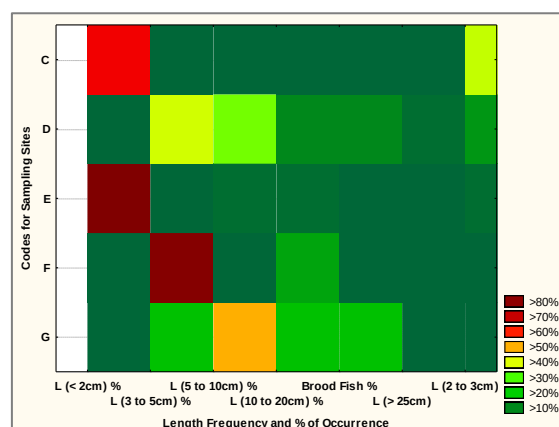


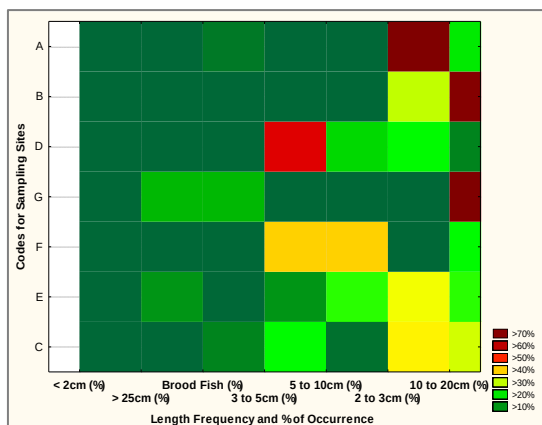
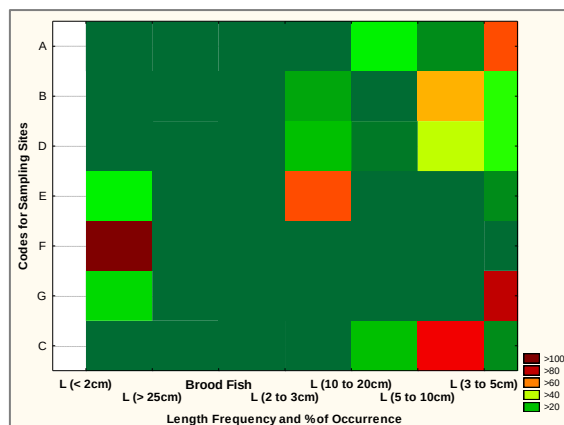
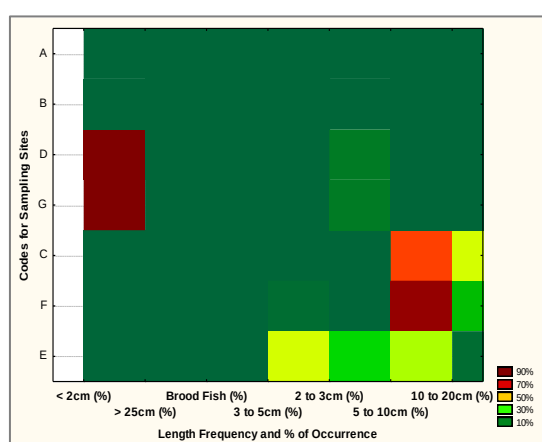
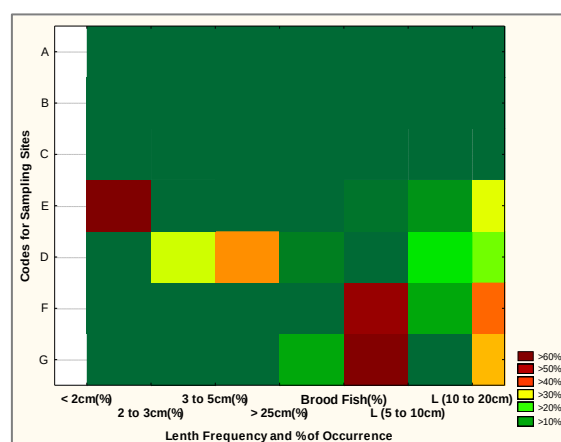
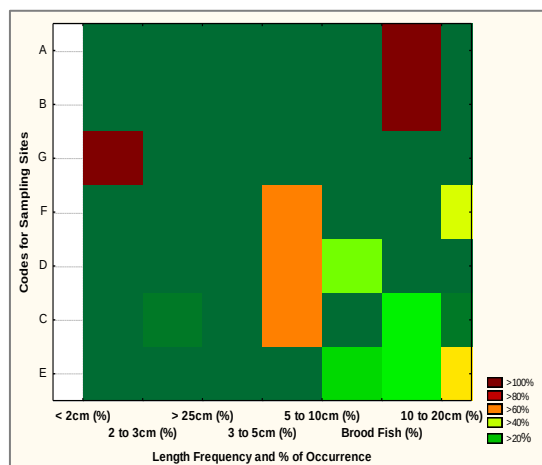
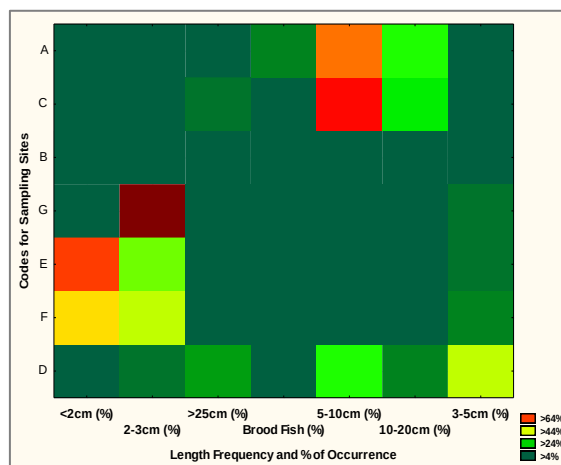
2024-25

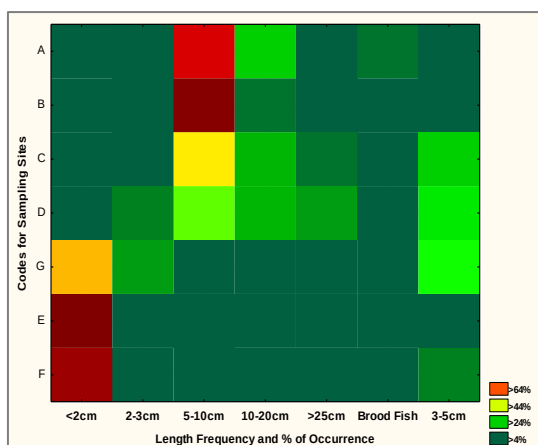
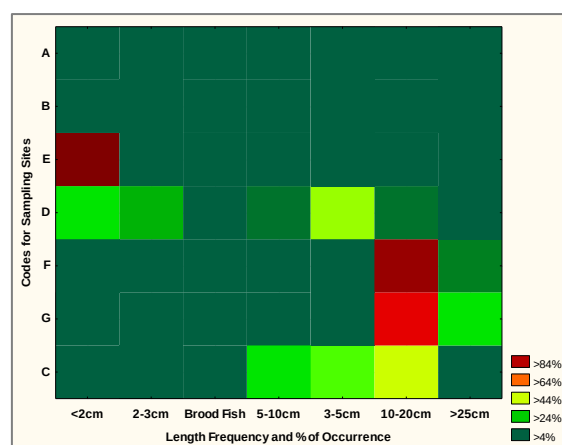
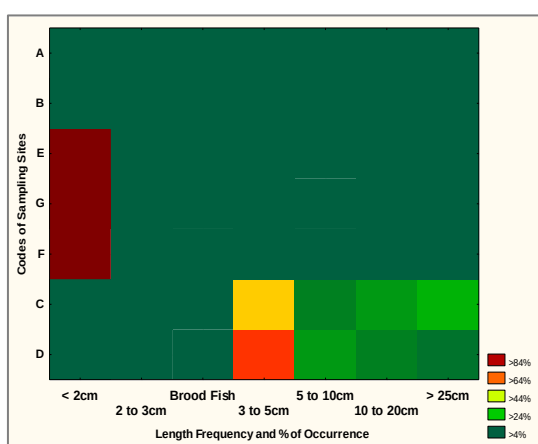
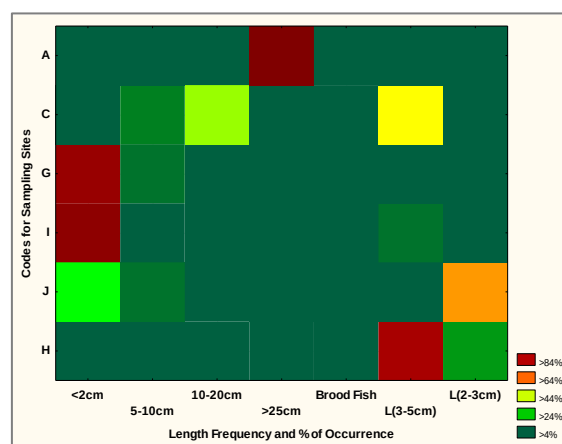
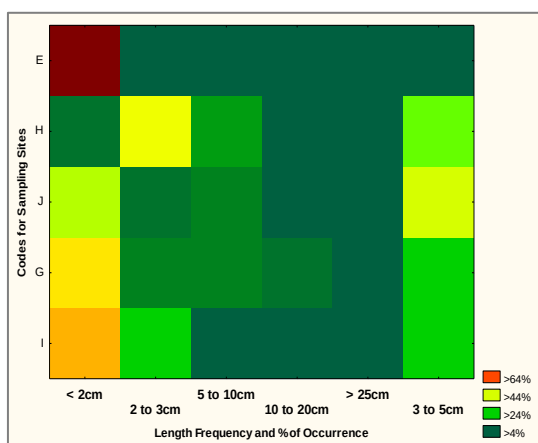
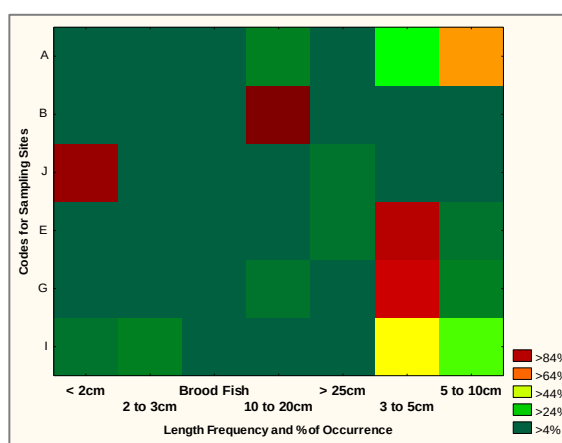


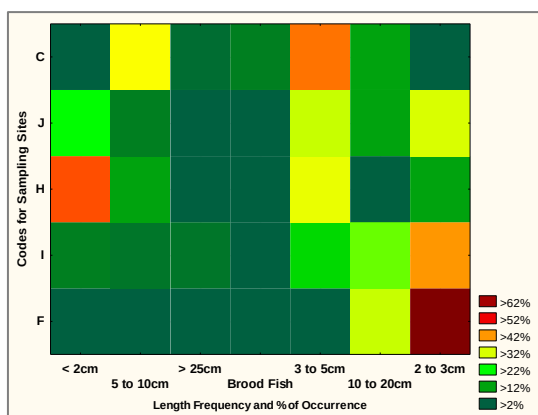
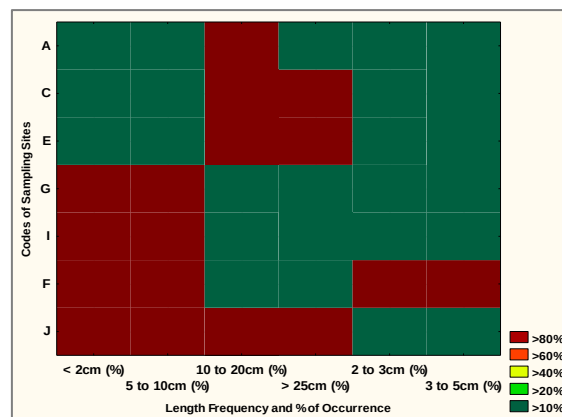
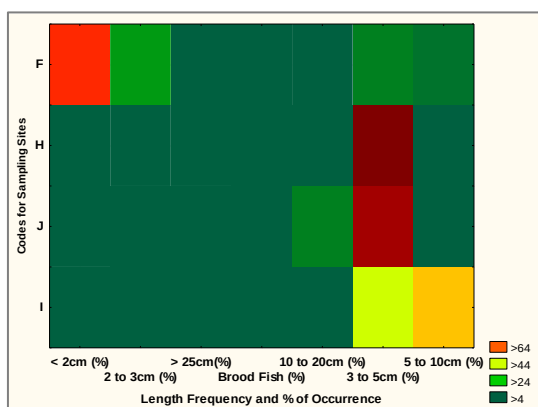
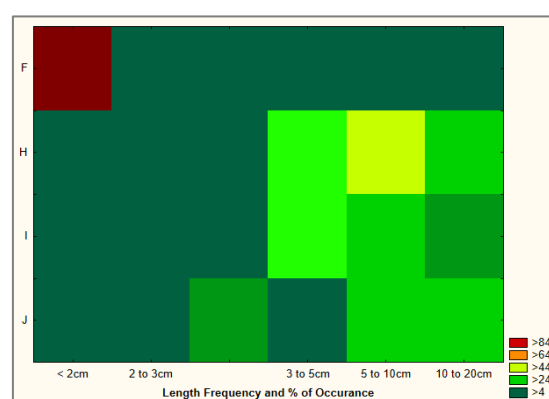
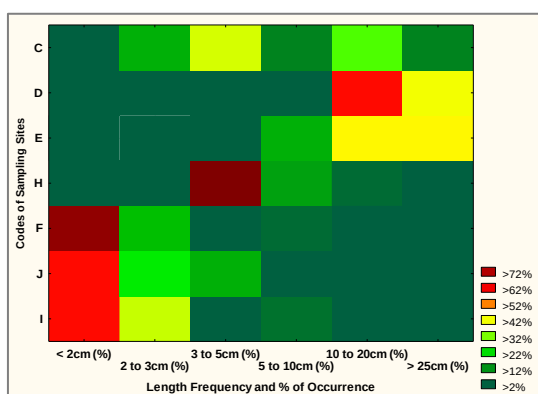
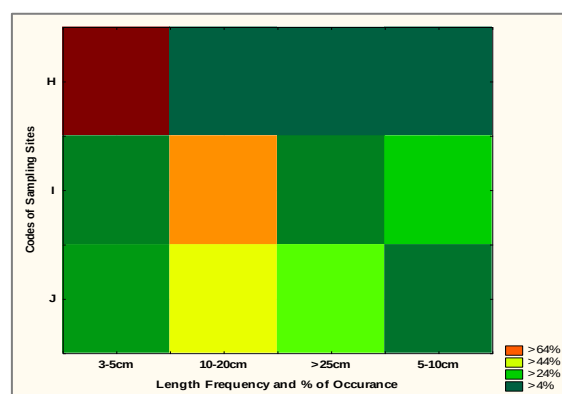
2025-26

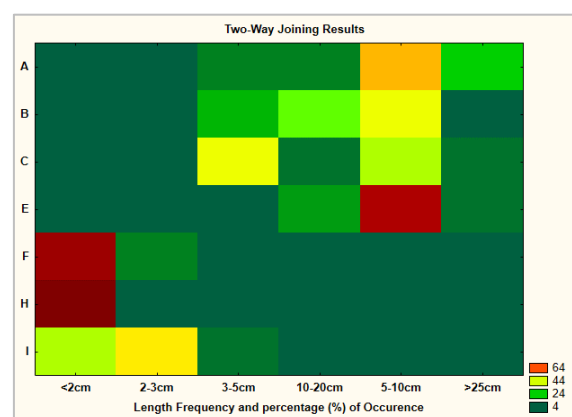
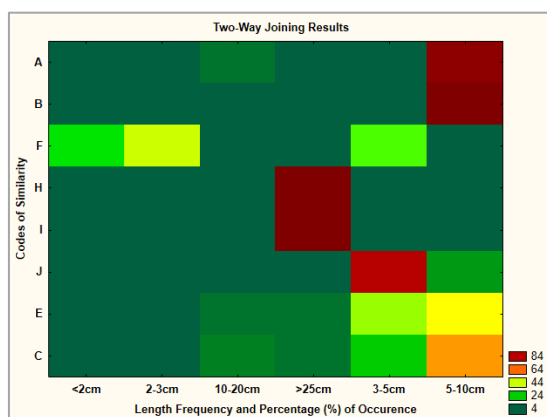
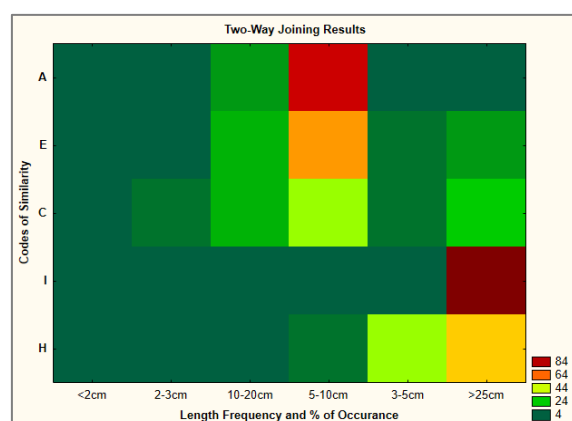
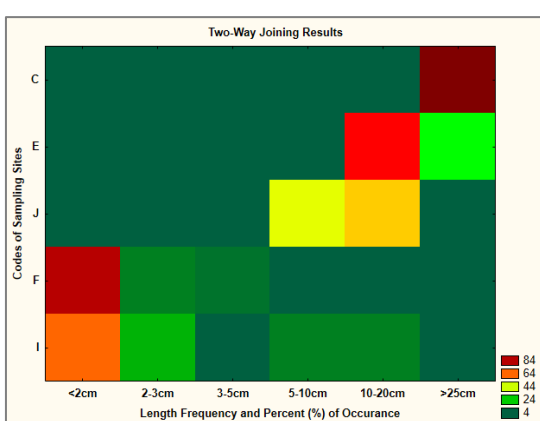
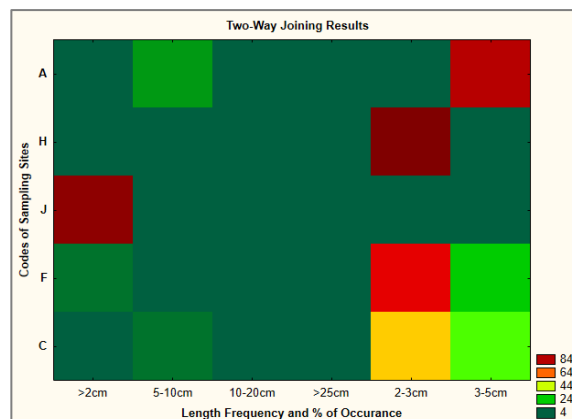
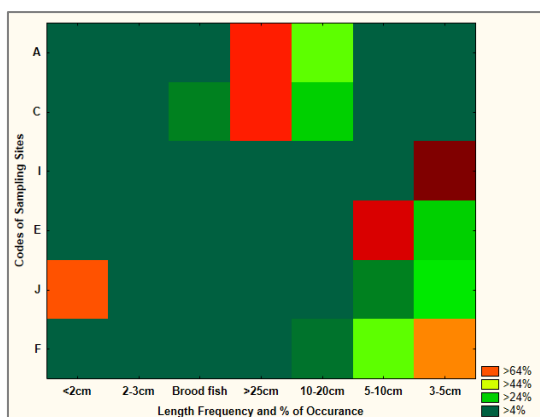
Figure D4: Fish Community Structure

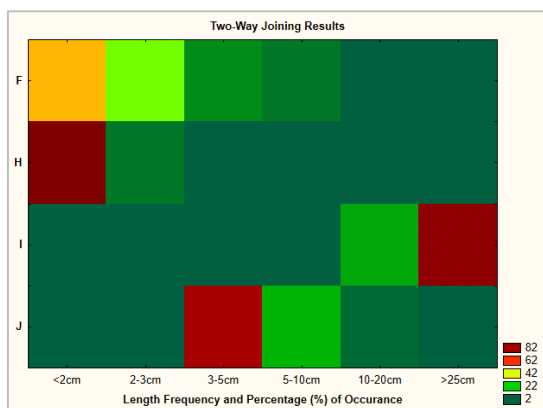
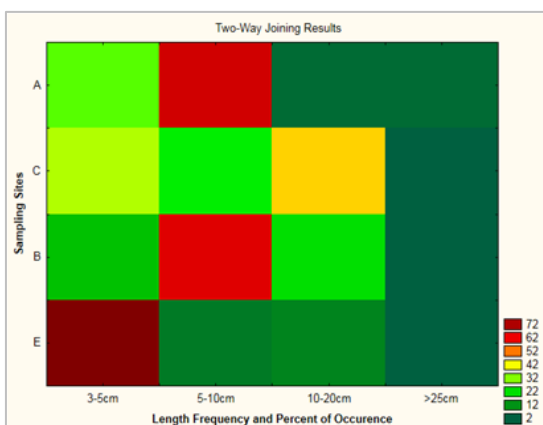
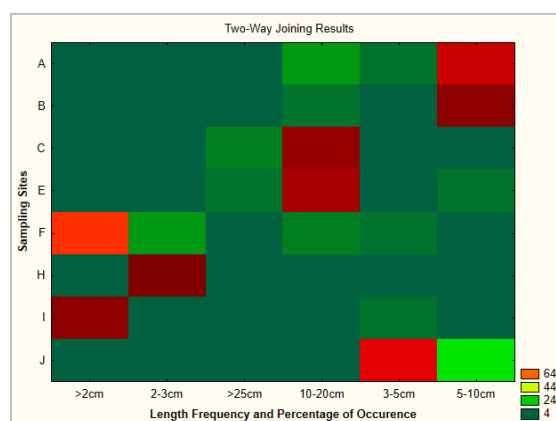
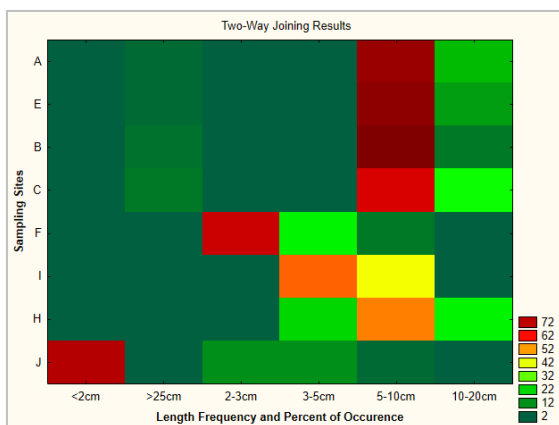
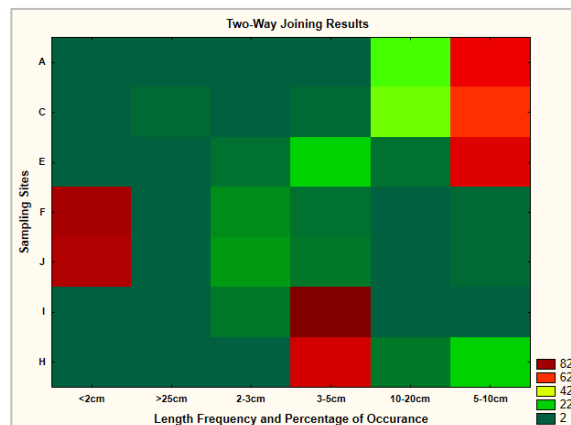
1st Monitoring, April, 20142nd Monitoring, July 20143rd Monitoring, October, 20144th Monitoring, January 20155th Monitoring, April, 20156th Monitoring, August, 2015

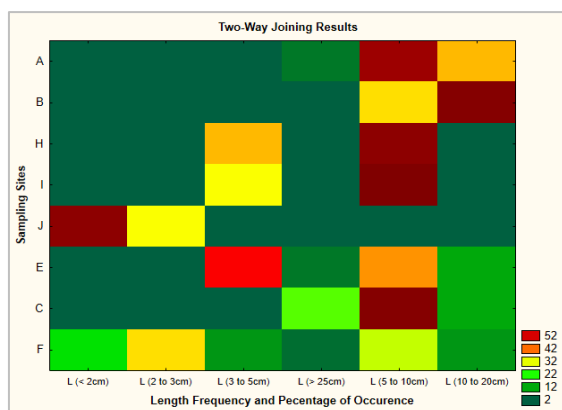
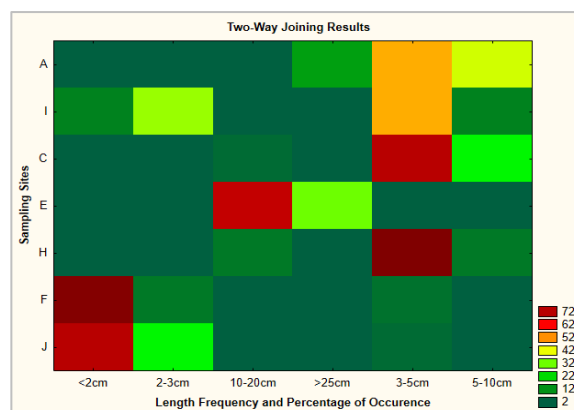
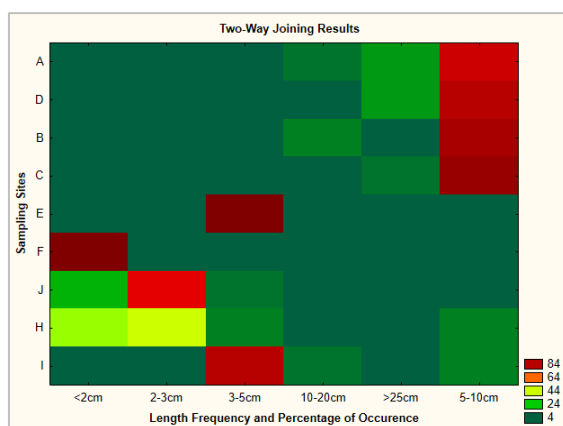
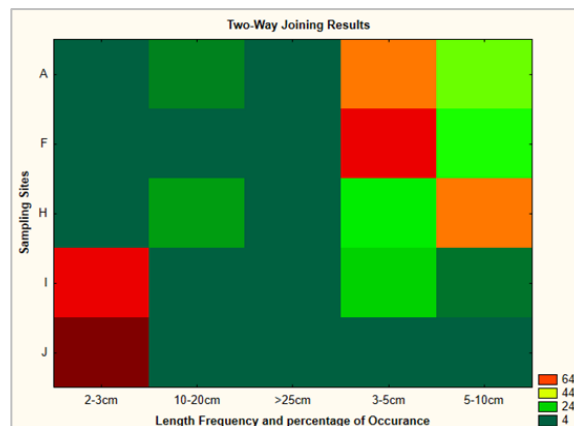
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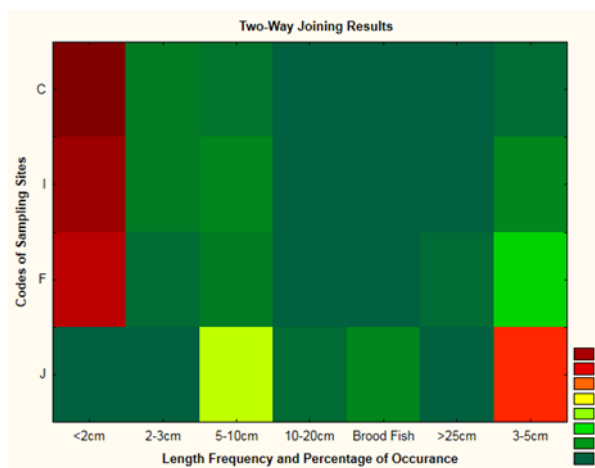
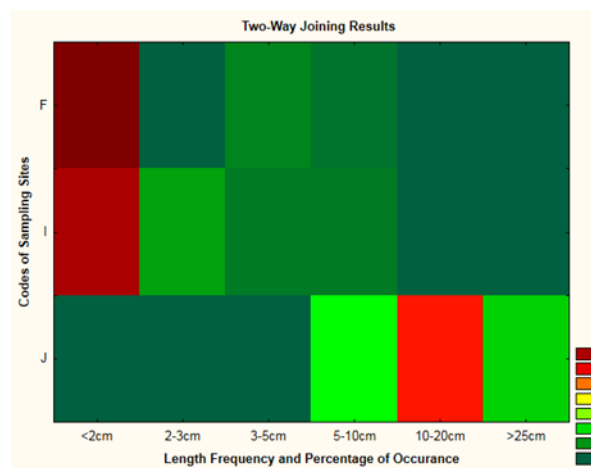
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19th Monitoring, February, 201920th Monitoring, April, 201921st Monitoring, July 201922nd Monitoring, November 201923rd Monitoring, February 202025th Monitoring, July 2020



32nd Monitoring, May 202233rd Monitoring, July 202234th Monitoring, Oct 202235th Monitoring, Feb 202336th Monitoring, May 202337th Monitoring, September 2023

38th Monitoring, November 202339th Monitoring, February 202440th Monitoring, May 202441st Monitoring, July 202442nd Monitoring, Nov 202443rd Monitoring, Feb 2025

44th Monitoring, April 202545th Monitoring, August 2025

Source: CEGIS Field Survey, 2019-20, 2020-21, 2021-22, 2022-23, 2023-2024, and 2024-2025

Table D.1: Site Wise Species Diversity using Shannon–Weiner Index (1st to 45th QM)

Quarters	Species Number										Shannon-Weiner Index									
Sites	A	B	C	D	E	F	G	H	I	J	A	B	C	D	E	F	G	H	I	J
1 st QM	33	12	2	12	7	3	6	-	-	-	0.5	0.9	0.3	0.3	0.4	0.8	0.7	-	-	-
2 nd QM	-	-	12	22	13	13	3	-	-	-	-	-	0.77	0.78	0.6	0.77	0.82	-	-	-
3 rd QM	13	24	9	15	10	6	5	-	-	-	0.7	0.6	0.4	0.7	0.8	0.5	0.7	-	-	-
4 th QM	7	14	-	26	11	4	7	-	-	-	0.6	0.4	-	0.5	0.8	0.6	0.7	-	-	-
5 th QM	3	-	11	27	6	10	18	-	-	-	1	-	0.8	0.7	0.2	0.7	0.2	-	-	-
6 th QM	-	-	26	24	16	8	3	-	-	-	-	-	0.6	0.7	0.7	0.4	1	-	-	-
7 th QM	10	11	18	20	9	14	8	-	-	-	0.6	0.6	0.5	0.5	0.9	0.8	0.7	-	-	-
8 th QM	15	3	24	25	9	6	6	-	-	-	0.4	0.6	0.7	0.7	0.4	0.7	0.8	-	-	-
9 th QM	-	-	17	8	15	7	6	-	-	-	-	-	0.6	0.6	0.7	0.8	0.6	-	-	-
10 th QM	-	-	-	19	12	5	4	-	-	-	-	-	-	0.6	0.5	0.7	0.9	-	-	-
11 th QM	1	1	23	32	5	7	12	-	-	-	-	-	0.6	0.6	0.7	0.9	0.2	-	-	-
12 th QM	2	-	10	27	4	12	3	-	-	-	0.9	-	0.6	0.8	0.7	0.9	0.7	-	-	-
13 th QM	2	5	18	15	4	9	15	-	-	-	0.74	0.37	0.79	0.76	0.51	0.53	0.67	-	-	-
14 th QM	-	-	-	-	-	6	81	112	3	4	-	-	-	-	-	0.85	0.62	0.54	0.88	0.78
15 th QM	-	-	-	-	-	17	29	13	13	5	-	-	-	-	-	0.81	0.74	0.21	0.33	0.32
16 th QM	3	-	12	-	-	-	21	3	12	10	0.92	-	0.69	-	-	-	0.78	0.55	0.21	0.54
17 th QM	-	-	-	-	-	-	16	18	10	14	-	-	-	-	0.31	-	0.85	0.49	0.65	0.52
18 th QM	8	2	-	-	12	-	19	2	17	11	0.16	0.92	-	-	0.73	-	0.34	-	0.85	0.52
19 th QM	-	-	24	-	-	13	-	13	11	11	-	-	0.53	-	-	0.56	-	0.4	0.61	0.29
20 th QM	2	-	11	-	2	22	26	-	8	12	0.65	-	0.86	-	0.99	0.74	0.58	-	0.14	0.5
21 st QM	-	-	-	-	-	19	-	5	9	14	-	-	-	-	-	0.5	-	0.14	0.52	0.71
22 nd QM	-	-	-	-	-	11	-	11	11	9	-	-	-	-	-	0.81	-	0.76	0.8	0.5
23 rd QM	-	-	10	1	2	11	-	10	12	8	-	-	0.78	-	0.72	0.56	-	0.4	0.54	0.64
25 th QM	-	-	-	-	-	-	-	11	6	15	-	-	-	-	-	-	-	0.55	0.45	0.46
26 th QM	7	-	4	-	9	12	-	-	16	11	0.64	-	0.82	-	0.29	0.7	-	-	0.41	0.53
27 th QM	18	-	28	-	-	7	-	3	-	12	0.59	-	0.53	-	-	0.18	-	0.12	-	0.19
28 th QM	-	-	4	-	3	20	-	-	18	4	-	-	0.88	-	0.74	0.37	-	-	0.52	0.96
29 th QM	6	-	10	-	13	-	-	9	1	-	0.49	-	0.82	-	0.79	-	-	0.85	-	-
30 th QM	20	7	34	-	25	10	-	1	1	8	0.61	0.73	0.83	-	0.73	0.68	-	-	-	0.58
31 st QM	25	25	33	-	12	13	-	11	12	-	0.5	0.52	0.54	-	0.71	0.59	-	0.06	0.67	-
32 nd QM	-	-	-	-	-	19	-	13	4	10	-	-	-	-	-	0.84	-	0.31	0.69	0.37
33 rd QM	-	-	-	-	-	6	-	8	11	13	-	-	-	-	-	0.91	-	0.36	0.79	0.83
34 th QM	11	7	13	-	12	-	-	-	-	-	0.39	0.65	0.81	-	0.52	-	-	-	-	-
35 th QM	13	7	3	-	7	20	-	12	12	7	0.58	0.3	0.38	-	0.39	0.46	-	0.2	0.35	0.46
36 th QM	20	18	5	-	23	22	-	9	4	20	0.69	0.47	0.73	-	0.66	0.75	-	0.9	0.75	0.48
37 th QM	9	-	32	-	20	23	-	3	11	20	0.48	-	0.6	-	0.85	0.75	-	0.81	0.73	0.69
38 th QM	16	10	9	-	7	31	-	8	5	13	0.91	0.6	0.85	-	0.66	0.75	-	0.81	0.73	0.69
39 th QM	8	-	12	-	3	22	-	11	14	24	0.88	-	0.46	-	0.81	0.64	-	0.71	0.66	0.53

Quarters	Species Number										Shannon-Weiner Index									
Sites	A	B	C	D	E	F	G	H	I	J	A	B	C	D	E	F	G	H	I	J
40 th QM	13	12	9	4	10	14	-	16	8	16	0.76	0.53	0.73	0.65	0.51	0.78	-	0.65	0.69	0.55
41 st QM	9	-	-	-	-	13	-	7	5	3	0.36	-	-	-	-	0.84	-	0.88	0.83	0.18
42 nd QM	16	20	9	-	26	5	-	-	5	-	0.35	0.45	0.62	-	0.72	0.67	-	-	0.4	-
43 rd QM	10	13	26	-	-	9	-	4	3	15	0.75	0.84	0.64	-	-	0.51	-	0.53	0.31	0.55
44 th QM			9			20			18	15			0.61			0.54			0.65	0.67
45 th QM	-	-	-	-	-	21	-	-	19	2	-	-	-	-	-	0.52	-	-	0.64	0.99

*According to Shannon-Weiner Index, 0-0.30: Low diversity/equally distribution (VH); 0.31-0.50: Moderate Diversity (M); 0.51-0.80: High Diversity (HD) and 0.80-1.0: Very High Diversity (VHD)

Table D.2: Site wise Rich Species Number (1st to 45th QM)

Fiscal Year	Monitoring Quarters	Rich Species in Sampling Sites									
		A	B	C	D	E	F	G	H	I	J
2014-15	1 st QM	4	7	1	2	1	3	3	-	-	-
	2 nd QM	0	0	5	2	10	6	3	-	-	-
	3 rd QM	4	4	2	5	4	2	2	-	-	-
	4 th QM	3	2	0	4	5	2	3	-	-	-
2015-16	5 th QM	3	0	4	5	3	4	1	-	-	-
	6 th QM	-	-	4	8	6	2	3	-	-	-
	7 th QM	3	3	3	3	4	4	3	-	-	-
	8 th QM	2	2	6	7	2	2	4	-	-	-
2016-17	9 th QM	0	0	4	4	4	3	2	-	-	-
	10 th QM	0	0	0	6	7	2	4	-	-	-
	11 th QM	1	1	4	3	3	3	1	-	-	-
	12 th QM	2	0	2	7	2	3	2	-	-	-
2017-18	13 th QM	2	1	-	-	7	6	-	2	1	4
	14 th QM	-	-	-	-	6	5	-	2	3	2
	15 th QM	-	-	-	-	6	7	-	1	2	1
2018-19	16 th QM	4	-	4	-	-	11	-	2	1	2
	17 th QM	-	-	-	-	2	9	-	3	3	3
	18 th QM	1	3	-	-	4	2	-	-	9	2
	19 th QM	-	-	4	-	-	3	-	3	3	2
2019-20	20 th QM	2	-	7	-	2	7	3	-	1	2
	21 st QM	-	-	-	-	-	4	-	1	1	3
	22 nd QM	-	-	-	-	-	6	-	5	6	2
	23 rd QM	-	-	5	1	2	2	-	2	3	3
2020-21	25 th QM	-	-	-	-	-	-	-	3	2	2
	26 th QM	2	-	3	-	1	4	-	-	3	3
	27 th QM	4	-	3	-	-	1	-	1	-	1
	28 th QM	-	-	2	-	2	2	-	-	3	2
2021-22	29 th QM	1	-	2	-	4	-	-	3	1	-
	30 th QM	3	4	6	-	4	3	-	-	1	2
	31 st QM	5	4	4	-	4	5	-	3	4	-
	32 nd QM	-	-	-	-	-	9	-	1	2	2
2022-23	33 rd QM	-	-	-	-	-	5	-	2	4	5
	34 th QM	2	3	6	-	2	-	-	-	-	-
	35 th QM	3	1	1	-	2	3	-	1	2	2
	36 th QM	5	2	8	-	5	9	-	6	2	3
2023-24	37 th QM	2	-	5	-	6	5	-	2	1	4
	38 th QM	4	-	5	-	3	9	-	5	3	5
	39 th QM	6	-	3	-	2	6	-	4	4	3
	40 th QM	5	3	4	2	2	6	-	5	5	3
2024-25	41 st QM	2	-	-	-	-	7	-	5	3	1
	42 nd QM	2	2	4	-	7	3	-	-	1	-
	43 rd QM	4	7	6	-	-	2	-	2	1	4
	44 th QM	-	-	5	-	-	4	-	-	7	5
2025-26	45 th QM	-	-	-	-	-	4	-	-	5	2

Source: CEGIS Field Survey, April 2014 - October 2025

Table D.3: Total Catch in the Sampling Sites

Monitoring Quarters	Total Catch (kg)									
	Sampling Site									
	A	B	C	D	E	F	G	H	I	J
1 st QM	28	65	1,559	0	0	0	0	-	-	-
2 nd QM	0	0	0.5	12	0.6	1.2	1.6	-	-	-
3 rd QM	3	1	8	3	5	13	4	-	-	-
4 th QM	28.7	3.3	8.7	30	0	3.7	0.7	-	-	-
5 th QM	6	0	1.05	10.5	0.5	1.5	2.9	-	-	-
6 th QM	0	0	0.33	5.08	0.4	0.7	0.83	-	-	-
7 th QM	20	10	19.5	10.75	0.6	0.8	0.825	-	-	-
8 th QM	276.2	12.8	173.6	189	7.8	0	70	-	-	-
9 th QM	0	0	2.8	0	5	1.5	1	-	-	-
10 th QM	0	0	0	12	7.5	0.8	0.8	-	-	-
11 th QM	10	4	2.6	18	2.6	0.5	0.1	-	-	-
12 th QM	2	0	10	56	0	0	0	-	-	-
13 th QM	2	0.25	8.13	77.5	0	0.3	0.12	-	-	-
14 th QM	-	-	-	-	1.5	0	10.5	-	0.4	0.3
15 th QM	-	-	-	-	2.56	-	37.67	-	0.67	-
16 th QM	17	-	1.5	-	-	-	3	0.33	0.13	1
17 th QM	-	-	-	-	0.1	-	4	22	3	0.25
18 th QM	16	1	-	-	2	-	27	-	5	1.2
19 th QM	-	-	93	-	-	-	-	5	1.2	0.6
20 th QM	0.4	-	17.5	-	0.5	-	-	-	-	0.17
21 st QM	-	-	-	-	-	-	-	11.5	0.5	1.6
22 nd QM	-	-	-	-	-	-	-	0.2	1.7	0.8
23 rd QM	-	-	4.6	1.35	1.17	-	-	20	0.4	-
25 th QM	-	-	-	-	-	-	-	10.5	3	6.3
26 th QM	30.5	-	18.9	-	2.07	0.6	-	-	5	7.5
27 th QM	3.5	-	33	-	-	-	-	4	-	-
28 th QM	-	-	12.7	-	47.5	2.3	-	-	3.5	0.3
29 th QM	1.1	-	5.85	0	11.34	-	-	6.1	7.75	-
30 th QM	27	13	23	-	52	-	-	0.25	2.5	3.25
31 st QM	30	14.5	20	-	4	-	-	1	0.1	-
32 nd QM	-	-	-	-	-	-	-	-	1.2	1.3
33 rd QM	-	-	-	-	-	0.6	-	0.8	1.25	3.1
34 th QM	81	0.4	1.1	-	5.7	-	-	-	-	-
35 th QM	51.7	20.5	8	-	27.5	0.8	-	0.2	-	0.5
36 th QM	14	39	20.3	-	18.5	0.8	-	1.3	0.2	0.3
37 th QM	1.25	-	10.9	-	10.6	1.1	-	0.2	0.25	0.5
38 th QM	104.5	34.75	2.1	-	5	9.85	-	0.3	0.25	0.4
39 th QM	0.4	-	6.4	-	13	-	-	0.72	1.3	3.16
40 th QM	53.4	138.6	31.93	11	4	-	-	11.25	0.75	0.22
41 st QM	47.6	-	-	-	-	31.3	-	0.5	-	3
42 nd QM	8	7	5.25	-	11.25	0.32	-	-	3	-
43 rd QM	3.5	3.3	16	-	-	2.0	-	-	2.0	0.5
44 th QM	-	-	63.17	-	-	27.6	-	-	3.75	1.45
45 th QM	-	-	-	-	-	5.55	-	-	4.17	9.45

*Average Weight 0.15kg/mud crab and average weight 0.6 kg/mud eel** Weight of Fry is not considered for catch assessment.

Table D.4: Occurrence of Species (1st to 22nd QM)

Local Name	Scientific Name	Local Status*	1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21 st QM	22 nd QM
			- = No; + = Occurrence																					
Hilsa	<i>Tenualosa ilisha</i>	NO	-	-	+	-	-	+	+	-	-	-	+	-	-	-	-	-	-	+	-	-	-	+
Sagor Baim	<i>Anguilla bengalensis</i>	NT	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bacha	<i>Eutropiichthys vacha</i>	CR	+	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	+
Bagda Chingri	<i>Penaeus monodon</i>	DD	+	+	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+
Banspata	<i>Brachypleura novae</i>	NO	+	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-
Kukurjib	<i>Cynoglossus lingua</i>	NO	+	-	-	-	-	-	-	+	+	+	-	+	-	-	+	-	-	-	+	-	+	+
Bele	<i>Glossogobius giuris</i>	NO	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
Aswine Bele	<i>Butis butis</i>	NO	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-	-
Bairagi	<i>Coilia dussumieri</i>	NO	+	+	+	+	+	+	-	+	-	-	-	+	+	+	+	+	+	+	+	+	+	-
Boishakhi Chingri	<i>Macrobrachium</i> sp.	NO	-	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-
Chammu Chingri	<i>Metapenaeus brevicornis</i>	DD	+	+	+	-	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+
Chaka Chingri	<i>Penaeus indicus</i>	DD	+	+	-	+	+	+	+	+	+	-	+	-	+	-	+	+	+	+	+	+	+	+
Ghora Chela	<i>Securicula gora</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chanda Chela	<i>Securicula</i> sp.		-	+	+	-	-	-	-	-	+	+	-	-	-	-	+	+	+	+	-	-	-	+
Sada Chewa	<i>Trepauchen vagina</i>	NO	+	-	+	-	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	+	-	+
Lal Chewa	<i>Taenioides cirratus</i>	NO	+	+	+	+	+	+	+	+	+	-	-	-	+	+	-	+	+	-	+	+	-	-
Chhuri	<i>Trichiurus muticus</i>	NO	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
Sagor Chela	<i>Megalops cyprinoids</i>	NO	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purabi Chela	<i>Thryssa purava</i>	NO	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabashi Tengra	<i>Mystus cavasius</i>	DD	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Gagra Tengra	<i>Nemapteryx nenga</i>	DD	-	+	+	-	+	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-
Gulsha Tengra	<i>Mystus bleekery</i>	DD	+	+	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-
Harina Chingri	<i>Metapenaeus ensis</i>	DD	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	+	+	+
Ekthuto	<i>Hyporhamphus limbatus</i>	NO	+	-	+	+	-	-	-	+	+	-	+	-	+	+	-	-	+	+	+	+	+	+
Kakila	<i>Xenentodon cancila</i>	NO	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-	-	-	+
Chapila	<i>Gudusia chapra</i>	NO	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	+	-	+	+

Local Name	Scientific Name	Local Status*	1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21st QM	22nd QM
			'-' = No; '+' = Occurrence																					
Kuchia	<i>Monopterusuchia</i>	DD	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
Loitta	<i>Harpodon nehereus</i>	NO	+	+	+	-	+	-	-	-	+	+	-	-	+	-	+	-	-	-	-	+	-	-
Motka Chingri	<i>Macrobrachium villosimanusless</i>	DD	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+
Mud Crab	<i>Scylla serrata</i>	NO	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	+	-	+	+	+	-	+
Tular Dandi	<i>Sillaginopsis panijus</i>	NO	+	-	+	-	+	-	+	-	-	-	+	-	-	+	-	-	-	+	+	+	+	-
Paira Chanda	<i>Scatophagus argus</i>	DD	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-
Paissa	<i>Liza parsia</i>	NO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+
Pangas	<i>Pangasius pangasius</i>	CR	+	-	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	+	+	+	+	+
Tak Chanda	<i>Leiognathus equulus</i>	NO	+	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Phessa	<i>Setipinna phasa</i>	NO	+	+	+	+	+	+	+	+	+	-	+	-	+	+	-	+	-	-	+	+	+	+
Teli Phessa	<i>Setipinna phasa</i>	DD	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Poma	<i>Poma poma</i>	NO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Potka	<i>Chelonodon patoca</i>	NO	+	+	-	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	-	-
Shilong	<i>Silonia silondia</i>	EN	+	-	+	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	+
Tailla	<i>Eleutheronema tetradactylum</i>	DD	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+	+	-
Tapse	<i>Polynemus paradiseus</i>	DD	+	+	+	-	-	+	+	+	-	-	+	+	-	+	+	+	+	+	+	+	+	-
Daitna	<i>Acanthopagrus latus</i>	DD	-	-	-	+	-	-	-	+	+	-	+	+	-	+	+	+	-	+	+	+	-	-
Shole	<i>Channa striatus</i>	DD	-	-	-	+	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-
Magur	<i>Clarias batrachus</i>	DD	-	-	-	+	-	-	-	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-
Koi	<i>Anabas testudineus</i>	DD	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Vetki	<i>Lates calcarifer</i>	DD	-	-	-	+	+	+	+	+	+	-	+	+	+	+	+	+	-	+	+	-	+	-

Table D.5: Occurrence of Species (23rd to 46th QM)

Local Name	Scientific Name	Local Status*	23 rd QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 th QM	32 nd QM	33 rd QM	34 th QM	35 rd QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM
			‘-’ = No; ‘+’ = Occurrence																						
Hilsa	<i>Tenulosa ilisha</i>	NO	-	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	+	-	+	-	+	+
Sagor Baim	<i>Anguilla bengalensis</i>	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bacha	<i>Eutropiichthys vacha</i>	CR	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Bagda Chingri	<i>Penaeus monodon</i>	DD	+	-	-	+	+	+	+	+	+	-	-	-	-	+	+	+	+	-	-	+	+	+	+
Banspata	<i>Brachypleura novae-zeelandiae</i>	NO	-	+	-	+	-	+	+	+	+	-	-	-	+	+	+	+	+	-	+	+	-	-	+
Kukurjib	<i>Cynoglossus lingua</i>	NO	-	+	+	+	-	+	+	+	-	+	-	+	+	-	-	+	+	+	-	-	-	-	-
Bele	<i>Glossogobius giuris</i>	NO	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+
Aswine Bele	<i>Butis butis</i>	NO	-	-	+	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	-	+	-	-	-
Bairagi	<i>Coilia dussumieri</i>	NO	+	+	-	+	+	+	+	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	+
Boishakhi Chingri	<i>Macrobrachium</i> sp.	NO	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chammu Chingri	<i>Metapenaeus brevicornis</i>	DD	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	+	+	+	+	+	-
Chaka Chingri	<i>Penaeus indicus</i>	DD	+	-	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-	-
Ghora Chela	<i>Securicula gora</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chanda Chela	<i>Securicula</i> sp.		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sada Chewa	<i>Trepauchen vagina</i>	NO	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lal Chewa	<i>Taenioides cirratus</i>	NO	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
Chhuri	<i>Trichiurus muticus</i>	NO	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Sagor Chela	<i>Megalops cyprinoids</i>	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purabi Chela	<i>Thryssa purava</i>	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kabashi Tengra	<i>Mystus cavasius</i>	DD	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gagra Tengra	<i>Nemapteryx nenga</i>	DD	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+
Gulsha Tengra	<i>Mystus bleekery</i>	DD	+	-	+	+	-	-	+	+	-	+	+	+	+	+	+	+	+	-	+	+	+	-	+
Harina Chingri	<i>Metapenaeus ensis</i>	DD	+	+	-	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ekthuto	<i>Hyporhamphus limbatus</i>	NO	-	-	+	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+	-	-	-	-
Kakila	<i>Xenentodon cancila</i>	NO	-	-	-	-	-	-	+	+	-	-	+	+	-	-	+	-	-	-	+	-	+	+	-
Chapila	<i>Gudusia chapra</i>	NO	-	+	+	+	+	-	+	+	+	+	-	-	+	-	+	-	-	+	-	+	-	-	+

Local Name	Scientific Name	Local Status*	23 rd QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 th QM	32 nd QM	33 rd QM	34 th QM	35 rd QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM
			‘-’ = No; ‘+’ = Occurrence																						
Kuchia	<i>Monopterusuchia</i>	DD	+	+	-	+	+	+	+	+	-	+	-	+	+	-	+	-	-	-	-	-	+	+	-
Loitta	<i>Harpodon nehereus</i>	NO	-	-	+	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Motka Chingri	<i>Macrobrachium villosimanusless</i>	DD	+	-	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	+
Mud Crab	<i>Scylla serrata</i>	NO	+	-	+	-	-	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+
Tular Dandi	<i>Sillaginopsis panijus</i>	NO	-	-	-	-	+	-	-	-	+	-	-	-	+	+	+	+	+	+	+	+	+	-	-
Paira Chanda	<i>Scatophagus argus</i>	DD	-	-	+	+	-	-	+	+	-	-	+	-	+	+	-	-	-	-	+	+	-	+	+
Paissa	<i>Liza parsia</i>	NO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pangas	<i>Pangasius pangasius</i>	CR	-	-	+	-	-	+	+	+	-	-	+	-	-	-	+	+	+	-	+	+	+	-	+
Tak Chanda	<i>Leiognathus equulus</i>	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Pheksha	<i>Setipinna phasa</i>	NO	+	-	-	-	+	+	+	+	-	-	-	+	+	-	+	+	-	+	+	+	-	-	+
Teli Pheksha	<i>Setipinna phasa</i>	DD	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-
Poma	<i>Poma poma</i>	NO	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+
Potka	<i>Chelonodon patoca</i>	NO	-	-	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-	-	+	+	+	+
Shilong	<i>Silonia silondia</i>	EN	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+
Tailla	<i>Eleutheronema tetradactylum</i>	DD	-	-	-	+	-	+	+	-	-	-	+	-	+	-	-	-	-	-	-	+	-	-	+
Tapse	<i>Polynemus paradiseus</i>	DD	+	+	+	-	-	+	+	-	+	-	-	-	+	+	+	-	-	-	-	+	-	+	+
Datina	<i>Acanthopagrus latus</i>	DD	+	-	-	+	-	-	+	+	-	-	+	+	+	+	+	+	+	+	-	+	+	-	+
Shole	<i>Channa striatus</i>	DD	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magur	<i>Clarias batrachus</i>	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Koi	<i>Anabas testudineus</i>	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vetki	<i>Lates calcarifer</i>	DD	-	-	-	-	-	+	+	-	-	-	+	-	-	+	+	-		+	-	+	-		+

*Local Status Source: IUCN Bangladesh, 2015

Table D.6: Length-wise species distribution (%) in sampling sites

Fish Species	Sampling	L (< 2cm)	L (2 to 3cm)	L (3 to 5cm)	L (5 to 10cm)	L (10 to 20cm)	L (> 25cm)	Brood Fish
Amadi	B	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	F	0.00	33.33	33.33	33.33	0.00	0.00	0.00
	J	25.00	25.00	25.00	25.00	0.00	0.00	0.00
Bagda	J	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Banshpata	C	0.00	0.00	0.00	0.00	0.00	100.00	0.00
	E	0.00	0.00	0.00	0.00	0.00	100.00	0.00
	I	0.00	0.00	0.00	0.00	0.00	100.00	0.00
Bele	I	0.00	0.00	0.00	0.00	100.00	0.00	0.00
	J	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Boal	C	0.00	0.00	0.00	0.00	0.00	100.00	0.00
Chela	B	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Chewa	F	0.00	33.33	33.33	33.33	0.00	0.00	0.00
	J	0.00	33.33	33.33	33.33	0.00	0.00	0.00
Chitra	C	0.00	0.00	20.00	40.00	40.00	0.00	0.00
	E	0.00	0.00	16.67	33.33	33.33	16.67	0.00
Chota Bele	C	0.00	0.00	0.00	0.00	100.00	0.00	0.00
	E	0.00	0.00	0.00	20.00	40.00	40.00	0.00
Datina	B	0.00	0.00	0.00	0.00	100.00	0.00	0.00
	C	0.00	0.00	0.00	0.00	50.00	50.00	0.00
Gagra Tengra	B	0.00	0.00	0.00	50.00	50.00	0.00	0.00
	F	0.00	0.00	0.00	0.00	50.00	50.00	0.00
Gangani	C	0.00	0.00	0.00	0.00	50.00	50.00	0.00
Goda Chingri	C	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Golda	C	0.00	0.00	0.00	33.33	66.67	0.00	0.00
	E	0.00	0.00	0.00	33.33	50.00	16.67	0.00
	F	0.00	0.00	0.00	0.00	50.00	50.00	0.00
	J	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulsha Tengra	B	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	C	0.00	0.00	0.00	50.00	50.00	0.00	0.00
	E	0.00	0.00	33.33	33.33	33.33	0.00	0.00
Harina Chingri	B	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	F	0.00	33.33	33.33	33.33	0.00	0.00	0.00
	J	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Ilish	F	0.00	0.00	0.00	0.00	0.00	100.00	0.00
Kain Magur	C	0.00	0.00	0.00	0.00	0.00	100.00	0.00
	E	0.00	0.00	0.00	0.00	50.00	50.00	0.00
	F	0.00	0.00	0.00	0.00	0.00	100.00	0.00
Kathali Chingri	B	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	C	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	E	0.00	0.00	28.57	28.57	28.57	14.29	0.00
Kharsul Bata	E	0.00	0.00	0.00	0.00	50.00	50.00	0.00
Madh	A	0.00	0.00	0.00	0.00	0.00	100.00	0.00
Motka Chingri	B	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	C	0.00	0.00	25.00	50.00	25.00	0.00	0.00

Fish Species	Sampling	L (< 2cm)	L (2 to 3cm)	L (3 to 5cm)	L (5 to 10cm)	L (10 to 20cm)	L (> 25cm)	Brood Fish
	E	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	F	0.00	33.33	33.33	33.33	0.00	0.00	0.00
	J	25.00	25.00	25.00	25.00	0.00	0.00	0.00
Nandi Bele	C	0.00	0.00	0.00	50.00	50.00	0.00	0.00
	E	0.00	0.00	0.00	40.00	40.00	20.00	0.00
	F	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Paissa	C	0.00	0.00	0.00	50.00	50.00	0.00	0.00
	E	0.00	0.00	0.00	25.00	50.00	25.00	0.00
Pangas	A	0.00	0.00	0.00	0.00	0.00	100.00	0.00
	J	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Phekka	E	0.00	0.00	0.00	0.00	0.00	100.00	0.00
Poikka	C	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Poma	B	0.00	0.00	50.00	50.00	0.00	0.00	0.00
	C	0.00	0.00	0.00	0.00	66.67	33.33	0.00
	E	0.00	0.00	0.00	33.33	33.33	33.33	0.00
	F	0.00	33.33	33.33	33.33	0.00	0.00	0.00
	I	0.00	0.00	0.00	0.00	66.67	33.33	0.00
	J	14.29	14.29	14.29	28.57	14.29	14.29	0.00
Ramchos	E	0.00	0.00	0.00	0.00	50.00	50.00	0.00
	I	0.00	0.00	0.00	0.00	100.00	0.00	0.00
	J	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Rekha	C	0.00	0.00	0.00	100.00	0.00	0.00	0.00
	E	0.00	0.00	50.00	0.00	50.00	0.00	0.00
Shilong	E	0.00	0.00	0.00	0.00	100.00	0.00	0.00
Tairel	F	0.00	33.33	33.33	33.33	0.00	0.00	0.00
	J	25.00	25.00	25.00	25.00	0.00	0.00	0.00
Vetki	E	0.00	0.00	0.00	0.00	50.00	50.00	0.00
	J	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: CEGIS field survey, October 2025

Table D.7: Purpose, timing and extent of migration for different year-class of migratory fish species (1st QM to 21st QM)

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21st QM
Tapsi	B	Juvenile and Age-1 adult	F&G	-	F&G	-	-	-		-	-	-	-	-	-	-	G	-	-	-	-	-	-
	C	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A	Juvenile and Age-1 adult	F&G	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Adult	F&G	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-
	J	Age-1 adult and Brood fish	F&G	S	-	-	-	F	F&S	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-
		Adult	-	-	F&G	-	-	F	F	-	-	-		-	-	F	-	-	F	-	-	F	F
	E	Juvenile and Age-1 adult	F&G	F&G		-	-	-	-	-	-	-	-	F	F	-	-	-	-	-	-	-	-
		Adult and Brood Fish	-	-	B&S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	F	Juvenile	-	-	F&G	-	-	-	F	-	-	-	F	-	-	F&G	-	F&G	-	-	-	-	-
	H	Adult	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-
		Fry										-					N		-	-	-	-	-
	SWP	Age-1 adult	F&G	F&G	F&G	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Brood Fish	-	-	-	-	-	B&S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bairagi	B	Juvenile and Age-1 adult	F&G	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A	Juvenile and Age-1 adult	F&G	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Juvenile and Adult	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-
	F	Fry	B&S	B&S	F&G	F	-	F	-	-	-	-	-	-	-	N	-	N	-	-		N	
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	F&G	F&G	-	M	F&G	-	N
	J	Juvenile and Age-1 adult	F&G	-	-	-	F&G	F	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21st QM
		Fry	-	-	-	-	-	-	-	-	-	-	-	N	N	-	-	-	-	N	-	N	-
	H	Fry	-	N	-	F	-	-	-	-	-	-	-	N	N	-	N	-	-	-	-	-	-
		Juvenile	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	F&G	-	-	-	-
	E	Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	F&G	-	-	-	-
	SWP	Juvenile	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Fry	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-
Chapila	B	Juvenile	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A	Juvenile	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	H	Fry	-	N	-	-	-	-	-	-	-	-	-	-	-	-	N	-	N	-	-	-	-
	J	Adult																					M
	SWP	Age-1 adult	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loitta	B	Juvenile and Age-1 adult	F&G	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A	Juvenile	F&G	-	-	-	F&	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A	Age-1 adult	-	-	F&G	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	Juvenile	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E	Fry, Juvenile	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	Age-1 adult	-	F&G	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Fry	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-
Poma	B	Juvenile	F&G	-	-	F	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
	A	Juvenile	F&G	-	-	-	-	-	-	G&F	-	-	-	-	-	-	-	-	-	-	-	-	-
		Age-1 adult	-	-	F&G	-	-	-	F	F	-	-	-	-	-	-	-	-	-	-	-	-	-
		Adult	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-
	F	Fry and Juvenile	B&S	N	-	-	-	F	-	-	-	-	-	-	-	-	N	-	F	-	-	-	-
		Juvenile	-	-	F&G	F	F&G	-	F&G	-		F&G			F&G	-	F&G	-	-	-	-	-	-
		Adult	-	-	-	-	-	-	F	-					-	F	F	-	-	-	-	-	-

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21st QM
		Brood Fish	-	-	-	-	-	-	-	-		S	-		-	-	-	-	-	-	-	-	-
	B	Fry and Juvenile	-	-	N	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-
	C	Brood Fish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-
		Juvenile and Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-	G&M	-
	E	Adult and Brood Fish	-	-	B&S	-	-	-	-	-	-	-	F&S	-	-	-	-	-	-	-	-	-	-
		Adult	-	-	-	-	-	-	F	-		-	F		-	-	-	-	-	F	-	-	-
		Fry and Juvenile	-	-	-	-	-	S&N	-	-	F&G		-	-	-	-	-	-	-	-	-	-	-
	H	Fry	-	-	S,F&G	-	-	-	-	N	-		-	N	N	-	-	-	N	-	F&G	-	-
		Juvenile	-	-	-	-	-	-	F&G	-		-	-		-	N	-	-	-	-	-	-	-
		Age-1 Adult	-	-	-	-	-	-	F	F	-		-	-	-	-	-	-	-	-	-	-	-
		Adult	-	-	-	F	-	F	-	-	-		F	-	-	-	-	-	-	-	-	F	-
		Brood Fish	-	-	-	-	-	-	-	-	-		S	-	-	-	-	-	-	-	-	-	-
	SWP	Adult	-	-	F	F	-	F	-	-	-		-	-	-	-	-	-	-	-	F	F	-
	C	Adult and Brood Fish	B&S	-	-	-	-	-	-	-	-	-	F,G&S	-	-	-	-	-	-	B&S	-	-	-
		Juvenile and Adult	-	-	F&G	F	F&G	-	F&G	-	-	-	-	-	-	-	-	-	-	-	M&F	M&F	-
		Fry	-	-	-	-	-	-	-	-	N	-	-	-	N	-	-	-	-	-	-	-	-
Chhuri	B	Adult	F	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A		F	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chela	B	Adult	F	-	F	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
	A	Juvenile and Adult	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E	Fry and Juvenile	-	F&G	-	-	-	N	-	-	-		-	-	-	-	-	-	-	-	-	-	-
	F		-	-	-	-	-	-	-	G&F	N		-	-	-	-	F&G	-	-	-	-	-	N

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19 th QM	20 th QM	21 st QM
	J	Fry and Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N&F	-	-	-	-	-
Gang Tengra	F	Juvenile and Age-1 adult	-	F&G	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Brood Fish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	-
	J	Age-1 adult	-	-	-	-	F&G	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
	H	Age-1 adult	-	F&G	-	-	-	-	-	-	-		-	-	-	-	-	-	F&G	-	-	-	-
	A	Juvenile and Adult	-	-	F&G	-	-	-	F	-	-		-	F	-	-	-	-	-	-	-	-	-
	B	Juvenile	-	-	-	-	-	-	F&G	-	-		-	-	-	-	-	-	-	-	-	-	-
	E	Adult	-	-	F	-	F&G	-	-	-	F		F		-	-	-	-	-	-	-	-	-
Gagra Tengra	F	Juvenile and Age-1 adult	-	F&G	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-
		Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-
	J	Age-1 adult	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	H	Age-1 adult	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	M&F
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	A	Juvenile and Adult	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-
		Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	B	Juvenile	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-
	E	Adult	-	-	F	-	F&G	-	-	-	-	-	F	-	F	F	-	-	-	-	F	-	-
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	M	-	-
	C	Juvenile and Age-1 adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-
Gulsha Tengra	B	Adult	F&B	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
	A	Juvenile		-	-	-	-	-	-	-	-		-	-	F	-	-	-	-	-	-	-	-
	F	Age-1 adult	-	-	-	F	-	F	F&G	-	-		-	F	-	-	F&G	-	-	-	-	-	-
		Juvenile	-	-	-	-	-	-	F&G	-		F&G	-		-	F&G	-	F&G	-	-	-	-	-

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21st QM
	H	Age-1 adult	-	F&G	-	F&G	-	F&G	-	F&G		-	-		-	-	-	-	F&G	-	-	-	-
		Juvenile	-	-	-	-	-	-	F&G	-		F&G	-		-	-	-	-	F&G	-	-	-	-
	E	Juvenile	-	-	-	-	-	-	F&G	-		-	-		-	-	-	-	F&G	-	-	-	-
		Age-1 adult	-	-	-	-	-	-	-	-	F&G	-	-	-	F	-	-	-	F&G	-	-	-	-
	I	Juvenile and Age-1 Adult	-	-	-	-	-	-	F&G	-		-	-	-	-	-	-	-	-	-	-	-	-
	J	Juvenile	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-
Potka	B	Adult	F&S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	F	Fry	S	S&N	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-
		Juvenile	-	-	-	-	-	-	-	F&G	-	-	-	F	F	-	-	-	-	-	F&G	-	-
		Adult	-	-	-	F	-	-	-	-	-	-	F	-	-	F&G	-	-	-	-	-	-	-
	H	Fry	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Juvenile	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-
	E	Fry	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Juvenile	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-
	I	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-
Paira Chanda	A	Adult	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	F	Fry	B&S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chewa	A	Juvenile and Adult	F	-	F&G	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
	F	Fry and Juvenile	S	-	F&G	-	N&G	N	F&G	-	N	-	-	-	F&G	F&G	F&G	-	-	-	-	N	F&G
		Adult	-	-	-	F	-	F	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-
	B	Juvenile and Adult	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E	Juvenile and Adult	-	-	F&G	-	-	F&N	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-
	M	Juvenile	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-
	I	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21st QM
Bele	SWP	Juvenile	-	F&G	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
	J	Adult	-	-	-	-	F	-	-	-	-		-	-	-	-	-	-	F	-	-	-	-
		Age-1 Juvenile	-	-	-	-	-	-	-	-	F&G		-	-	-	-	-	-	-	-	-	-	-
	A	Adult	F	-	F	F	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
		Juvenile	-	-	-	-	-	-	-	F&G	-		-	-	-	-	-	-	-	-	-	-	-
	B	Juvenile and Adult	-	-	N&G	F	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
	E	Juvenile and Adult	-	-	F&G	-	F&G	N&F	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	F	Fry	B&S	N	-	-	N	N	-	-	N	-	-	-	-	-	-	N	N	-	-	N	-
		Juvenile and Adult	-	-	F&G	F	-	F	-	F	-	-	F&G	-	-	-	F&G	-	-	-	-	F&G	-
	E	Juvenile and Age-1 Adult	-	-	-	-	-	-	F&G		-	-	-	-	-	-	-	-	-	-	-	-	-
Tular Dandi (Nona Bele)	H	Fry	B&S	-	-	-	-	N	-	-	-		-	-	-	N	N	-	N	-	-	-	-
		Juvenile and Adult	-	-	N&G	F	F&G	F	F&G	-	-		-	-	-	-	-	-	-	-	-	-	M&F
	J	Fry	B&S	N	-	-	N	-	-	N	-		-	-	-	-	N	N	N	-	-	-	-
		Adult	-	-	-	F	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
	I	Juvenile and Age-1 adult	-	F&G	F&G	F	F&G	-	-	-	F&G		-	-	-	-	F	-	F&G	F&G	-	-	-
		Fry	-	-	-	-	-	-	-	N	-		-	N	N	-	-	-	-	-	-	-	-
	A	Adult	F	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	F&M	-
	I	Adult														F	-	-	-	-	M	-	-
Tairrel	F	Age-1 Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	G	-	-	-
	SWP	Adult	-	-	F	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-
	J	Adult	F	-	F	-	F	-	F	-	-	-	-	-	-	-	-	-	-	-	M	M	M&F
Tairrel	A	Adult	F	-	-	-	-	-	-	F	-	-	-	-	-	-	-	F	-	-	-	-	-

Migratory Species	Sites	Year Class*	Migration Purpose																					
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19 th QM	20 th QM	21 st QM	
	E	Age-1 Adult	-	-	-	-	-	-	-	-	F&G	-	-	-	-	F&G	F&G	-	-	-	-	-	-	
	H	Juvenile	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	
Pheksa	A	Adult	F	-	-	-	-	-	-	F	-		-	-	-	-	-	-	-	-	-	-	-	
		Juvenile	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	B	Juvenile	-	-	F&G	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	
		Adult	-	-	-	F	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	
	E	Juvenile	-	-	-	-	-	-	-	-	F&G		-	-	-	-	-	-	-	-	-	-	-	
	J	Juvenile and Adult	F	F&G	-	-	-	-	F&G	-			-	-	-	-	-	F&G	-	-	-	M	-	
		Adult	-	-	F	F	F	-	F	-	-		-	-	-	F	F	-	-	-	M	-	M	
	H	Adult	-	-	F	F	-	-	F&G	-	-		F	-	-	-	-	-	-	-	M	-	-	
		Juvenile															-	G	-	-	-	-	-	
	F	Juvenile and Adult	F	F&G	-	-	F&G	-		-	-		-	-	-	-	-	F&G	-	-	M	-	-	
	I	Juvenile and Adult	F	F&G	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	
		Juvenile	-	-	-	-	-	-	F&G	-	-		-	-	-	-	-	-	-	-	-	-	-	
		Adult	-	-	F	F	-	F	-	-	-		-	-	-	-	-	-	-	-	-	-	-	
	Paissa	A	Juvenile and Adult	F	-	F&G	F	-	-	-	F&G	-	-	-	F	F	-	-	-	-	G&M	-	-	-
			Brood	-	-	-	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-
Juvenile			-	-	-	-	-	-	F&G		-	-	-		-	-	-	-	-	-	-	-	-	
B		Juvenile and Adult	F	-	F&G	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Juvenile	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
E		Juvenile	-	-	F	-	F&G	-	F&G	-	-	-	-	-	-	F&G	F&G	-	-	-	-	-	-	
		Adult	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-					-	
F		Fry	B&S	-	-	-	-	N	-	-	-	N	-	-	-	-	-	N	-	-	F&G	N	-	

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19 th QM	20 th QM	21 st QM
		Juvenile and Adult	-	-	F&G	-	-	N&F	-	-	-	-	F&G	F	F	-	-	F&G	-	M	-	-	-
	E	Juvenile	-	-	-	-	-	-	F&G	-	-	-		-	-	-	-	-	-	M	-	-	-
	H	Fry	B&S	-	-	-	-	N	-	-	N	-	-	-	-	-	N	-	-	-	-	-	-
		Age-1 Juvenile	-	-	-	-	-	-	F&G	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-
		Age-1 Adult	-	-	-	-	F&G	F	-	-		-	-	-	-	-	-	-	-	-	-	-	-
	I	Fry	B&S	F&G	-	-	F&G	-	-	-		-	-	-	-	-	-	-	-	-	F&G	-	-
		Juvenile	-	-	-	-	-	-	F&G	-	-	-	F&G	-	-	-	-	-	-	G	-	-	-
		Adult	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Banshpata	J	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G
	F	Juvenile	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G	F&G	-	-	-	-
		Adult	-	-	-	F	-	F	-	-	-	-	-	-	-	F	F	-	-	-	-	-	-
	A	Juvenile	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Adult	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-
	B	Juvenile and adult	-	-	F&G	F	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	Juvenile and Age-1 Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	G&M	-	-
	E	Adult	-	-	-	-	-	-	-	F	F	-	F	-	-	-	-	-	-	-	-	-	-
	H	Fry and Adult	F	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-
		Adult	-	-	-	F	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-
	I	Adult	-	-	F	F	-	B&S	-	-	-	-	-	-	-	F	-	-	-	G&M	G&M	-	-
	J	Adult	-	-	F	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G&M	F	-
Hilsa	A	Brood Fish	-	-	-	-	-	-	-	-	-	-	B&S	-	-	-	-	-	-	-	-	-	-
	B	Brood Fish	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-
		Juvenile	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E	Brood Fish	-	-	-	-	-	-	-	-	-	-	B&S	-	-	-	-	-	-	-	-	-	-

Migratory Species	Sites	Year Class*	Migration Purpose																				
			1st QM	2nd QM	3rd QM	4th QM	5th QM	6th QM	7th QM	8th QM	9th QM	10th QM	11th QM	12th QM	13th QM	14th QM	15th QM	16th QM	17th QM	18th QM	19th QM	20th QM	21st QM
	F	Adult and Brood Fish	-	-	-	-	-	-	F&B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	H	Adult	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Brood Fish	-	-	-	-	-	-	-	-	-	-	B&S	-	-	-	-	-	-	-	-	-	-
	I	Age-1 Adult	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-
Pangas	J	Adult	-	-	-	-	-	B&S	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-
	B	Juvenile	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E	Adult	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-
	H	Juvenile and Adult	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	F&G

Table D.8: Purpose, timing and extent of migration for different year-class of migratory fish species

Migratory Species	Sites	Year Class*	Migration Purpose																								
			22 th QM	23 th QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM	
Tapsi	B	Juvenile and Age-1 adult	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-	M&F	-	-	-	-	-	-	-
	C	Adult	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	
	J	Adult	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	
		Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	E	Juvenile and Age-1 adult	-	-	-	-	-	-	F	F	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	
	H	Adult	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	M&F	M&F	-	
		Fry	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bairagi	B	Juvenile and Age-1 adult	-	-	-	-	-	-	-	-	M	-	-	-	-	F	-	-	-	M&F	-	-	M&F	-	-	-	
	A	Juvenile and Age-1 adult	-	-	-	-	-	-	F	F	-	-	-	-	F&G	F	-	-	-	-	-	-	-	M&F	M&F	-	
	F	Fry	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	M&F	
		Juvenile	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	M&F	-	-	M&F	-	-	-	-	

Migratory Species	Sites	Year Class*	Migration Purpose																									
			22 th QM	23 th QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM		
	J	Juvenile and Age-1 adult	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	
	E	Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	M&F	-	M&F	
	H	Fry	-	N	N	-	-	-	-	-	-	F&G	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	
	I	Juvenile	F&G	-	-	-	-	-	F&G	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	C	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	
Chapila	B	Juvenile	-	-	-	-	-	-	-	-	G	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	-	
	A	Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	F	-	-	
	H	Fry	-	-	-	-	-	-	-	-	N	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	M&F	
		Juvenile	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	
	J	Adult	F	-	-	-	-	-	-	-	-	F&G	F&G	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	
		Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	
Poma	B	Age-1 adult	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	
	A	Juvenile	-	-	-	-	-	-	-	-	G	-	-	-	F&G	-	-	-	F	-	-	-	-	-	-	-	M&F	
		Age-1 adult	-	-	-	-	-	-	M	-	-	-	-	-	-	M&F	M&F	-	M&F	-	-	-	-	-	-	-	-	
	C	Juvenile and Adult	-	G&M	-	-	G&M	M	-	M	G&M	-	-	-	-	M&F	M&F	-	-	-	-	-	M&F	M&F	-	-	-	
	J	Fry	-	-	-	-	-	-	-	N	-	G	-	-	-	-	-	N	-	-	N	-	-	-	-	-	-	
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	G	-	-	-	-	-	F&G	-	M&F	-	M&F		
		Adult	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	N		
	B	Fry and Juvenile	-	-	-	-	-	-	-	-	G	-	-	-	-	-	-	-	-	-	-	-	F&G	-	M	M&F		
	E	Juvenile and Adult	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	F	M&F	G&M	
		Adult	-	-	-	-	-	-	M	-	M	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	
		Fry and Juvenile	-	N	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	
	H	Fry	-	N&M	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Age-1 Adult	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	I	Adult	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Migratory Species	Sites	Year Class*	Migration Purpose																							
			22 th QM	23 th QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM
		Juvenile	-	-	M&F	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-		M&F	F&G	-	-	-
		Fry	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	F	-	-
	J	Juvenile and Adult		-	M&F	-	-	-	-	-	-	M&F	M&F	-	-	-	M&F	-	-	-		-	F&G	F&G	M&F	-
Chhuri	A	Adult	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-
	B	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-		-	-	-	-	-
Chela	A	Juvenile and Adult	-	-	-	-	M&F	-	-	-	F	-	-	-	-	-	-	-	-	-		-	-	-	-	-
	C	Juvenile and Adult	-	-	-	-	-	-	-	-	G	-	-	-	-	-	-	-	-	M&F		-	-	-	-	-
	E	Fry and Juvenile	-	-	-	N&M	-	-	-	-	-	-	-	-	-	M&F	N&F	-	-	F&G		-	-	-	-	M&F
	J	Fry and Juvenile	N&M	-	N&M	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	F&G		-	F&G	-	-	-
	F	Fry and Juvenile		-	-	N&M	-	F&G	-	F&G	-	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-
	H	Fry and Juvenile	N&M	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gang Tengra	F	Adult		-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-
Ghagra Tengra	F	Juvenile and Age-1 adult		-	-	M	-	M	-	-	-	-	-	-	-	-	M&F	-	-	M&F	-	M&F	-	-	-	-
	H	Age-1 adult		-		-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	M&F	-	-	-	-	-
		Juvenile	-	-	F&G	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F
	A	Juvenile and Adult		-	-	M	-	-	-	-	-	-	-	M&F		M&F	-	M&F	-	-	-	M&F	-	-	-	-
		Adult		-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-
	B	Juvenile		-	-	-	-	-	-	F&G	-	-	-	-	M	-	-	-	-	-	-	-	F&G	-	-	-
		Adult	-	-	-	-	-	-	-	-	M	-	-	-	-	M&F	-	-	-	M&F	-	-	M&F	-	-	-
	E	Adult	-	-	-	M	-	M	F	M	-	-	-	-	-	M&F	-	F	M&F	-	-	-	-	-	-	-
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	M&F
	C	Juvenile and Age-1 adult	M	-	-	M	-	M	-	M	-	-	-	M&F	-	M&F	-	-	M&F	M&F	-	M&F	-	-	-	-
	B	Adult		-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Migratory Species	Sites	Year Class*	Migration Purpose																							
			22 th QM	23 th QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM
Gulsha Tengra	A	Adult		-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	M&F	-	-	-	-	M&F	-	-
	F	Juvenile		-	-	-	-	-	-	F&G	-	F&G	F&G	-	-	-	-	-	-	-	-	-	-	M	M&F	-
	C	Juvenile		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	M	-	-
		Age-1 adult	-	-	-	-	M	-	-	M	-	-	-	-	-	M&F	-	-	-	-	-	-	M&F	-	-	M&F
	E	Age-1 adult		-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	-
	J	Juvenile	-	-	F&G		-	-	-	-	-	-	M	-	-	-	-	-	-	M&F	-	-	-	F&G	-	-
Potka	A	Adult	-	-		-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	M&F
	B	Adult	-	-	-	-	-	-	-	-	F	-	-	-	-	M&F	-	-	-	-	-	M&F	-	M&F	-	-
	J	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	M&F
	J	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	F&G	-	-
		Juvenile		-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Adult		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-
	C	Juvenile and adult	-	-	-	-	F&G	-	-	F&G	-	-	-	-	-	M&F	M&F	-	-	-	-	-	M&F	-	M&F	-
Paira Chanda	A	Adult	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	-	-	-
		Juvenile and Adult	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	B	Juvenile and Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-
	C	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	-
Chewa	J	Fry and Juvenile		-	-	-	-	F&G	-	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Juvenile		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	G	Fry and Juvenile	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	H	Juvenile	M	M	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Fry		-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-	-	-	-	-	-	M&F	-	M&F
	I	Juvenile	M	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	M&F
Bele	A	Adult	F	-	F	-	-	-	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	F&G	F&G	-
		Age-1 Juvenile		M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G

Migratory Species	Sites	Year Class*	Migration Purpose																									
			22 th QM	23 th QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM		
		Juvenile and Adult		-	-	-	F	-	-	F&G	F&G	-	-	M&F	-	-	M&F	M&F	-	-	-	M&F	-	-	-	-	-	
	J	Fry and Juvenile	N	-	-	-	-	M	-	-	-	-	-	-	N	-	-	N	N	N	M	-	M	-	F&G	-	-	
		Juvenile and Adult	-	-	-	M&F	-	-	-	-	-	-	-	-	-	M&F	M&F	M&F	-	-	-	M&F	-	-	-	-	-	
	G	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	E	Juvenile and Age-1 Adult	-	-	-	-	-	-	-	F&M	M	-	-	F	-	-	M&F	M&F	-	-	-	M&F	-	-	-	F&G	-	
	H	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Juvenile and Adult	-	-	-	-	-	-	-	-	-	M&F	M&F	-	-	M&F	-	M&F	M&F	-	M&F	-	-	-	-	-	-	
	J	Fry		-		-	-	-	-	-	-	-	-	-	N	-	-	N	-	-	-	-	N	-	-	-	N	
		Fingerling		N	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Juvenile and Age-1 adult	-	-	M&F	-	-	-	-	-	F&M	-	-	-	-	-	-	M&F	-	M&F	M&F	-	-	-	-	-	-	
	I	Juvenile and Age-1 adult	M& F	M&F	-	-	-	F&G	-	-	-	-	-	-	-	-	-	M&F	-	M&F	M&F	-	-	-	M&F	M&F	-	
		Fry	-	-		-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	C	Juvenile and Age-1 adult	-	-		-	-	-	M	-	M	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	-	
	Tular Dandi	F	Age-1 Adult		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	
		J	Adult	-	-	-	M&F	-	M&F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
I		Age-1 Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	M&F		
Tairel	A	Adult	-	-	-	-	M	-	-	M	-	-	-	-	-	M&F	-	-	-	M&F	-	-	M&F	-	M&F	-		
	B	Juvenile	-	-	-	-	-	-	-	-	-	-	-	G&M	-	-	-	-	-	-	-	-	-	-	-	-		
	C	Juvenile		-	-	-	-	-	-	M	-	-	-	-	-	M	-	-	-	-	-	-	-	M&F	-	-		
	E	Age-1 Adult		-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	-		
	F	Juvenile		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	F&G	-	-	-	-	-		
	J	Juvenile		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	I	Fry		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N&G	-	-	-	-	-		
Pheksa	A	Adult		-	-	-	-	-	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	B	Juvenile																			-	G&M	-	M	-	-		

Migratory Species	Sites	Year Class*	Migration Purpose																									
			22 th QM	23 th QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM		
	C	Juvenile and Adult	-	-	-	-	-	-	-	-	M	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	-	F&G	
	E	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	M&F	M&F	-	-	-	F&G	
	J	Juvenile and Adult			-	M	-	M	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	
		Adult	F		-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	H	Adult		M	-	-	-	-	-	-	M	-	-	-	G&M	-	-	-	-	-	-	-	-	-	-	-	-	
		Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	M&F	-	-	G&M	-	-	-	-	
	F	Juvenile and Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	M	-	-	-	-	-	M&F	
	I	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-	-	
Paissa	A	Juvenile and Adult	-	-	-	-	G&M	-	-	G&M	G&M	-	-	G&M	-	-	M&F	M&F	M&F	M&F	G&M	M&F	-	-	-	-		
	B	Juvenile and Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-		
	C	Juvenile and Adult	-	-	-	-	F	-	-	G&M	G&M	-	-	G&M	-	-	M&F	M&F	M&F	M&F	-	M&F	-	-	-	-		
		Fry	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	E	Juvenile and Adult		-	-	F&G	-	-	F	G&M	G&M	-	-	G&M	-	-	M&F	-	M&F	-	-	M&F	-	-	-	-		
		Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	J	Fry		N	N	-	F	-	-	-	-	-	G&M	-	-	-	M&F	F&G	-	-	-	-	-	-	-	-		
	H	Fry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G&M	-	-	M&F		
	F	Fry and Juvenile	N	N	-	F&G	F	F&G	-	-	N	G&M	-	-	-	-	-	F	N	N	G&M	M&F	G&M	M&F	-			
		Age-1 Adult	M	-	-	-	-	-	-	-	-	-	G&M	-	-	-	-	F&G	-	-	-	-	-	-	-	M&F		
	I	Fry and Juvenile	-	-	-	F&G	-	-	-	-	-	M	G&M	-	-	-	G&M	-	-	-	-	-	-	-	-	-		
		Age-1 adult		M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Banshpata	F	Juvenile		-	-	-	-	-	-	-	-	-	-	-	G&M	G&M	-	-	-	-			-	-	-	-	
Adult				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	-	-		
C		Juvenile and Age-1 Adult		-	-	-	G&M	-	-	G&M	M	-	-	-	-	M&F	M&F	-	-	-	-	-	M&F	-	G&M	-		
A		Juvenile		-	-	-	-	-	-	-	G&M	-	-	-	-	M&F	-	-	-	-	-	-	-	-	-	-		

Migratory Species	Sites	Year Class*	Migration Purpose																							
			22 th QM	23 th QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	46 th QM
	B	Juvenile and adult		-	-	-	-	-	-	-	M	-	-	-	-	M&F	-	-	-	-	-	M&F	-	M&F	G&M	-
	E	Adult		-	-	-	-	-	-	F&G	-	-	-	-	-	M&F	-	-	-	-	-	M&F	-	-	-	-
	I	Juvenile and Age-1 Adult		-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	J	Juvenile and Age-1 Adult		-	G&M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F	-	-	M&F
Hilsa	A	Brood Fish		-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	I	Age-1 Adult	M	-	-	-	-	-	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	J	Adult	F	-	-	-	-	-	-	M	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F
	H	Age-1 Adult	-	-	-	-	-	-	-	M	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	M&F
Pangas	A	Adult	-	-	-	-	-	-	-	-	-	-	-	F	-	-	-	-	-	-	-	-	-	-	-	-
	B	Juvenile	-	-	-	-	-	-	-	-	G	-	-	-	-	-	-	-	-	-	-	G&F	-	-	-	-
	C	Adult	-	-	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	E	Juvenile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G&F	-	-	M&F	-
	H	Juvenile	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	I	Juvenile and Age-1 Adult	F&G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: Field findings at different times; Only Age-1 to Brood fish was allowed to interpret the migration purpose; SWP= South-west of the Project; F = Feeding; B=Breeding, S= Spawning, N=Nursing, G=Growing, M=Maturation

Table D.9: The Present Catch in Three (03) Sampling Ghers

Sampling Site	Species	Total Catch (Ton)																			
		1 st QM	2 nd QM	3 rd QM	4 th QM	5 th QM	6 th QM	7 th QM	8 th QM	9 th QM	10 th QM	11 th QM	12 th QM	13 th QM	14 th QM	15 th QM	16 th QM	17 th QM	18 th QM	19 th QM	20 th QM
1	Bagda	5.0	6.42	4.8	-	-	1.6	2.0	-	-	-	3.0	-	-	3.0	-	2.0	0.76	-	-	3.2
	Golda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-
	Harina	0.78	-	-	-	1	1	0.32	0.8	-	-	0.8	-	1.0	-	-	0.1	1.6	-	-	4.8
	Bele	0.98	-	-	-	-	0.25	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-
	Chali	0.11	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	1.2	-	-	-
	Chaka	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Paissa	-	-	-	-	-	0.25	0.24	0.6	-	-	0.1	-	-	-	-	-	-	-	-	-
	Vetki/Patari	1.57	-	-	-	-	-	0.02	0.8	-	-	2.0	-	-	-	-	-	-	-	-	-
	Gulsha	-	-	-	-	-	-	0.08	-	-	-	0.1	-	-	-	-	-	-	-	-	-
	Kailla	-	-	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tilapia	-	-	-	-	-	-	-	1.6	-	-	-	-	-	-	-	0.45	12.8	-	-	-
	Rui	-	-	-	-	-	-	-	3	-	-	-	-	-	1.3	-	0.12	0.12	4.2	-	-
	Catla	-	-	-	-	-	-	-	2	-	-	-	-	-	1.0	-	0.3	-	1.2	-	-
	Minar Carp	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	0.3	-	-
	Grass Carp	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	0.2	-	0.3	-	-
Sub-total =		8.52	6.42	4.8	-	1.0	3.6	2.7	9.0	-	-	6.0	-	1.0	5.3	-	3.27	16.68	6.0	-	8.0
2	Bagda	4	1	7	-	-	1.67	-	-	1.0	-	0.2	0.29	-	5	-	3.93	1.48	5.0	-	1.41
	Golda	-	0.01	0.9	-	-	-	-	-	-	-	-	-	-	-	-	0.13	-	0.08	-	0.1
	Harina	2	0.33	-	-	-	0.5	-	-	0.14	-	0.08	-	-	-	-	1.91	0.5	1.8	-	2.92
	Chali	0.18	0.08	-	-	-	0.3	-	-	-	-	0.04	-	-	-	-	1.16	0.04	0.4	-	1.52
	Motka	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	-	-	-
	Bele	-	0.08	-	-	-	0.3	-	-	-	-	0.16	0.15	-	-	-	0.43	0.06	-	-	1.35
	Tengra	-	-	0.2	-	-	-	-	-	-	-	0.08	0.31	-	-	-	4.20	0.13	0.8	-	0.27
	Paissa	-	0.04	10	-	-	0.25	-	-	-	-	0.2	0.22	-	7	-	0.14	0.05	0.08	-	0.6
	Vetki	-	-	1	-	-	-	-	-	-	-	0.24	0.06	-	0.5	-	0.96	0.01	2.0	-	-
	Phessa	-	-	2.4	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-
	Bhangan	-	-	1.7	-	-	-	-	-	-	-	-	-	-	0.7	-	-	0.01	0.05	-	-
	Tilapia	-	-	-	-	-	-	-	-	-	-	8.0	0.53	-	-	-	5.9	0.41	8.0	-	0.3
	Chela	-	-	-	-	-	-	-	-	-	-	-	0.45	-	-	-	-	0.01	-	-	-
	Rui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.41	-	3.0	-	0.35

Sampling Site	Species	Total Catch (Ton)																			
		1 st QM	2 nd QM	3 rd QM	4 th QM	5 th QM	6 th QM	7 th QM	8 th QM	9 th QM	10 th QM	11 th QM	12 th QM	13 th QM	14 th QM	15 th QM	16 th QM	17 th QM	18 th QM	19 th QM	20 th QM
	Catla																		3.0	-	0.2
	Grass Carp																0.11			-	-
	Common Carp																5.55			-	-
	Sarpunti																0.53			-	-
	Tairel																0.003			-	-
	Pheksa																0.001			-	-
Sub-total =		6.18	1.52	23.2	-	-	3.02	-	-	1.14	-	9.0	2.01	-	14.2	-	33.36	2.75	24.21	-	9.02
3	Bagda	1.38	2.4	1.5	-	-	3.5	0.4	-	2	-	0.4	-	-	0.2	-	0.5	0.1	-	-	0.4
	Harina	0.34	0.34	-	-	-	-	0.35	-	-	-	0.3	-	-	-	-	0.6		-	-	0.1
	Chali	0.17	0.17	-	-	-	-	0.6	-	-	-	-	-	-	-	-	-		-	-	0.03
	Chaka							0.1	-	-	-	-	-	-	-	-	-		-	-	0.01
	Motka	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02
	Paissa	-	-	0.01	-	-	-	3.2	-	-	-	0.06	-	-	0.8	-	-		-	-	-
	Tengra	-	-	0.01	-	-	-	-	-	-	-	0.04	-	-	0.2	-	0.12		-	-	-
	Bele	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	0.01
	Tilapia	-	-	0.22	-	-	-	0.06	-	-	-	3.2	-	-	0.5	-	1.5	0.2	-	-	-
	Rui	-	-	0.21	-	-	-	-	-	-	-	-	-	-	0.3	-	-		-	-	-
	Catla							-							1.0	-	-		-	-	-
	Vetki	-	-	-	-	-	-	0.4	-	-	-	-	-	-	0.2	-	-		-	-	-
	Chami	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
	Tairel	-	-	-	-	-	-	0.06	-	-	-	-	-	-	-	-	-		-	-	-
Sub-total =		1.89	2.91	1.97	-	-	3.5	5.17	-	2.0	-	4.0	-	-	3.2	-	2.72	0.3	-	-	0.57
Grand-total =		16.59	10.87	29.97	-	1.0	10.12	7.87	9.0	3.14	-	19.0	2.01	1.0	22.7	-	39.35	19.73	30.21	-	17.59

Table D.10: The Present Catch in Three (03) Sampling Ghers

Sampling Site	Species	Total Catch (Ton)																								
		21 st QM	22 nd QM	23 rd QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	
1	Bagda	2.72	0.8	-	-	0.3	-	0.7	0.5	-	-	1.2	1.2	0.7	0.7	1.35	2.0	0.01	-	0.20	-	0.1	-	0.09	0.6	
	Golda	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	
	Harina	3.44	1.0	0.02	2.0	0.2	-	0.15	0.6	0.1	-	0.5	0.2	0.2	0.2	0.59	1.6	0.05	-	-	0.3	0.25	-	0.12	0.5	
	Bele	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	-	
	Chali	-	0.2	-	-	-	-	-	0.3	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Chaka	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Paissa	0.17	-	-	-	0.05	-	-	0.05	-	-	-	-	0.05	0.05	-	0.2	0.08	-	-	-	0.04	-	-	0.6	
	Patari	-	0.3	-	-	0.2	-	-	-	0.3	-	-	-	0.05	0.05	-	-	0.04	-	-	-	0.04	-	-	-	
	Gulsha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kailla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Tilapia	0.7	0.5	-	-	0.5	-	-	2.0	1.2	-	-	-	2.0	0.2	0.53	4.0	2.4	-	-	1.2	0.09	-	-	-	
	Rui	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	
	Catla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Mrigal																								0.3	
	Minar Carp	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Grass Carp	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	
	Tairel	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Datina	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kakra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	0.2	
	Sub-total =	7.03	2.83	0.02	2.0	2.37	-	0.85	3.45	1.7	-	1.7	1.4	3.0	1.2	2.47	8.1	2.59	-	0.02	1.5	0.52	-	0.21	2.36	
2	Bagda	6.74	3.42	-	4.48	1.45	-	0.04	2.73	0.07	-	3.2	1.5	0.07	-	2.4	1.6	-	-	-	-	-	-	0.32	0.8	
	Golda	0.01	0.4	-	0.03	0.3	-	-	-	-	-	-	-	-	-	0.22	0.4	-	-	-	-	-	-	-		
	Harina	-	3.96	0.01	0.92	1.08	-	0.14	0.96	0.81	-	0.28	0.16	0.8	-	0.4	0.6	0.08	-	-	-	-	-	-		
	Chali	0.04	0.38	-	0.20	0.3	-	0.03	0.11	0.01	-	0.12	0.1	0.12	-	-	-	-	-	-	-	-	-	-		
	Bele	0.09	2.11	-	0.27	0.19	-	-	0.44	0.58	-	0.15	0.15	0.52	-	-	0.15	-	-	-	-	-	-	-		
	Tengra	0.57	-	-	0.01	0.17	-	-	0.01	0.02	-	-	0.1	0.02	-	-	-	-	-	-	-	-	-	-		
	Paissa	0.01	2.62	-	0.04	1.8	-	-	0.23	0.34	-	0.1	0.2	0.32	-	0.25	0.4	0.16	-	-	-	-	-	0.08		
	Vetki/Patari	-	2.25	-	0.25	0.25	-	-	-	1.75	-	0.04	0.6	1.6	-	-	0.2	0.08	-	-	-	-	-	-		
	Bhangan	0.08	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Tilapia	0.22	9.85	-	3.87	6.93	-	-	12.9	7.82	-	4.5	-	7.0	-	0.35	-	0.88	-	-	-	-	-	2.98	1.0	
	Rui	-	1.27	-	1.95	-	-	-	-	0.27	-	-	0.6	0.24	-	-	2.0	0.20	-	-	-	-	-	-	2.3	
	Catla	-	-	-	0.04	0.05	-	-	-	-	-	-	-	-	-	-	0.2	0.08	-	-	-	-	-	-	1.3	
	Mrigal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	
	Kailla	-	0.96	-	-	-	-	-	-	0.03	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	

Sampling Site	Species	Total Catch (Ton)																								
		21 ^{tst} QM	22 nd QM	23 rd QM	25 th QM	26 th QM	27 th QM	28 th QM	29 th QM	30 th QM	31 st QM	32 nd QM	33 rd QM	34 th QM	35 th QM	36 th QM	37 th QM	38 th QM	39 th QM	40 th QM	41 st QM	42 nd QM	43 rd QM	44 th QM	45 th QM	
	Grass Carp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kakra	0.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Datina	-	1.01	-	-	-	-	-	-	0.06	-	-	0.14	0.06	-	-	-	-	-	-	-	-	-	-	-	
	Chemo	-	0.02	-	0.32	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Chaka	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Nundi Bele	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kakra	-	0.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub-total =		8.41	28.83	0.01	12.38	12.57	-	0.21	17.38	11.76	-	8.39	3.65	10.75	-	3.62	5.55	1.48	-	-	-	-	-	3.38	6.3	
3	Bagda	0.02	0.02	-	0.1	0.02	-	0.01	0.04	0.04	-	0.04	0.05	0.06	-	0.02	0.14	0.01	-	0.08	-	0.05	-	0.02	0.04	
	Golda	0.03	0.01	-	0.03	0.01	-	-	0.01	0.01	-	-	-	-	-	0.01	0.04	0.01	-	0.01	-	0.01	-	0.01	-	
	Harina	0.02	0.01	-	0.15	0.02	-	0.06	0.06	0.04	-	0.07	0.4	0.40	-	0.12	0.18	0.01	-	0.02	0.05	0.04	-	0.03	0.10	
	Chali	-	0.01	-	-	0.02	-	-	-	-	-	-	-	-	-	-	0.02	0.02	-	-	-	0.04	-	-	-	
	Chaka	0.01	-	-	0.01	0.02	-	-	0.04	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	-	
	Paissa	0.01	0.06	-	0.05	0.03	-	-	0.12	0.08	-	-	-	0.8	-	0.02	0.1	0.02	-	0.01	0.02	0.05	-	0.10	0.01	
	Kharsul	-	0.01	-	0.01	-	-	-	-	-	-	-	-	0.05	-	-	0.04	-	-	-	-	0.01	-	-	-	
	Tengra	-	0.01	-	0.02	0.01	-	-	-	-	-	-	-	-	-	-	0.12	-	-	-	-	0.01	-	-	-	
	Bele	-	-	-	0.03	-	-	-	0.01	-	-	-	-	-	-	-	0.02	0.01	-	-	-	0.01	-	-	-	
	Tilapia	-	0.24	-	-	0.06	-	-	0.08	0.16	-	-	-	0.12	-	-	0.11	0.01	-	-	0.16	0.06	-	0.01	-	
	Patari	0.01	0.02	-	-	0.02	-	-	0.02	0.04	-	-	0.4	0.04	-	-	0.04	0.01	-	-	-	0.03	-	-	-	
	Chaina Punti	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Chami	-	-	-	-	-	-	-	0.04	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Ilish	-	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Motka	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.01	-	-	0.02	-	-	-	-	
	Chaka	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kakra	-	-	-	-	-	-	0.01	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	
	Tairu	0.01	-	-	0.02	0.01	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	-	-	-	-	-	
	Bhangan	0.01	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	-	-	-	-	-	
	Datina	0.03	0.02	-	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	
	Pheksa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-		
Sub-total =		0.15	0.46	-	0.44	0.25	-	0.08	0.54	0.45	-	0.11	0.85	1.47	-	0.17	0.87	0.11	-	0.12	0.25	0.32	-	0.29	0.15	
Grand-total =		15.59	32.14	0.03	14.82	15.46	-	1.14	21.37	13.91	-	10.20	5.90	15.22	1.2	6.26	14.52	4.18	-	0.32	1.75	0.84	-	3.88	8.81	

(E) Traffic Survey Data

Table E.1: Traffic Volume Survey at Khulna Mongla Road (Khudir Bottola)

Date: August 03, 2025 (Sunday)

Vehicles		7:00 AM to 10:00AM			12:00 PM to 2:00PM			17:00 PM to 19:00PM		
Direction	Factor	Khulna to Mongla	Mongla to Khulna	PCU	Khulna to Mongla	Mongla to Khulna	PCU	Khulna to Mongla	Mongla to Khulna	PCU
Pedestrian	0	39	18	0	22	11	0	30	17	0
Auto Rickshaw	0.8	3	1	2	0	3	2	0	0	0
Van	0.6	111	84	116	116	118	140	16	152	101
Cycle	0.2	31	13	9	27	5	6	1	29	6
Human Howler	0.6	19	13	19	18	3	12	0	8	5
CNG	0.5	26	23	24	22	21	21	4	15	9
Private Car	1	43	27	70	39	30	68	1	46	47
Motor Cycle	0.3	137	105	73	144	153	89	9	220	69
Jeep	1	5	8	13	9	3	12	2	9	11
Pick-up	2	13	19	63	24	14	76	0	13	26
Micro	1	41	17	58	39	34	73	2	36	38
Bus	2.5	64	40	260	65	50	288	0	44	109
Light Truck	2	16	14	60	13	18	61	0	6	12
Medium Truck	2	51	32	164	66	43	218	0	43	85
Heavy Truck	2	11	12	44	10	7	34	2	6	16
			Total	974			1100			532

Table E.2: Traffic Volume Survey at Khulna Mongla Road (Gonaibelai Bridge)

Date: August 2, 2025 (Saturday)

Vehicles		7:00 AM to 10:00AM			12:00 PM to 2:00PM			17:00 PM to 19:00PM			
Direction	Factor	Babubari to Plant site	Plant site to Babubari	PCU	Babubari to Plant site	Plant site to Babubari	PCU	Babubari to Plant site	Plant site to Babubari	PCU	
Pedestrian	0	12	12	0	7	4	0	5	5	0	
Auto Rickshaw	0.8	0	0	0	0	0	0	0	0	0	
Van	0.6	37	34	42	20	9	17	16	17	20	
Cycle	0.2	22	8	6	10	5	3	1	11	2	
Human Howler	0.6	8	10	11	3	3	4	0	2	1	
CNG	0.5	7	7	7	7	3	5	4	4	4	
Private Car	1	4	5	9	2	2	4	1	2	3	
Motor Cycle	0.3	38	36	22	39	27	20	9	27	11	
Jeep	1	0	1	1	1	1	2	2	0	2	
Pick-up	2	0	1	2	0	1	1	0	2	4	
Micro	1	2	2	4	3	3	6	2	4	6	
Bus	2.5	0	0	1	1	1	4	0	3	6	
Light Truck	2	0	0	1	2	1	5	0	0	0	
Medium Truck	2	1	0	2	0	0	0	0	0	0	
Heavy Truck	2	0	0	0	1	1	2	2	0	4	
Total				108				71			63

Table E.3: Traffic Volume Survey at Power Plant access road (Gonai Bridge)

Date: August 1, 2025 (Friday)

<i>Vehicles</i>		7:00 AM to 10:00AM			12:00 PM to 2:00PM			17:00 PM to 19:00PM		
Direction	Factor	Khulna to Mongla	Mongla to Khulna	PCU	Khulna to Mongla	Mongla to Khulna	PCU	Khulna to Mongla	Mongla to Khulna	PCU
Pedestrian	0	12	13	0	13	21	0	18	23	0
Auto Rickshaw	0.8	0	0	0	0	0	0	0	0	0
Van	0.6	18	23	24	30	72	61	48	48	57
Cycle	0.2	3	12	3	3	4	1	5	7	2
Human Howler	0.6	10	8	11	3	12	9	9	17	15
CNG	0.5	9	14	11	10	11	10	22	10	16
Private Car	1	7	11	17	3	6	8	4	13	17
Motor Cycle	0.3	28	27	16	30	70	30	65	61	38
Jeep	1	2	1	2	1	2	3	1	2	3
Pick-up	2	3	2	10	3	7	19	1	6	14
Micro	1	7	3	10	2	5	7	3	6	9
Bus	2.5	7	6	34	6	5	28	13	10	55
Light Truck	2	5	1	13	5	0	10	2	2	7
Medium Truck	2	8	2	20	8	5	24	8	14	43
Heavy Truck	2	2	1	5	3	2	9	4	3	14
Total				178				218		

(F) Ecological monitoring data

Table F1: Plant species composition of the sampled homesteads

Nov-25																								
Sl. No.	Species Name	Local Name	Family	Rajnagar				Borni				Kalekarber				Chalkghona				Total Number of	pi	Ln pi	pi*Ln pi	Biodiver
				Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16					
1	<i>Acrostichum aureum</i>	Tiger Fern	Pteridaceae					12		20	25				13	22			92	0.15	-1.89	-0.29	2.68	
2	<i>Albizia richardiana</i>	Chambol	Fabaceae					1			1	1	3	1	1				8	0.01	-4.33	-0.06		
3	<i>Albizia saman</i>	Rendi Koroi	Fabaceae					4	2	1	1							1	9	0.01	-4.21	-0.06		
4	<i>Aphanamixis polystachya</i>	Rhyna	Meliaceae											1					1	0.00	-6.41	-0.01		
5	<i>Areca catechu</i>	Supari	Arecaceae					2	1			4		2	1				10	0.02	-4.11	-0.07		
6	<i>Azadirachta indica</i>	Nem	Meliaceae					3	2	4			3	6	2	1			21	0.03	-3.37	-0.12		
7	<i>Borassus flabellifer</i>	Taal	Arecaceae							1			3			2		2	8	0.01	-4.33	-0.06		
8	<i>Cocos nucifera</i>	Narikel	Arecaceae		2	4	4						5	7	6			1	31	0.05	-2.98	-0.15		
9	<i>Diospyros pregrina</i>	Gaab	Ebenaceae														15	32	47	0.08	-2.56	-0.20		
10	<i>Excoecaria agallocha</i>	Gewa	Euphorbiaceae	5	15	7	5										1		33	0.05	-2.92	-0.16		
11	<i>Ficus hispida</i>	Dumur	Moraceae				1						1	3					5	0.01	-4.80	-0.04		
12	<i>Hibiscus tiliaceus</i>	Bola	Malvaceae					3	3				6						12	0.02	-3.93	-0.08		
13	<i>Lannea coromandelica</i>	Jigar	Anacardiaceae	1					5				3					2	10	21	0.03	-3.37		-0.12
14	<i>Manilkara zapota</i>	Safeda	Sapotaceae												1				1	0.00	-6.41	-0.01		
15	<i>Mimusops elengi</i>	Bokul	Sapotaceae												1				1	0.00	-6.41	-0.01		
16	<i>Moringa oleifera</i>	Sazna	Moringaceae									1	1	3				1	6	0.01	-4.62	-0.05		
17	<i>Musa sp</i>	Kola	Musaceae	5	5	1	1							3	5			3	23	0.04	-3.28	-0.12		
18	<i>Phoenix sylvestris</i>	Khejur	Arecaceae			2	1		1	1	3		5				6	3	1	23	0.04	-3.28		-0.12
19	<i>Phyllanthus acidus</i>	Orboroi	Phyllanthaceae										1						2	0.00	-5.72	-0.02		
20	<i>Pithecellobium dulce</i>	Jilapi	Fabaceae		2												1		3	0.00	-5.31	-0.03		
21	<i>Pongamia pinnata</i>	Koromja	Fabaceae	1								1		1				1	4	0.01	-5.03	-0.03		
22	<i>Psidium guajava</i>	Peyara	Myrtaceae															1	1	0.00	-6.41	-0.01		
23	<i>Sonneratia apetala</i>	Kewra	Lythraceae		1														1	0.00	-6.41	-0.01		
24	<i>Magnifera Indica</i>	Aam	Anacardiaceae											2	4			5	11	0.02	-4.01	-0.07		
25	<i>Swietenia mahagoni</i>	Mahagoni	Meliaceae					3					11	23	13	9			2	61	0.10	-2.30		-0.23
26	<i>Ziziphus mauritiana</i>	Kul boroi	Rhamnaceae																2	2	0.00	-5.72		-0.02
27	<i>Acacia auriculiformis</i>	Akashmoni	Fabaceae					1	1	2									4	0.01	-5.03	-0.03		
28	<i>Morinda citrifolia</i>	Noni	Rubiaceae					2	2	5	3								12	0.02	-3.93	-0.08		
29	<i>Avicenia officinalis</i>	Baen	Acanthaceae			1													1	0.00	-6.41	-0.01		
30	<i>Eucalyptus sp</i>	Eucalyptus	Myrtaceae	1															1	0.00	-6.41	-0.01		
31	<i>Ficus benamina</i>	Lokkho Pakur	Moraceae						1	2									3	0.00	-5.31	-0.03		
32	<i>Euphorbia tirucalli</i>	Pencil Tree	Euphorbiaceae					2	3	3									8	0.01	-4.33	-0.06		
33	<i>Acanthus ilicifolius</i>	Hargoja	Acanthaceae				10												10	0.02	-4.11	-0.07		
34	<i>Ceiba pentandra</i>	Shet-shimul	Bombacaceae															1	1	0.00	-6.41	-0.01		
35	<i>Nypa fruticans</i>	Golpata	Arecaceae										4					3	7	0.01	-4.47	-0.05		
36	<i>Citrus grandis</i>	Jambura	Rutaceae			1													1	0.00	-6.41	-0.01		
37	<i>Colocasia esculenta</i>	Taro	Araceae															2	2	0.00	-5.72	-0.02		
38	<i>Cordia dichotoma</i>	Bohal/Gum Tree	Boraginaceae	1				1	2										4	0.01	-5.03	-0.03		
39	<i>Cassia fistula</i>	Sonalu	Fabaceae						1										1	0.00	-6.41	-0.01		
40	<i>Lawsonia inermis</i>	Mehedi	Lythraceae		3														3	0.00	-5.31	-0.03		
41	<i>Erythrina ovalifolia</i>	Mandar	Fabaceae						1										1	2	0.00	-5.72		-0.02
42	<i>Heritiera fomes</i>	Sundori	Malvaceae	1															1	0.00	-6.41	-0.01		
43	<i>Phyllanthus reticulatus</i>	Shitki	Phyllanthaceae										1			1			2	0.00	-5.72	-0.02		
44	<i>Albizia lebbeck</i>	Kala Korai	Fabaceae											1					1	0.00	-6.41	-0.01		
45	<i>Terminalia arjuna</i>	Arjun	Combretaceae															1	1	0.00	-6.41	-0.01		
46	<i>Spondias pinnata</i>	Amra	Anacardiaceae																1	0.00	-6.41	-0.01		
47	<i>Syzygium cumini</i>	Jam	Myrtaceae	1															2	3	0.00	-5.31		-0.03
Total				16	28	26	12	40	20	41	36	39	49	35	25	32	64	21	22	506	1	(232)	(3)	2.68

Source: Field Survey, November, 2025

F2: Plant health status of the monitored homesteads

Location		Rajnagar								Borni								Kalekarber Dighi								Chalkghona										
Plant Name		<i>Cocos nucifera</i>	<i>Phoenix sylvestris</i>	<i>Manilkara zapota</i>	<i>Albizia saman</i>	<i>Excoecaria agallocha</i>	<i>Mangifera indica</i>	<i>Psidium guajava</i>	<i>Heritiera fomes</i>	<i>Cocos nucifera</i>	<i>Phoenix sylvestris</i>	<i>Borassus flabellifer</i>	<i>Mangifera indica</i>	<i>Excoecaria agallocha</i>	<i>Swietenia mehogani</i>	<i>Areca catechu</i>	<i>Manilkara zapota</i>	<i>Psidium guajava</i>	<i>Syzygium cumini</i>	<i>Cocos nucifera</i>	<i>Phoenix sylvestris</i>	<i>Mangifera indica</i>	<i>Manilkara zapota</i>	<i>Borassus flabellifer</i>	<i>Zizyphus sp</i>	<i>Psidium guajava</i>	<i>Tamarindus indica</i>	<i>Swietenia mehogani</i>	<i>Cocos nucifera</i>	<i>Phoenix sylvestris</i>	<i>Albizia saman</i>	<i>Excoecaria agallocha</i>	<i>Manilkara zapota</i>	<i>Psidium guajava</i>	<i>Mangifera indica</i>	<i>Borassus flabellifer</i>
Total No. of Plant		17	25	1	2	100	3	2	1	10	12	6	6	18	11	10	1	2	1	56	10	5	1	8	1	8	2	1	39	24	3	36	1	17	7	2
No. of Unhealthy Plant	Apr-14	NS	NS	NS	NS	NS	NS	NS	-	-	-	3	3	-	-	-	-	2	-	35	-	1	-	-	-	1	-	-	25	-	-	-	-	7	2	-
	Jun-14	10	15		-	-	1	2	-	3	5	1	3	-	-	6	-	1	-	5	3	1	-	-	-	-	-	-	19	10	-	-	-	7	1	-
	Apr-15	5	4		-	1	-	-	-	-	4	-	1	-	-	2	-	-	-	1	-	-	-	-	-	-	-	5	1	-	1	-	-	-	-	
	Aug-15	4	9		-	-	-	-	-	1	1	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	20	5	-	-	-	-	-	-	
	Oct-15	5	13		-	-	-	-	-	2	4	-	-	-	-	2	-	-	-	3	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
	Oct-16	3	10		-	-	-	-	-	1	4	-	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-	2	1	-	-	-	-	-	-	
	Jan-17	4	2		-	-	-	-	-	2	3	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	2	-	-	-	-	1	-		
	Jan-18	6	5		-	-	1	-	-	3	4	-	-	-	-	-	-	-	-	-	3	-	-	-	-	1	-	4	5	-	-	-	-	-	-	
	Nov-18	4	6		-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	
	Feb-19	4	8		-	-	-	-	-	1	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	3	-	1	-	-	3	-	-	
	Apr-19	3	9		-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	4	1	-	-	-	-	-	-	
	Jul-19	2	5		-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	
	Nov, 2019	3	3		-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	4	2	-	-	-	1	-	-	
	Feb, 2020	10	4		-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	3	1	-	-	-	-	-	-	
	Jul, 2020	3	4		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	3	-	-	-	-	-	-	5	3	-	-	-	-	-	-	
	Nov 2020	7	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
	Jan 2021	11	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
	Apr 2021	10	12	-	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-	-	
	Jul 2021	10	2	-	2	10	2	-	-	-	-	-	-	3	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	
	Nov, 2021	10	3	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
	Jan, 2022	3	2	-	-	-	-	-	1	1	-	-	3	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	
	May 2022	1	2	-	2	-	-	-	-	-	-	-	3	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	
	Jul, 2022	2	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	22-Dec	4	7	1	2	12	3	2	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	2	2	-	-	-	-	1	-	
23-Feb	5	3	D	L	3	D	D	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	1	2	-	-	-	-	0	-		
23-May	7	2	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	3	3	-	-	-	-	3	-		

Location		Rajnagar								Borni								Kalekarber Dighi								Chalkghona										
Plant Name		Cocos nucifera	Phoenix sylvestris	Manilkara zapota	Albizia saman	Excoecaria agallocha	Mangifera indica	Psidium guajava	Heritiera fomes	Cocos nucifera	Phoenix sylvestris	Borassus flabellifer	Mangifera indica	Excoecaria agallocha	Swietenia mehogani	Areca catechu	Manilkara zapota	Psidium guajava	Syzygium cumini	Cocos nucifera	Phoenix sylvestris	Mangifera indica	Manilkara zapota	Borassus flabellifer	Zizyphus sp	Psidium guajava	Tamarindus indica	Swietenia mehogani	Cocos nucifera	Phoenix sylvestris	Albizia saman	Excoecaria agallocha	Manilkara zapota	Psidium guajava	Mangifera indica	Borassus flabellifer
	Sep. 23	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	1
	23-Nov	2	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	
	Feb,24	15	2	-	-	3	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	2	3	-	-	-	-	-	
	May'24	2	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Jul'24	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Aug'24	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Oct'24	1	1	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	
	Feb'25	1	-	-	-	-	-	-	-	1	-	-	1	-	-	-	1	-	3	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	
	Apr'25	2	1	-	-	-	-	-	-	3	-	-	1	-	-	-	-	-	3	3	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
July,25	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	
	Nov25	3	6dead	-	-	15cut	1D	1D	-	1	4	-	2	-	-	-	1c	-	-	-	-	-	-	-	-	1c	1	-	-	-	-	-	-	-	5Ld	-

Source: Field Survey, November, 2025.

F3: Butterfly observation sheet

SI No	Common Nam	Scientific Name	Baseline				Construction				Operation			
			3rd QM (Oct 14)				18th QM (Nov 18)				46th QM (Nov25)			
			R	B	K	C	R	B	K	C	R	B	K	C
1	Blue Tiger	<i>Tirumala hamata</i>		**	*									
2	Checkered Swalotail/Lime Butterfly	<i>Papilio demoleus</i>				*								
3	Chocolate Argus	<i>Junonia hedonia</i>										*		***
4	Common albatross	<i>Appias albina</i>												*
5	Common Cerulean	<i>Jamides celeno</i>			*									
6	Common Crow	<i>Euploea core</i>	*	*		*		*			*	**		*
7	Common Emigrant	<i>Catopsilia pomona</i>	*	*	**	*								
8	Common Gull	<i>Cepora nerissa</i>		*										
9	Common gull	<i>Papilio nerissa</i>										**		

SI No	Common Nam	Scientific Name	Baseline				Construction				Operation			
			3rd QM (Oct 14)				18th QM (Nov 18)				46th QM (Nov25)			
			R	B	K	C	R	B	K	C	R	B	K	C
10	Common Leopard	<i>Papilo phalantha</i>		*	*									
11	Common palmfly	<i>Elymnias hypermnestra</i>		*	*							*****		
12	Common Pierrot	<i>Castalius rosimon</i>		*		*			*					
13	Common Red Eye	<i>Matapa aria</i>						***				*		
14	Common Rose	<i>Pachliopta aristolochiae</i>				*								
15	Dainty Grass-blue	<i>Zizula hylax</i>		*	*			***				*		
16	Danaid Eggfly	<i>Hypolimnas misippus</i>										*		
17	Dark Cerulean	<i>Papilio bochus</i>												
18	Evening Brown	<i>Melanitis leda</i>						**	*			*	*	
19	Foscus Swallowtail	<i>Papilio fuscus</i>										*****		
20	Grey Pansy	<i>Junonia atlites</i>		*							*			
21	Indian sunbeam	<i>Curetis thetis</i>				*								
22	Lemon Pansy	<i>Junonia lemonius</i>		*							*	*		
23	Mangrove Jewel	<i>Hypochrysops epicurus</i>												
24	Monarch	<i>Danaus plexippus</i>												
25	Orange Tiger/Stripped Tiger	<i>Danaus genutia</i>	*		*									
26	Orchard Swallowtail	<i>Papilio aegaeus</i>												
27	Papuan Grass-yellow/Three spot Grass Yellow	<i>Eurema blanda</i>	*	**		*		*						
28	Peacock pansy	<i>Junonia almana</i>		**				*	*		*		*	
29	Plain Hedge Blue	<i>Celastrina limbata</i>												
30	Purple Copper	<i>Paralucia spinifera</i>												
31	Rice Swift	<i>Borbo cinnara</i>		**	*	**						*		
32	Shining Cerulean	<i>Jamides amaraugae</i>												
33	Small Grass-yellow	<i>Eurema smilax</i>										***	*	
34	Spotted Pea-blue	<i>Euchrysops cnejus</i>												
35	Spotted Sailer/Common evening Brawn	<i>Neptis kasiana</i>									*	***	****	
36	Swamp Tiger	<i>Danaus affinis</i>												

Source: CEGIS Field survey from 2014 to 2025.

Table F5: Phenological behavior of of major mangrove species

Species	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Leafing											
Sundari												
Gewa												
Amor												
Goran												
Kakra												
Passur												
	Leaf Shedding											
Sundari												
Gewa												
Amor												
Goran												
Kakra												
Hental												
Passur												
Lata Sundori												
	Flowering											
Sundari												
Gewa												
Keora												
Baen												
Amor												
Hetal												
Goran												
Kakra												
kalilata												
Passur												
Jhanagarjan												
	Fruiting											

Species	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sundari												
Gewa												
Goran												
Kakra												
Amor												
Urmoi												
Sanagarjon												
Passur												
	Seed/Popagule dropping time											
Sundari												
Gewa												
Goran												
Kakra												
Passur												
Golpata												

Source: CEGIS field visit, November 2025

Table F4: Dolphin observation Datasheet

Monitoring Tier	Tidal Condition	Passur River at Project Site	Karamjal	Harbaria	Akram Point	Maidara River	Shella River at Chandpai
Apr-14	FT	Y	NS	NS	NS	Y	NS
	NT	Y	NS	NS	NS	N	NS
Jun-14	FT	Y	NS	NS	NS	N	NS
	NT	Y	N	N	N	N	NS
Oct-14	FT	Y	NS	NS	NS	Y	NS
	NT	Y	Y	Y	N	Y	NS
Jan-15	FT	Y	Y	Y	NS	Y	NS
	NT	Y	Y	N	Y	N	NS
Apr-15	FT	Y	N	N	Y	Y	NS
	NT	Y	N	N	Y	N	NS
Aug-15	FT	Y	NS	N	NS	Y	NS
	NT	Y	Y	N	NS	N	NS

Monitoring Tier	Tidal Condition	Passur River at Project Site	Karamjal	Harbaria	Akram Point	Maidara River	Sheella River at Chandpai
Oct-15	FT	NS	NS	Y	N	NS	NS
	NT	Y	Y	NS	Y	Y	NS
Oct-15	FT	Y	Y	Y	Y	N	NS
	NT	Y	N	N	NS	Y	NS
Jul-16	FT	Y	Y	Y	NS	Y	NS
	NT	Y	NS	Y	NS	NS	NS
Oct-16	FT	N	Y	Y	N	NS	NS
	NT	Y	Y	NS	N	Y	NS
Jan-17	FT	Y	Y	N	NS	N	NS
	NT	Y	Y	N	NS	Y	NS
Jan-18	FT	Y	NS	Y	N	NS	NS
	NT	Y	Y	N	N	Y	N
Jun-18	FT	Y	N	N	N	Y	Y
	NT	Y	NS	N	Y	Y	NS
Nov-18	FT	NS	N	N	N	NS	NS
	NT	Y	N	N	N	Y	Y
Feb-19	FT	NS	Y	Y	N	NS	Y
	NT	Y	N	N	Y	N	NS
Apr-19	FT	NS	Y	N	N	NS	NS
	NT	N	N	Y	N	N	Y
Jul-19	FT	Y	Y	N	N	Y	Y
	NT	Y	NS	N	N	N	NS
Nov-19	FT	NS	Y	Y	N	NS	Y
	NT	Y	Y	N	Y	Y	Y
Feb-20	FT	Y	Y	Y	Y	Y	Y
	NT	Y	N	NS	NS	Y	Y
Jul-20	FT	Y	N	N	N	Y	Y
	NT	Ns	Y	N	N	NS	Y
Nov-20	FT	NS	NS	NS	NS	NS	Y
	NT	Y	NS	NS	NS	Y	NS
Jan-21	FT	NS	NS	NS	NS	NS	Y
	NT	Y	NS	NS	NS	Y	NS
Dec-22	FT	NS	N	N	N	Y	Y

Monitoring Tier	Tidal Condition	Passur River at Project Site	Karamjal	Harbaria	Akram Point	Maidara River	Shella River at Chandpai
	NT	Y	NS	NS	N	NS	NS
Feb-23	FT	NS	NS	Y	NS	Y	Y
	NT	Y	NS	NS	Y	NS	NS
May-23	FT	NS	NS	N	NS	Y	Y
	NT	Y	Y	NS	N	NS	NS
Sep-23	FT	NS	Y	N	NS	Y	Y
	NT	NS	N	Y	N	NS	NS
Nov-23	FT	NS	N	Y	N	NS	NS
	NT	Y	N	Y	N	Y	Y
Nov-23	FT	y	N	N	N	Y	NS
	NT	N	Y	N	N	NS	Y
Feb, 24	FT	y	N	N	N	Y	NS
	NT	N	Y	N	N	NS	Y
May, 24	FT	NS	N	N	N	Y	NS
	NT	N	Y	NS	N	NS	Y
Aug, 24	FT	NS	Y	NS	N	NS	Y
	NT	Y	Y	N	N	Y	NS
Oct'24	FT	NS	Y	NS	N	NS	NS
	NT	Y	Y	Y	N	Y	Y
Feb, 25	FT	Y	Y	NS	N	Y	NS
	NT	NS	Y	Y	N	NS	Y
April,25	FT	Y	N	Y	N	Y	N
	NT	NS	Y	Y	N	Y	Y
Aug, 24	FT	Y	Y	NS	N	Y	Y
	NT	NS	NS	Y	N	Y	NS
Nov,25	FT	Y	Y	NS	N	Y	Y
	NT	NS	NS	Y	N	Y	NS

Note: FT=Flood Tide, NT=Neap Tide, NS=Not Surveyed; Occurrence Status: Y = Occurred, N = Not occurred

Source: CEGIS Field survey from 2014 to 2025.

Appendix V: Analysis Results from the Laboratory

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জীবনের জন্য বিজ্ঞান

বাংলাদেশ বিজ্ঞান ও শিল্প গবেষণা পরিষদ
BANGLADESH COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
Institute of National Analytical Research and Service (INARS)

ANALYSIS REPORT

ASC Ref No. : IN-406 of Analytical Service Cell
BCSIR-02/09/2025

Lab/Sample ID : A-265-269

Client's Details : মোঃ হুতাসিন বিদ্রাহ
রিসার্চ এনালিসিস্ট, সি.ই.জি.আই.এস,
পাওয়ার এনার্জি এন্ড মিনারেল রিসোর্স ডিভিশন, সি.ই.জি.আই.এস।
Center For Environmental And Geographic
Information Service (CEGIS)
CEGIS Bhaban, Plot: F-14/E, Agargaon Administrative Area,
Sher-E-Bangla Nagar, Dhaka-1207.

Number of Sample : 05 (Five)

Sample Description : রাসপাল ২২৬৬০ মোঃ ও বিদ্রাহ প্রকল্পের অধীনে নদীর পলির নমুনা পরীক্ষণ প্রসঙ্গে,
তারিখ ০২/০৯/২০২৫ ইং।

Test Commencement Date : 02/09/2025

Test Completion Date : 24/09/2025

Lab ID	Particulars of supplied sample	Parameters	Results	Test Method (APHA)
A-265	River Bed Sediment (Maidara)	pH at 25.0 °C	8.55 (5% Solution)	4500-H ⁺ .B
		Sulphate (SO ₄)	675 mg/kg	4110.B
		Arsenic (As)	4.67 mg/kg	3114.C
		Lead (Pb)	15.1 mg/kg	3111.B
		Mercury (Hg)	0.26 mg/kg	3112.B

Page 1 of 2

Note:
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b. Any complain about test report will not be acceptable after one month from the date of issuing of the said report.
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BANGLADESH COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
Institute of National Analytical Research and Service (INARS)

ANALYSIS REPORT

ASC Ref No. : IN-406 of Analytical Service Cell
BCSIR-02/09/2025

Lab/Sample ID : A-265-269

Client's Details : মোঃ হুতাসিন বিদ্রাহ
রিসার্চ এনালিসিস্ট, সি.ই.জি.আই.এস,
পাওয়ার এনার্জি এন্ড মিনারেল রিসোর্স ডিভিশন, সি.ই.জি.আই.এস।
Center For Environmental And Geographic
Information Service (CEGIS)
CEGIS Bhaban, Plot: F-14/E, Agargaon Administrative Area,
Sher-E-Bangla Nagar, Dhaka-1207.

Number of Sample : 05 (Five)

Sample Description : রাসপাল ২২৬৬০ মোঃ ও বিদ্রাহ প্রকল্পের অধীনে নদীর পলির নমুনা পরীক্ষণ প্রসঙ্গে,
তারিখ ০২/০৯/২০২৫ ইং।

Test Commencement Date : 02/09/2025

Test Completion Date : 24/09/2025

Lab ID	Particulars of supplied sample	Parameters	Results	Test Method (APHA)
A-265	River Bed Sediment (Maidara)	pH at 25.0 °C	8.55 (5% Solution)	4500-H ⁺ .B
		Sulphate (SO ₄)	675 mg/kg	4110.B
		Arsenic (As)	4.67 mg/kg	3114.C
		Lead (Pb)	15.1 mg/kg	3111.B
		Mercury (Hg)	0.26 mg/kg	3112.B

Page 1 of 2

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Lab ID	Particulars of supplied sample	Parameters	Results	Test Method (APHA)
A-266	River Bed Sediment (Akram Point)	pH at 25.1 °C	8.71 (5% Solution)	4500-H ⁺ .B
		Sulphate (SO ₄)	1038 mg/kg	4110.B
		Arsenic (As)	4.37 mg/kg	3114.C
		Lead (Pb)	5.86 mg/kg	3111.B
		Mercury (Hg)	0.18 mg/kg	3112.B
A-267	River Bed Sediment (Project Jetty)	pH at 28.8 °C	8.42 (5% Solution)	4500-H ⁺ .B
		Sulphate (SO ₄)	164 mg/kg	4110.B
		Arsenic (As)	4.22 mg/kg	3114.C
		Lead (Pb)	5.44 mg/kg	3111.B
		Mercury (Hg)	0.22 mg/kg	3112.B
A-268	River Bed Sediment (Mongla Con.)	pH at 24.7 °C	8.76 (5% Solution)	4500-H ⁺ .B
		Sulphate (SO ₄)	770 mg/kg	4110.B
		Arsenic (As)	4.25 mg/kg	3114.C
		Lead (Pb)	6.66 mg/kg	3111.B
		Mercury (Hg)	0.13 mg/kg	3112.B
A-269	River Bed Sediment (Harbaria)	pH at 25.3 °C	8.60 (5% Solution)	4500-H ⁺ .B
		Sulphate (SO ₄)	741 mg/kg	4110.B
		Arsenic (As)	5.13 mg/kg	3114.C
		Lead (Pb)	7.28 mg/kg	3111.B
		Mercury (Hg)	0.08 mg/kg	3112.B

Analyst: *Shamim* 22.9.25
 Dr. Md. Ahmed Akbar
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 Dr. Md. Salim Khan
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 Dr. Md. Salim Khan
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Lab ID	Particulars of supplied sample	Parameter	Results	Test Method (APHA)
A-275	Surface Water (Sample-01)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-276	Surface Water (Sample-02)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-277	Surface Water (Sample-03)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-278	Surface Water (Sample-04, Jetty)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-279	Surface Water (Sample-05)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-280	Surface Water (Sample-06)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-470	Surface Water (Sample-07)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-281	Surface Water (Sample-08)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-282	Surface Water (Sample-09)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-283	Surface Water (Sample-10)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-284	Surface Water (Sample-11, Shapmari)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B

Analyst: *Dr. Md. Salim Khan* 24/9/25
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বাংলাদেশ বিজ্ঞান ও শিল্প গবেষণা পরিষদ

BANGLADESH COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Lab ID	Particulars of supplied sample	Parameter	Results	Test Method (APHA)
A-285	Surface Water (Power Plant, GW)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-286	Surface Water (Rajnagar)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-287	Surface Water (Akram Point)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-288	Water (Hiron Point)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-289	Water (Mongla Con.)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-290	Water (Kapashdanga)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B
A-291	Water (Harbaria)	Mercury (Hg)	Less than 0.0001 mg/L	3112.B
		Lead (Pb)	Less than 0.01 mg/L	3111.B

Page 3 of 6

Note:

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- This report/result shall not be reproduced/published without prior approval of the authority.

Analytical Service Cell

Dr. Quadrat-I-Khuda Road, Dhanmondi, Dhaka-1205, Bangladesh
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Form No. QSF-22

Revision No. 14

Revision Date: 04 November, 2024



বাংলাদেশ বিজ্ঞান ও শিল্প গবেষণা পরিষদ

BANGLADESH COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Lab ID	Particulars of supplied sample	Parameters	Results (µg/L)	Test Method (APHA)
A-292	Water, Hiron Point- Polynuclear Aromatic Hydrocarbon (PAH)	Acenaphthene	Not detectable	6440.B
		Acenaphthylene	Not detectable	6440.B
		Anthracene	Not detectable	6440.B
		Benzo[A]Anthracene	Not detectable	6440.B
		Benzo[B]Fluoranthene	Not detectable	6440.B
		Benzo[K]Fluoranthene	Not detectable	6440.B
		Benzo[G,H,I]Perilene	Not detectable	6440.B
		Benzo[A]Pyrene	Not detectable	6440.B
		Chrysene	Not detectable	6440.B
		Dibenzo[A,H]Anthracene	Not detectable	6440.B
		Fluoranthene	Not detectable	6440.B
		Fluorene	Not detectable	6440.B
		Indeno[1,2,3-CD]Pyrene	Not detectable	6440.B
		Naphthalene	Not detectable	6440.B
		Phenanthrene	Not detectable	6440.B
		Pyrene	Not detectable	6440.B
	Water, Hiron Point	TOC (Total Organic Carbon)	4.20 mg/L	5310.B
		Total Carbon	2.38 %	Elemental Analyzer

Page 4 of 6

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Form No. QSF-22 Revision No. 14 Revision Date: 04 November, 2024
জীবনের জন্য বিজ্ঞান

বাংলাদেশ বিজ্ঞান ও শিল্প গবেষণা পরিষদ
BANGLADESH COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Lab ID	Particulars of supplied sample	Parameters	Results (µg/L)	Test Method (APHA)
A-483	Water, Project Jetty- Polynuclear Aromatic Hydrocarbon (PAH)	Acenaphthene	Not detectable	6440.B
		Acenaphthylene	Not detectable	6440.B
		Anthracene	Not detectable	6440.B
		Benzo[A]Anthracene	Not detectable	6440.B
		Benzo[B]Fluoranthene	Not detectable	6440.B
		Benzo[K]Fluoranthene	Not detectable	6440.B
		Benzo[G,H,I]Perilene	Not detectable	6440.B
		Benzo[A]Pyrene	Not detectable	6440.B
		Chrysene	Not detectable	6440.B
		Dibenzo[A,H]Anthracene	Not detectable	6440.B
		Fluoranthene	Not detectable	6440.B
		Fluorene	Not detectable	6440.B
		Indeno[1,2,3-CD]Pyrene	Not detectable	6440.B
		Naphthalene	Not detectable	6440.B
		Phenanthrene	Not detectable	6440.B
		Pyrene	Not detectable	6440.B
	Water, Project Jetty	TOC (Total Organic Carbon)	5.28 mg/L	5310.B
		Total Carbon	1.09 %	Elemental Analyzer

Page 5 of 6

Note:

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Form No. QSF-22 Revision No. 14 Revision Date: 04 November, 2024
জীবনের জন্য বিজ্ঞান

বাংলাদেশ বিজ্ঞান ও শিল্প গবেষণা পরিষদ
BANGLADESH COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Lab ID	Particulars of supplied sample	Parameters	Results (µg/L)	Test Method (APHA)
A-484	Water, Harbaria, Polynuclear Aromatic Hydrocarbon (PAH)	Acenaphthene	Not detectable	6440.B
		Acenaphthylene	Not detectable	6440.B
		Anthracene	Not detectable	6440.B
		Benzo[A]Anthracene	Not detectable	6440.B
		Benzo[B]Fluoranthene	Not detectable	6440.B
		Benzo[K]Fluoranthene	Not detectable	6440.B
		Benzo[G,H,I]Perilene	Not detectable	6440.B
		Benzo[A]Pyrene	Not detectable	6440.B
		Chrysene	Not detectable	6440.B
		Dibenzo[A,H]Anthracene	Not detectable	6440.B
		Fluoranthene	Not detectable	6440.B
		Fluorene	Not detectable	6440.B
		Indeno[1,2,3-CD]Pyrene	Not detectable	6440.B
		Naphthalene	Not detectable	6440.B
		Phenanthrene	Not detectable	6440.B
		Pyrene	Not detectable	6440.B
	Water, Harbaria	TOC (Total Organic Carbon)	9.99 mg/L	5310.B
		Total Carbon	1.55 %	Elemental Analyzer

Page 6 of 6

Note:

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Environmental Laboratory

Memo No. ELAB202509004027

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_001 Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁	Nitrate (NO ₃ ⁻)	-	-	7	-	4.7548	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	61.874	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0178	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam
Designation: Research Associate & Scientific Instrument In-Charge (addl) and Laboratory Expert
Signature: *Rafiqul Islam* 19.10.2025

Compiled & approved by

Name: Md. Rafiqul Alam
Designation: Laboratory Expert
Signature: *Rafiqul Alam* 19.10.2025



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Environmental Laboratory

Memo No. ELAB202509004028

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_002 Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₂	Nitrate (NO ₃ ⁻)	-	-	7	-	2.9465	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	50.720	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0326	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam
Designation: Research Associate & Scientific Instrument In-Charge (addl) and Laboratory Expert
Signature: *Rafiqul Islam* 19.10.2025

Compiled & approved by

Name: Md. Rafiqul Alam
Designation: Laboratory Expert
Signature: *Rafiqul Alam* 19.10.2025


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Environmental Laboratory

Memo No. ELAB202509004029 Date: 19/10/2025
 Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_003 Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah Received Date: 31/08/2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

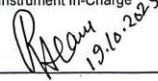
SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₃	Nitrate (NO ₃ ⁻)	-	-	7	-	1.9793	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	70.860	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0105	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam

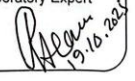
Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert

Signature: 

Compiled & approved by

Name: Md. Rafiqul Alam

Designation: Laboratory Expert

Signature: 


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 Tel: 88 (02) 38817447-52, 9842581, 9842551 Fax: 88 (02) 9843128 e-mail: cegis@cegisbd.com http://www.cegisbd.com

Environmental Laboratory

Memo No. ELAB202509004030 Date: 19/10/2025
 Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_004 Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah Received Date: 31/08/2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

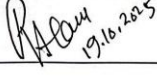
SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₄	Nitrate (NO ₃ ⁻)	-	-	7	-	0.5284	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	67.603	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0437	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam

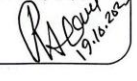
Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert

Signature: 

Compiled & approved by

Name: Md. Rafiqul Alam

Designation: Laboratory Expert

Signature: 

Environmental Laboratory

Memo No. ELAB202509004031

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water

ID: FPC008_005

Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah

Received Date: 31/08/2025

Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SWs	Nitrate (NO ₃ ⁻)	-	-	7	-	0.1920	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	55.873	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0083	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam
 Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert
 Signature: *Rafiqul Islam* 19.10.2025

Compiled & approved by

Name: Md. Rafiqul Alam
 Designation: Laboratory Expert
 Signature: *Rafiqul Alam* 19.10.2025

Environmental Laboratory

Memo No. ELAB202509004032

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water

ID: FPC008_006

Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah

Received Date: 31/08/2025

Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SWs	Nitrate (NO ₃ ⁻)	-	-	7	-	0.1499	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	46.214	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0121	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam
 Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert
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Name: Md. Rafiqul Alam
 Designation: Laboratory Expert
 Signature: *Rafiqul Alam* 19.10.2025

Environmental Laboratory

Memo No. ELAB202509004033

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water

ID: FPC008_007

Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah

Received Date: 31/08/2025

Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₇	Nitrate (NO ₃ ⁻)	-	-	7	-	0.7387	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	59.250	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0099	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam

Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert

Signature:

Compiled & approved by

Name: Md. Rafiqul Alam

Designation: Laboratory Expert

Signature:

Environmental Laboratory

Memo No. ELAB202509004034

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water

ID: FPC008_008

Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah

Received Date: 31/08/2025

Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₈	Nitrate (NO ₃ ⁻)	-	-	7	-	0.2551	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	66.464	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0225	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam

Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert

Signature:

Compiled & approved by

Name: Md. Rafiqul Alam

Designation: Laboratory Expert

Signature:


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 Tel: 88 02 5817449-52; 9542581, 9542551 Fax: 88 02 9843178 e-mail: cegis@cegisbd.com http://www.cegisbd.com

Environmental Laboratory

Memo No. ELAB202509004035 Date: 19/10/2025
 Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008
 Sample Type: Surface Water ID: FPC008_009 Collection Date: July/Aug-2025
 Location: N/A
 Received From: Md. Mutasim Billah Received Date: 31/08/2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₉	Nitrate (NO ₃ ⁻)	-	-	7	-	0.1289	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	64.970	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0200	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam ✓

Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert

Signature: *Rafiqul Islam* 19.10.2025

Compiled & approved by

Name: Md. Rafiqul Alam

Designation: Laboratory Expert

Signature: *Md. Rafiqul Alam* 19.10.2025


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Environmental Laboratory

Memo No. ELAB202509004036 Date: 19/10/2025
 Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008
 Sample Type: Surface Water ID: FPC008_010 Collection Date: July/Aug-2025
 Location: N/A
 Received From: Md. Mutasim Billah Received Date: 31/08/2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁₀	Nitrate (NO ₃ ⁻)	-	-	7	-	0.7597	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	79.651	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0178	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam ✓

Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert

Signature: *Rafiqul Islam* 19.10.2025

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Name: Md. Rafiqul Alam

Designation: Laboratory Expert

Signature: *Md. Rafiqul Alam* 19.10.2025

Environmental Laboratory

Memo No. ELAB202509004036

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_010 Collection Date: July/Aug-2025

Location: N/A

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁₀	Nitrate (NO ₃)	-	-	7	-	0.7597	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	79.651	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0178	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam ✓
 Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert
 Signature: *Rafiqul Islam* 19.10.2025

Compiled & approved by

Name: Md. Rafiqul Alam
 Designation: Laboratory Expert
 Signature: *Md. Rafiqul Alam* 19.10.2025

Environmental Laboratory

Memo No. ELAB202509004037

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_011 Collection Date: July/Aug-2025

Location: Shapmari.

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁₁	Nitrate (NO ₃)	-	-	7	-	0.2551	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	123.81	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0680	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

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Compiled & approved by

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 Designation: Laboratory Expert
 Signature: *Md. Rafiqul Alam* 19.10.2025

Environmental Laboratory

Memo No. ELAB202509004038

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_012 Collection Date: July/Aug-2025

Location: Mongla.

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁₂	Nitrate (NO ₃ ⁻)	-	-	7	-	7.1729	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	35.946	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0541	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

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 Designation: Laboratory Expert
 Signature: *Md. Rafiqul Alam* 19.10.2025

Environmental Laboratory

Memo No. ELAB202509004039

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_013 Collection Date: July/Aug-2025

Location: Harbaria.

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁₃	Nitrate (NO ₃ ⁻)	-	-	7	-	0.7887	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	52.314	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0036	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

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Environmental Laboratory

Memo No. ELAB202509004040

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_014 Collection Date: July/Aug-2025

Location: Akram Point.

Received From: Md. Mutasim Billah Received Date: 31/08/2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁₄	Nitrate (NO ₃ ⁻)	-	-	7	-	1.0331	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	145.78	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	0.0134	ppt	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

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Name: Md. Rafiqul Alam
 Designation: Laboratory Expert
 Signature: *Rafiqul Alam* 19.10.2025

Environmental Laboratory

Memo No. ELAB202509004041

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_015 Collection Date: July/Aug-2025

Location: Hiron Point.

Received From: Md. Mutasim Billah Received Date: /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	SW ₁₅	Nitrate (NO ₃ ⁻)	-	-	7	-	0.4253	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	-	-	-	-	193.19	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	-	-	0.5	-	Undetectable	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam
 Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert
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Environmental Laboratory

Memo No. ELAB202509004042

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Drinking Water ID: FPC008_016 Collection Date: July/Aug-2025

Location: PPj RO Drinking.

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	GW ₁	Nitrate (NO ₃ ⁻)	10	-	45	-	0.3392	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	400	-	250	-	14.911	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	6	-	-	-	Undetectable	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

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Environmental Laboratory

Memo No. ELAB202509004043

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water ID: FPC008_017 Collection Date: July/Aug-2025

Location: Rajnagar.

Received From: Md. Mutasim Billah Received Date: 31/08 /2025 Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	GW ₂	Nitrate (NO ₃ ⁻)	10	-	45	-	1.6849	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	400	-	250	-	0.4833	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	6	-	-	-	0.4073	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

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Environmental Laboratory

Memo No. ELAB202509004044

Date: 19/10/2025

Test Report
Physical/Chemical/Bacteriological Analysis of water

Project Name: Environmental and Socio-Economic Monitoring of 2x660 MW MSTPP at Rampal. Code: FPC008

Sample Type: Surface Water

ID: FPC008_018

Collection Date: July/Aug-2025

Location: Kapashdanga.

Received From: Md. Mutasim Billah

Received Date: 31/08/2025

Testing Date: 03/09-19/10/2025

Laboratory Test Results:

SL #.	Name of Sample	Water quality parameters	Bangladesh Standard ECR/1997		Bangladesh Standard ECR/2023		Concentration Present	Unit	Analysis Method	Min ^m Detection Limit (MDL)
			Drinking	Others	Drinking	Others				
01	GW ₃	Nitrate (NO ₃ ⁻)	10	-	45	-	4.0609	ppm	UV-VIS	0.05008
02		Sulphate (SO ₄ ²⁻)	400	-	250	-	2.9471	ppm	UV-VIS	0.02
03		Phosphate (PO ₄ ³⁻)	6	-	-	-	1.3239	ppm	UV-VIS	0.0003

N.B: UV-VIS: Ultra Violet - 1800 Visible Spectrophotometer. Report is valid only for supplied sample tested.

Test Performed by & checked by

Name: Rafiqul Islam & Md. Rafiqul Alam

Designation: Research Associate & Scientific Instrument In-Charge (addl.) and Laboratory Expert

Signature:

Compiled & approved by

Name: Md. Rafiqul Alam

Designation: Laboratory Expert

Signature:

অধ্যাপক ড. মাহমুদ হোসেন
ফরেস্ট্রি এন্ড উড টেকনোলজি ডিসিপ্লিন
খুলনা বিশ্ববিদ্যালয়, খুলনা-৯২০৮
বাংলাদেশ।



Prof. Dr. Mahmood Hossain
Forestry & Wood Technology Discipline
Khulna University, Khulna-9208
Bangladesh.

Results for March 2025 Samples

Sampling sites	Depth of soil sample	Sample weight for Bulk density (g)	EC (ms/cm)	pH	Organic carbon (%)	Nitrogen final concentration (mg/g)	Phosphorus final concentration (mg/g)
Karamjal	0-15	106.26	4.86	7.11	2.78	0.55	0.09
	15-30	102.11	7.23	7.13	2.65	0.73	0.13
	30-50	123.22	5.21	7.77	2.35	0.30	0.08
	50-100	130.24	5.98	7.65	2.27	0.66	0.11
	0-15	111.02	4.01	6.45	2.05	1.75	0.50
	15-30	115.78	4	7.55	2.28	1.13	0.10
	30-50	105.12	5.12	6.85	2.65	0.29	0.25
	50-100	115.21	4.85	7.85	2.83	0.28	0.36
	0-15	101.28	4.25	7.62	2.95	0.54	0.32
	15-30	120.23	6.78	7.21	3.02	0.54	0.28
Harbariya	30-50	119.24	7.45	6.84	0.99	0.56	0.23
	50-100	116.5	7.55	6.95	2.19	0.76	0.25
	0-15	112.75	2.59	7.44	1.72	0.64	0.32
	15-30	120.25	4.1	7.23	1.85	0.35	0.08
	30-50	115.85	4.95	7.62	1.73	0.25	0.15
	50-100	112.95	3.15	7.35	1.67	0.24	0.08
	0-15	114.13	3.11	7.41	1.38	0.33	0.07
	15-30	116.8	3.75	7.66	1.10	0.23	0.13
	30-50	125.22	3.1	7.42	2.24	0.46	0.18
	50-100	103.98	2.88	7.88	1.38	0.28	0.12
Hironpoint	0-15	106.95	2.2	7.23	2.35	0.49	0.13
	15-30	95.95	4.1	6.21	1.77	0.28	0.09
	30-50	88.85	4.1	6.21	1.77	0.28	0.09
	50-100	89.68	4.32	6.45	2.22	0.35	0.13
	0-15	108.13	2.88	6.99	2.56	0.88	0.10
	15-30	135.54	5.16	6.43	2.70	0.60	0.08
	30-50	130.25	5.66	7.22	2.60	0.38	0.08
	50-100	130.45	5.22	7.66	2.65	0.46	0.08
	0-15	116.22	5.86	7.48	2.53	0.89	0.07
	15-30	118.21	5.25	7.65	2.19	0.76	0.07
Akrampoint	30-50	90.82	4.78	6.56	2.66	0.70	0.13
	50-100	115.8	4.77	6.92	2.34	0.37	0.56
	0-15	112.82	5.65	6.41	1.86	0.32	0.41
	15-30	110.65	5.75	6.39	1.97	0.29	0.17
	30-50	115.11	5.88	7.1	1.32	0.37	0.18
	50-100	125.8	4	7.12	1.42	0.54	0.35
	0-15	116.23	4.15	7.32	1.61	1.02	0.73
	15-30	120.5	4.35	7.01	2.78	0.51	0.13
	30-50	116.36	4.99	7.63	2.65	0.58	0.10
	50-100	110.8	4.95	7.25	2.35	0.64	0.23
Sutarkhall	0-15	108.5	3.95	7.15	2.27	0.61	0.28
	15-30	101.9	5.11	7.21	2.05	0.57	0.65
	30-50	106.02	5.1	7.33	2.28	0.58	0.91
	50-100	100.4	3.55	7.1	2.65	0.58	1.06
	0-15	96.9	4	7.11	2.83	0.61	0.58
	15-30	99.75	5.44	7.25	2.95	0.64	0.13
	30-50	100.95	4.11	7.32	3.02	0.66	0.10
	50-100	137.23	4.62	7.11	0.99	0.76	0.86
	0-15	120.41	3.59	7.85	2.19	0.70	0.53
	15-30	108.25	4.35	6.98	1.72	0.41	0.07

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অধ্যাপক ড. মাহমুদ হোসেন
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বাংলাদেশ।



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Results for August 2025 Samples

Sampling sites	Depth of soil sample	Sample weight for Bulk density (g)	EC (ms/cm)	pH	Organic carbon (%)	Nitrogen final concentration (mg/g)	Phosphorus final concentration (mg/g)
Karamjal	0-15	87.38	3.21	7.01	3.87	0.56	0.26
	15-30	102.67	6.23	7.12	3.02	0.57	0.24
	30-50	113.21	5.45	7.96	2.95	0.32	0.21
	50-100	109.56	4.32	6.23	2.43	0.53	0.14
	0-15	95.88	4.21	6.85	2.84	0.63	0.10
	15-30	120.03	4.12	7.45	2.18	0.87	0.18
	30-50	99.96	5.23	7.68	2.23	0.58	0.31
	50-100	119.21	3.29	7.59	2.06	0.58	0.26
	0-15	110.79	4.1	7.98	2.56	0.39	0.27
	15-30	110.35	7.12	7.23	2.76	0.40	0.26
Harbariya	30-50	120.55	7.23	6.98	2.10	0.63	0.19
	50-100	109.32	7.95	7.84	2.32	0.84	0.21
	0-15	122.45	2.21	7.64	2.26	0.69	0.40
	15-30	119.65	2.95	7.11	1.78	0.63	0.39
	30-50	115.41	4.98	7.62	3.22	0.57	0.27
	50-100	103.45	3.01	7.01	1.98	0.57	0.16
	0-15	108.23	3.55	7.09	1.94	0.58	0.08
	15-30	106.34	3.25	7.21	1.08	0.54	0.18
	30-50	125.21	3.96	7.28	1.23	0.25	0.16
	50-100	101.73	4.21	7.51	0.74	0.56	0.10
Hironpoint	0-15	103.34	4.26	7.77	2.61	0.83	0.18
	15-30	89.65	2.26	7.74	2.91	0.40	0.26
	30-50	95.66	3.78	7.79	1.67	0.53	0.43
	50-100	105.88	4.35	7.98	2.99	0.58	0.40
	0-15	110.36	2.39	7.96	0.78	0.58	0.24
	15-30	122.65	5.45	7.93	1.57	0.58	0.27
	30-50	132.52	7.25	7.65	1.90	0.57	0.29
	50-100	121.21	6.85	7.02	1.79	0.34	0.16
	0-15	105.29	6.12	7.89	1.87	0.58	0.19
	15-30	111.11	5.25	6.95	2.02	0.57	0.14
Akrapoint	30-50	88.98	5.24	6.92	2.21	0.57	0.10
	50-100	103.34	4.01	6.78	1.73	0.70	0.45
	0-15	104.66	5.21	7.09	2.65	0.56	0.43
	15-30	110.25	4.95	7.56	1.81	0.56	0.48
	30-50	112.35	5.56	7.35	1.48	0.59	0.47
	50-100	118.26	4.85	7.11	1.27	0.65	0.40
	0-15	115.39	4.58	7.35	1.66	0.64	0.15
	15-30	112.23	4.96	7.26	1.85	0.56	0.18
	30-50	113.65	4.78	7.49	2.12	0.59	0.11
	50-100	108.45	4.78	7.64	2.40	0.78	0.19
Sutarkhall	0-15	115.36	5.95	7.62	2.67	0.72	0.21
	15-30	98.96	5.99	7.41	2.44	0.41	0.22
	30-50	99.58	5.23	7.01	2.09	0.61	0.16
	50-100	106.25	3.91	7.61	2.23	0.74	0.21
	0-15	104.52	2.11	6.93	2.21	0.64	0.13
	15-30	111.32	3.23	6.9	2.79	0.59	0.18
	30-50	115.36	3.58	7.06	1.90	0.39	0.19
	50-100	138.95	3.65	7.05	1.74	0.52	0.10
	0-15	123.87	3.56	7.95	1.40	0.70	0.08
	15-30	101.03	3.84	7.39	1.88	0.67	0.16

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Office of the Chief Chemist
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Central Lab, 38-39, Mohakhali C/A, Dhaka-1212
Phone: 88-02-9881927, Fax: 88-02-9882003, Email: wqmsc_central_lab@yahoo.com



Lab Memo: 322/ CC, DPHE, CL, Dhaka

Date: 05-10-2025

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2025100001	Sample Receiving date: 04-09-2025
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal
Care Taker: CEGIS (Sample ID : SW-01)	Union:, Vill.:
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Calcium (Ca)	75	35	mg/L	AAS	0.17
3	Chemical Oxygen Demand (COD)	4.0	16	mg/L	CRM	-
4	Chloride	150-600	30	mg/L	Titrimetric	-
5	Silica (SiO ₂)	0.0	1	mg/L	UVS	-
6	Bi-Carbonate (HCO ₃ ⁻)	0.0	110	mg/L	Titrimetric	-
7	Hardness	200-500	140	mg/L	Titrimetric	-
8	Iron (Fe)	0.3-1	24.56	mg/L	AAS	0.05
9	Magnesium (Mg)	30-35	12	mg/L	AAS	0.05
10	Potassium (K)	12.0	6	mg/L	AAS	-
11	Sodium (Na)	200	13	mg/L	AAS	0.34
12	Total Dissolved Solid (TDS)	1000	150	mg/L	Multimeter	-
13	Total Suspended Solid (TSS)	10	148	mg/L	Gravimetric Method	-
14	Turbidity	10	891	NTU	Turbidity Meter	-
15	Carbonate (CO ₃)	-	0.20	mg/L	Titrimetric	-

Comments: Sample was collected & supplied by client.

N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Signature

Signature

Signature

Signature
05/10/2025
Md. Biplab Hossain
Chief Chemist
Department of Public Health Engineering

Page 1 of 2

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer Signature: <i>[Signature]</i> 05/10/2025						
Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist Signature: <i>[Signature]</i> 05.10.2025 2.) Name: Md. Biplab Hossain Designation: Chief Chemist Signature: <i>[Signature]</i> 05/10/2025 Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka						

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Lab Memo: 322/ CC, DPHE, CL, Dhaka

Date: 05-10-2025

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2025100002	Sample Receiving date: 04-09-2025
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal
Care Taker: CEGIS (Sample ID : SW-02)	Union:, Vill.:
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	16	mg/L	CRM	-
3	Hardness	200-500	150	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	250	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	288	mg/L	Gravimetric Method	-

Comments: Sample was collected & supplied by client.

N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer Signature: <i>[Signature]</i> 05/10/2025 2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer Signature: <i>[Signature]</i> 05.10.2025		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist Signature: <i>[Signature]</i> 05.10.2025 2.) Name: Md. Biplab Hossain Designation: Chief Chemist Signature: <i>[Signature]</i> 05/10/2025 Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka	
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Lab Memo: 322/ CC, DPHE, CL, Dhaka

Date: 05-10-2025

Physical /Chemical/ Bacteriological Analysis of Water Sample

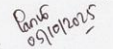
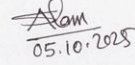
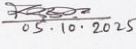
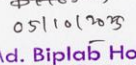
Sample ID: CEN2025100003	Sample Receiving date: 04-09-2025
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal
Care Taker: CEGIS (Sample ID : SW-03)	Union:, Vill.:
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.005	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	20	mg/L	CRM	-
3	Hardness	200-500	140	mg/L	Titrimetic	-
4	Total Dissolved Solid (TDS)	1000	220	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	282	mg/L	Gravimetric Method	-

Comments: Sample was collected & supplied by client.

N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer Signature:  2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer Signature: 	Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist Signature:  2.) Name: Md. Biplob Hossain Designation: Chief Chemist Signature:  Md. Biplob Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka
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Lab Memo: 322/ CC, DPHE, CL, Dhaka

Date: 05-10-2025

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2025100004	Sample Receiving date: 04-09-2025
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal
Care Taker: CEGIS (Sample ID : SW-04)	Union:, Vill.:
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025

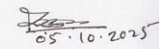
LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Calcium (Ca)	75	36	mg/L	AAS	0.17
3	Chemical Oxygen Demand (COD)	4.0	24	mg/L	CRM	-
4	Chloride	150-600	80	mg/L	Titrimetic	-
5	Silica (SiO ₂)	0.0	1	mg/L	UVS	-
6	Bi-Carbonate (HCO ₃ ⁻)	0.0	120	mg/L	Titrimetic	-
7	Hardness	200-500	150	mg/L	Titrimetic	-
8	Iron (Fe)	0.3-1	30.10	mg/L	AAS	0.05
9	Magnesium (Mg)	30-35	15	mg/L	AAS	0.05
10	Potassium (K)	12.0	7	mg/L	AAS	-
11	Sodium (Na)	200	28	mg/L	AAS	0.34
12	Total Dissolved Solid (TDS)	1000	240	mg/L	Multimeter	-
13	Total Suspended Solid (TSS)	10	298	mg/L	Gravimetric Method	-
14	Turbidity	10	945	NTU	Turbidity Meter	-
15	Carbonate (CO ₃)	-	0.22	mg/L	Titrimetic	-

Comments: Sample was collected & supplied by client.

N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.




 05.10.2025
Md. Biplob Hossain
 Chief Chemist
 Department of Public Health Engineering
 Central Laboratory Mohakhali, Dhaka

Page 1 of 2

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>Signature</i> 05.10.2025						
Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>Signature</i> 05/10/2025 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>Signature</i> 05/10/2025 Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka						

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	12	mg/L	CRM	-
3	Hardness	200-500	150	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	170	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	228	mg/L	Gravimetric Method	-

Comments: Sample was collected & supplied by client.
 N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by:		Countersigned/Approved by:	
Name	Signature	Name	Signature
1.) Name: S.M. Parves Talukder Designation: Sample Analyzer	<i>Signature</i> 05/10/2025	1.) Name: Mita Sarker Designation: Senior Chemist	<i>Signature</i> 05.10.2025
2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer	<i>Signature</i> 05.10.2025	2.) Name: Md. Biplab Hossain Designation: Chief Chemist	<i>Signature</i> 05/10/2025 Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100006	Sample Receiving date: 04-09-2025					
Ref Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : SW-06)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	20	mg/L	CRM	-
3	Hardness	200-500	150	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	170	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	228	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer 2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist 2.) Name: Md. Biplab Hossain Designation: Chief Chemist Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100007	Sample Receiving date: 04-09-2025					
Ref Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : SW-07)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Calcium (Ca)	75	42	mg/L	AAS	0.17
3	Chemical Oxygen Demand (COD)	4.0	24	mg/L	CRM	-
4	Chloride	150-600	35	mg/L	Titrimetric	-
5	Silica (SiO ₂)	0.0	1	mg/L	UVS	-
6	Bi-Carbonate (HCO ₃ ⁻)	0.0	100	mg/L	Titrimetric	-
7	Hardness	200-500	145	mg/L	Titrimetric	-
8	Iron (Fe)	0.3-1	29.40	mg/L	AAS	0.05
9	Magnesium (Mg)	30-35	15	mg/L	AAS	0.05
10	Potassium (K)	12.0	7	mg/L	AAS	-
11	Sodium (Na)	200	20	mg/L	AAS	0.34
12	Total Dissolved Solid (TDS)	1000	170	mg/L	Multimeter	-
13	Total Suspended Solid (TSS)	10	628	mg/L	Gravimetric Method	-
14	Turbidity	10	756	NTU	Turbidity Meter	-
15	Carbonate (CO ₃)	-	0.28	mg/L	Titrimetric	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
		Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
Test Performed by: Signature 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer 2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer 05.10.2025						
Countersigned/Approved by: Signature 1.) Name: Mita Sarker Designation: Senior Chemist 2.) Name: Md. Biplab Hossain Designation: Chief Chemist Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka						

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.003	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	16	mg/L	CRM	-
3	Hardness	200-500	150	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	160	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	720	mg/L	Gravimetric Method	-

Comments: Sample was collected & supplied by client.
 N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by:		Countersigned/Approved by:	
Name	Signature	Name	Signature
1.) Name: S.M. Parves Talukder Designation: Sample Analyzer	05.10.2025	1.) Name: Mita Sarker Designation: Senior Chemist	05.10.2025
2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer	05.10.2025	2.) Name: Md. Biplab Hossain Designation: Chief Chemist	05.10.2025

Md. Biplab Hossain
 Chief Chemist
 Department of Public Health Engineering
 Central Laboratory Mohakhali, Dhaka

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Lab Nemo: 322/ CC, DPHE, CL, Dhaka Date: 05-10-2025						
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100009	Sample Receiving date: 04-09-2025					
Ref Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : SW-09)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.003	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	4	mg/L	CRM	-
3	Hardness	200-500	150	mg/L	Titrimetic	-
4	Total Dissolved Solid (TDS)	1000	160	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	720	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>Signature: Parves 05/10/2025</i>		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>Signature: Mita Sarker 05.10.2025</i> 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>Signature: Md. Biplab Hossain 05/10/2025</i> Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Nemo: 322/ CC, DPHE, CL, Dhaka Date: 05-10-2025						
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100010	Sample Receiving date: 04-09-2025					
Ref Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : SW-10)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	20	mg/L	CRM	-
3	Hardness	200-500	135	mg/L	Titrimetic	-
4	Total Dissolved Solid (TDS)	1000	190	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	430	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>Signature: Parves 05/10/2025</i>		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>Signature: Mita Sarker 05.10.2025</i> 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>Signature: Md. Biplab Hossain 05/10/2025</i> Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100011	Sample Receiving date: 04-09-2025					
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : SW-11)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	24	mg/L	CRM	-
3	Hardness	200-500	140	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	2320	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	254	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>(Signature: S.M. Parves Talukder, 05/10/2025)</i>		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>(Signature: Mita Sarker, 05.10.2025)</i> 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>(Signature: Md. Biplab Hossain, 05.10.2025)</i> Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100012	Sample Receiving date: 04-09-2025					
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : SW-12, Mongla)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.003	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	12	mg/L	CRM	-
3	Hardness	200-500	145	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	190	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	310	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>(Signature: S.M. Parves Talukder, 05/10/2025)</i>		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>(Signature: Mita Sarker, 05.10.2025)</i> 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>(Signature: Md. Biplab Hossain, 05.10.2025)</i> Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100013		Sample Receiving date: 04-09-2025				
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025		Sample Source: Surface Water				
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.		Dist: Bagerhat, Upa: Rampal				
Care Taker: CEGIS (Sample ID : SW-13, Harbaria)		Union:, Vill.:				
Sample Collection date:		Date of Testing: 04/09/2025-30/09/2025				
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	8	mg/L	CRM	-
3	Hardness	200-500	145	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	360	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	344	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer Signature: <i>S.M. Parves Talukder</i> 05.10.2025 2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer Signature: <i>A. Alam</i> 05.10.2025		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist Signature: <i>Mita Sarker</i> 05.10.2025 2.) Name: Md. Biplob Hossain Designation: Chief Chemist Signature: <i>Md. Biplob Hossain</i> 05.10.2025 Md. Biplob Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100014		Sample Receiving date: 04-09-2025				
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025		Sample Source: Surface Water				
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.		Dist: Bagerhat, Upa: Rampal				
Care Taker: CEGIS (Sample ID : SW-14, Akram Point)		Union:, Vill.:				
Sample Collection date:		Date of Testing: 04/09/2025-30/09/2025				
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	12	mg/L	CRM	-
3	Hardness	200-500	150	mg/L	Titrimetric	-
4	Total Dissolved Solid (TDS)	1000	2570	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	278	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer Signature: <i>S.M. Parves Talukder</i> 05.10.2025 2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer Signature: <i>A. Alam</i> 05.10.2025		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist Signature: <i>Mita Sarker</i> 05.10.2025 2.) Name: Md. Biplob Hossain Designation: Chief Chemist Signature: <i>Md. Biplob Hossain</i> 05.10.2025 Md. Biplob Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2025100015	Sample Receiving date: 04-09-2025
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Surface Water
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal
Care Taker: CEGIS (Sample ID : SW-15, Hiron Point)	Union:, Vill.:
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.004	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	8	mg/L	CRM	-
3	Hardness	200-500	140	mg/L	Titrimetic	-
4	Total Dissolved Solid (TDS)	1000	4650	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	342	mg/L	Gravimetric Method	-

Comments: Sample was collected & supplied by client.
 N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>Signature</i> 05/10/2025	Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>Signature</i> 05.10.2025 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>Signature</i> 05/10/2025 Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka
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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025

Physical /Chemical/ Bacteriological Analysis of Water Sample

Sample ID: CEN2025100016	Sample Receiving date: 04-09-2025
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Ground Water
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal
Care Taker: CEGIS (Sample ID : GW-01, Karpasdanga)	Union:, Vill.:
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.053	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	4	mg/L	CRM	-
3	Hardness	200-500	130	mg/L	Titrimetic	-
4	Total Dissolved Solid (TDS)	1000	690	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	7	mg/L	Gravimetric Method	-

Comments: Sample was collected & supplied by client.
 N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>Signature</i> 05/10/2025	Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>Signature</i> 05.10.2025 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>Signature</i> 05/10/2025 Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka
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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100017	Sample Receiving date: 04-09-2025					
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Ground Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : GW-02, Rajnagar)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.005	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	4	mg/L	CRM	-
3	Hardness	200-500	145	mg/L	Titrimetic	-
4	Total Dissolved Solid (TDS)	1000	410	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	4	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>(Signature: S.M. Parves Talukder, 05.10.2025)</i> 2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer <i>(Signature: Md. Saiful Alam Khosru, 05.10.2025)</i>		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>(Signature: Mita Sarker, 05.10.2025)</i> 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>(Signature: Md. Biplab Hossain, 05.10.2025)</i> Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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Lab Memo: 322/ CC, DPHE, CL, Dhaka		Date: 05-10-2025				
Physical /Chemical/ Bacteriological Analysis of Water Sample						
Sample ID: CEN2025100018	Sample Receiving date: 04-09-2025					
Ref. Memo No: 42.06.0000.119.37.001.25.03067 & Dated: 31-08-2025	Sample Source: Ground Water					
Sent by: Mohammad Mukteruzzaman, Director (in-charge), CEGIS, Agargaon, Dhaka.	Dist: Bagerhat, Upa: Rampal					
Care Taker: CEGIS (Sample ID : GW-03, Project site)	Union:, Vill.:					
Sample Collection date:	Date of Testing: 04/09/2025-30/09/2025					
LABORATORY TEST RESULTS:						
Sl.#	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Arsenic (As)	0.05	0.001	mg/L	AAS	0.001
2	Chemical Oxygen Demand (COD)	4.0	8	mg/L	CRM	-
3	Hardness	200-500	150	mg/L	Titrimetic	-
4	Total Dissolved Solid (TDS)	1000	320	mg/L	Multimeter	-
5	Total Suspended Solid (TSS)	10	1	mg/L	Gravimetric Method	-
Comments: Sample was collected & supplied by client. N.B: AAS - Atomic Absorption Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.						
Test Performed by: 1.) Name: S.M. Parves Talukder Designation: Sample Analyzer <i>(Signature: S.M. Parves Talukder, 05.10.2025)</i> 2.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer <i>(Signature: Md. Saiful Alam Khosru, 05.10.2025)</i>		Countersigned/Approved by: 1.) Name: Mita Sarker Designation: Senior Chemist <i>(Signature: Mita Sarker, 05.10.2025)</i> 2.) Name: Md. Biplab Hossain Designation: Chief Chemist <i>(Signature: Md. Biplab Hossain, 05.10.2025)</i> Md. Biplab Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka				

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