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SURFACE AND GROUND WATER QUALITY REPORT 2022

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Surface and Ground Water Quality Report 2022

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MESSAGE

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Water is a major need for a growing economy with a continuous growth rate of more than 7 percent a year. Water is also impotant for irrigation, health, domestic use and for fisheries and other biodiversity. Rivers and wetlands are lifeline of Bangladesh. Three major river systems namely the Ganges, the Brahammaraputra and the Maghna which drain through the country of the Bay of Bengal created huge floodplains, active and moribund and a good number of unique water ecosystems. Industrialization, urbanization and other development initiatives pose a continuous risk of pollution of surface and ground waters.

Department of Environment (DoE) has been monitoring surface water quality since its establishment in 1973. DoE's surface water quality monitoring network includes pollution hotspots of rivers, lakes, marine water (on a limited scale) and ground water.

Surface and Ground Water Quality Report 2022 is the ninth of its kind that gives overall status of river and ground water quality in Bangladesh. Municipal and industrial solid wastes, untreated sewage and effluents, are highly polluting rivers surrounding major cities and other urban growth centers. Water quality of rivers around the major cities and towns were not within the quality standards as set in the Environment Conservation Rules 2023, and the quality of water of large rivers such as the padma, the Meghna, the Jamuna, the Brahmmaputa was within the limit. Water quality of some rivers in southern coastal region degraded due to high salinity and turbidity and thus, waters of those rivers are often unfit for domestic and agricultural use especially in the dry season. In addition, this report includes the water quality of three lakes (namely Dhanmondi, Gulshan and Hatir Jheel) and 73 ground water stations of three districts.

This report also highlighted the necessary steps to be taken for improvement in monitoring water quality and sustainable management of aquatic ecosystems. Hopefully this doccument will be useful in decision making for conservation of degraded riverine ecosystems of Bangladesh.

I sincerely thank Natural Resources Management and Research wing of the Department for preparing this report.

Dr Abdul Hamid
Director General
Department of Environment

FOREWORD

The aquatic ecosystem of these rivers, haors, baors and perennial flood-plains largely depends on the quality of its water. Population increase, release of untreated industrial effluents and sewage, unplanned solid waste dumping along the river banks, encroachment and non-point source pollution for agricultural activities are continuously deteriorating the water quality and their aquatic ecosystem. The aquatic ecosystem of Bangladesh is increasingly being threatened by surface water pollution and excessive ground water abstraction. Bangladesh, as a downstream part of three major rivers is dominated by floodplain and deltaic ecosystem. The dry season availability of both surface and ground water is already under pressure due to upstream uptake by the neighboring countries. Hence, monitoring of the quality and continuous improvement initiatives are vital for better ecosystem services.

In 2022, the monitoring program covered sampling of 103 points of 26 rivers, 13 points of 03 Lakes (Gulshan-06 Stations, Dhanmondi-04 Stations and Hatir Jheel lakes-03 Stations) of Dhaka and 73 stations (Barisal Dist.-58 Stations, Sylhet Dist.-05 Stations, Bogura Dist.-10 Stations) of 3 districts for analysis of drinking water quality in Bangladesh.

The surface and ground water quality report 2022 contains data and some basic statistical analysis of a number of water quality parameters 103 points of 26 rivers, 13 points of 03 lakes and 73 stations of 03 districts of ground water for the period from January to December 2022. Physiochemical water quality parameters such as pH, EC, TDS, DO, BOD, COD, SS, Chloride, Turbidity, Total Alkalinity and Salinity were measured in laboratory base analysis. The mean value of such respective parameters in both seasons was compared with the water quality standards as set by the EQS guideline of Department of Environment (DoE). The report does not include biological indicators for monitoring.

The quality of water of rivers in dry season surrounding Dhaka city, near Chattagram city, Khulna city and near other major urban areas were below the Environmental Quality Standard (EQS) depicted in the Environmental Conservation rules 2023. The pollution level of different points along a single stress of a river also varied. River erosion and dumping of solid waste increased the turbidity of river water in some sampling points. The water quality of three lakes in Dhaka was mostly below the EQS although Gulshan Lake’s data showed some improvements.

The report suggests future programme of actions for conservation of water resources. Implementation of recommended activities in this report is vital to pave the way of conservation and sustainable use of water resources at various levels of our development agenda.

Syeda Masuma Khanam
Director (Joint Secretary)
Natural Resource Management
Department of Environment

EDITORIAL NOTES

Water quality refers to the chemical, physical, biological, and radiological characteristics of water. Water is an essential element for industrial as well as agricultural development. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is most frequently used by reference to a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact, and drinking water. Water quality and quantity greatly affects ecosystems productivity and services they provide. To provide with necessary information for sustainable services especially of aquatic ecosystem, continuous monitoring of water quality is essential.

Water quality parameters like pH, Dissolve Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Turbidity, Total Dissolve Solids (TDS), Suspended Solid (SS), Total Alkalinity, Electrical Conductivity (EC), Chloride and Salinity presented in this report were measured more or less round the year of 2022. Basic analysis was done on all rivers included in this report. The report did not incorporate biological data and data which were not measured/received from the DoE Laboratories. Due to limited time and resource allocation it also did not cover all the analytical methods. A number of data are missing in various months due to unavailability. The yearly trend analysis of water quality of major rivers was avaraged data and hence the data variation was unexpectedly high in some cases.

As water pollution affects the entire biosphere of plants and organisms living in these water bodies, as well as organisms and plants that might be exposed to the water, this report can act as a guide for intervention measures.

AKM Rafiqul Islam
Deputy Director (Water & Bio)

ACKNOWLEDGEMENT

The River Water Quality Report 2022 is an effort of series of analytical results of water quality data that were collected by the Laboratories of Department of Environment (DoE). At the outset, I would like to express our gratitude to Dr A.K.M Rarique Ahmed, Director General, Department of Environment, for the supervision and guidance during the preparation of this report. Our sincere gratitude to all laboratories' personnel (Directors, Deputy Directors, Senior Chemists, Junior Chemists, Assistant Biochemists and Sample Collectors) of all six laboratories of DoE for collecting water samples, conducting on-site and laboratory tests of water and provide us the data. Without their support it could not be done. I would like to extend our sincere thanks and appreciation to the editors Dr. Fahmida Khanom, Director (Natural Resources Management & Research) and A K M Rafiqul Islam, Deputy Director (Water & Bio) for their continuous efforts with excellent guidance to accomplish this report. Special thanks are also extended to Mr. Md. Abubakar Ahmed, Junior Consultant, for compiling data for this report.

Zawata Afnan
Assistant Director (Water & Bio.)

ABBREVIATIONS

BOD	-	Biochemical Oxygen Demand
COD	-	Chemical Oxygen Demand
TDS	-	Total Dissolved Solids
EC	-	Electrical Conductivity
ECA	-	Ecologically Critical Area
ECR	-	Environmental Conservation Rules
DO	-	Dissolved Oxygen
SS	-	Suspended Solids
DoE	-	Department of Environment
EQS	-	Environmental Quality Standard
GEMS	-	Global Environment Monitoring System
GPS	-	Global Positioning System
IWM	-	Integrated Watershed Management
NTU	-	Nephelometric Turbidity Unit
SoE	-	State of the Environment
WQI	-	Water Quality Index
WCZ	-	Water Control Zone

GLOSSARY

pH:

pH is a logarithmic scale used to specify the acidity or basicity of an aqueous solution. It is approximately the negative of the base 10 logarithm of the molar concentration, measured in units of moles per liter, of hydrogen ions. The pH of aqueous solutions can be measured with a glass electrode and a pH meter, or an indicator.

Dissolved Oxygen (DO):

Dissolved Oxygen is the amount of gaseous oxygen (O_2) dissolved in the water. Oxygen enters the water by direct absorption from the atmosphere, by rapid movement, or as a waste product of plant photosynthesis. Adequate dissolved oxygen is important for good water quality and necessary to all forms of life. Dissolved oxygen levels that drop below 5.0 mg/L cause stress to aquatic life. Lower concentrations cause greater stress. Oxygen levels that go below 1-2 mg/L for a few hours may result in large fish kills.

Biochemical Oxygen Demand (BOD_5):

Biochemical Oxygen Demand (BOD_5), also called Biological Oxygen Demand) is the amount of dissolved oxygen needed (i.e. demanded) by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period. The BOD value is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20 °C and is often used as a surrogate of the degree of organic pollution of water. BOD can be used as a gauge of the effectiveness of wastewater treatment plants. There are two commonly recognized methods for the measurement of BOD. Dilution method & Manometric method.

Chemical Oxygen Demand (COD):

Chemical oxygen demand (COD) is an indicative measure of the amount of oxygen that can be consumed by reactions in a measured solution. It is commonly expressed in mass of oxygen consumed over volume of solution which in SI units is milligrams per litre (mg/L COD is useful in terms of water quality by providing a metric to determine the effect an effluent will have on the receiving body, much like biochemical oxygen demand (BOD).

Total Dissolved Solid (TDS):

Total dissolved solids (TDS) is a measure of the dissolved combined content of all inorganic and organic substances present in a liquid in molecular, ionized or micro-granular (colloidal sol) suspended form. Total dissolved solids are normally discussed only for freshwater systems, as salinity includes some of the ions constituting the definition of TDS.

Electrical Conductivity (EC):

Electrical conductivity is the measure of the amount of electrical current a material can carry or it's'ability to carry a current. Electrical conductivity is also known as specific conductance. Conductivity is an intrinsic property of a material.

Suspended Solids (SS):

Suspended solids refers to small solid particles which remain in suspension in water as a colloid or due to the motion of the water. It is used as one indicator of water quality.

Total Suspended Solids (TSS):

Total suspended solids (TSS) is the dry-weight of suspended particles, that are not dissolved, in a sample of water that can be trapped by a filter that is analyzed using a filtration apparatus. It is a water quality parameter used to assess the quality of a specimen of any type of water or water body, ocean water for example, or wastewater after treatment in a wastewater treatment plant.

Chloride:

The chloride ion is the anion (negatively charged ion) Cl^-. It is formed when the element chlorine (a halogen) gains an electron or when a compound such as hydrogen chloride is dissolved in water or other polar solvents. Chloride salts such as sodium chloride are often very soluble in water. It is an essential electrolyte located in all body fluids responsible for maintaining acid/base balance, transmitting nerve impulses and regulating fluid in and out of cells.

Alkalinity:

Alkalinity is the capacity of water to resist changes in pH that would make the water more acidic. Alkalinity is the strength of a buffer solution composed of weak acids and their conjugate bases. It is measured by titrating the solution with a monoprotic acid such as HCl until its pH changes abruptly, or it reaches a known endpoint where that happens. Alkalinity is expressed in units of meq/L (milliequivalents per liter), which corresponds to the amount of monoprotic acid added as a titrant in millimoles per liter.

Turbidity:

Turbidity is the cloudiness or haziness of a fluid caused by large numbers of individual particles that are generally invisible to the naked eye, similar to smoke in air. The measurement of turbidity is a key test of water quality. Turbidity (or haze) is also applied to transparent solids such as glass or plastic. In plastic production, haze is defined as the percentage of light that is deflected more than 2.5° from the incoming light direction.

Salinity:

Salinity is the saltiness or amount of salt dissolved in a body of water, called saline water (see also soil salinity). Salinity is an important factor in determining many aspects of the chemistry of natural waters and of biological processes within it, and is a thermodynamic state variable that, along with temperature and pressure, governs physical characteristics like the density and heat capacity of the water.

Hardness:

Hardness is a measure of the resistance to localized plastic deformation induced by either mechanical indentation or abrasion. Some materials (e.g. metals) are harder than others (e.g. plastics, wood). Macroscopic hardness is generally characterized by strong intermolecular bonds, but the behavior of solid materials under force is complex; therefore, there are different measurements of hardness: scratch hardness, indentation hardness, and rebound hardness. Hardness is dependent on ductility, elastic stiffness, plasticity, strain, strength, toughness, viscoelasticity, and viscosity.

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EXECUTIVE SUMMARY

Quality of surface and ground water mainly depends on the anthropogenic activities, its source characteristics, geological landform, volume of flow and the ecosystem of each habitat. As a riverine country Bangladesh's surface water sources cover the downstream of three major international rivers, (namely, the Ganges, the Brahmmaputra and the Meghna) and their tribuitaries and distribuitaires, perinnial floods of riverine and deltaic flood plains and the wetlands (Haors, Baors and lakes, as a part of the *geological sinks*). They are also replenishing the sources of groundwater. The volumes of water they carry vary widely depending on the season, heavy summer rainstorms, upstream diversion of water flow and dry winter months. These sources carry a vast amount of biodiversity withim each ecosystem. The dry season flow along with anthropogenic misuse of water resulted in poor quality of water which mainly prevails in major urban areas and industrial clusters and rural growth centres.

In 2022, Water quality-monitoring programme of DoE covered sampling from 103 points of 26 rivers, 13 points of 3 Lakes (Gulshan, Dhanmondi and Hatir Jheel lakes) of Dhaka and 73 groundwater stations of 3 districts in Bangladesh. The monitoring involved field measurements (only pH at some stations) and collecting water samples for laboratory analyses. Six divisional offices measured a total of 12 parameters (physical and chemical) of collected samples. Depending on continuity of measurements and spatio-temporal context, ten parameters viz. pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Suspended Solids (SS), Total Dissolved Solids (TDS), Electrical Conductivity (EC), Chloride, Turbidity, Total Alkalinity and Salinity were taken for analysis.

In 2022, the monitoring program covered sampling of 103 points of 26 rivers, 13 points of 03 Lakes (Gulshan-06 Stations, Dhanmondi-04 Stations and Hatir Jheel lakes-03 Stations) of Dhaka and 73 stations (Barisal Dist.-58 Stations, Sylhet Dist.-05 Stations, Bogura Dist.-10 Stations) of 3 districts for analysis of drinking water quality in Bangladesh.

Based on the parameters, water quality of large rivers viz. the Padma, the Meghna, the Jumuna, the Surma, the Korotoa etc. was found within the limit of Environmental Quality Standards (EQS) in 2022. In the Meghna River DO and BOD level were found within the EQS which varied from 0.5 mg/l to 8.0 mg/l and 2.0 mg/l to 22 mg/l, respectively. In the Jamuna River, DO and BOD levels were found from 4.6 mg/l to 11.5 mg/l and 2.0 to 6.2 mg/l, respectively. On the other hand, rivers around greater Dhaka were highly polluted specially in the first five months of 2022 in terms of DO, BOD

and COD values. High levels of Turbidity (158 NTU), TDS (704 mg/l), BOD (42 mg/l) and COD (126 mg/l) were found in the Buriganga River from January to December in 2022. High BOD (88.5 mg/l), COD (222 mg/l) and Turbidity (86.3 NTU) was found in the Balu River. High BOD (34 mg/l) and Turbidity (356 NTU) was found in the Turag River.

Among the coastal rivers, high levels of Chloride, TDS and Turbidity were found in the Moyuri, the Rupsa, the Pashur and in the Kakshiali River. The level of Chloride (13705 mg/l), TDS (9060 mg/l) and Turbidity (130 NTU) were also very high in the Pashur River. Highest value of Chloride (4068 mg/l), Turbidity (120 NTU), Salinity (3.46 ppt) and EC (6580 µmohos/cm) was found in the Kakshiali River. High COD (88 mg/l), SS (1700 mg/l) and TDS (18550 mg/l) was found in the Karnapuli River. High DO (7.74 mg/l), COD (696 mg/l) and EC (1961 µmohos/cm) was found in the Kirtankhola River. High DO (7.06 mg/l) and BOD (2.8 mg/l) was found in the Surma River.

Ground water has been the main source of water for drinking and irrigation. It is also the source of arsenic poisoning that affects millions of people in Bangladesh. For monitoring ground water quality, samples were collected from 73 (Seventy-Three) different locations of 03 (Three) districts of the country. Depending on continuity of measurements and spatio-temporal context, 6 parameters viz. pH, EC, TDS, Iron, T. alkalinity and Total Hardness were taken for analysis. Based on these parameters, water quality of ground water was found within the limit of Environmental Quality Standards (EQS) in 2022.

Impact of seasonality on water quality was evident in data analysis. During dry seasons, water quality in rivers around Dhaka was more degraded. The quality improved greatly during the wet seasons indicating clear relationship between increased flow of river and river water quality.

CHAPTER 1: INTRODUCTION

1.1 Background

Water is essential not only for survival of human-beings, but also for animals, plants and all other living beings. Monitoring water quality is one of the vital responsibilities of the Department of Environment (DoE). According to the clause 18,A of the Constitution of Bangladesh "The state shall endeavor to protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetlands, forests and wild life for the present and future citizens". As a part of that responsibility the Governmnet has to conserve water quality for human consumption and other uses. The Government has set Environmental Quality Standard (EQS) for inland surface water under the Environmental Conservation Rules (ECR), 2023. The monitoring of water quality includes and identifies part of diagnosis of functionality of the aquatic ecosystem of rivers and other surface water sources. Also, it would help evaluating effectiveness of the pollution control measures.

There are about 405 rivers in Bangladesh including 57 transboundary rivers (BWDB, 2011). The flow in the rivers varies greatly depending on seasons, rainfall intensity and upstream diversion of transboundary rivers. Following fluctuation in flow river water quality varies significantly. Dumping of industrial untreated wastes, household and municipal wastes, medical wastes, naval waste etc. into water courses further degrade surface water quality. Because of severe pollution, Government has already declared five rivers (Buriganga, Shitalakhya, Turag, Balu and Jaflong Dawki) as Ecologically Critical Area (ECA) to protect from further pollution.

DoE has established a monitoring network. Following this network for surface water quality, DoE collect surface water samples for laboratory analyses. Samples are collected on monthly basis from selected sampling points of rivers under the monitoring network. In 2022, the monitoring program covered sampling of 103 points of 26 rivers, 13 points of 03 Lakes (Gulshan-06 Stations, Dhanmondi-04 Stations and Hatir Jheel lakes-03 Stations) of Dhaka and 73 stations (Barisal Dist.-58 Stations, Sylhet Dist.-05 Stations, Bogura Dist.-10 Stations) of 3 districts for analysis of drinking water quality in Bangladesh.

1.2 Major objectives of the report

Mojor objectives of this report are -

- Provide updated information on quality of surface and ground water to help information-based decision-making process for environmental and ecosystem conservation, sustainable development and management of water resources;
- Deliver information for research/study in the relevant field;
- Water quality data to Global Environment Monitoring System (GEMS);
- Sensitize and create awareness among the stakeholders and public in general;
- Share information and prepare of State of the Environment (SoE) Report and
- Give a guidance to policy makers.

1.3 Limitation of the report

This report has been prepared based on primary data and information collected by six divisional offices of DoE for the period of January to December 2022. The limitations of the report are:

- In some cases, data on all the parameters as per ECR 2023, for the entire period of the year could not be furnished with this report because of non-availability of data for certain parameters in some months of the year.
- This report does not include information on microbiological parameters and biological indicators. Data on weather conditions of the sampling locations at the time of sampling were unavailable.
- This report does not cover all the sources of surface water and all rivers.

CHAPTER 2: AN OVERVIEW OF RIVERS OF BANGLADESH

2.1 Surface Water Sources and Rivers of Bangladesh

Rivers, cannels, streams, lakes, Haors, Baors, Beels and ponds as surface water sources are the most important elements of physiographic features of Bangladesh and play a crutial role in the economy. The rivers of Bangladesh are considered as the lifeline of the people. These rivers generally flow towards south. The larger rivers serve as the main source of water for cultivation and as the principal arteries of commercial transportation. Rivers also provide fish, an important source of protein. Flooding of the rivers during the monsoon season and river bank erosion cause enormous hardship and hinders development, but fresh deposits of rich silt replenish the fertile but overworked soil. The rivers also drain excess monsoon rainfall into the Bay of Bengal. Thus, the great river system is at the same time the country's principal resource and source of its greatest hazard.

As also mentioned earlier, Bangladesh is situated at the confluence of three mighty rivers the Ganges, the Brahmaputra and the Meghna. Apart from these three rivers, there are many rivers which create a net-like network covering the whole country. The country has 405 rivers (BWDB, 2011) of which 57 are trans-boundary rivers. **A map of river network is also given in the Figure-A.** Three large rivers systems (Brahmaputra-Jamuna, Ganges-Padma and Surma-Meghna) of the world covering a combined total catchments area of about 1.7 million sq. km. extending over Bhutan, China, India and Nepal, flow through this country. Out of these huge catchments only 7% lies within Bangladesh. The fourth river system lies in the Chittagong region of the country.

The river systems of the country can be divided into four major systems, which are:

1. Brahmaputra-Jamuna River System
2. Ganges-Padma River System
3. Surma-Meghna River System
4. Chittagong Region River System

Brahmaputra-Jamuna River System: Brahmaputra-Jamuna and old Brahmaputra, with their main tributary Teesta, and a good number of small tributaries and distributaries constitute the largest floodplain of Bangladesh.

The Brahmaputra enters Bangladesh from east of Bhabanipur (India) and northeast of Kurigram district. It first flows south and then turns southeast and travels through the Madhupur Tract to meet the Meghna near Bhairab Bazar. Among the major rivers, Brahmaputra-Jamuna is the most energetic and has the highest stream power.

Ganges-Padma River System: Ganges River is one of the largest river systems of the world and an important river flowing through India and Bangladesh. The Ganges rises near the Tibet-Indian border. The Bhagirathi is accepted traditionally as the original Ganges. The source is Gangotri glacier located at an altitude of about 3,900m in the Himalayas. The Bhagirathi joins its western tributary the Jahnavi, a little away to the north of the main Himalayan range and about 11 km below the Gangotri temple. The combined river then cuts through the main Himalayan range through a magnificent gorge in

which the river bed is 3,960 m below the peaks on either side. The river flows in a southeasterly direction across India and crosses the western border of Bangladesh in Nawabganj district.

Flowing almost in the same direction it meets the Jamuna (the Brahmaputra) at Goalondaghat and then further down meets the Meghna at Chandpur. From the confluence with the Jamuna to the confluence with the Meghna the river is named Padma. The Ganges has a total length of about 2,600 km up to its confluence with the Jamuna and a catchment area of about 10,87,400 sq. km of which about 46,300 sq. km lies within Bangladesh.

Surma-Meghna River System: Surma-Meghna River System is the longest river (669 km) system in the country. It also drains one of the world's heaviest rainfall areas (e.g. about 1,000 cm at Cherapunji, Meghalaya, India). East of Brahmaputra-Jamuna River system is Surma-Meghna River System. The Surma originates in the hills of Shillong and Meghalaya of India. The main source is Barak River, which has a considerable catchment in the ridge and valley terrain of Naga-Manipur hills bordering Myanmar. Barak-Meghna has a length of 950 km of which 340 km lies within Bangladesh. On reaching the border with Bangladesh at Amalshid in Sylhet district, Barak bifurcates to form the steep and highly flashy rivers Surma and Kushiyara.

Between the Surma and the Kushiyara, there lays a complex basin area comprised of depressions (Haors). Most of the Surma system falls in the Haor basin, where the line of drainage is not clear or well defined.

Meghna has two distinct parts. Upper Meghna from Bhairab Bazar to Shaitnol is comparatively a small river. Lower Meghna below Shaitnol is one of the largest rivers in the world, because it is the mouth of Ganges-Padma and Brahmaputra-Jamuna rivers. It is a tidal reach carrying almost the entire fluvial discharge of Ganges, Brahmaputra and Upper Meghna River.

Chittagong Region River System: Chittagong Region River System the Chittagong region consists of the 5 hilly districts of Chittagong division namely Chittagong, Cox's Bazar, Bandarban, Rangamati and Khagrachhari. It is bounded by the Bay of Bengal on the south and west, the Naf river with Myanmar on the southeast, and India on the east. The region is characterized by three distinct ecological zones: inter-tidal zone, coastal plains and extensive hill areas. The remainder of the region consists of plains. The total area is approximately 19,956 sq. km with a hilly area of 1,300 sq. km.
The major rivers of this region are: Karnafuli and its tributaries (e.g. Rainkhiang, Kasalong, Halda, Ichamati etc.); Bakkhali, Sangu, Matamuhuri, Naf, and Feni. The Kutubdia and Maheshkhali channels are the coastal channels of the region. The Karnafuli is the principal river of the region. It originates in the Lushai Hills of Mizoram (India), flows through Rangamati and the port city of Chittagong and discharges into the Bay of Bengal near Patenga. The river is flashy and its length is about 131 km. Rainkhiang, Sublong, Thega, Kasalong, Ichamati and Halda are its main tributaries. Its major distributaries are Saylok and Boalkhali.

2.2 Ground water

Groundwater is the main source of water for drinking and irrigation in Bangladesh. The sediments underlying most of Bangladesh provide good aquifers which are widely exploited to supply domestic and irrigation water, except in the hilly areas. In most of the areas except major city areas like Dhaka and Barind Tract, aquifers are mostly recharged every year by rainfall, seasonal flooding and percolation of water through river beds. Due to abstraction of groundwater, serious depletion of groundwater table around major cities, particularly in Dhaka has reached at an alarming situation. Similar situation is reported for the Barind areas (due to excessive withdrawal of groundwater for irrigation purposes. Currently, 35,322 deep tube wells, 1,523,322 shallow tube wells and 170,570 low lift pumps are working in Bangladesh to provide water for irrigation. About 79% of the total cultivated area in Bangladesh is irrigated by groundwater, whereas the remaining is irrigated by surface water. The Arsenic contamination in groundwater is increasing at an alarming rate. Today, in Bangladesh, an estimated 35–77 million people have been chronically exposed to Arsenic via drinking water. An estimated 25% of the wells exceed Arsenic levels according to the Bangladesh standard. (CSISA-MI, 2015)

In the last two decades, increased groundwater accessibility resulting from the expansion of deep and shallow tube wells helped Bangladesh attain near self-sufficiency in rice. This has resulted in serious problems, most notably excessive drawdown in intensively irrigated areas, and the deterioration of groundwater quality. As such, Government has decided not to expand further deep tube wells in irrigated areas. Increasing energy prices are also threatening the sustainability of Bangladesh's groundwater irrigated economy.

Artesian flow (where groundwater comes to surface naturally) occurs in a few places on piedmont plains near the foot of the Northern and Eastern Hills and in some areas of the Madhupur Tract (Brammer, 2012).

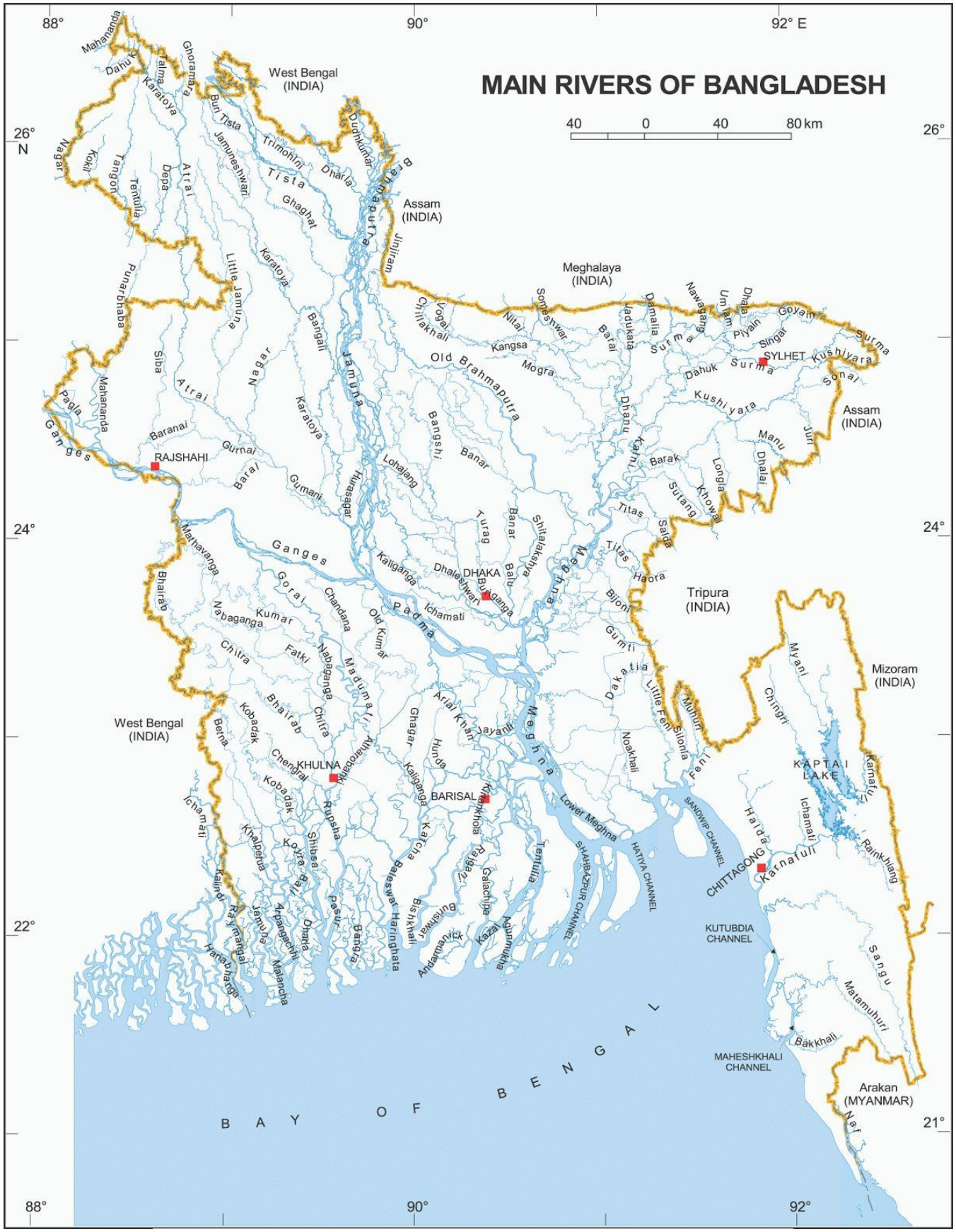

Figure-A: River system of Bangladesh (Source: BWDB, 2011)

CHAPTER 3: METHODS FOR MEASUREMENT AND ANALYSIS OF WATER QUALITY

3.1 Water Quality Parameters

Water quality monitoring can help researchers to predict and learn from natural processes at the environment and determine human impacts on an ecosystem. The measurement efforts of the quality can assist in restoration projects or ensure environmental standards are being met.

Water has physical, chemical and biological properties. Physical properties of water quality include temperature and turbidity. Chemical characteristics involve parameters such as pH and dissolved oxygen. Biological indicators of water quality include algae and phytoplankton. These parameters are relevant not only to surface water studies of the ocean, lakes and rivers, also to studies of groundwater and monitoring the industrial processes as well.

A comprehensive range of physico-chemical parameters such as Temperature, Electrical Conductivity (EC), Dissolved Oxygen (DO), pH, Total Alkalinity, Turbidity, Total Dissolved Solids (TDS), Suspended Solids (SS), Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD), Chloride and Salinity were measured to assess the inland surface water quality in Bangladesh.

3.2 Sampling Locations

In 2022, the monitoring program covered sampling of 103 points of 26 rivers, 13 points of 03 Lakes (Gulshan-06 Stations, Dhanmondi-04 Stations and Hatir Jheel lakes-03 Stations) of Dhaka and 73 stations (Barisal Dist.-58 Stations, Sylhet Dist.-05 Stations, Bogura Dist.-10 Stations) of 3 districts for analysis of drinking water quality in Bangladesh (Figure B).

3.3 Methods of Analysis

Usually testing procedures and parameters grouped into physical, chemical, bacteriological and microscopic categories.

-Physical tests indicate properties detectable by the senses.
-Chemical tests determine the amounts of mineral and organic substances that affect the water quality.
-Bacteriological tests show the presence of bacteria, characteristic of faecal pollution. This report only covered the physio-chemical analysis. The following mathods are followed for analaysis:

Parameters	Mathods
Dissolved Oxygen (DO)	Modified Winkler's Method/Titrimetric Method
Biochemical Oxygen Demand (BOD_5)	Dilution Method
Chemical Oxygen Demand (COD)	Closed Reflux Colorimetric Method
Total Dissolved Solid (TDS)	Gravimetric Method
Suspended Solid (SS)	Gravimetric Method
Chloride	Argentometric Method
Temperature	Thermometer
Turbidity	Nephelometric Method
pH	Standard method/Using Electrode
EC	Standard method
Total Alkalinity	Standard method/ Titrimetric Method
Salinity	Using Electrode

3.4 Surface Water Monitoring Stations

Table- A: Water Quality Monitoring Stations of DoE

Sl	River Name	Monitoring Stations	No. of Stations
1	Buriganga	Mirpur Bridge, Bosila Bridge, Hajaribag, Satmosjid Road, Chadnighat, Bangladesg China Friendship Bridge, Fatullah	07
2	Shitalakhya	Port Road, Majhira Demra Ghat, Murapara (Rupganj), Gorashal Fertilizer	04
3	Turag	Turag Bridge, Ashulia, Kaliakoir, Vawal, Nama Bazar	05
4	Balu	Trimohoni Bridge, Jolshiri Abason	02
5	Dhaleshwari	Mukterpur, Pathorghata, Ruhitpur, Hazratpur, Utorro Mitra	05
6	Brahmaputra	Mymensingh	01
7	Kaliganga	Veuta Ghat, Manikgonj	01
8	Jamuna	Jamuna Eco Park (Up), Jamuna Eco Park (Dn), Shariakandi Groin badth (Up), Shariakandi Groin badth (Dn), Mohonganj (Up), Mohonganj (Dn), Horipur Kheya Ghat (Up), Horipur Kheya Ghat (Dn), Kakua, Tarakandi (Dn), Tarakandi (Up)	11
9	Meghna	Meghna Ghat, Bisnondi, Norsingdi Launch Terminal, Anondo Bazar, Bhairob Bazar	05
10	Padma	Mawa Ghat, Shimulia Ghat, Barha Ghat	03
11	Korotoa	Dutta Bari Bridge-Bogra (Up stream), Dutta Bari Bridge-Bogra (Down stream), Aziz Ahmed Taki Road (Up stream), Aziz Ahmed Taki Road (Down stream)	04
12	Tista	Near Tista Bridge (U.S), Near Tista Bridge (D.S), Nohali Sapmari (U.S), Nohali Sapmari (D.S), Tista Barrage (U.S), Tista Barrage (D.S)	06
13	Karnaphuli	CUFL, TSP, Shikalbaha, Kalurghat Bridge, Mariam Nagar, Karnaphuli Paper	06
14	Halda	Maduna Ghat, Garduara Sluice Gate, Halda Bridge	03
15	Moyuri	Shoshan Ghat (M), Buro Moulavir Darga (M), Dosh Gate Jalma (M)	03
16	Bhairab	Basundia Bazar-Aladipur, Noapara Ferry Ghat-Abhaynagar, Noapara-Jafarpur, Fultala Ghat-Dhulgram	04
17	Rupsa	Rupsa Ghat (M), Kalibari Ghat (M), Charer Hat-Sulpur Aijgati (M), Gilatala-Nadam Pratap	04
18	Pashur	Batia Ghat, By Pass (M)	01
19	Kakshiali	Kaliganj Bazar, Boshontopur, Gobindakathi	03
20	Ganges	Sardah (Up Stream), Sardah (Down Stream), Nurullapur (Up Stream), Nurullapur (Down Stream), Kanchan Park (Up Stream), Kanchan Park (Down Stream), Gorai off Take	07
21	Kirtankhola	Launch Ghat (S), Launch Ghat (M), Kaower Char (S), Kaower Char (M), Dopdopia Kheyaghat (S), Dopdopia Kheyaghat (M)	06
22	Tetulia	Vadura Launch Ghat (S), Vadura Launch Ghat (M)	02
23	Sugandha	Gabkhan Launch Terminal (S), Gabkhan Launch Terminal (M)	02
24	Lohalia	Patuakhali Launch Ghat (S), Patuakhali Launch Ghat (M)	02
25	Surma	Mendibag Point, Kin Bridge Point, Sheaik Ghat, Chhatak	04
26	Kushiara	Fenchuganj Bridge Point, Fenchuganj Fertilizer Industry Point	02

Map of Existing Monitoring Station of DoE

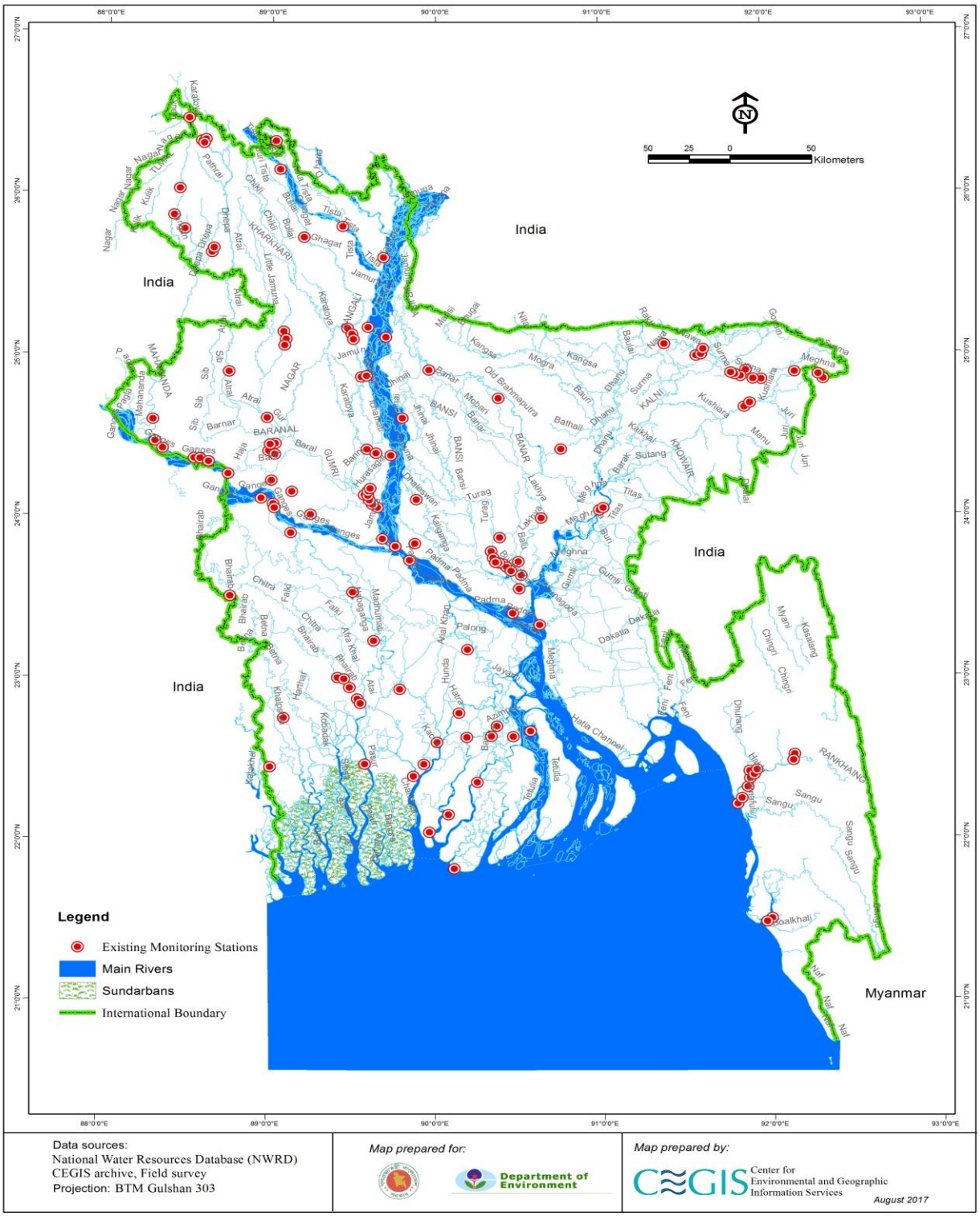

Figure-B: Location of Surface Water Monitoring Stations

CHAPTER 4: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF RIVER WATER QUALITY IN 2022

4.1 Buriganga River

Buroganga river starts fromTurag River at Amin Bazar of Savarand falls into Dhaleswari River at Keraniganj of Dhaka (Source: Bangladesh Water Development Board 2011, Department of Bangladesh Haor & Wetlands Development 2016).

To monitor water quality of Buriganga river, samples were collected from 07 (Seven) different locations viz. Mirpur Bridge (M.B), Bosila Bridge (B.B), Hajaribag (Hg), Satmosjid Road (S.R), Chadnighat (C.G), Bangladesg China Friendship Bridge (B.C.F.B), Fatullah (Fh) along the river. Detail data is attached Annex-1 (Table: 1-10).

In 2022, standard pH range for inland surface water for fisheries 6.0 to 9.0. The maximum pH was 7.97 in October and the minimum 6.41 in July (Fig.1a). In 2021, pH range varied from 6.61 to 7.99. In 2022, the maximum DO 6.26 mg/l in July at Bangladesh China Friendship Bridge (B.C.F.B) point and the minimum 0.1 mg/l in April at Bosila Bridge and Stamosque Road (Fig.1b). In 2021, DO range varied from 0.0 mg/l to 5.94 mg/l. In 2022, BOD of Buriganga river water was higher than EQS (≤6 mg/l). In 2022, The maximum BOD 42 mg/l in April at Bangladesh China Friendship Bridge (B.C.F.B) and the minimum 6 mg/l in May at Bosola Bridge, Chadnighat, Bangladesh China Friendship Bridge (B.C.F.B) and Fatullah point (Fig.1c). In 2021, BOD range varied from 5.8 mg/l to 40 mg/l. In 2022, COD level was mostly below the EQS (50 mg/l) set for Fisheries. The maximum and the minimum COD concentration of Buriganga river was 127 mg/ in April at satmosque Road and 10 mg/l in August at Fatullah point (Fig.1d). In 2021, COD range varied from 12 mg/l to 120 mg/l. In 2022, the maximum and the minimum TDS was 704 mg/l in April at Hazaribag and 75 mg/l in August at Mirpur Bridge (Fig.1e). The EQS of 1000 mg/l for Fisheries. In 2021, TDS range varied from 68.7 mg/l to 594 mg/l.

In 2022, Chloride concentration of the Buriganga river was below the EQS for industrial wastewater after treatment. The maximum concentration was 100 mg/l in March at Satmosque Road and the minimum 4.5 mg/l in October at Hazaribag point (Fig.1f). In 2021, Chloride range varied from 13.5 mg/l to 76 mg/l. In 2022, SS of Buriganga river water at different locations was below the EQS (100 mg/l) for wastewater after treatment from industrial units. In 2022, The maximum SS was 204 mg/l in March at Satmosque point and the minimum 6.0 mg/l in June at Fatullah (Fig.1g). In 2021, SS range varied from 2.0 mg/l to 254 mg/l. In 2022, the maximum and the minimum Total Alkalinity of Buriganga river water was 370 mg/l in March at Fatullah and 28 mg/l in October at Basila Bridge and Fatullah Point (Fig.1h). In 2019, Total Alkalinity range varied from 19 mg/l to 614 mg/l. In 2022, the maximum EC of Buriganga river water is 1401 µmhos/cm in April at Hazaribag Point and the minimum 148 µmhos/cm in November at Mirpur Bridge (Fig.1i). In 2021, EC range varied from 122.4 µmhos/cm to 1149 µmhos/cm. In 2022, the maximum and the minimum Turbidity of Buriganga river water was 158 NTU in December at Satmosque Road point and 10.3 NTU in May at Bangladesh China Friendship Bridge (B.C.F.B) point while EQS is 10 NTU (Fig.1j). In 2021, Turbidity range varied from 19.9 NTU to 512 NTU.

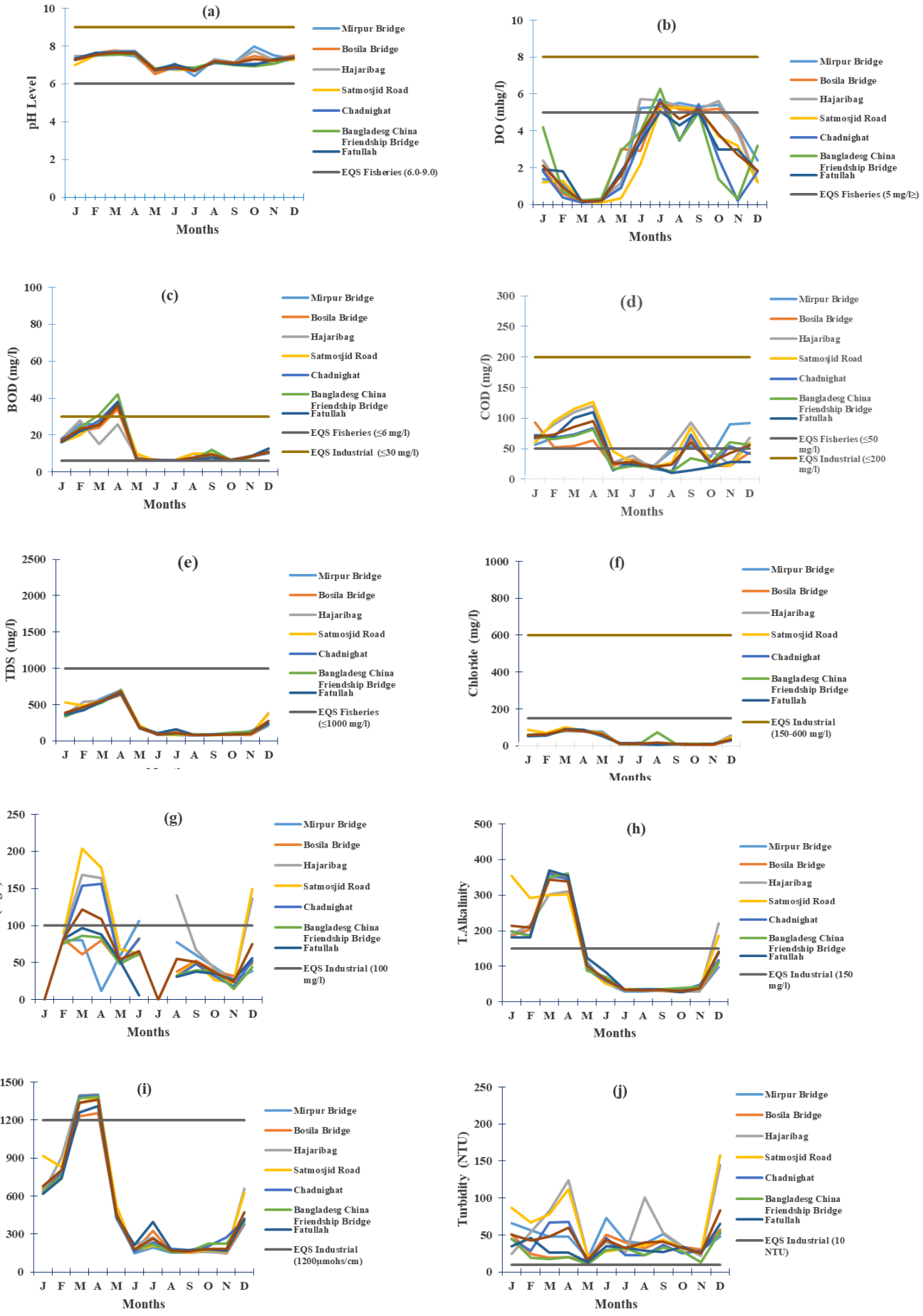

Fig. 1: Status of pH, DO, BOD, COD, TDS, Chloride, SS, T. Alkalinity, EC and Turbidity of Buriganga River in 2022

4.2 Shitalakhya River

The Shitalakhya river is a distributary of the Brahmaputra river. It remains navigable round the year. For monitoring water quality, samples were colleted from 04 (Four) different locations viz. Port Road, Majhira Demra Ghat, Murapara (Rupganj), Gorashal Fertilizer. Detail data is attached Annex-1 (Table:11-19).

In 2022, pH of Shitalakhya river water was within the EQS (6.5-8.5) range for inland surface water. The maximum pH was 7.95 in March at Ghorasal Fertilizer point and the minimum pH was 6.34 in July at Mazhira Demra Ghat point (Fig.2a). In 2021, pH range varied from 6.54 to 7.84. In 2022, the maximum DO 7.9 mg/l in November at Murapara, Rupgonj and the minimum 0.0 mg/l in April at Mazhira Demra Ghat point (Fig.2b). In 2021, DO range varied from 0.0 mg/l to 6.5 mg/l. In 2022, Highest value of BOD 24 mg/l in March at Port Road point and lowest 3.0 mg/l in November at Ghorasal point (Fig.2c). In 2021, BOD range varied from 4 mg/l to 49.2 mg/l. In 2022, COD level was within the EQS (50 mg/l) for fisheries of Shitalakhya river. In 2022, The maximum COD 82 mg/l in March at Dhamra Ghat point and the minimum COD 8.0 mg/l in July at Ghorasal point (Fig.2d). In 2021, COD range varied from 54 mg/l to 166 mg/l. In 2022, TDS of Shitalakhya river water EQS (1000 mg/l) for fisheries. In 2022, maximum TDS 528 mg/l in April at Demra Ghat point and the minimum 52 mg/l in June at the same ponit (Fig.2e). In 2021, TDS range varied from 54.9 mg/l to 445 mg/l. In 2022, Chloride concentration of the Shitalakhya river water was below the EQS (150-600 mg/l) for wastewater after treatment from industrial units. In 2022, The maximum Chloride 140 mg/l in April at Demra Ghat and the minimum is 8.0 mg/l in October at Ghorasal point (Fig.2f). In 2021, Chloride range varied from 6 mg/l to 70 mg/l. In 2022, SS of Shitalakhya river water at different sampling locations is within the EQS (100 mg/l). In 2022, Maximum SS concentration of Shitalakhya river was 181 mg/l in June at Murapara, Rupgonj and the minimum is 7.0 mg/l in August at the same point (Fig.2g). In 2021, SS range varied from 5 mg/l to 143 mg/l. In 2022, EC of Shitalakhya river at different locations was mostly within the EQS (1200 µmhoms/cm) for treated wastewater from industrial units (Fig.2h). The maximum EC 1138 µmhoms/cm in July at Murapara, Rupgonj point and the minimum EC 65.2 µmho/cm in August at G.F.F point. In 2021, EC range varied from 101.5 µmhoms/cm to 919 µmhoms/cm. In 2022, maximum Total Alkalinity 320 mg/l in April at Mazhira, Demra Ghat point and minimum was 22 mg/l in August at Ghorasal point (Fig.2i). In 2021, Total Alkalinity range varied from 11 mg/l to 262 mg/l.

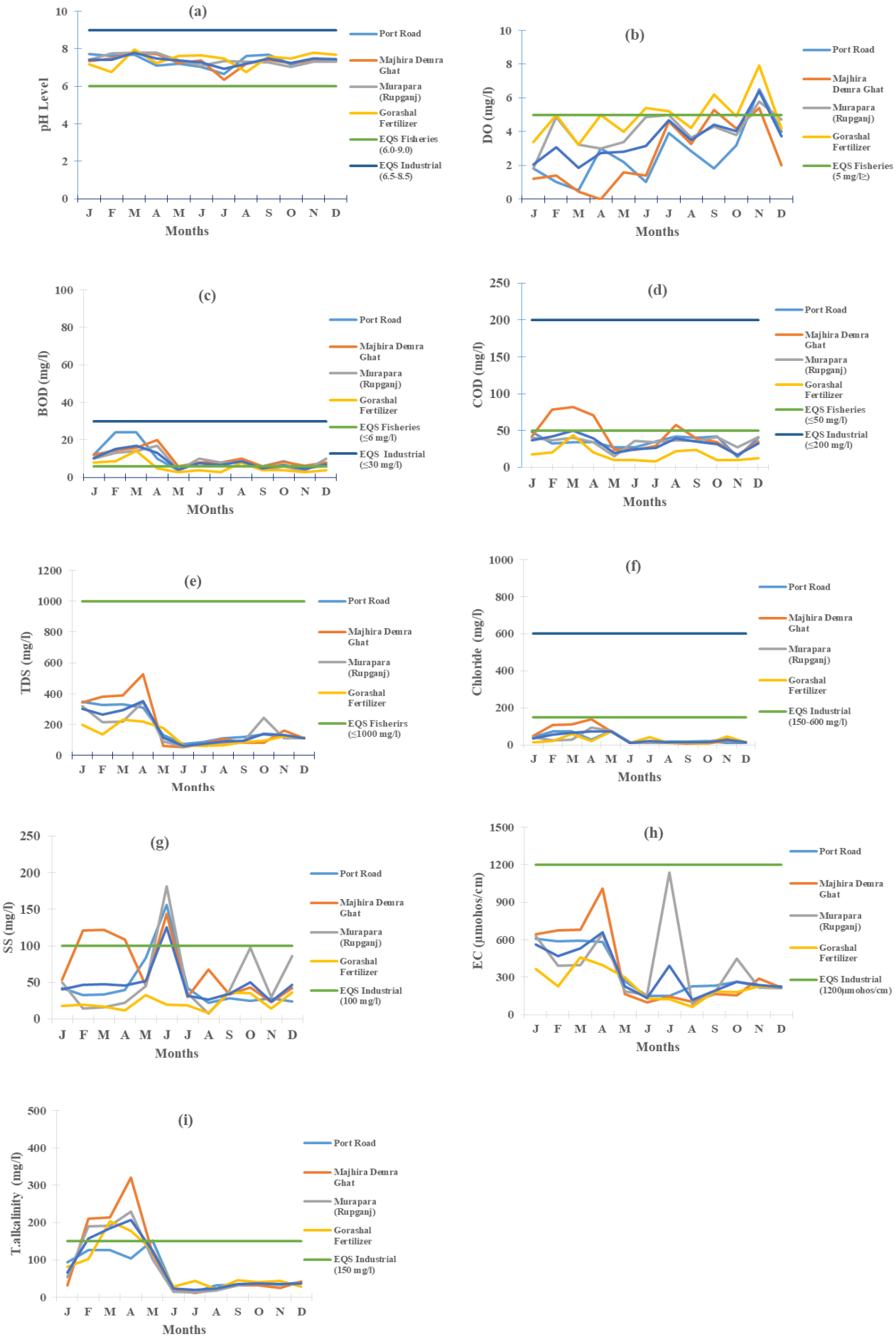

Fig.2: Status of pH, DO, BOD, COD, TDS , Chloride, SS, EC and T.Alakinity of Shitalakhya River in 2022

4.3 Turag River

The Turag River is the upper tributary of the Buriganga. It sourced (offtake) from Bangshi River of Kaliakair Upazila of Gazipur District and ended (outfall) into Buriganga River of Savar Upazila of Dhaka District (Source: Bangladesh Water Development Board 2011, Department of Bangladesh Haor & Wetlands Development 2016). To monitor water quality in 2022, water samples were collected from 05 (Five) locations such as Turag Bridge, Ashulia, Kaliakoir, Vawal, Nama Bazar. Detail data is attached Annex-1 (Table: 20-28).

In 2022, the pH of Turag River was within EQS (6.5 -8.5). The maximum pH 8.47 in August at Kaliakoir point and the minimum pH 6.69 in November at Bhawal (Fig.3a). In 2021, pH range varied from 6.42 to 7.98. In 2022, the maximum DO 8.7 mg/l in December at Kaliakoir point and the minimum DO 0.21 mg/l in March at Ashulia (Fig.3b). In 2021, DO range varied from 0.0 mg/l to 7.6 mg/l. In 2022, the maximum BOD was 34 mg/l in February at Nama Bazar point and the minimum is 2.0 mg/l in October at Bhawal point (Fig.3c). In 2021, BOD varied from 6.2 mg/l to 36 mg/l. In 2022, the maximum and the minimum COD content of Turag River water was 97 mg/l in September at kaliakoir point and 10 mg/l in November at Ashulia, Bhawal and Namabazar point (Fig.3d), while EQS for fisheries 50 mg/l. In 2021, COD range varied from 10 mg/l to 129 mg/l. TDS was below the EQS (1000 mg/l) for fisheries (Fig.3e) at all the sampling points. In 2022, the maximum TDS was 837 mg/l in March at Ashulia point and minimum was 51 mg/l in May at Kaliakoir point. In 2021, TDS range varied from 53.6 mg/l to 813 mg/l. In 2022, the maximum Turbidity was 356 NTU in may at Bhawal point and minimum was 8.0 in February at Ashulia (Fig.3f). In 2021, Turbidity range varied from 10 to 517 NTU. In 2022, the maximum Chloride was 106 mg/l in March at Turagh and the minimum Chloride was 3.0 mg/l in August at Kaliakoir (Fig.3g). In 2021, Chloride range varied from 6 mg/l to 112 mg/l. In 2022, the maximum SS 372 mg/l in May at Namabazar point and the minimum 5.0 mg/l in December at Turagh Bridge (Fig.3h). In 2021, SS range varied from 1.0 mg/l to 396 mg/l. In 2022, the maximum EC 1847 µmhos/cm in March at Ashulia point and the minimum 100 µmhos/cm in May at Kaliakoir point (Fig.3i). In 2021, EC range varied from 93.4 µmhos/cm to 1372 µmhos/cm. In 2022, The maximum Total Alkalinity 400 mg/l in March at Turagh Bridge and the minimum 20 mg/l in August at Kaliakoir point (Fig.3j). In 2021, Total Alkalinity range varied from 46 mg/l to 358 mg/l.

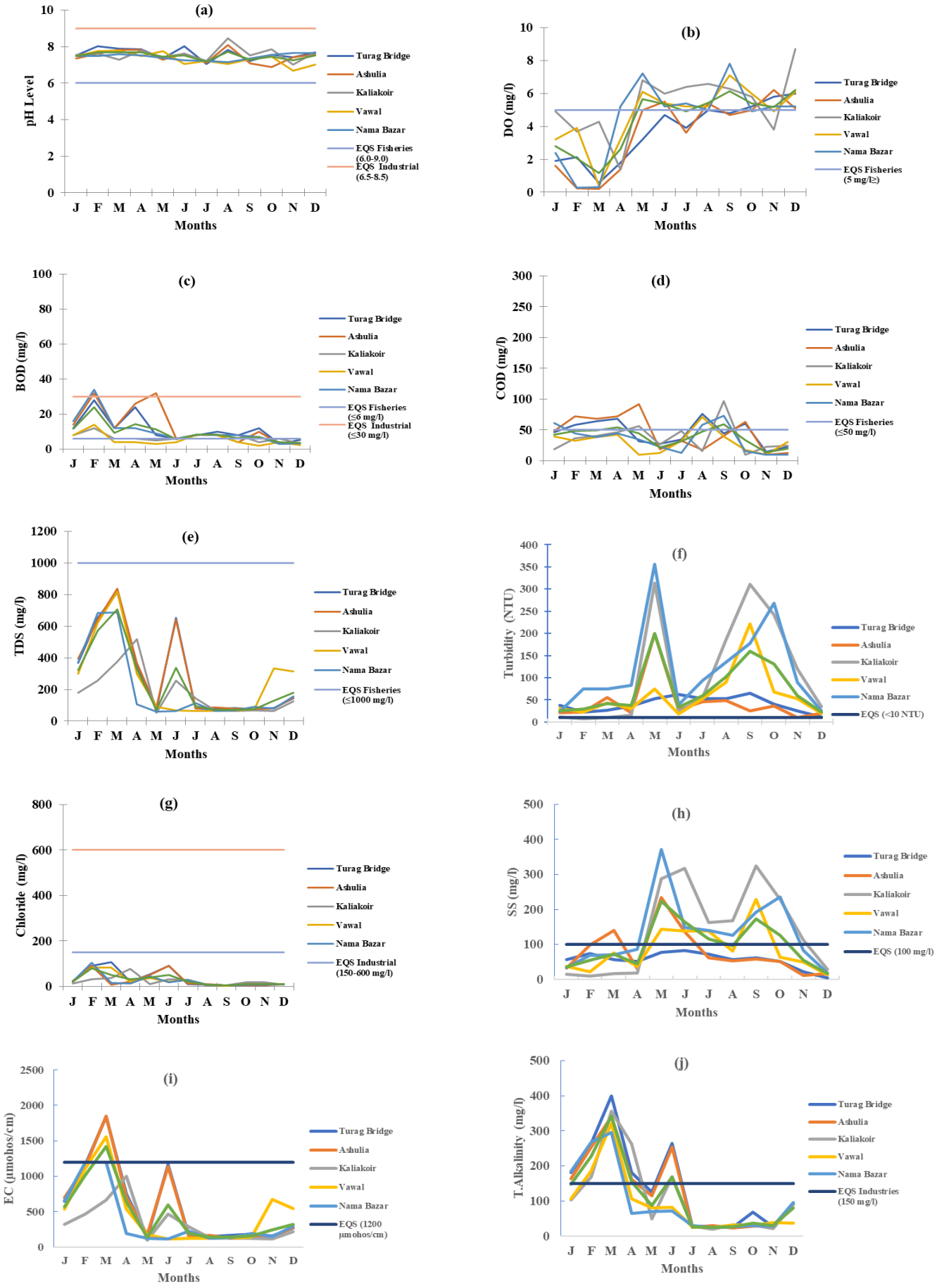

Fig.3. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, EC and T. Alkalinity of Turag River in 2022

4.4 Balu River

The Balu river runs mainly through the extensive swamps of Beel Belai and those east of Dhaka, joining the shitalakshya near demra. It has a narrow connection through the Suti Nadi near kapasia with the Shitalakshya, and also by way of the Tongi Khal with the turag; there is also a link with the Shitalakshya near kaliganj. Although it carries floodwater from the Shitalakshya and the Turag during the flood season, the Balu is of importance mainly for local drainage and access by small boats. [Sifatul Quader Chowdhury]. To monitor water quality in 2022, water samples were collected from 02 (Two) locations such as Trimohoni Bridge, Jolshiri Abason. Detail data is attached Annex-1 (Table: 29-38).

In 2022, the pH of Balu River was within EQS (6.5 -8.5). The maximum pH 7.623 in July at Jalshiri Abason and the minimum pH 6.5 in September at the same point (Fig.4a). In 2021, pH range varied from 6.55 to 7.77. In 2022, the maximum DO 8.0 mg/l in November at Jalshiri Abason point and the minimum DO 0.0 mg/l in May at Thimohoni Bridge (Fig.4b). In 2021, DO range varied from 0.0 mg/l to 5.9 mg/l. In 2022, the maximum BOD was 88.5 mg/l in December at Trimohoni Bridge point and the minimum was 3.0 mg/l in November at Jalshiri Abason point (Fig.4c). In 2021, BOD range varied from 4 mg/l to 54 mg/l. In 2022, COD of Balu River was over the EQS (50 mg/l). In 2022, The maximum COD content of Balu River water was 222 mg/l in December at Trimohoni Bridge and the minimum COD content 10 mg/l in October at Jalshiri Abason point (Fig.4d). In 2021, COD range varied from 10 mg/l to 153 mg/l. TDS was below the EQS (1000 mg/l) for fisheries (Fig.4e) at all the sampling points. In 2022, The maximum TDS was 470 mg/l in February at Trimohoni Bridge point while that of minimum was 90 in November at Jalshiri Abason pint. In 2021, TDS range varied from 78 mg/l to 618 mg/l. In 2022, the maximum Turbidity of Balu River was 86.3 NTU) in March at Jalshiri Abason point and the minimum 4.9 NTU in July at Jalshiri Abason point (Fig.4f). In 2021, Turbidity range varied from 7.82 NTU to 336 NTU. In 2022, the maximum Chloride was 102 mg/l found in March at Trimohoni point and the minimum Chloride was 8.0 mg/l in April at Jalshiri Abason point (Fig.4g). In 2021, Chloride range varied from 13.5 mg/l to 90 mg/l. In 2022, The maximum SS 220 mg/l in March at Jalshiri Abason and the minimum 7.0 mg/l in November at Jalshiri Abason point (Fig.4h). In 2021, SS range varied from 2 mg/l to 103 mg/l. In 2022, the maximum Total Alkalinity 370 mg/l in February at trimohoni bridge point and the minimum 32 mg/l in June at Jalshiri Abason (Fig.4i). In 2021, Total Alkalinity range varied from 73 mg/l to 287 mg/l. In 2022, The maximum EC 842 µmhos/cm in December at Trimohoni Bridge and the minimum 154 µmhos/cm in June at Jalshiri Abason point (Fig.4j). In 2021, EC range varied from 147 µmohos/cm to 1115 µmohos/cm.

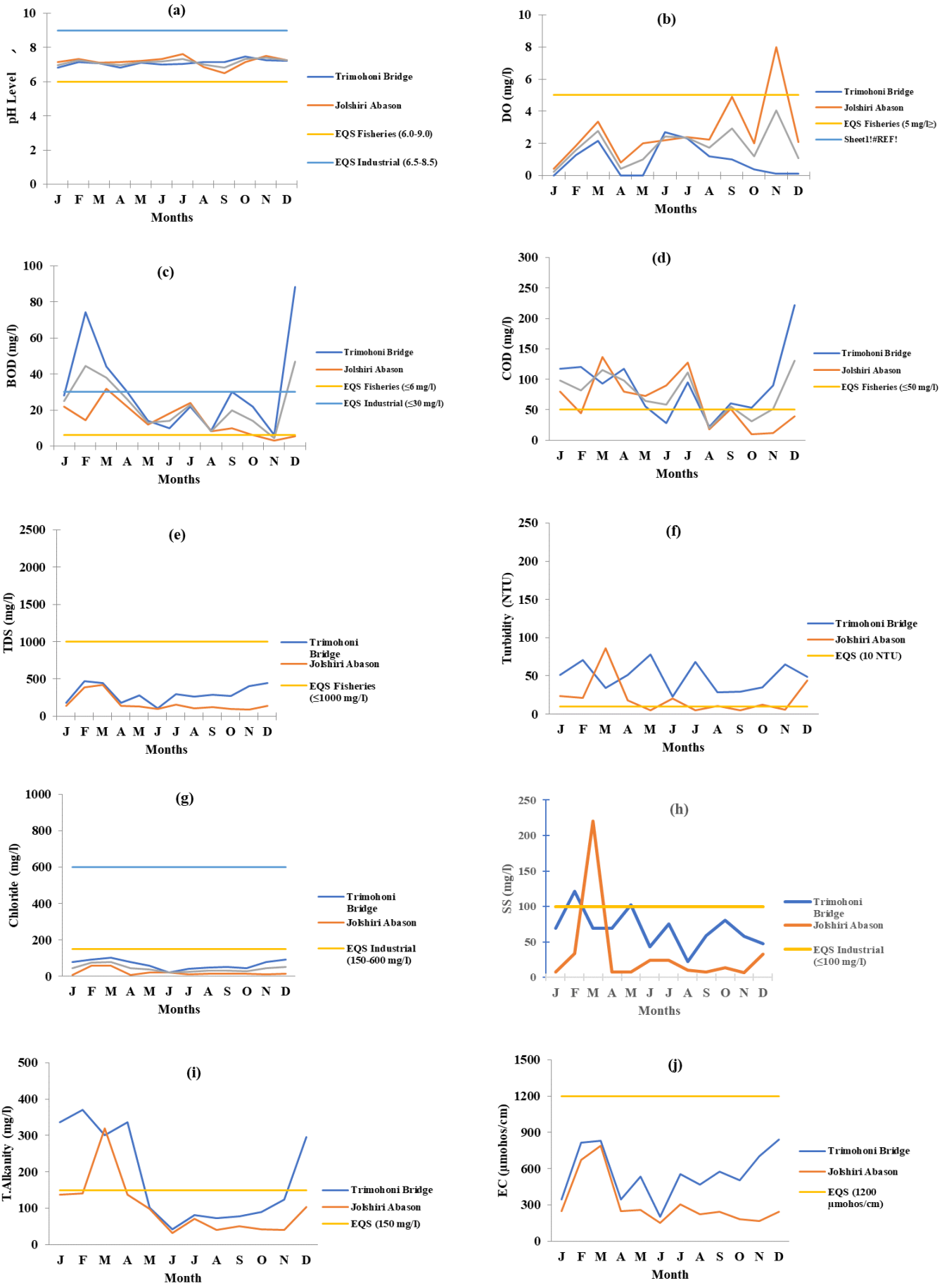

Fig 4. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. alkalinity and EC of Balu River in 2022

4.5 Dhaleshwari River

The Dhaleshwari river is a 160 km long distributary of the Jamuna river flowing through central part of Bangladesh. Dhaleswari River is an important branch river Brahmaputra-Jamuna River. It starts off Brahmaputra-Jamuna River at Kalihati Upazila of Tangail District and finally meets with Meghna (Upper) River at Gazaria Upazila of Munshiganj District. (Source: Bangladesh Water Development Board 2011, Department of Bangladesh Haor & Wetlands Development 2016). In 2022, water samples were collected from 05 (Five) location namely Mukterpur, Pathorghata, Ruhitpur, Hazratpur, Utorro Mitra. Detail data is attached Annex-1 (Table: 39-44).

In 2022, Dhaleshwari river water maximum pH 8.73 in April at Ruhitpur point and minimum 6.91 in October at Utorro Mitra point (Fig.5a). In 2021, pH range varied from 6.12 mg/l to 8.07 mg/l. In 2022, the maximum DO concentration 15 mg/l in April at Pathoghata point and the minimum 0.0 mg/l in January at Mukterpur point (Fig.5b). In 2021, DO range varied from 0.5 mg/l to 16.1 mg/l. In 2022, the maximum BOD was 28 mg/l in August at Pathorghata point and the minimum BOD was 1.2 mg/l in Decmber at Ruhitpur and Hazarpur point (Fig.5c). In 2021, BOD range varied from 4 mg/l to 34 mg/l. Level of COD of Dhaleshwari river water was within the EQS. In 2022, the maximum COD of Dhaleshwari river water 90 mg/l in August at Pathorghata point and the minimum was 6.0 mg/l in October and December at Hazratpur and Utorro Mitra point (Fig.5d) against the EQS (50 mg/l) for fisheries. In 2021, COD range varied from 10 mg/l to 90 mg/l. In 2022, TDS while standard level was 1000 mg/l for fisheries. In 2022, the maximum TDS 411 mg/l in March at Pathoeghata point and the minimum TDS was 61 mg/l in June at Utorro Mitra point (Fig.5e). In 2021, TDS range varied from 65.1 mg/l to 401 mg/l. In 2022, Electrical Conductivity (EC) of Dhaleshwari river water at different locations was mostly within the EQS (1200 µmhos/cm). In 2022, the maximum and the minimum EC of Dhaleshwari river water was 808 µmhos/cm in March at Pathorghata and 103 µmhos/cm in June at Ruhitpur point (Fig.5f). In 2021, EC range varied from 124.1 µmhos/cm to 675 µmhos/cm.

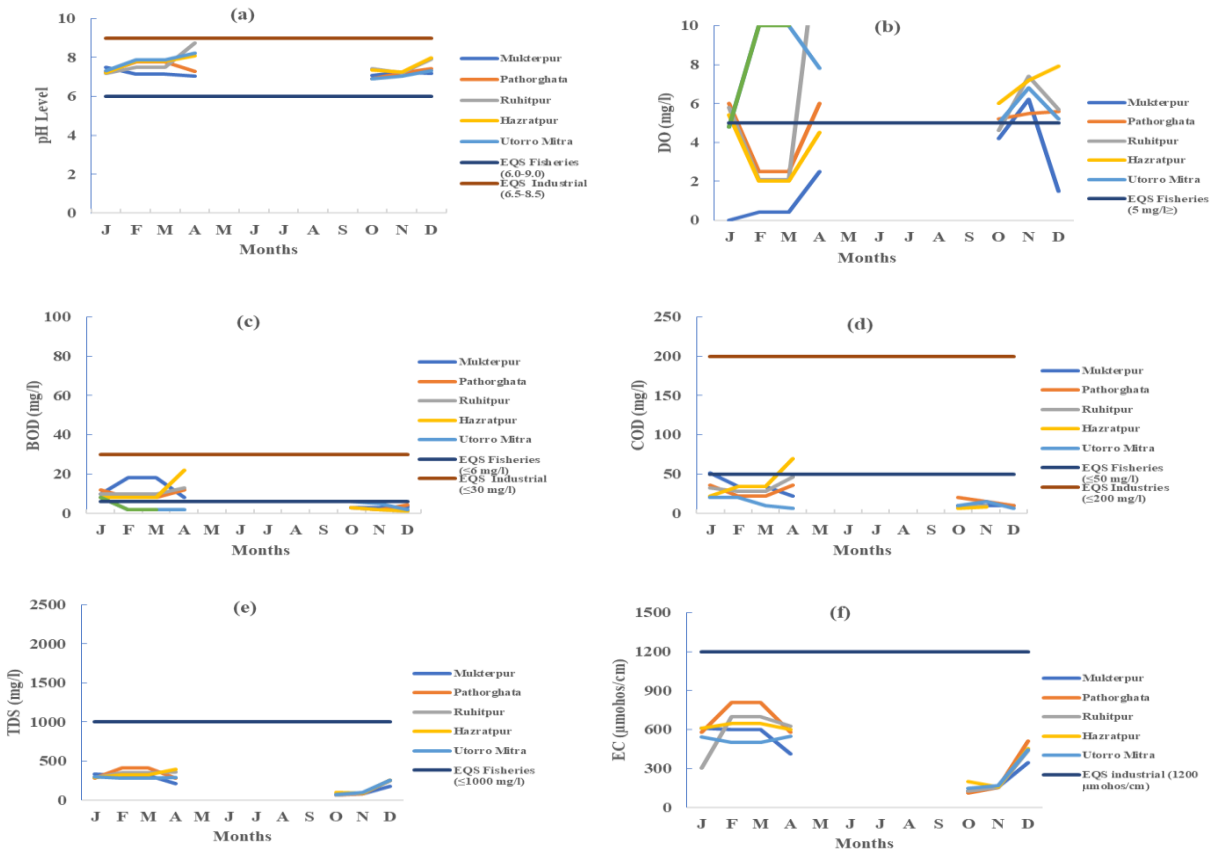

Fig.5. Status of pH, DO, BOD, COD, TDS and EC of Dhaleshwari River in 2022

4.6 Brahmaputra River

Brahmaputra river originates from mount kailash of the Himalay. After flowing past Chilmari, Bangladesh, it is joined on its right bank by the Tista River and then follows south as the Jamuna River. South of Gaibanda, the Brahmaputra leaves the left bank of the mainstream and flows past Jamalpur and Mymensingh to join the Meghna River at Bhairab Bazar (Source: Bangladesh Water Development Board 2011, Department of Bangladesh Haor & Wetlands Development 2016). For monitoring of water quality, water samples were collected from one location (e.g. Mymensingh) of the river. Detail data is attached Annex-1 (Table: 45-50).

In 2022, Brahmaputra River water pH level Maximum 7.97 in Fenruary at Mymensing and minimum 6.85 in August at Jamalpur Bridge point (Fig.6a), while standard range for fisheries 6.5 to 8.5. In 2021, pH range varied from 7.12 mg/l to 8.03 mg/l. In 2022, the highest and the lowest DO was 11.4 mg/l in February at Mymensing and 7.4 mg/l in August at Jamalpur Bridge point (Fig.6b), while EQS for DO for fisheries was ≥5 mg/l. In 2021, DO range varied from 6.2 mg/l to 8.8 mg/l. In 2022, maximum BOD was 7.2 mg/l in February at Mymensing and minimum was 3.0 mg/l in December at Jamalpur Bridge point (Fig.6c) while EQS for fisheries is ≤6 mg/l. In 2021, BOD range varied from 2.0 mg/l to 9.0 mg/l. In 2022, the highest and the lowest COD was 34 mg/l in February at Mymensing point and 10 mg/l in December at Jamalpur Bridge point (Fig.6d). In 2021, COD range varied from 8 mg/l to 20 mg/l. In 2022, The highest and the lowest TDS was 169.5 mg/l in December at Jamalpur Rail Bridge point and 57.2 mg/l in August at Jamalpur Bridge point (Fig.6e), within the EQS (1000 mg/l) for fisheries. In 2021, TDS range varied from 124 mg/l to 480 mg/l. In 2022, maximum SS level was 294 mg/l in August at Jamalpur Bridge point and minimum is 8.0 mg/l in December at Jamalpur Bridge point (Fig.6f). In 2021, SS range varied from 5 mg/l to 480 mg/l. In 2022, Maximum Chloride level was 11.5 mg/l in December at Jamalpur Rail Bridge point and minimum was 2.0 mg/l in December at Jamalpur Bridge point (Fig.6g) and which was less than EQS (150-600 mg/l) for treated wastewater from industrial units. In 2021, Chloride range varied from 9.0 mg/l to 14 mg/l. Electrical Conductivity (EC) of Brahmaputra River water at different locations was mostly within the EQS (1200 µmhos/cm). In 2022, the maximum and the minimum EC of Brahmaputra River water was 318 µmhos/cm in December at Jamalpur Bridge point and 111.1 µmhos/cm in August at Jamalpur Bridge point (Fig.6h). In 2021, EC range varied from 136 µmhos/cm to 291 µmhos/cm.

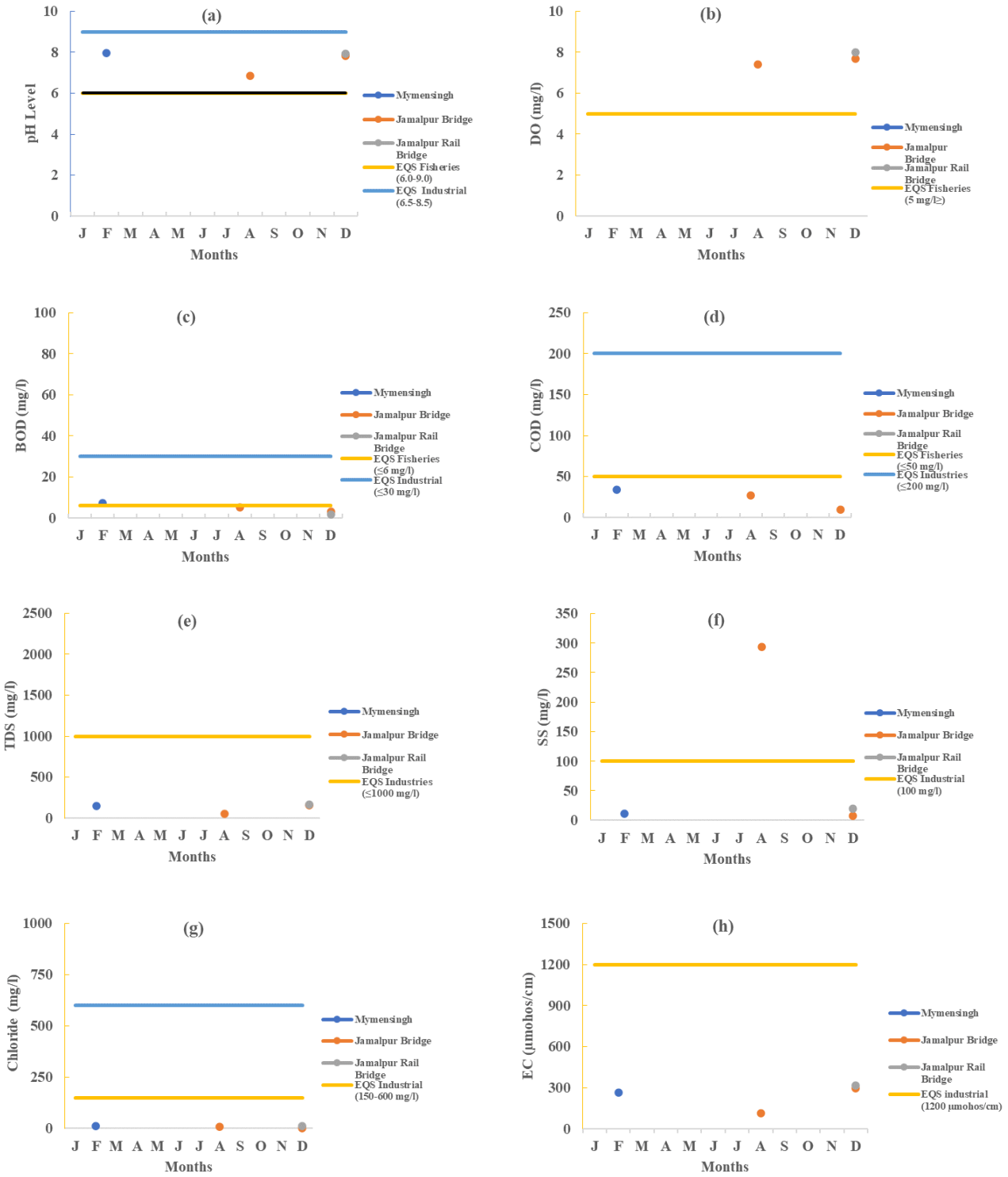

Fig.6. Status of pH, DO, BOD, SS, Chloride, TDS, COD and EC of Brahmaputra River in 2022

4.7 Kaliganga River

The Kaliganga river flows by Manikganj district. For monitoring of water quality, water samples were collected from 01(One) location (e.g. Bheutha Ghat, Manikganj) of the river. Detail data is attached Annex-1(Table: 51-56).

In 2022, the maximum and the minimum pH was 7.72 in February and 6.95 in August (Fig.7a). pH standard range for fisheries 6.5 to 8.5. In 2021, pH range varied from 6.94 mg/l to 8.21 mg/l. In 2022, the highest and the lowest DO was 8.8 mg/l in December and 6.1 mg/l in August (Fig.7b), while EQS for DO for fisheries is ≥5 mg/l. In 2021, DO range varied from 5.0 mg/l to 9.8 mg/l. In 2022,

maximum BOD was 12 mg/l in February and minimum was 2.0 mg/l in November (Fig.7c), while EQS for fisheries was ≤6 mg/l. In 2021, BOD range varied from 1.0 mg/l to 8.0 mg/l. In 2022, the highest and the lowest COD was 44 mg/l in February and 8.0 mg/l in November (Fig.7d). In 2021, COD range varied from 8 mg/l to 24 mg/l. In 2022, The highest and the lowest TDS is 432 mg/l in august and 89.7 mg/l on November (Fig.7e), within the EQS (1000 mg/l) for fisheries. In 2021, TDS range varied from 62.1 mg/l to 259 mg/l. In 2022, maximum Chloride level was 21 mg/l in February and minimum was 5.5 mg/l in Auguat (Fig.7f) and which was less than EQS (150-600 mg/l) for treated wastewater from industrial units. In 2021, Chloride range varied from 8.0 mg/l to 26 mg/l.

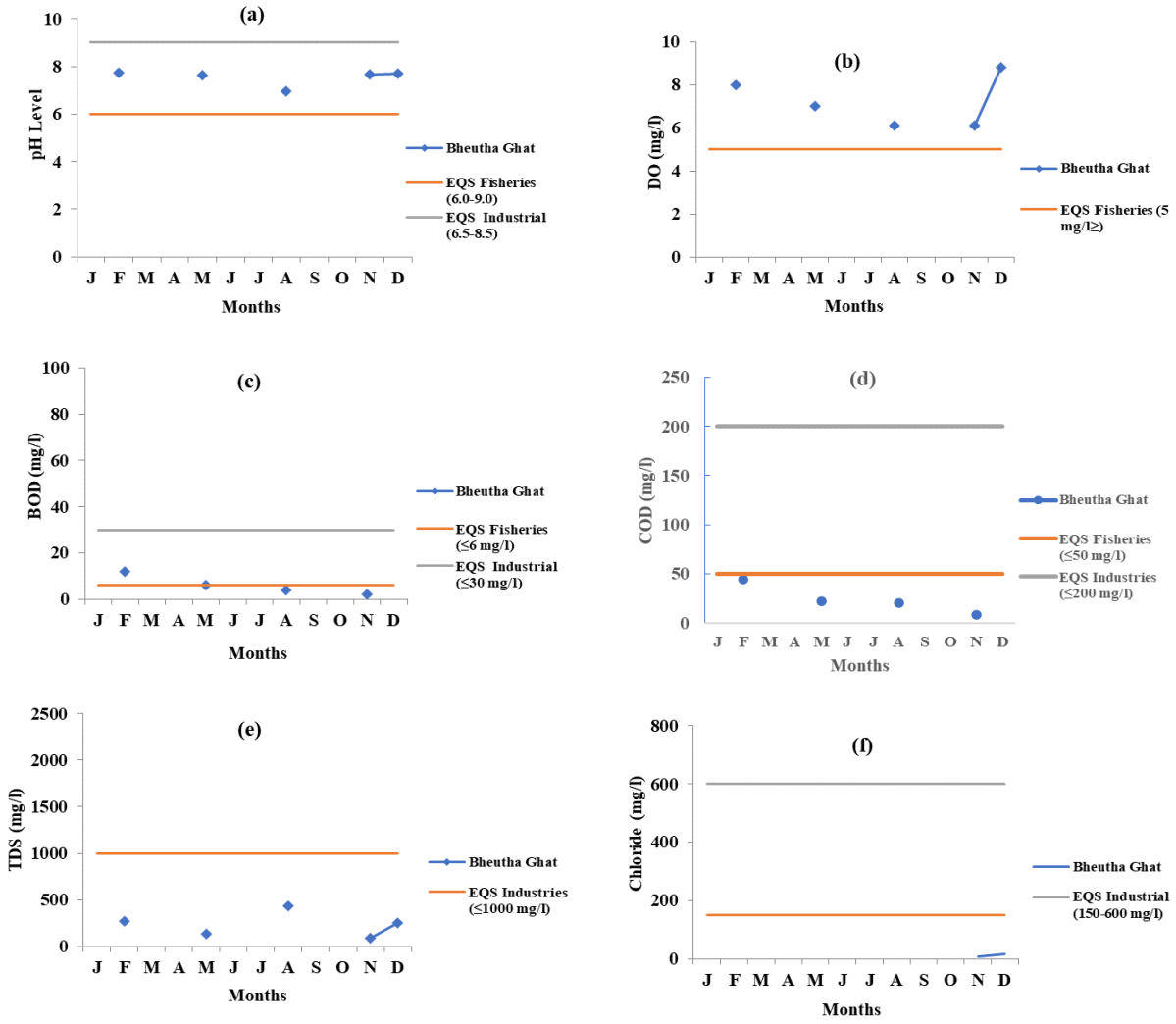

Fig.7. Status of pH, DO, BOD, COD, TDS and Chloride of Kaliganga Rriver in 2022

4.8 Jamuna River

To monitor water quality, samples were collected only from 11 (Eleveen) locations e.g. Jamuna Eco Park (Up)-J.E.P(U), Jamuna Eco Park (Dn)-J.E.P(D), Shariakandi Groin Badth (Up)-S.G.B(U), Shariakandi Groin Badth (Dn)-S.G.B(D), Mohonganj (Up), Mohonganj (Dn), Horipur Kheya Ghat (Up)-H.KG(U), Horipur Kheya Ghat (Dn)-H.K.G(D), Kakua, Tarakandi (Dn), Tarakandi (Up). Detail data is attached Annex-1 (Table: 57-62).

In 2022, the maximum and the minimum pH was 8.57 in December at Kakua and 7.14 in September at Tarakandi Down (Fig.8a). pH standard range for fisheries 6.0 to 9.0. In 2021, pH range varied from 7.13 to 8.13. In 2022, the highest and the lowest DO is 11.5 mg/l in December at Kakua point and 4.6 mg/l in March at Tarakandi Up point (Fig.8b), while EQS for DO for fisheries was ≥5 mg/l. In 2021,

DO range varied from 4.0 mg/l to 8.12 mg/l. In 2022, the Maximum BOD was 6.2 mg/l in June at Kakua and minimum was 2.0 mg/l in September at Kakua (Fig.8c), while EQS for fisheries is ≤6 mg/l. In 2021, BOD range varied from 2 mg/l to 26 mg/l. In 2022, The highest and the lowest TDS was 231mg/l in March Tarakandi Down point and 59.1 mg/l in June at Kakua (Fig.8d), within the EQS (1000 mg/l). In 2021, TDS range varied from 74.3 mg/l to 253 mg/l. In 2022, The highest and the lowest SS was 403 mg/l in June at kakua Point and 7.0 mg/l in March at Tarakandi Down Point (Fig.8d). In 2021, SS range varied from 7.0 mg/l to 440 mg/l. In 2022, Maximum EC level was 451 µmohos/cm in March at Tarakandi (Dn) Point and minimum was 101.6 mg/l in June at Kakua Point (Fig.8f) and while the EQS (1200 µmohos/cm) for treated wastewater from industrial units.

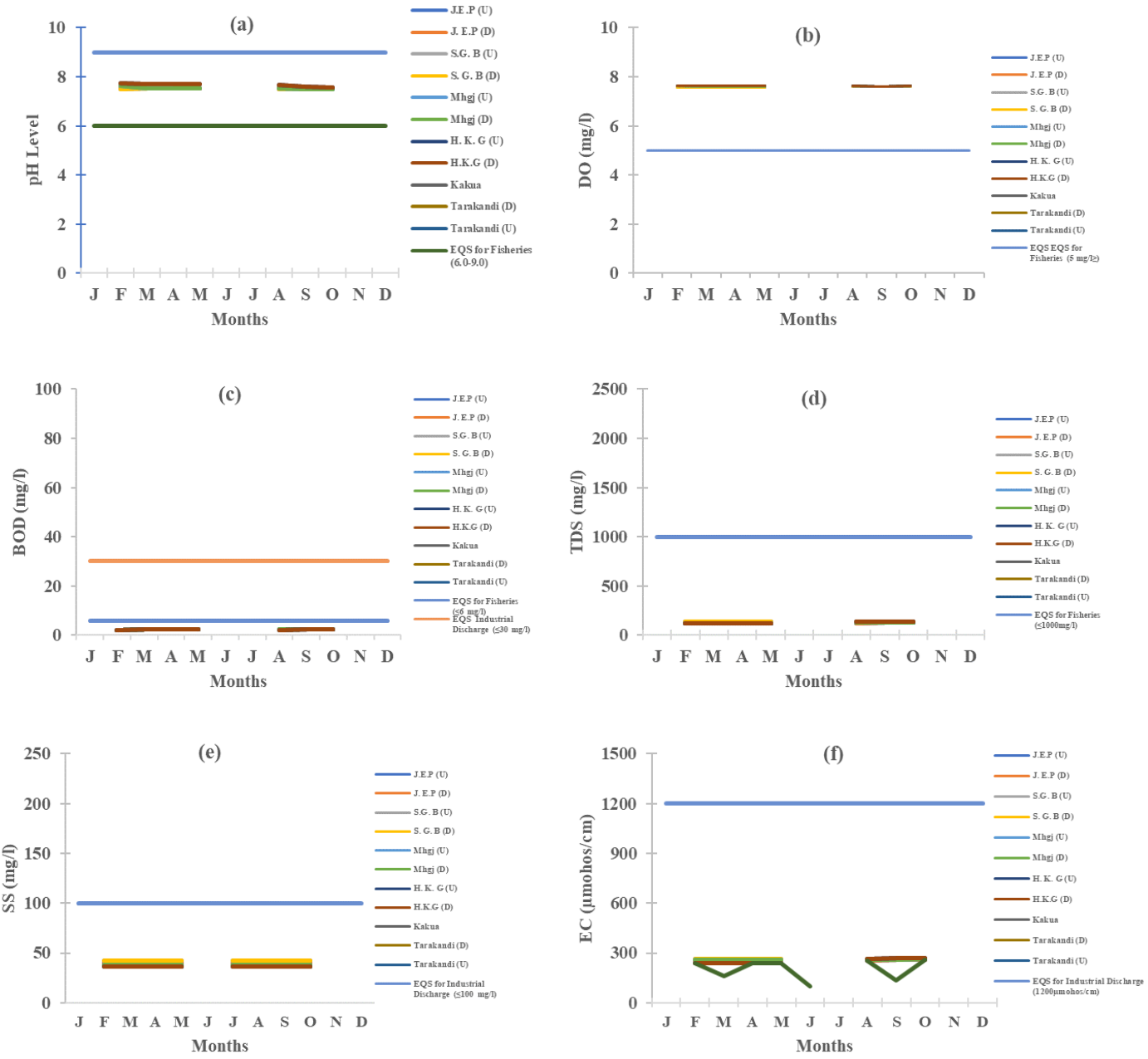

Fig.8. Status of pH, DO, BOD, TDS, SS and EC of Jamuna Rriver in 2022

4.9 Meghna River

To monitor water quality, water samples were collected from 05 (Five) locations of Meghna Ghat, Bisnondi, Norsingdi Launch Terminal, Anondo Bazar, Bhairob Bazar of the Meghna River. Detail data is attached Annex-1 (Table: 63-68).

In 2022, the maximum and the minimum pH was 8.01 in March at Norsingdi Lunach Terminal Point and 6.46 in May at Anondo Bazar point (Fig.9a). pH standard range for fisheries was 6.5 to 8.5. In 2021, pH range varied from 6.41 to 8.65. In 2022, The highest and the lowest DO was 8.0 mg/l in March at Bhairab Bazar Point and 0.5 mg/l in March at Norsingdi Lunach Terminal Point (Fig.9b), while EQS for DO for fisheries was ≥5 mg/l. In 2021, DO range varied from 0.7 mg/l to 9.8 mg/l. In 2022, maximum BOD was 22 mg/l in March at Norsingdi Lunach Terminal Point and minimum was 2.0 mg/l in September at Norsingdi Lunach Terminal and Bhairab Bazar Point (Fig.9c), while EQS for fisheries was ≤6 mg/l. In 2021, BOD range varied from 2.0 mg/l to 23 mg/l. In 2022, The highest and the lowest COD was 64 mg/l in March at Norsingdi Lunach Terminal Point and 5.0 mg/l in December at Bisnondi and Anondo Bazar Point (Fig.9d). In 2021, COD range varied from 6.0 mg/l to 65 mg/l. In 2022, the highest and the lowest TDS was 246 mg/l in March at Norsingdi Lunach Terminal Point and 26 mg/l in May at Bisnondi Point (Fig.9e), within the EQS (1000 mg/l). In 2021, TDS range varied from 23 mg/l to 237 mg/l. In 2022, maximum Chloride level was 42.5 mg/l in March at Megna Ghat Point and minimum was 2.0 mg/l in September at Bhairab Bazar (B.B) Point (Fig.9f) and which was less than EQS (150-600 mg/l) for treated wastewater from industrial units. In 2021, Chloride range varied from 4.5 mg/l to 46 mg/l.

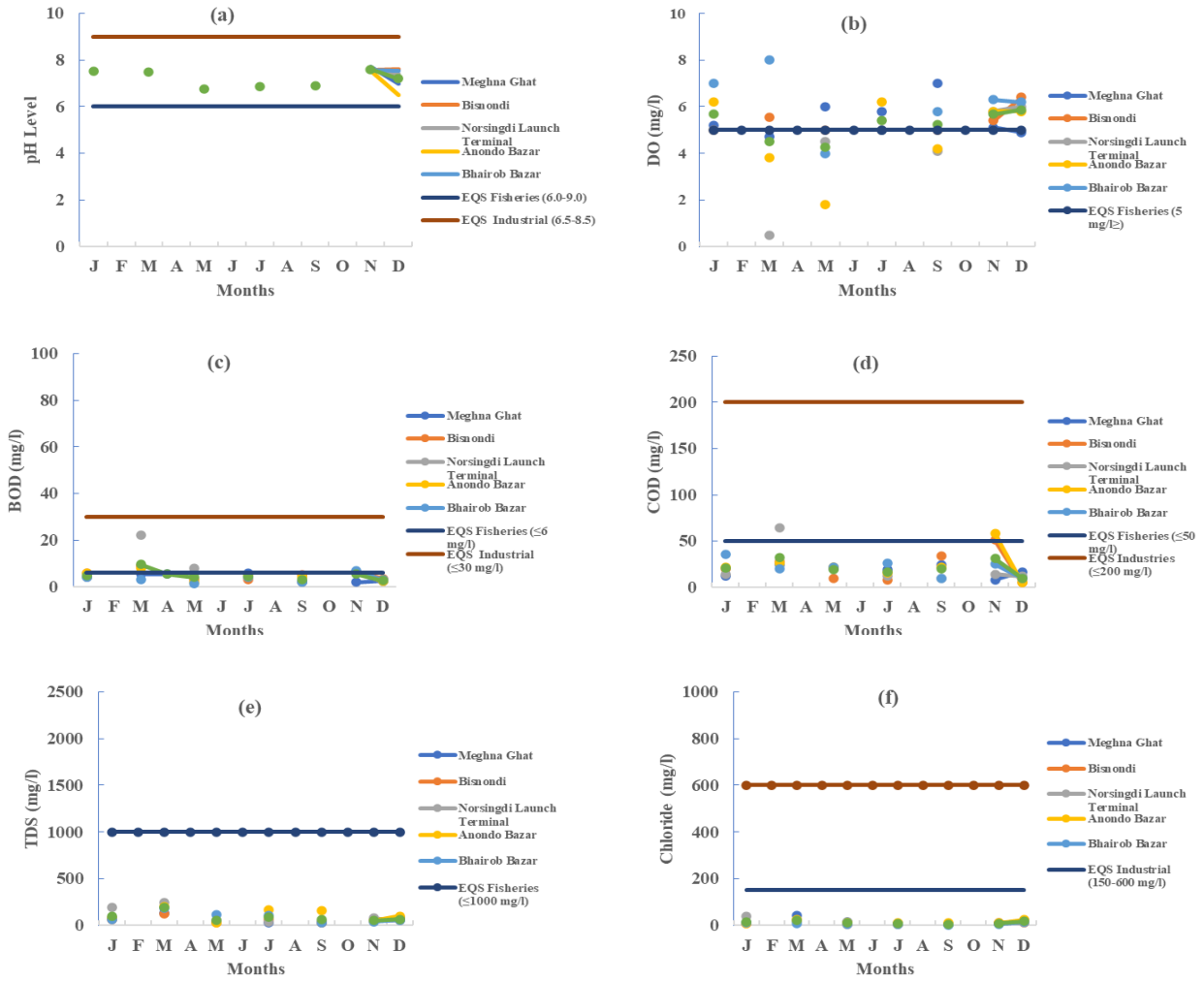

Fig.9. Status of pH, DO, BOD, COD, TDS and Chloride of Meghna River in 2022

4.10 Padma River

Padma River enters Bangladesh from India near Nawabganj of Rajshahi and meets the Jamuna near Aricha and retains its name, but finally meets with the Meghna near Chandpur and adopts the name Meghna before flowing into the Bay of Bengal (Source: Bangladesh Water Development Board 2011, Department of Bangladesh Haor & Wetlands Development 2016). Water samples were collected from 03 (Three) locations of the river namely Mawa Ghat, Shimulia Ghat, Barha Ghat points were used in the analysis. Detail data is attached Annex-1 (Table: 69-74).

Standard pH for fisheries 6.0 to 9.0. In 2022, the maximum pH was 8.25 in February at Mawa Ghat and the minimum pH level was 7.38 in March at Barha Ghat (Fig.10a). In 2021, pH range varied from 7.78 to 8.17. In 2022, DO level above EQS (≥5 mg/l) for fisheries (Fig.10b). In 2022, the maximum DO was 10 mg/l in February at Mawa Ghat and the minimum 6.9 mg/l in March at Barha Ghat. In 2021, DO range varied from 5.0 mg/l to 9.2 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, The maximum BOD was 12 mg/l in March at Barha Ghat and the minimum is 2.0 mg/l in November at Mawa Ghat (Fig.10c). In 2021, BOD range varied from 1.0 mg/l to 30 mg/l. In 2022, TDS Maximum level of Padma River water was 133 mg/l in February at Mawa Ghat and minimum is 51 mg/l in June at Barha Ghat (Fig.10d). In 2021, TDS range varied from 40 mg/l to 148 mg/l. In 2022, the maximum and the minimum EC of Padma River water was 254 µmhos/cm in February at Mawa Ghat and 98 µmhos/cm in June at Barha Ghat (Fig.10e), while EQS was 1200 µmhos/cm wastewater after treatment from industrial units. In 2021, EC range varied from 122.9 µmhos/cm to 271 µmhos/cm. In 2022, the maximum SS was 620 mg/l in June at Barha Ghat and the minimum was 34 mg/l in March at Barha Ghat (Fig.10f). In 2021, SS range varied from 4.0 mg/l to 393 mg/l.

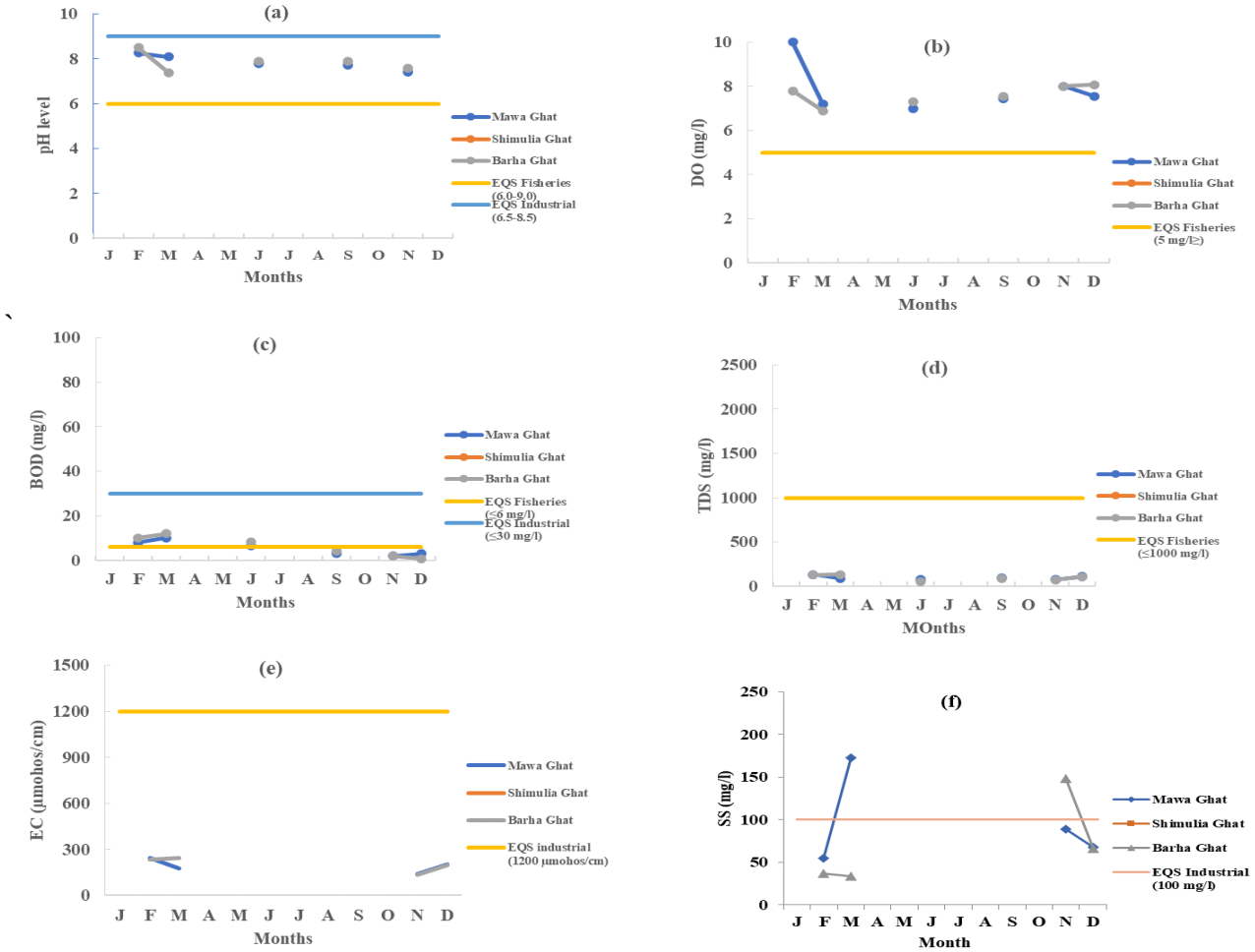

Fig.10. Status of pH, DO, BOD, TDS, EC and SS of Padma River in 2022

4.11 Korotoa River

To monitor water quality of Korotoa river in 2022, water samples were collected from 04 (Four) locations of the river e.g. Dutta Bari Bridge-Bogra (Up stream)-D.B.B(U.S), Dutta Bari Bridge-Bogra (Down stream)-D.B.B(D.S), Aziz Ahmed Taki Road (Up stream)-A.A.T.R(U.S), Aziz Ahmed Taki Road (Down stream)-A.A.T.R(D.S). Detail data is attached Annex-1 (Table: 75-80).

Standard pH for fisheries 6.0 to 9.0. In 2022, the maximum pH was 7.34 in December at Dutta Bari Bridge Up and the minimum pH level was 7.02 in May Dutta Bari Bridge Up (Fig.11a). In 2021, pH range varied from 6.92 to 7.26. In 2022, DO level above EQS (≥5 mg/l) for fisheries (Fig.11b). In 2022, the maximum DO was 6.9 mg/l in August Dutta Bari Bridge Up and the minimum 4.2 mg/l in May Dutta Bari Bridge Up. In 2021, DO range varied from 3.48 mg/l to 6.8 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, the maximum BOD was 4.2 mg/l in February at Aziz Ahmed Taki Road Down and the minimum was 2.1 mg/l in July at the same point (Fig.11c). In 2021, BOD range varied from 3.0 mg/l to 6.46 mg/l. In 2022, TDS Maximum level was 198 mg/l in October at Dutta Bari Bridge Up & the Minimum was 155 mg/l in August at Aziz Ahmed Taki Road Down (Fig.11d). In 2021, TDS range varied from 134 mg/l to 270 mg/l. In 2022, the maximum SS was 58 mg/l in April at Dutta Bari Bridge Up and the minimum was 54 mg/l in October at Aziz Ahmed Taki Road Down (Fig.11e). In 2021, SS range varied from 46 mg/l to 72 mg/l. 2022, the maximum and the minimum EC of water was 396 µmhos/cm in October at Dutta Bari Bridge Up and 310 µmhos/cm in September at Aziz Ahmed Taki Road Down, while EQS was 1200 µmhos/cm wastewater after treatment from industrial units. (Fig.11f). In 2021, EC range varied from 268 µmhos/cm to 408 µmhos/cm.

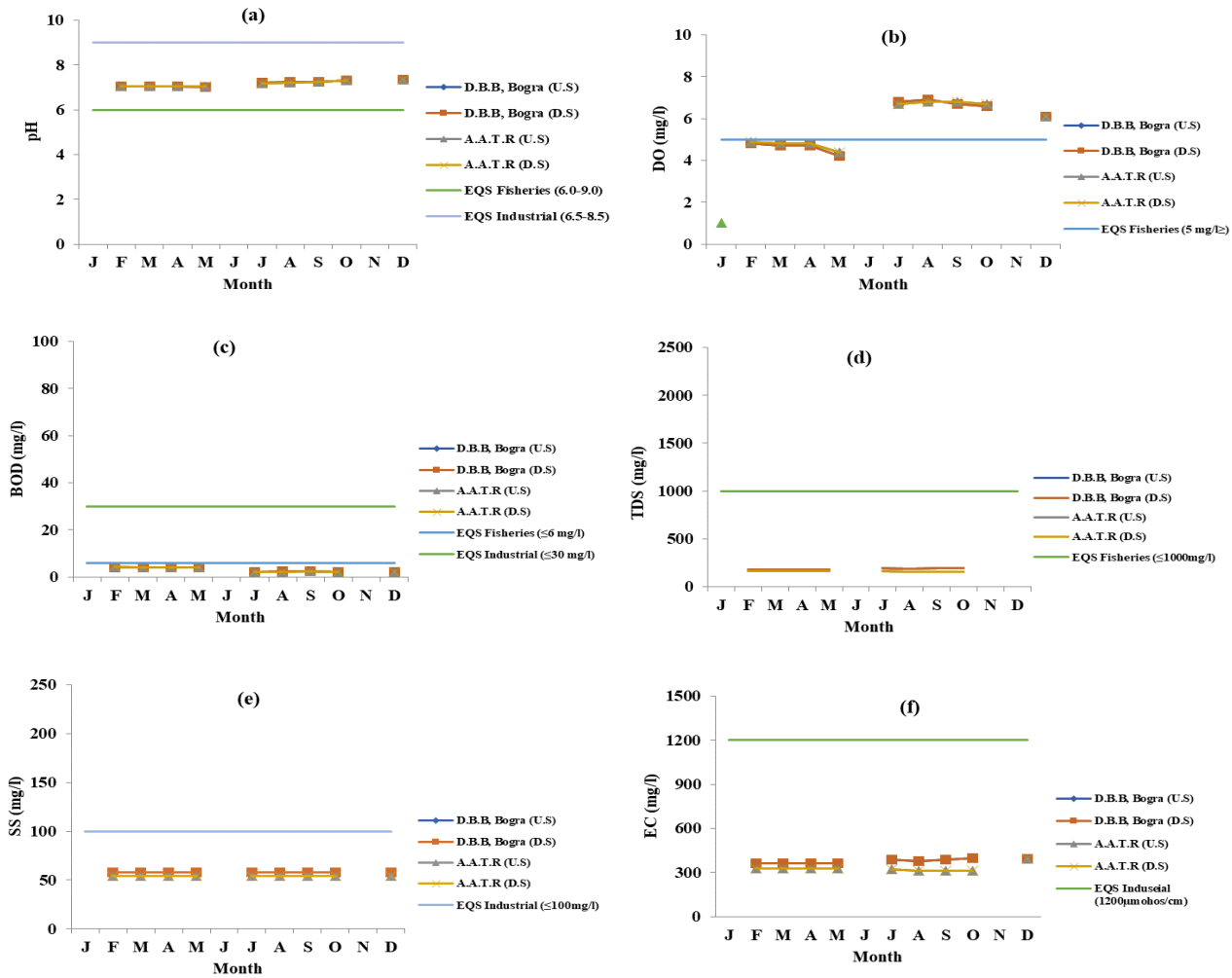

Fig.11. Status of pH, DO, BOD, TDS, SS and EC of Korotoa River in 2022

4.12 Teesta River

The Teesta River is about 315 km long and it rises in the eastern Himalayas, flows through the Indian states of West Bengal and Sikkim through Bangladesh and enters the Bay of Bengal. It joins the Jamuna River at Fulchhari in Bangladesh. Water samples were collected from 06 (Six) locations viz. Near Teesta Bridge (U.S), Near Teesta Bridge (D.S), Nohali Sapmari (U.S), Nohali Sapmari (D.S), Tista Barrage (U.S), Tista Barrage (D.S) of Teesta River for monitoring of water quality in 2022. Detail data is attached Annex-1 (Table: 81-86).

In 2022, Standard pH for fisheries 6.0 to 9.0. The maximum pH was 7.9 in May and the minimum pH level was 7.56 in December (Fig.12a). In 2021, pH range varied from 7.56 to 8.08. In 2022, DO level above EQS (≥5 mg/l) for fisheries (Fig.12b). In 2022, the maximum DO was 7.88mg/l in May at Near Teesta Bridge UP point and the minimum 7.6 mg/l in August at Nohaki Sapmari Down. In 2021, DO range varied from 7.64 mg/l to 8.14 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, the maximum BOD was 2.4 mg/l in October at Nohali Sapmari Up and the minimum is 2.2 mg/l in August at the same point (Fig.12c). In 2021, BOD range varied from 2.2 mg/l to 2.3 mg/l. In 2022, TDS Maximum level was 132 mg/l in May at Near Teesta Bridge UP point & the minimum was 127 mg/l in August at Tista Barage Up (Fig.12d). In 2021, TDS range varied from 114 mg/l to 138 mg/l. In 2022, the maximum SS is 44 mg/l in April at Near Teesta Bridge UP point and the minimum was 37 mg/l in October at Nohali Sapmari Up (Fig.12e). In 2021, SS range varied from 32 mg/l to 46 mg/l. In 2022, EC of water varies from 246 µmohos/cm to 264 µmohos/cm (Fig.12f).

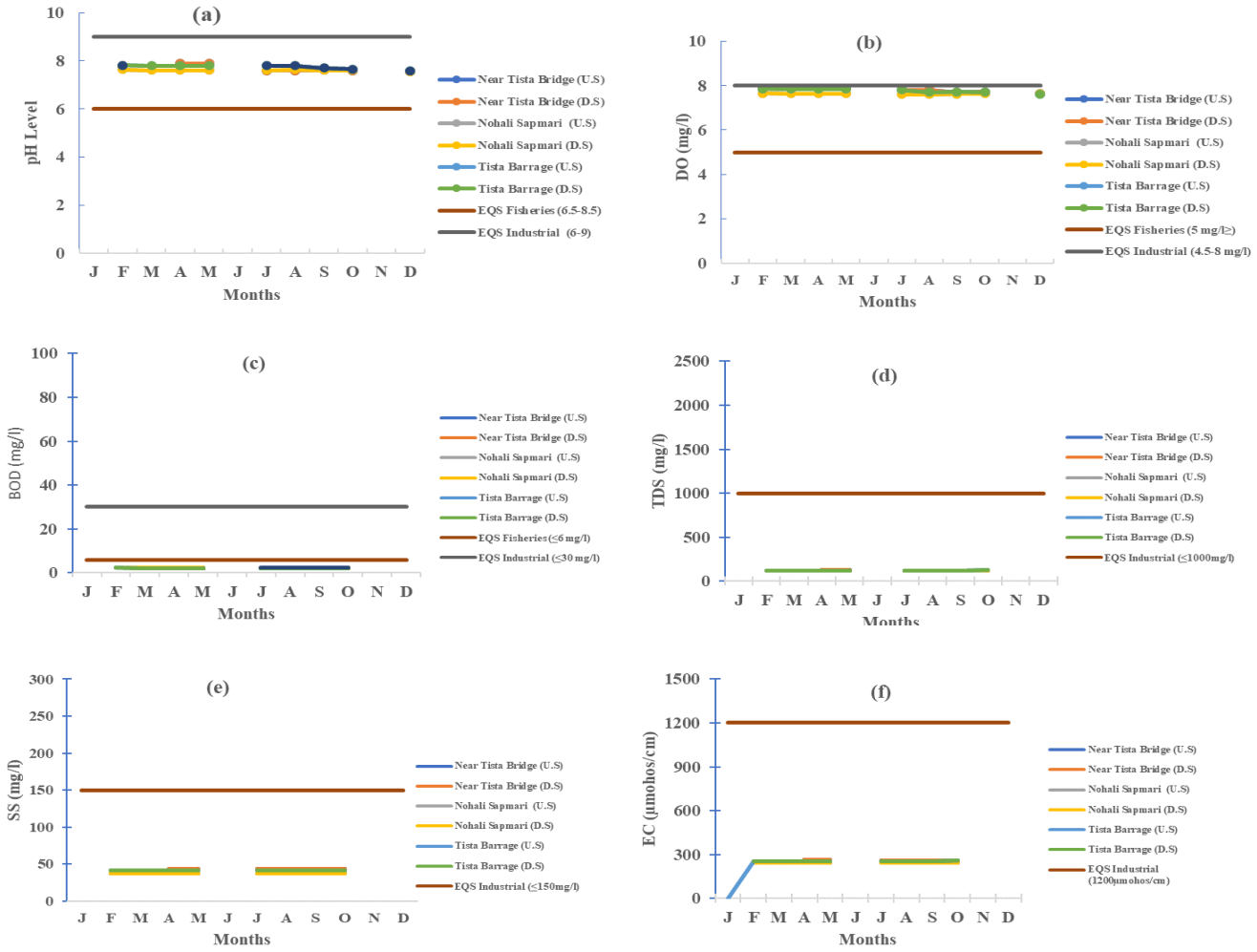

Fig.12. Status of pH, DO, BOD, TDS, SS and Chloride of Tista River in 2022

4.13 Karnaphuli River

The Karnaphuli river is in the south-eastern part of Bangladesh that flows through Chattagram Hill Tracts and Chattagram into the Bay of Bengal. Water samples were collected from 06 (Six) locations (e.g. CUFL, TSP, Shikalbaha, Kalurghat Bridge, Mariam Nagar, Karnaphuli Paper) of Karnaphuli river for monitoring of water quality in 2022. Detail data is attached Annex-1 (Table: 87-92).

In 2022, Standard pH for fisheries was 6.0 to 9.0. In 2022, the maximum pH is 8.18 in Septmber at TSP and the minimum pH level was 6.11 in November at CUFL point (Fig.13a). In 2021, pH range varied from 6.14 to 8.19. In 2022, DO level above EQS (≥5 mg/l) for fisheries (Fig.13b). In 2022, the maximum DO was 8.42 mg/l in December at CUFL point and the minimum 5.7 mg/l in November at TSP point. In 2021, DO range varied from 5.89 mg/l to 8.89 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, The maximum BOD was 21 mg/l in March at CUFL point and the minimum was 3.0 mg/l in August at Kalurghat Bridge (Fig.13c). In 2021, BOD range varied from 4.0 mg/l to 167 mg/l. In 2022, COD Maximum level was 88 mg/l in August at CUFL point & the Minimum is 9.0 in December at Kalurghat Bridge point (Fig.13d). In 2021, COD range varied from 10 mg/l to 560 mg/l. In 2022, The maximum SS was 1700mg/l in July at TSP point and the minimum was 12 mg/l in January at TSP point (Fig.13e). In 2021, SS range varied from 5 mg/l to 533 mg/l. In 2022, the maximum and the minimum EC of water was 36500 µmhos/cm in December at CUFL point and 298 µmhos/cm in February at Morium Nagar point, while EQS 1200 µmhos/cm wastewater after treatment from industrial units. (Fig.13f). In 2021, EC range varied from 112 µmhos/cm to 25790 µmhos/cm.

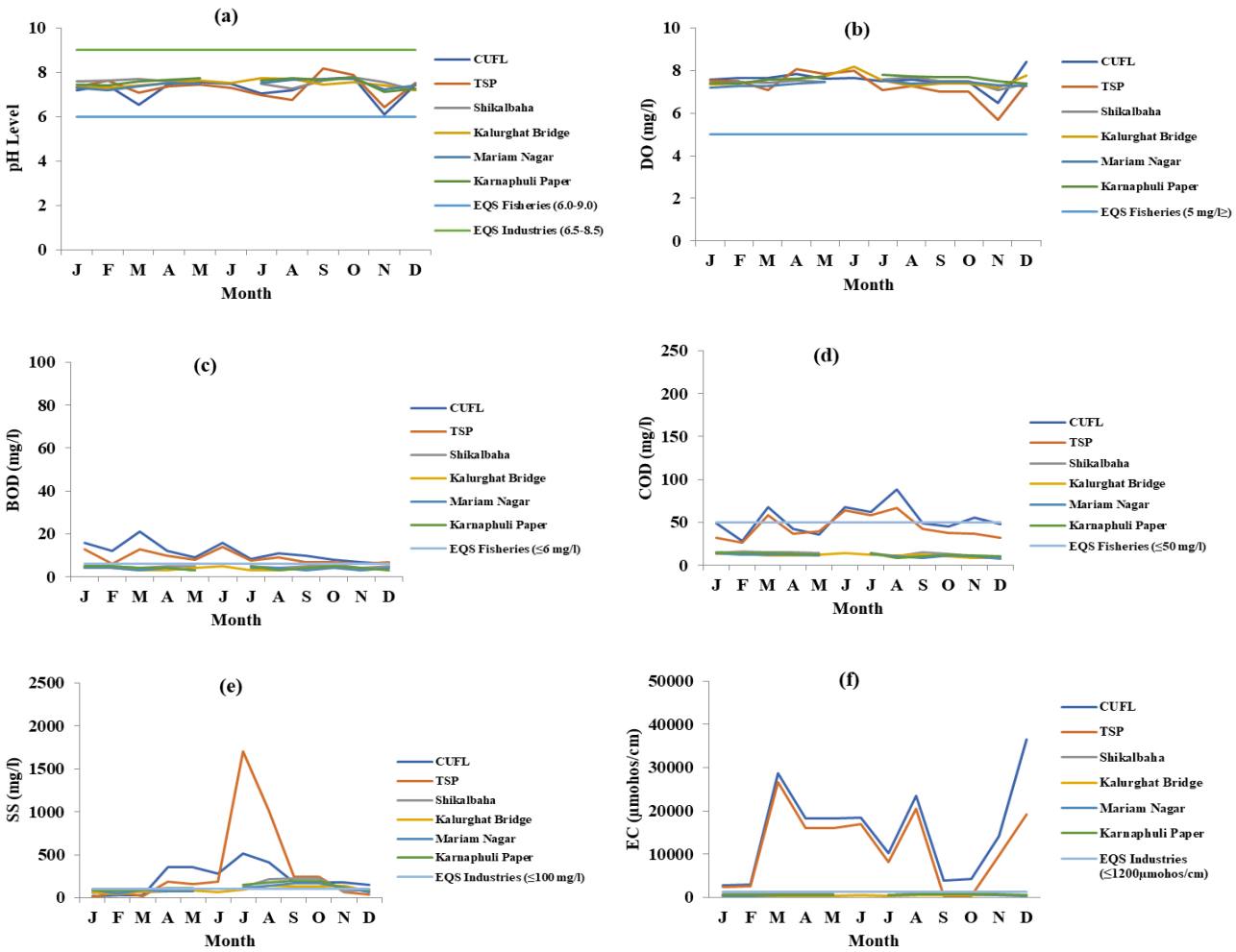

Fig.13. Status of pH, DO, BOD, COD, SS and EC of Karnaphuli River in 2022

4.14 Halda River

The Halda river passes through the South-Eastern part of Bangladesh. Water sampling 03 (Three) locations were Maduna Ghat, Garduara Sluice Gate, Halda Bridge of Halda River. Detail data is attached Annex-1 (Table: 93-98).

In 2022, Standard pH for fisheries is 6.0 to 9.0. In 2022, the maximum pH was 8.63 in October and the minimum pH level was 6.57 in June (Fig.14a). In 2021, pH range varied from 7.02 to 9.03. In 2022, DO level above EQS (≥5 mg/l) for fisheries (Fig.14b). In 2022, the maximum DO was 8.28 mg/l in October at Maduna Ghat point and the minimum 5.2 mg/l in July at Garduara Sluice Gate point. In 2021, DO range varied from 4.17 mg/l to 8.26 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, the maximum BOD was 9.1 mg/l in September at maduna Ghat point and the minimum was 3.0 mg/l in May at Halda Bridge Point (Fig.14c). In 2021, BOD range varied from 3 mg/l to 12 mg/l. In 2022, COD Maximum level was 16 mg/l in March at Halda Bridge point & the Minimum was 9.0 mg/l in August at Madunaghat Point (Fig.14d). In 2021, COD range varied from 9.0 mg/l to 60 mg/l. In 2022, The maximum SS was 187 mg/l in August at Halda Bridge Point and the minimum is 12 mg/l in January at Maduna Ghat Point (Fig.14e). In 2021, SS range varied from 14 mg/l to 548 mg/l. In 2022, the maximum and the minimum EC of water was 245 µmhos/cm in April at Halda Bridge Point and 74.8 µmhos/cm in June at the same point, while EQS is 1200 µmhos/cm wastewater after treatment from industrial units. (Fig.14f). In 2021, EC range varied from 36.2 µmhos/cm to 1407 µmhos/cm.

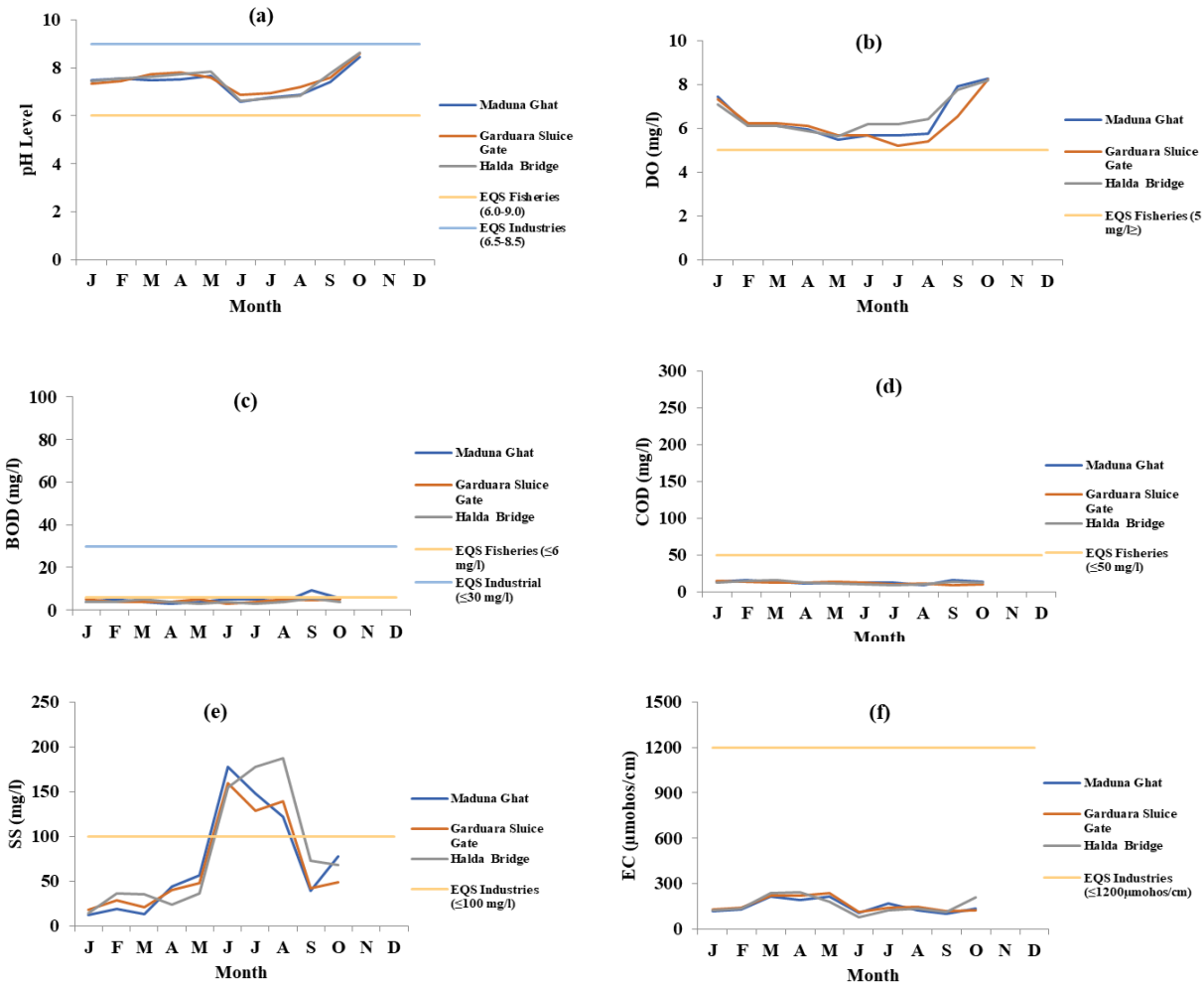

Fig.14. Status of pH, DO, BOD, COD, SS and EC of Halda River in 2022

4.15 Moyuri River

The Moyuri River is situated at the back swamp of the Bhairab-Rupsa River. For monitoring water samples were collected from 03 (Three) locations named Shoshan Ghat (M), Buro Moulavir Darga (M), Dosh Gate Jalma (M) of the river. Detail data is attached Annex-1 (Table: 99-106).

In 2022, pH of Moyuri River water was within the EQS (6.0-9.0) range for inland surface water. In 2022, The maximum pH was 7.6 in May at Sosan Ghat and the minimum was 7.46 in May at Dosh Gate Jalma point (Fig.15a). In 2021, pH range varied from 7.2 to 8.36. In 2022, the maximum DO 5.4 mg/l in May at Dosh Gate Jalma point and the minimum 0.4 mg/l in May at Sosan Ghat (Fig.15b). In 2021, DO range varied from 0.0 mg/l to 6.67 mg/l. In 2022, TDS of Moyuri River water EQS (1000 mg/l) for fisheries. In 2022, maximum TDS 5842 mg/l in May at Dosh Gate Jalma point and the minimum 348 mg/l in May at Sosan Ghat point (Fig.15c). In 2021, TDS range varied from 63 mg/l to 2815 mg/l. In 2022, Chloride concentration of the Moyuri River water was below the EQS (150-600 mg/l) for wastewater after treatment from industrial units. In 2022, The maximum Chloride 7830 mg/l in May at Dosh Gate Jalma point and the minimum was 408 mg/l in May at Sosan Ghat point (Fig.15d). In 2021, Chloride range varied from 87 mg/l to 1410 mg/l. In 2022, The maximum Turbidity 68 NTU in May at Dosh Gate Jalma point and the minimum was 20 NTU in May at Buro Moulavir Darhga point (Fig.15e). In 2019, Turbidity range varied from 34.3 NTU to 48.4 NTU. The EQS for drinking water is 10 NTU. In 2022, The maximum EC 11010 µmhoms/cm in May at Dosh Gate Jalma point and the minimum was 712 µmho/cm in May at Sosan Ghat point (Fig.15f). In 2021, EC range varied from 131 µmho/cm to 5630 µmho/cm. In 2022, Maximum Salinity 6.21 ppt in May at Dosh Gate Jalma point and minimum was 1.95 ppt in May at Buro Maulovir darga (Fig.15g). In 2019, Salinity range varied from 0.2 ppt to 2.1 ppt. In 2022, SS of Moyuri River water at different sampling locations was within the EQS 100 mg/l. In 2022, Maximum SS concentration of Moyuri River was 112 mg/l in May at Buro Maulovir Darga point and the minimum was92 mg/l in May at Sosan Ghat point (Fig.15h). In 2021, SS range varied from 54 mg/l to 78 mg/l.

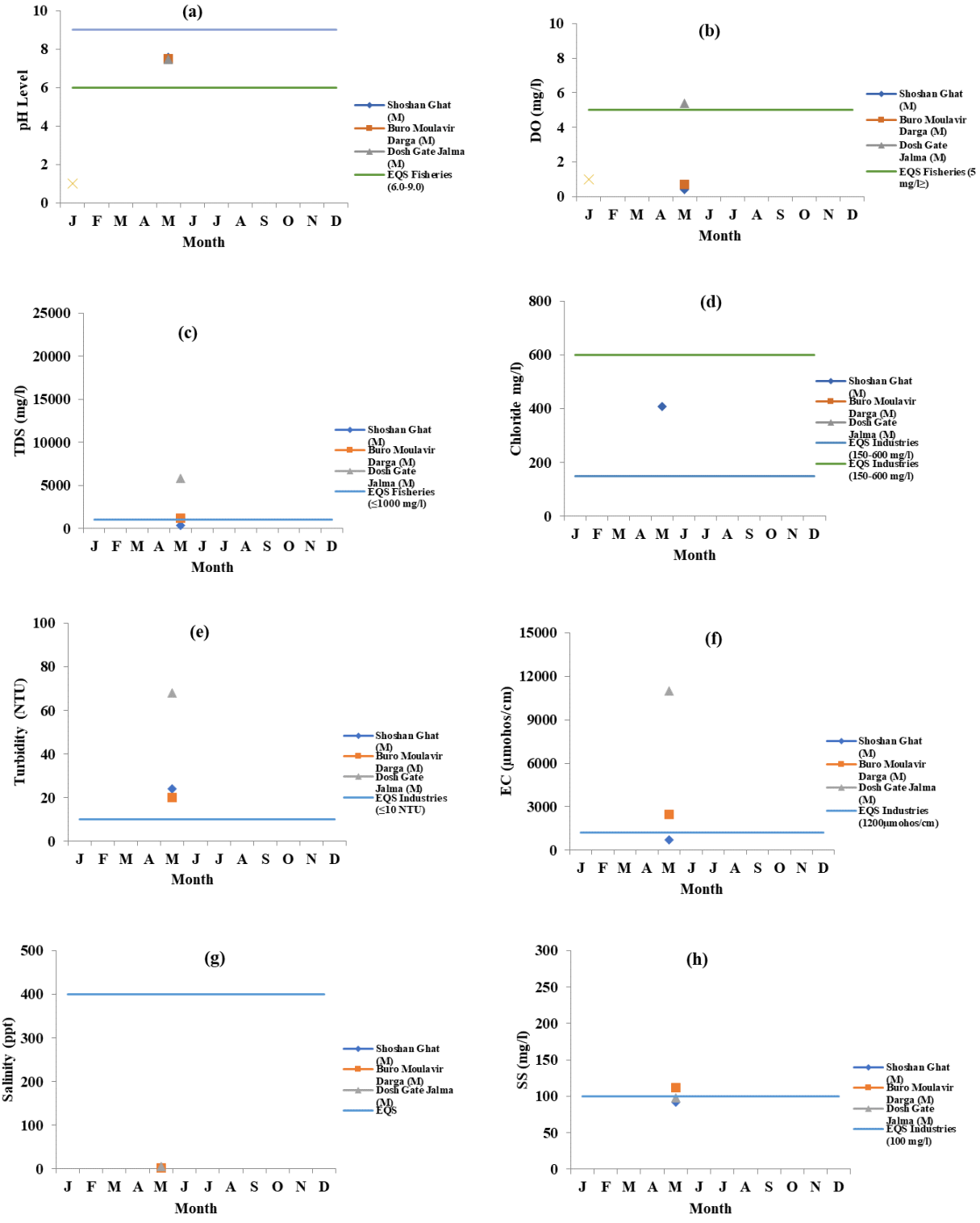

Fig.15. Status of pH, DO, TDS, Chloride, Turbidity, EC, Salinity and SS of Moyuri River in 2022

4.16 Bhairab River

The Bhairab river flows in the south of Bangladesh. Its water carries plenty of silt. Water samples were collected from 04 (Four) locations (e.g. Basundia Bazar-Aladipur, Noapara Ferry Ghat-Abhaynagar, Noapara-Jafarpur, Fultala Ghat-Dhulgram) of Bhairab River for monitoring water quality in 2022. Detail data is attached Annex-1 (Table: 107-114).

In 2022, pH of Bhairab river water was within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH is 8.26 in May and the minimum was 7.55 in May (Fig.16a). In 2021, pH range varied from 7.3 to 8.9. In 2019, the maximum DO was 4.7 mg/l in Fultola Ghat point and the minimum 1.01 mg/l in May at Basundia Bazar point (Fig.16b). In 2021, DO range varied from 0.0 mg/l to 6.8 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, the maximum BOD was 3.5 mg/l in May at Basundia Bazar point and the minimum was 1.6 mg/l in May at Noapara Jaforpur point (Fig.16c). In 2021, BOD range varied from 0.65 mg/l to 5.3 mg/l. In 2022, TDS of Bhairab river water EQS (1000 mg/l) for fisheries. In 2022, maximum TDS 655 mg/l in May at Fultola Ghat point and the minimum 229 mg/l in May at Basundia Bazar point (Fig.16d). In 2021, TDS range varied from 63 mg/l to 4160 mg/l. In 2022, Chloride concentration of the Bhairab river water was below the EQS (150-600 mg/l) for wastewater after treatment from industrial units. In 2022, The maximum Chloride 4212 mg/l in May at Basundia Bazar point and the minimum is 805 mg/l in May at Noapara Ferry Ghat point (Fig.16e). In 2021, Chloride range varied from 68 mg/l to 1631 mg/l. In 2022, the maximum Turbidity 75 NTU in May Fultola Ghat and the minimum was 12 NTU in May at Basundia Bazar point (Fig.16f). In 2021, Turbidity range varied from 60.5 NTU to 76.4 NTU. The EQS for drinking water 10 NTU. In 2022, the maximum EC 1219 µmhoms/cm in May at Fultola Ghat and the minimum was 510 µmho/cm in May at Basundia Bazar point and was mostly within the EQS (1200 µmhoms/cm) for treated wastewater from industrial units (Fig.16g). In 2021, EC range varied from 134 µmhoms/cm to 8480 µmhoms/cm. In 2022, SS of Bhairab river water at different sampling locations is within the EQS (100 mg/l). the maximum SS concentration of Bhairab river was 123 mg/l in May at Basundia Bazar point and the minimum was 90 mg/l in May Noapara Ferry Ghat (Fig.16h).

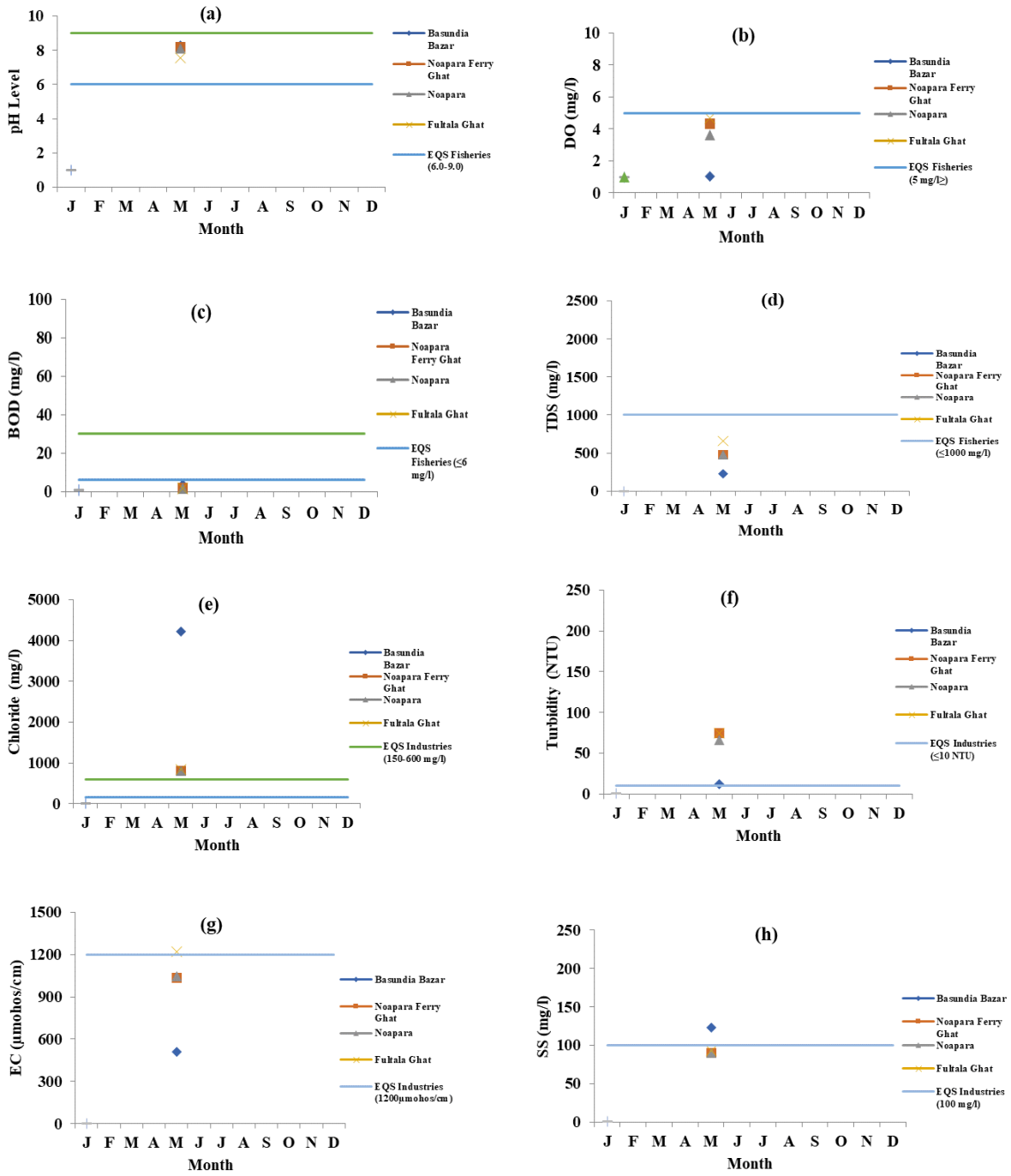

Fig.16. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and SS of Bhairab River in 2022

4.17 Rupsa River

The Rupsa river forms from the confluence of the Bhairab and Atrai rivers, and flows into the Pasur River. Its etire length is affected by tides. Water samples were collected from 04 (Four) different locations (e.g. Rupsa Ghat (M), Kalibari Ghat (M), Charer Hat-Sulpur Aijgati (M), Gilatala- Nadam Pratap] of Rupsa River for monitoring water quality in 2022. Detail data is attached Annex-1 (Table: 115-122).

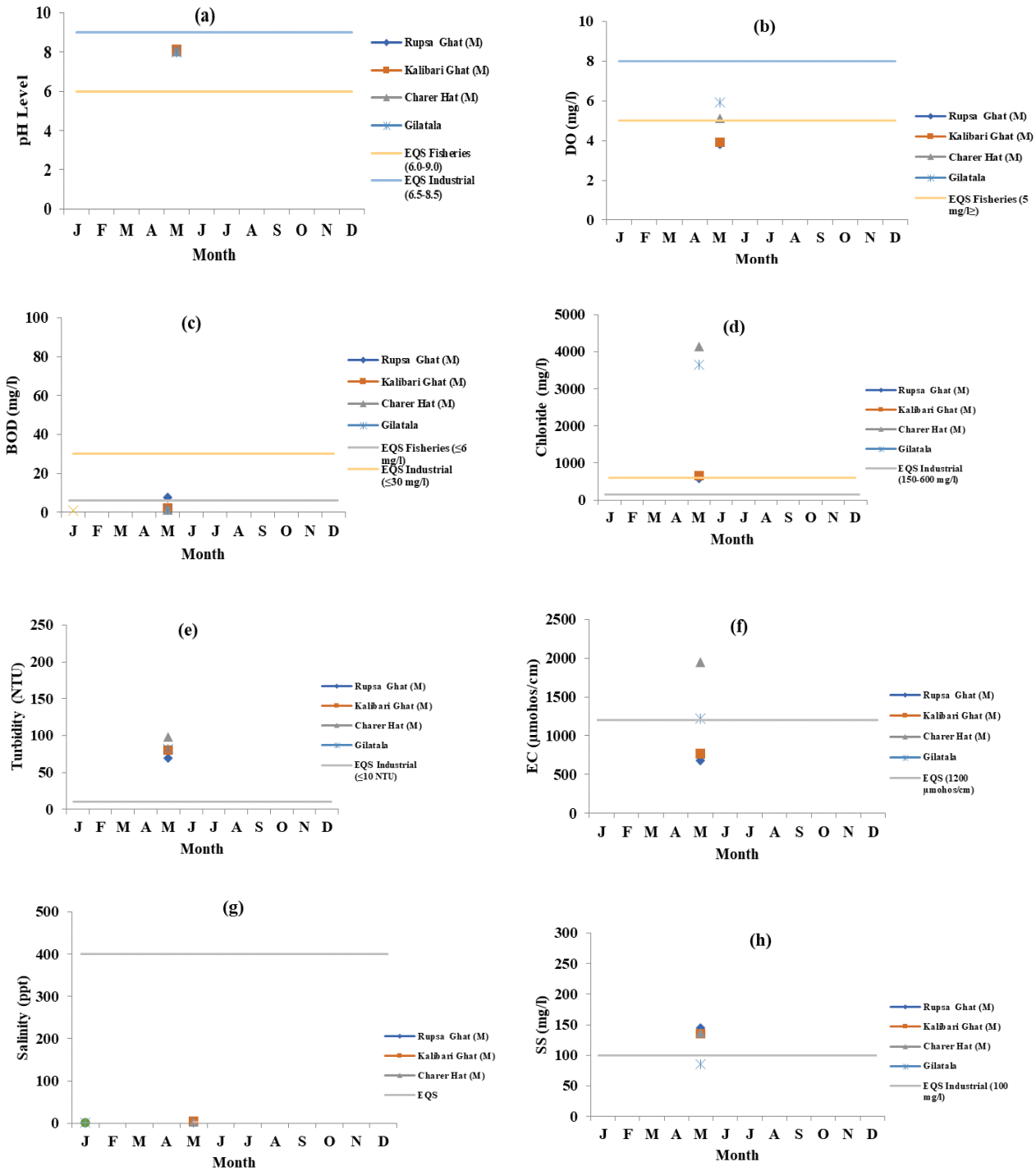

Fig.17. Status of pH, DO, BOD, Chloride, SS, Turbidity, EC, Salinity and SS of Rupsa River in 2022

In 2022, pH of Rupsa River water was within the EQS (6.0-9.0) range for inland surface water. In 2022, The maximum pH was 8.11 in May and the minimum was 8.01 in May (Fig.17a). In 2021, pH range varied from 7.15 to 8.8. In 2022, the maximum DO 5.9 mg/l in May at Gilatola point and the minimum 3.8 mg/l in May at Rupsha Ghat Point (Fig.17b). In 2021, DO range varied from 3.5 mg/l to 8.25 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, the maximum BOD was 7.5 mg/l in May at Rupsha Ghat Point and the minimum was 1.3 mg/l in May at Chorarhat point (Fig.17c). In 2021, BOD range varied from 0.2 mg/l to 3.3 mg/l. In 2022, Chloride concentration of the Rupsa River water was below the EQS (150-600 mg/l) for wastewater after treatment from industrial units. In 2022, the maximum Chloride 4142 mg/l in May at Chorar Hat point and the minimum was 570 mg/l in May at Rupsha Ghat Point (Fig.17d). In 2021, Chloride range varied from 66 mg/l to 1212 mg/l. In 2022, the maximum Turbidity 98 NTU in May at Chorarhat and

the minimum was 69.0 NTU in May at Rupsha Ghat Point (Fig.17e). In 2021, Turbidity range varied from 66.2 NTU to 75.4 NTU. The EQS for drinking water is 10 NTU. In 2022, the maximum EC 1945 µmhoms/cm in May at Chorarhat point and the minimum was 678 µmho/cm in May at Rupsha Ghat Point and was mostly within the EQS (1200 µmhoms/cm) for treated wastewater from industrial units (Fig.17f). In 2021, EC range varied from 111 µmhoms/cm to 4250 µmhoms/cm. In 2022, Maximum Salinity was 4.55 ppt in May at Kalibary Ghat and minimum was 0.75 ppt in May at Rupsha Ghat Point (Fig.17g). In 2021, Salinity range varied from 0.06 ppt to 5.34 ppt. In 2022, Maximum SS concentration of Rupsa River was 145 mg/l in May at Rupsha Ghat Point and the minimum was 86 mg/l in May at Gilatola point (Fig.17h). In 2021, SS range varied from 57 mg/l to 78 mg/l.

4.18 Pashur River

The Pashur river located in southwestern Bangladesh, and a distributary of the Ganges, continues the Rupsa river. All its distributaries are tidal. It meets the Shibsa River within the Sundarbans, and near to the sea the river becomes the Kunga River. For monitoring of water quality, water samples were collected from one location of Pashur river 01 (One) location at Batia Ghat, By Pass (M). Detail data is attached Annex-1 (Table: 123-130).

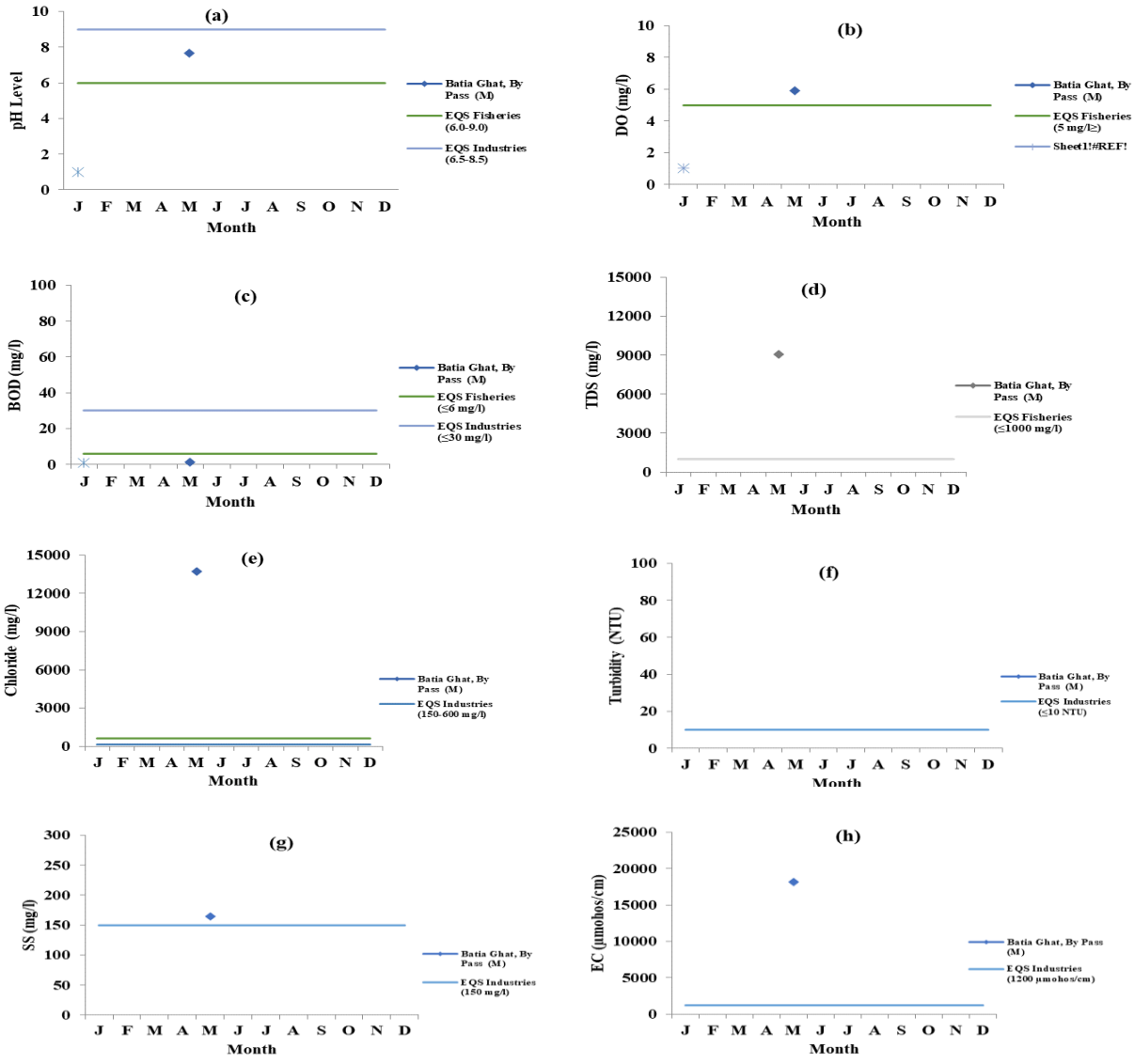

Fig.18. Status of pH, DO, BOD, TDS, Chloride, Turbidity, SS and EC of Pashur River in 2022

In 2022, pH of Pashur river water was within the EQS (6.0-9.0) range fo r inland surface water. In 2022, the maximum pH was 7.65 in May (Fig.18a). In 2021, pH range varied from 7.78 to 8.57. In 2022, DO was 5.9 mg/l (Fig.18b). In 2021, DO range varied from 4.2 mg/l to 8.35 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries. In 2022, the BOD was 1.2 mg/l Fig.18c). In 2021, BOD range varied from 1.1 mg/l to 3.2 mg/l. In 2022, the TDS was 9060 mg/l (Fig.18d). In 2021, TDS range varied from 64 mg/l to 5860 mg/l. In 2022, Chloride concentration of the Pashur river water was below the EQS (150-600 mg/l) for wastewater after treatment from industrial units. In 2022, the Chloride was 13705 mg/l (Fig.18e). In 2021, Chloride range varied from 88 mg/l to 2675 mg/l. In 2022, Turbidity 130 NTU (Fig.18f). In 2021, Turbidity range varied from 58.2 NTU to 78.8 NTU. The EQS for drinking water was 10 NTU. In 2022, SS concentration of Pashur river was 164 mg/l (Fig.18g). In 2021, SS range varied from 60 mg/l to 2131 mg/l. In 2022, the EC was 18120 µmhoms/cm (Fig.18h). In 2021, EC range varied from 134 µmhoms/cm to 10700 µmhoms/cm.

4.19 Khakshiali River

The Khakshiali river is located in Satkhira district in Khulna division. To monitor water quality of Khakshiali river, water samples were collected from 03 (Three) different points of Kaligonj location e.g. Kaliganj Bazar, Boshontopur, Gobindakathi of river in 2022. Detail data is attached Annex-1 (Table: 131-138).

In 2022, pH of Khakshiali river water was within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH was 7.75 and the minimum was 7.73(Fig.19a). In 2021, pH range varied from 7.69 to 8.46. In 2022, the maximum DO was 5.4 mg/l at Kaligonj Bazar point and the minimum 5.10 mg/l at Gobindakathi point (Fig.19b). In 2021, DO range varied from 1.4 mg/l to 8.7 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, BOD was 1.3 mg/l (Fig.19c). In 2021, BOD range varied from 1.0 mg/l to 10 mg/l. In 2022, the maximum TDS was 3265 mg/l at kaligonj Bazar and the minimum was 3201 mg/l at Bosontopur point (Fig.19d). In 2021, TDS range varied from 216 mg/l to 3990 mg/l. In 2022, Chloride concentration of the Khakshiali river water is below the EQS (150-600 mg/l) for wastewater after treatment from industrial units. In 2022, the maximum Chloride 4068 mg/l at Gobindo kathi point and the minimum was 4024 mg/l at Bosontopur point (Fig.19e). In 2021, Chloride range varied from 138 mg/l to 1375 mg/l. In 2022, The maximum Turbidity 120 NTU at Kaligonj Bazar point and the minimum was 117 NTU at Gobindokathi point (Fig. 19f). The EQS for drinking water was 10 NTU. In 2021, Turbidity range varied from 53.2 NTU to 153 NTU. In 2022, the maximum EC was 6580 µmhoms/cm at Gobindokathi and the minimum was 6485 µmho/cm at Kaligonj Bazar point (Fig.19g). In 2021, EC range varied from 434 µmhoms/cm to 7430 µmhoms/cm. In 2022, EC of Khakshiali river at different locations is mostly within the EQS (1200 µmhoms/cm) for treated wastewater from industrial units. In 2022, Maximum Salinity 3.46 ppt at Gobindokathi point and minimum was 3.3 ppt at Bosontopur point (Fig. 19h). In 2021, Salinity range varied from 0.11 ppt to 4.1 ppt.

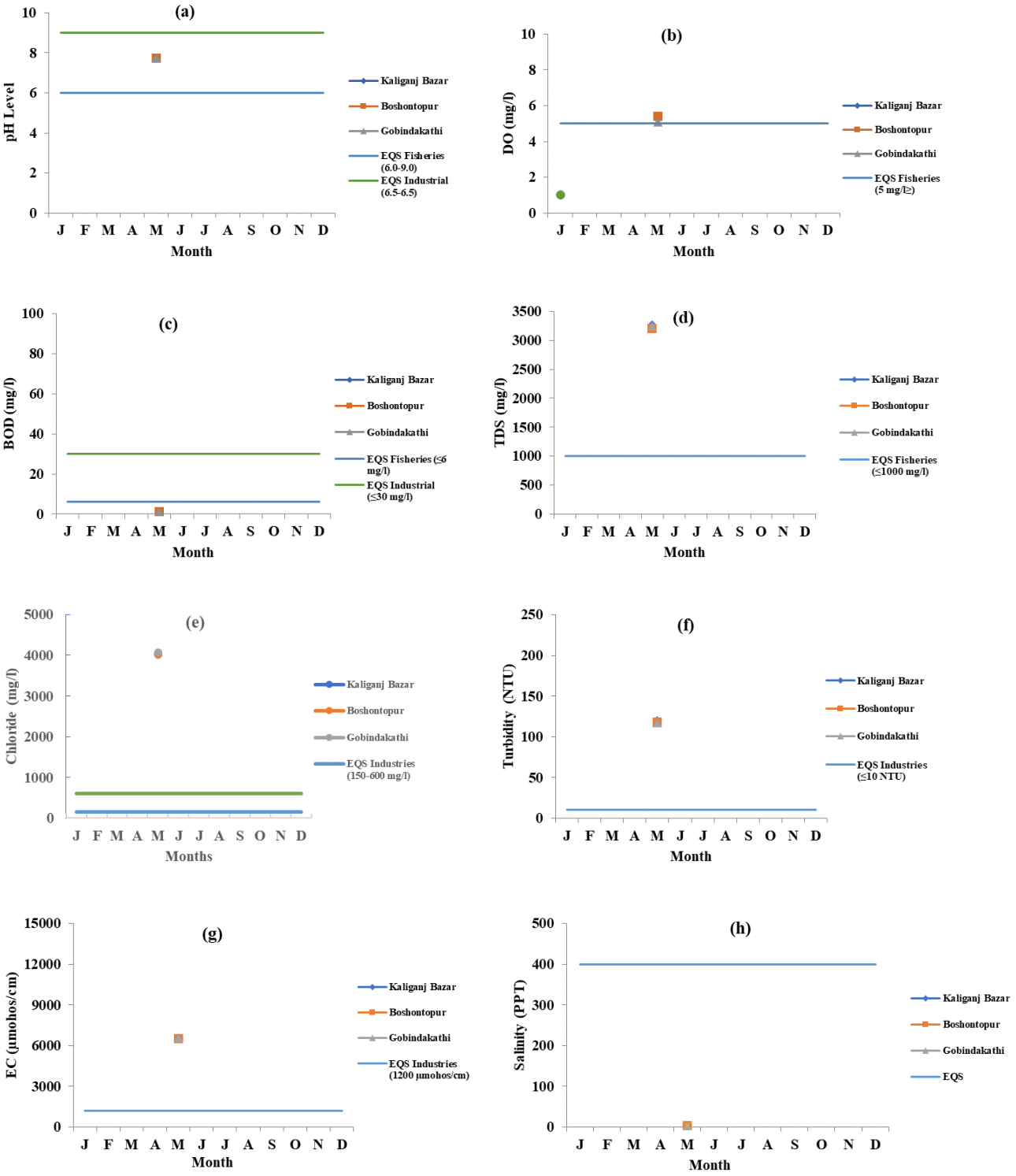

Fig.19. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Khakshiali River in 2022

4.20 Ganges River

Ganges River one of the largest river systems of the world and an important river flowing through India and Bangladesh. The entire course of the Ganges inside Bangladesh is popularly called the Padma, though actually it is not. The Ganges has a total length of about 2,600 km up to its confluence with the Jamuna and a catchment area of about 10,87,400 sq km of which about 46,300 sq km lies within Bangladesh (Source: Banglapedia). To monitor water quality of Ganges River in 2023, samples were collected from 07 (Seven) location i.e. Sardah (Up Stream), Sardah (Down Stream), Nurullapur (Up Stream), Nurullapur (Down Stream), Kanchan Park (Up Stream), Kanchan Park (Down Stream), Gorai off Take. Detail data is attached Annex-1 (Table: 139-146).

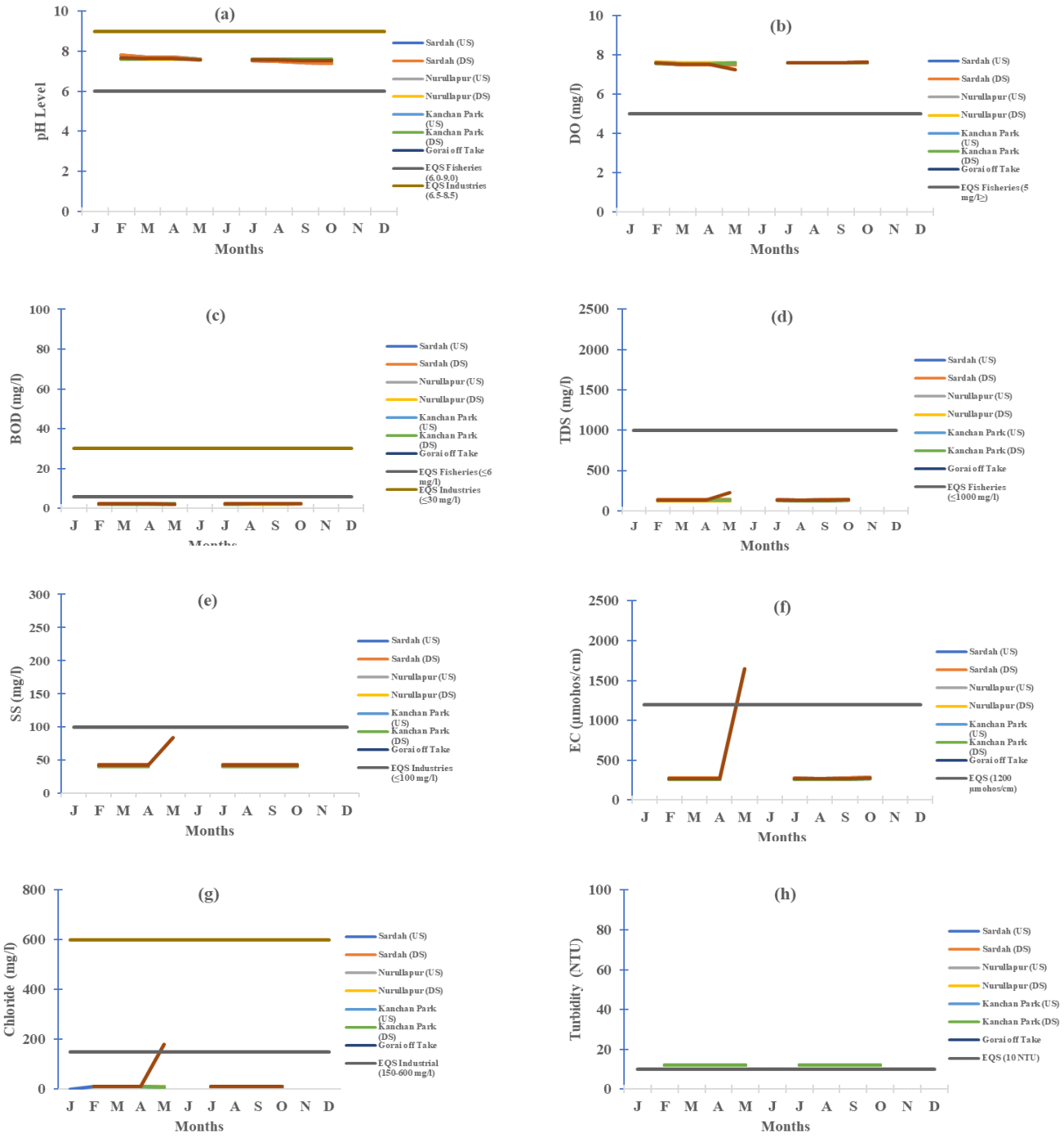

Fig.20. Status of pH, DO, BOD, TDS, SS, EC, Chloride and Turbidity of Ganges River in 2022

In 2022, pH of Ganges River water is within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH was 7.19 in May at Gorai off Take point and the minimum was 7.8 in February at Sardah (Down Stream) point (Fig. 20a). In 2021, pH range varied from 7.84 to 8.32. In 2022, the maximum DO 7.66 mg/l in February at Nurullapur (Down Stream) point and the minimum 5.3 mg/l in May at Gorai off Take point (Fig. 20b). In 2021, DO range varied from 6.36 mg/l to 8.76 mg/l. In 2022, the maximum BOD was 2.5 mg/l in October at Sardah (Up and Down Stream) and the minimum was 130 mg/l in September at Kanchan Park (Up and Down Stream) point (Fig. 20c). In 2021, BOD range varied from 0.43 mg/l to 4.8 mg/l. In 2022, the maximum TDS was 764 mg/l in May at Gorai off Take and the minimum was 130 mg/l in September at Kanchan Park (Up and Down Stream) point (Fig. 20d). In 2021, TDS range varied from 73 mg/l to 609 mg/l. In 2022, Maximum SS 84 mg/l in May at Gorai off Take and minimum was 40 mg/l at Kanchan Park (Up and down Stream) point al over the year (Fig.20e). In 2021, SS range varied from 50 mg/l to 58 mg/l. In 2022, the maximum EC 1647 µmhoms/cm in May at Gorai off Take point and the minimum EC was 260 µmho/cm in August and September at Kanchan Park Up Stream point (Fig.20f) while the EQS (1200 µmhoms/cm) for treated wastewater from industrial units. In 2021, EC range varied from 150 µmho/cm to 1218 µmho/cm. In 2022, the maximum Chloride 1202 mg/l in May at Gorai off Take and the minimum was 10 mg/l in May at Sardah (Up Stream) (Fig. 20g). In 2022, Turbidity was 12 NTU all over the year.

4.21 Kirtankhola River

The Kirtankhola river starting from Sayeshtabad in Barisal district, the river Kirtankhola ends into the Gajalia near Gabkhan khal. This old river is now known as the Barisal River. The total length of the river is about 160 km. For monitoring purpose water samples were collated from 06 (Six) location of the river e.g. Launch Ghat (S), Launch Ghat (M), Kaower Char (S), Kaower Char (M), Dopdopia Kheyaghat (S), Dopdopia Kheyaghat (M). Detail data is attached Annex-1 (Table:147-151). Data was not available the month of March to June.

In 2022, pH of Kirtankhola river water is within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH was 8.99 in October and the minimum was 8.24 in September (Fig. 21a). In 2021, pH range varied from 7.2 to 8.4. In 2022, the maximum DO 7.74 mg/l in August at Kaower Char (Side) point and the minimum was 6.19 mg/l in August at Dopdia Kheya Ghat (Middle) point (Fig. 21b). In 2021, DO range varied from 3.2 mg/l to 6.5 mg/l. In 2022, COD load was within the EQS (≤50 mg/l) for fisheries at all locations. In 2022, The maximum COD is 696 mg/l in May at Kaower Char (Middle) point and the minimum was 122 mg/l in August at Kaower Char (Middle) point (Fig. 21c). In 2022, the maximum TDS was 957 mg/l in November at Kaower Char (Middle) point and the minimum was 71.9 mg/l in August at Dopadia Kheya Ghat (Middle) point (Fig. 21d). In 2021, TDS range varied from 146 mg/l to 2573 mg/l. In 2022, the maximum EC was 1961 µmhoms/cm in September at Kaower Char (Side) point and the minimum was 130.3 µmho/cm in October at Launch Ghat (Side) point (Fig. 21e). In 2021, EC range varied from 292 µmhoms/cm to 5982 µmhoms/cm.

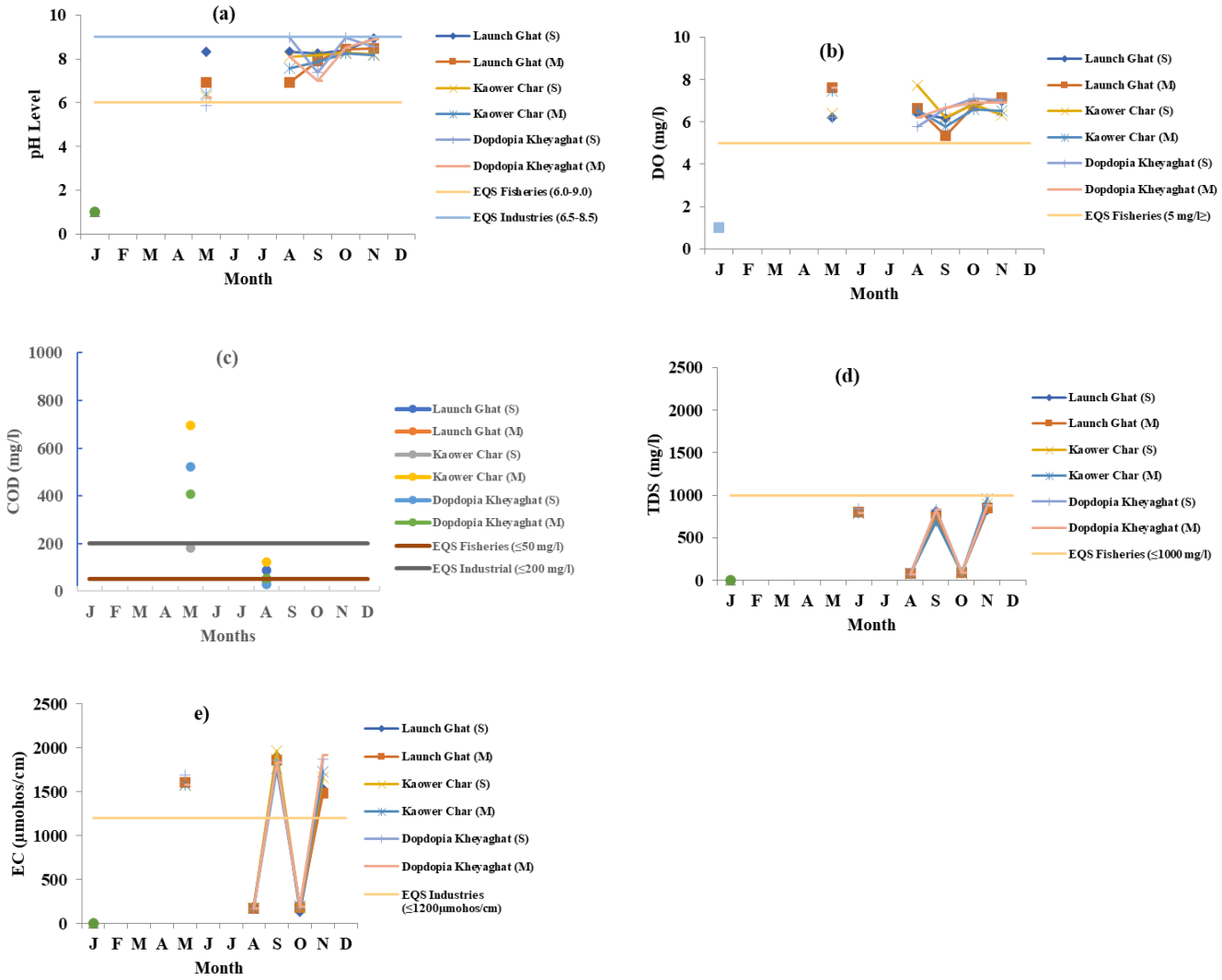

Fig.21. Status of pH, DO, BOD, TDS, TS and EC of Kirtankhola River in 2022

4.22 Tatulia River

For monitoring of water quality of Tatulia river water samples was collated from 02 (Two) points e.g. Vadura Launch Ghat (S), Vadura Launch Ghat (M). Detail data is attached Annex-1 (Table: 152-155).

In 2022, pH of Tatulia river water is within the EQS (6.0-9.0) range for inland surface water. In 2022, The maximum pH was 8.77 in July at Vadura Launch Ghat (S) point and the minimum was 8.43 in July at Vadura Launch Ghat (M) point (Fig. 22a). In 2021, pH range varied from 7.7 to 8.24. In 2022, the maximum DO was 6.3 mg/l at Vadura Launch Ghat (S) point and the minimum was 5.06 mg/l at Vadura Launch Ghat (M) point (Fig. 22b). In 2021, DO range varied from 5.0 mg/l to 6.4 mg/l. In 2022, COD load was within the EQS (≤50 mg/l) for fisheries at all locations. In 2022, the maximum COD was 128 mg/l at Vadura Launch Ghat (S) point and the minimum was 112 mg/l at Vadura Launch Ghat (M) point (Fig. 22c). In 2022, the maximum TDS was 75.6 mg/l at Vadura Launch Ghat (S) point and the minimum was 73.5 mg/l at Vadura Launch Ghat (M) point (Fig. 22d). In 2021, TDS range varied from 155 mg/l to 702 mg/l.

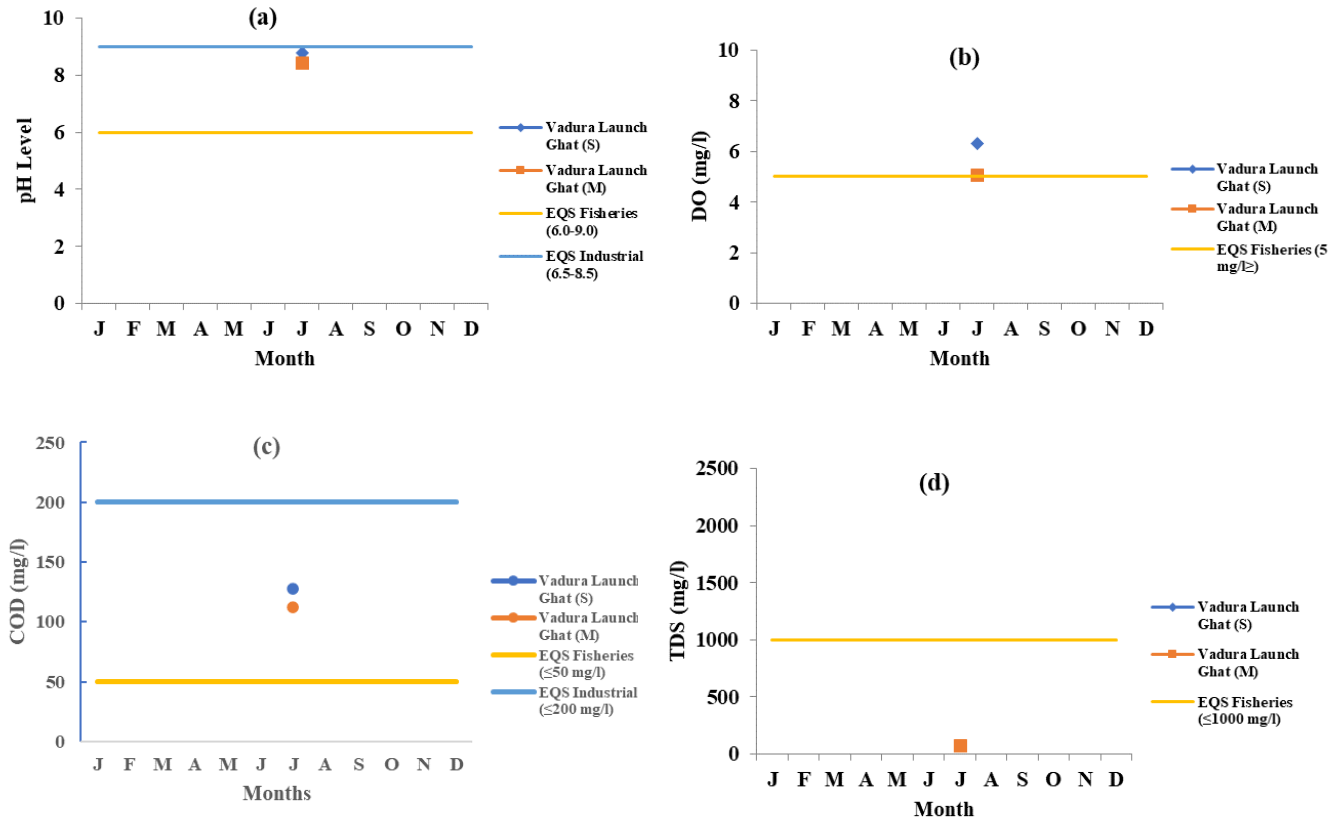

Fig.25. Status of pH, DO, COD and TDS of Tatulia River in 2022

4.23 Sugandha River

The Biskhali is a river of Bangladesh, a continuation of the Sugandha. Bishkhali River continuation of the kirtankhola and nalchity rivers. The total length of the river is 96 km. The average width of the river from its origin to first 30 km is about 1 km and the rest is about 2 km. The average depth is about 16m. The Sugandha turns into Bishkhali after entering Jhalokati town. To monitor water quality of Sughanda River water samples were colleted for analysis from 02 (Two) points, Gabkhan Launch Terminal (S), Gabkhan Launch Terminal (M) of the river. Detail data is attached Annex-1 (Table: 156-160).

In 2022, pH of Sughanda river water is within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH was 9.39 in August and the minimum was 8.36 in August (Fig. 23a). In 2021, pH range varied from 7.6 to 8.24. In 2022, the maximum DO 7.5 mg/l in June at Gabkhan Launch Terminal (M) point and the minimum was 6.14 mg/l in August at Gabkhan Launch Terminal (S) point (Fig. 23b). In 2021, DO range varied from 5.4 mg/l to 6.5 mg/l. In 2022, COD load was within the EQS (≤50 mg/l) for fisheries at all locations. In 2022, the maximum COD was 109 mg/l in June at Gabkhan Launch Terminal (M) point and the minimum was 6.14 mg/l in August at Gabkhan Launch Terminal (S) point (Fig. 23c). In 2022, the maximum TDS was 86.3 mg/l in June at Gabkhan Launch Terminal (S) point and the minimum was 69.6 mg/l in June at Gabkhan Launch Terminal (M) point (Fig. 23d). In 2021, TDS range varied from 156 mg/l to 762 mg/l.

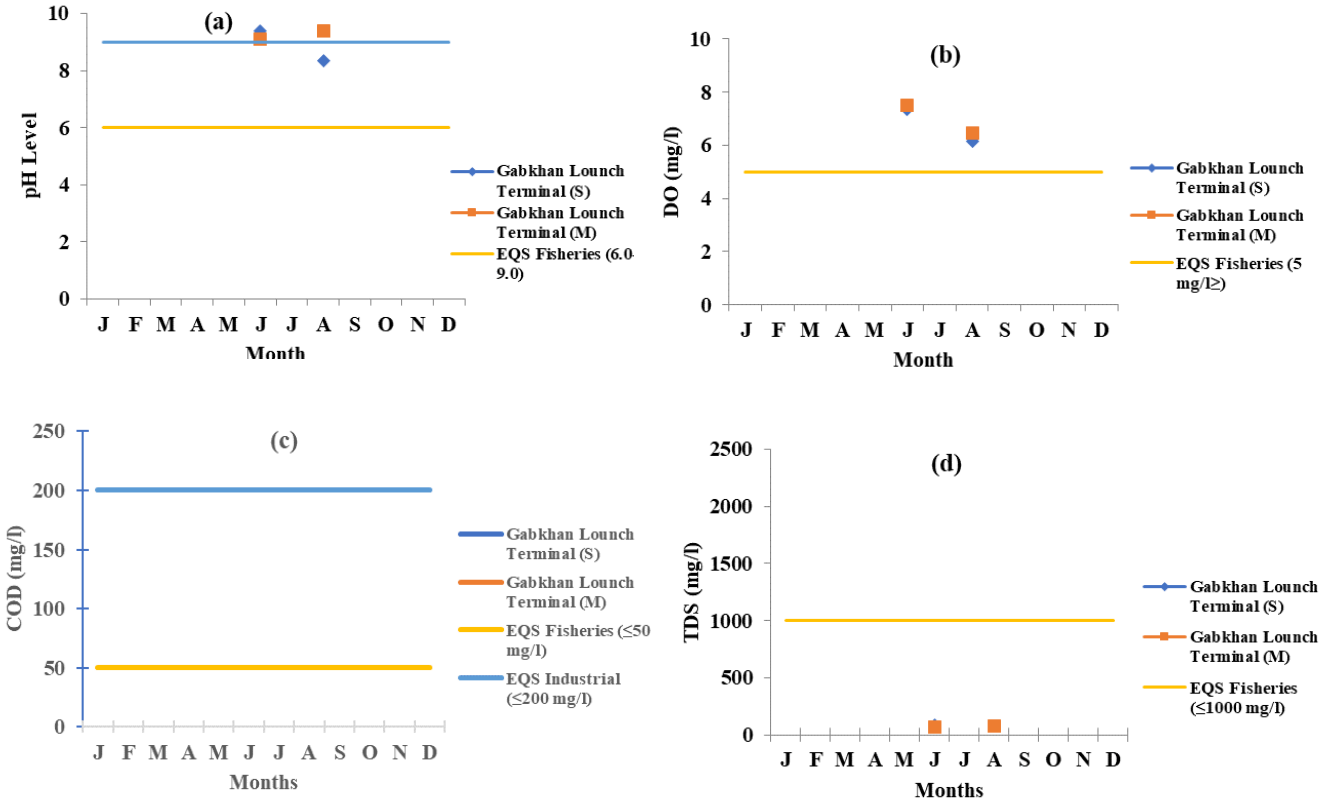

Fig.23. Status of pH, DO, COD and TDS of Sughanda River in 2022

4.24 Lohalia River

Patuakhali city is surrounded on three sides by two rivers. The two major rivers are Laukathi and Lohalia, which are directly connected with the Bay of Bengal. For monitoring purpose water samples were collected from 02 (Two) locations e.g. Patuakhali Launch Ghat (S), Patuakhali Launch Ghat (M). Detail data is attached Annex-1 (Table: 161-164).

In 2022, pH of Lohalia river water is within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH was 9.01 in October and the minimum was 8.62 (Fig. 24a). In 2021, pH range varied from 7.6 to 8.26. In 2022, the maximum was DO 7.15 mg/l at Patuakhali Launch Ghat (S) point and the minimum was 6.61 mg/l at Patuakhali Launch Ghat (M) point (Fig. 24b). In 2021, DO range varied from 5.4 mg/l to 6.2 mg/l. In 2022, the maximum TDS was 94.4 mg/l at Patuakhali Launch Ghat (S) point and the minimum was 94.3 mg/l at Patuakhali Launch Ghat (M) point (Fig. 24c). In 2021, TDS range varied from 150 mg/l to 1106 mg/l. In 2022, the maximum EC 210 µmohos/cm at Patuakhali Launch Ghat (S) point and the minimum was 206 µmohos/cm at Patuakhali Launch Ghat (M) point Fig. 24d). In 2021, EC range varied from 299 µmohos/cm to 2210 µmohos/cm.

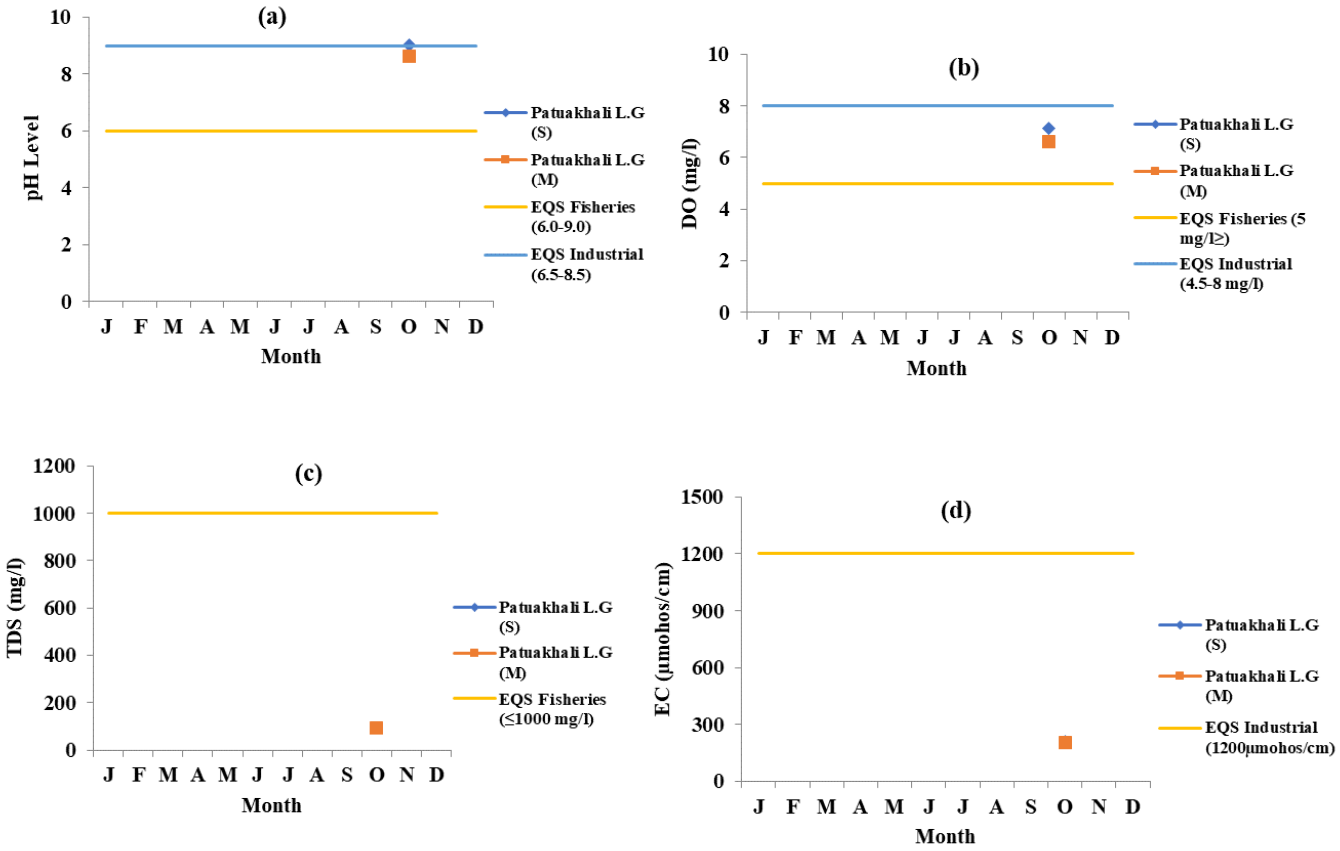

Fig.24. Status of pH, DO, TDS and EC of Lohalia River in 2022

4.25 Surma River

The Surma River is a major river in Bangladesh, part of the Surma-Meghna River System. It starts when the Barak River from northeast India divides at the Bangladesh border into the Surma and the Kushiyara rivers. It ends in Kishoreganj District, above Bhairab Bazar, where the two rivers rejoin to form the Meghna River. The waters from the river ultimately flow into the Bay of Bengal. The average depth of this river is 86m and maximum depth is 170m. For monitoring purpose water samples were collected from 04 (Four) different locations of the river namely Mendibag Point, Kin Bridge Point, Sheaik Ghat, Chhatak. Detail data is attached Annex-1 (Table: 165-170).

In 2022, pH of Surma river water is within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH was 6.84 and the minimum was 6.61 (Fig. 25a). In 2021, pH range varied from 6.51 to 7.76. In 2022, the maximum DO 7.06 mg/l at Sheaik Ghat point and the minimum 6.92 mg/l at kin bdidge point (Fig. 25b). In 2021, DO range varied from 4.97 mg/l to 8.55 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2022, the maximum BOD was 2.8 mg/l at Sheaik Ghat point and the minimum was 2.1 mg/l at Mendibag point (Fig. 25c). In 2021, BOD range varied from 1.7 mg/l to 3.8 mg/l. In 2022, the maximum COD was 15 mg/l at Sheaik Ghat point and the minimum was 10 mg/l at Chatak (Fig. 25d). In 2021, COD range varied from 12 mg/l to 24 mg/l. In 2022, the maximum SS was 66 mg/l at Sheaik Ghat point and the minimum was 38 mg/l at Chatak point (Fig. 25e). In 2021, SS range varied from 24 mg/l to 68 mg/l. In 2022, the maximum TDS was 68 mg/l at Sheaik Ghat point and the minimum was 49 mg/l at Chatak point (Fig. 25f). In 2021, TDS range varied from 44 mg/l to 69.2 mg/l.

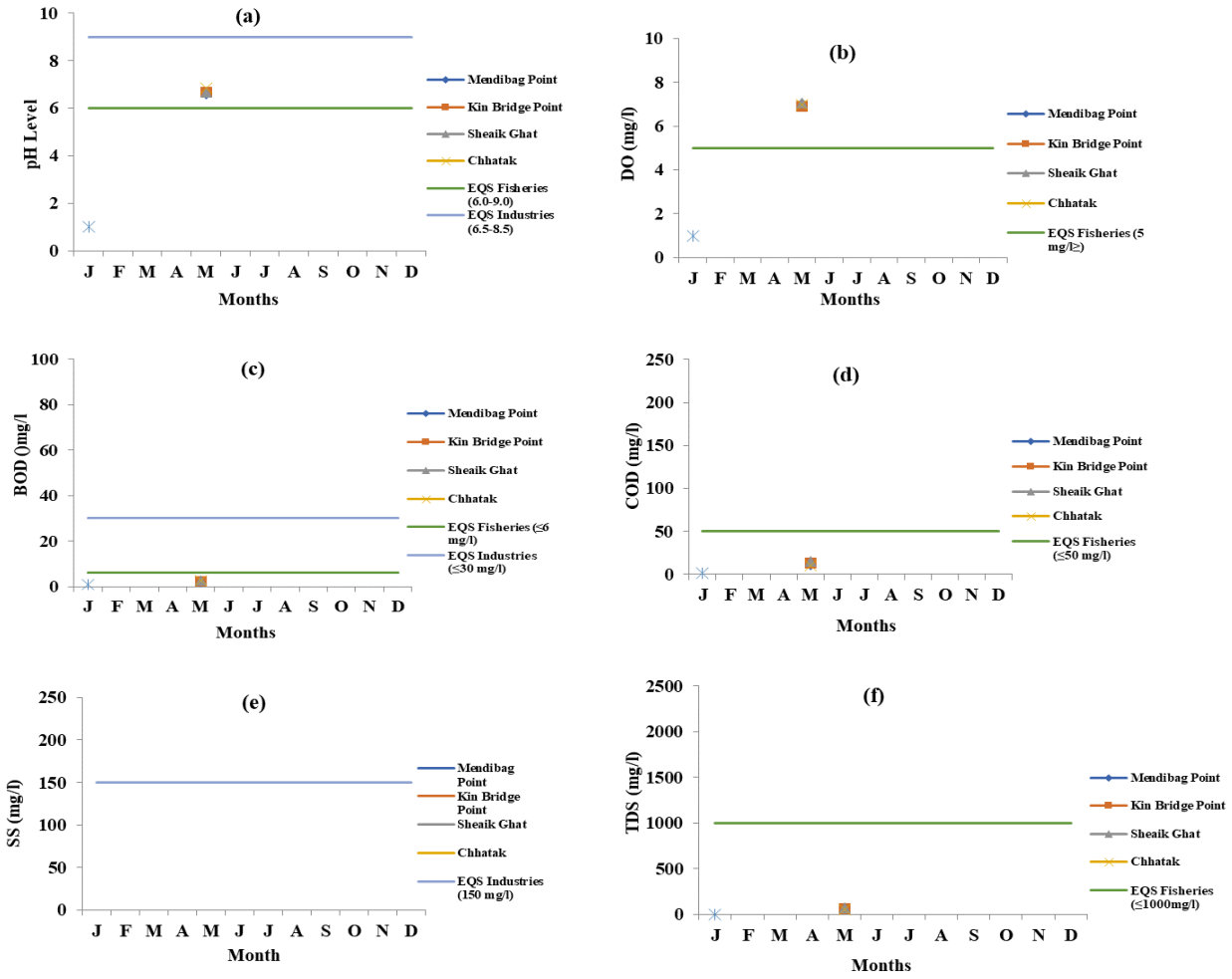

Fig.25. Status of pH, DO, BOD,TDS, SS and COD of Surma River in 2022

4.26 Kushiara River

The Kushiara river is one of the Trans-boundary rivers of Bangladesh. The total length of the Kushiara is about 161 km and width of the river is 250m. During rainy season the mean depth of the Kushiyara reaches upto 10m. Water samples were collected 02 (Two) Locations e.g. Fenchuganj Bridge Point, Fenchuganj Fertilizer Industry Point of the river. Detail data is attached Annex-1 (Table: 171-176).

In 2022, pH of Kushiara river water is within the EQS (6.0-9.0) range for inland surface water. In 2022, the maximum pH was 8.5 and the minimum was 6.89 (Fig. 26a). In 2021, pH range varied from 6.91 to 7.3 mg/l. In 2022, the maximum DO was 7.24 mg/l at Fenchuganj Bridge point and the minimum 3.83 mg/l at Fenchuganj Fertilizer Inds. point (Fig. 26b). In 2021, DO range varied from 6.7 mg/l to 7.3 mg/l. In 2022, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. The maximum BOD was 2.6 mg/l at Fenchuganj Fertilizer Inds. point and the minimum was 2.3 mg/l at Fenchuganj Bridge point (Fig. 26c). In 2021, BOD range varied from 2.5 mg/l to 3.6 mg/l. In 2022, the maximum COD was 15 mg/l at Fenchuganj Bridge point and the minimum was 14 mg/l at Fenchuganj Fertilizer Inds. point (Fig. 26d). In 2022, COD range varied from 15 mg/l to 22 mg/l. In 2022, the maximum SS 62.3 at Fenchuganj Bridge point mg/l and the minimum was 54 mg/l at Fenchuganj Fertilizer Inds. point (Fig. 26e). In 2021, SS range varied from 63 mg/l to 74 mg/l. In 2022, the maximum TDS was 152 mg/l at Fenchuganj Fertilizer Inds. point and the minimum was 63 mg/l at Fenchuganj Bridge point (Fig. 26f). In 2021, TDS range varied from 47 mg/l to 59 mg/l.

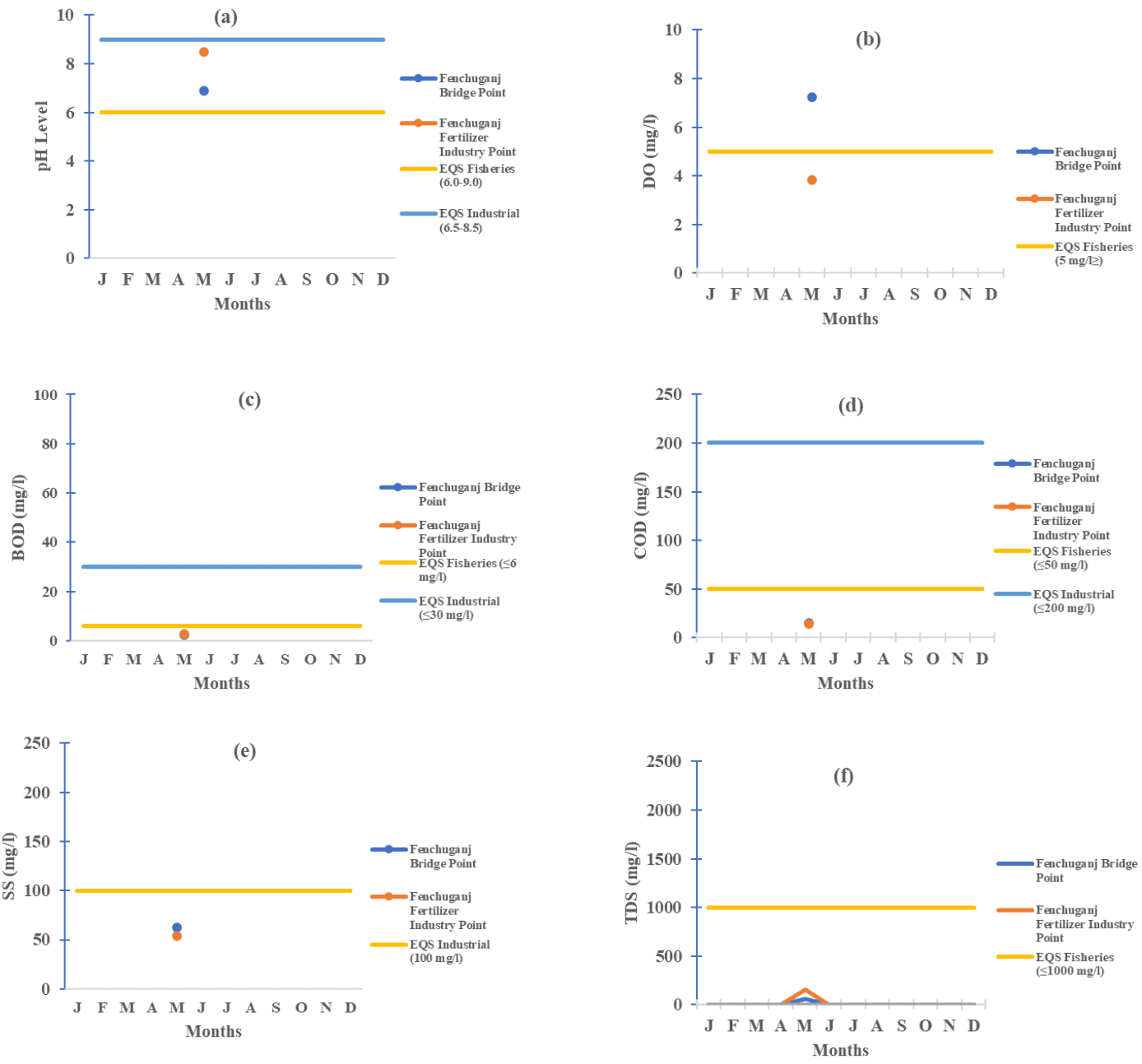

Fig 26. Status of pH, DO, BOD, COD, SS and TDS of Kushiara River in 2022

CHAPTER 5: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF LAKE WATER QUALITY IN 2022

5.1 Water Quality Parameters of Gulshan Lake Water

It is an important urban water body in Dhaka city providing environmental services. However, the lack itself is a victim of environmental pollution. Direct discharge of sewage and dumping of municipal waste into the lake turned it highly polluted. The lake has been declared by the government as "Ecologically Critical Area" in 2001. Water samples were collected from 06 (Six) locations e.g. Near United Hospital, Kalachadpur (N.U.H, Kcp.), Near Housing, South Bridge (N.H.S.B.), Near Lake View Clinic (N.L.V.C.), North Side Gulshan Baridhara Lake (N.S.G.B.L), Taltola Shooting Complex, South Side (T.S.C.S.S), South Side Gulshan Baridhara Lake (S.S.G.B.L) of the lake in 2022 for analysis of water quality. Detail data is attached Annex-2 (Table: 177-186).

In 2022, pH of Gulshan Lake water varied from 7.01 to7.73 (Fig. 30a). In 2019, pH range varied from 6.69 to 9.35. In 2022, DO of Gulshan Lake water varied from 0.12 to 10.26 mg/l (Fig. 30b). In 2019, DO range varied from 0.4 mg/l to 18.8 mg/l. In 2022, BOD of Gulshan Lake water varied from 16 to 45 mg/l (Fig. 30c). In 2019, BOD range varied from 12 mg/l to 48 mg/l. In 2022, the maximum COD 343 mg/l and the minimum COD 49 mg/l (Fig. 30d). In 2019, COD range varied from 19 mg/l to 194 mg/l. In 2022, TDS of Gulshan Lake water varied from 41 to 315 mg/l. (Fig. 30e). In 2019, TDS range varied from 94.7 to 333 mg/l. In 2022, Turbidity of Gulshan Lake water varied from 22.2 to 208 NTU (Fig. 30f). In 2019, Turbidity range varied from 13.1 to 77.1 NTU. In 2022, Chloride of Gulshan Lake water varied from 38 to 48 mg/l (Fig. 30g). In 2019, Chloride range varied from 17 to 48 mg/l. In 2022, the maximum SS was 253 mg/l and the minimum SS was 64 mg/l (Fig. 30h). In 2019, SS range varied from 36 mg/l to 441.1 mg/l. In 2022, Total Alkalinity of Gulshan Lake water varied from 156 mg/l to 224 mg/l (Fig. 30i). In 2019, Total Alkalinity range varied from 112 mg/l to 352 mg/l. In 2022, the maximum EC was 561 µmohos/cm and the minimum EC was 387 µmohos/cm (Fig. 30j). In 2019, EC range varied from 230 µmohos/cm to 638 µmohos/cm.

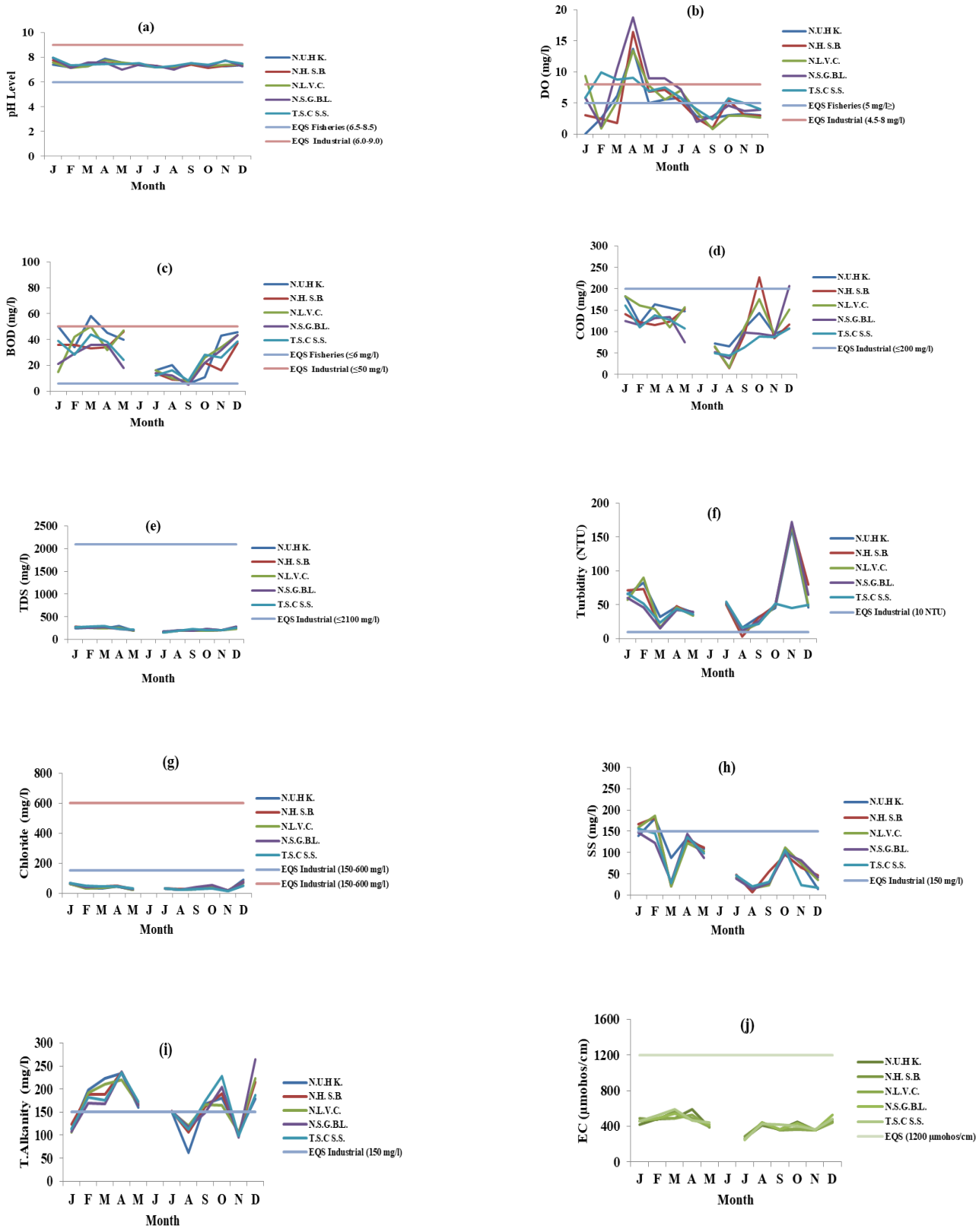

Fig 30. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Gulshan Lake in 2022

5.2 Water Quality Parameters of Dhanmondi Lake

Dhanmondi Lake is in the Dhanmondi residential area in Dhaka, Bangladesh. The lake was originally a dead channel and was connected to the Turag River. The lake is partially connected with the Begunbari Canal. In 1956, Dhanmondi was developed as a residential area. In the development plan, about 16% of the total area of Dhanmondi was designated for the lake. The lake has become a well visited tourist spot, with cultural hubs such as the Rabindra-Sarobar located along its side. Detail data is attached Annex-2 (Table: 187-196).

Water samples were collected from 04 (Four) locations e.g. 8 No. Road Bridge (8 N.R.B), Near Gigatola Pilkhana More (N.G.P.M), Dhanmondi Lake near Road No 28 at the end of Lake (N.D-R.No-28), Dhanmondi Lake near Bridge Road No 32 (N.D.R.N-32) of the lake in 2022 for analysis of water quality.

In 2022, pH level of Dhanmondi Lake water was within the EQS (6.0-9.0) for fisheries. It varied from 7.19 to 7.68 (Fig. 31a). In 2019, pH range varied from 6.87 to 8.3. In 2022, DO was varied from 1.5 to 7.14 mg/l (Fig. 31b). In 2019, DO range varied from 2.2 to 12.4 mg/l. In 2022, BOD was varied from 1.4 to 8.0 mg/l (Fig. 31c). In 2019, BOD range varied from 2.8 to 29 mg/l. In 2022, COD was varied from 10 to 76 mg/l COD was within the EQS (Fig. 31d). In 2019, COD range varied from 7 to 79 mg/l. In 2022, TDS was varied from 121.7 to 201 mg/l and was within the EQS (Fig. 31e). In 2019, TDS range varied from 90.4 mg/l to 330 mg/l. In 2022, Turbidity was varied from 1.5 to 70 NTU (Fig. 31f). In 2019, Turbidity was varied from 3 to 68 NTU. In 2022, Chloride was varied from 24 to 56 mg/l and was within the EQS (Fig. 31g). In 2019, Chloride was varied from 5.5 to 49 mg/l. In 2022, SS was varied from 5.0 to 67 mg/l and was within the EQS (Fig. 31h). In 2019, SS was varied from 5 to 180 mg/l. In 2022, Total Alkalinity was within the EQS (150 mg/l) and varied from 86 to 114 mg/l (Fig. 31i). In 2019, Total Alkalinity varied from 15 to 304 mg/l. In 2022, EC was within the EQS (1200 µmohos/cm) limit and it was varied 222 to 311 µmohos/cm (Fig. 31j). In 2019, EC was varied µmohos/cm 7.91 to 639 µmohos/cm.

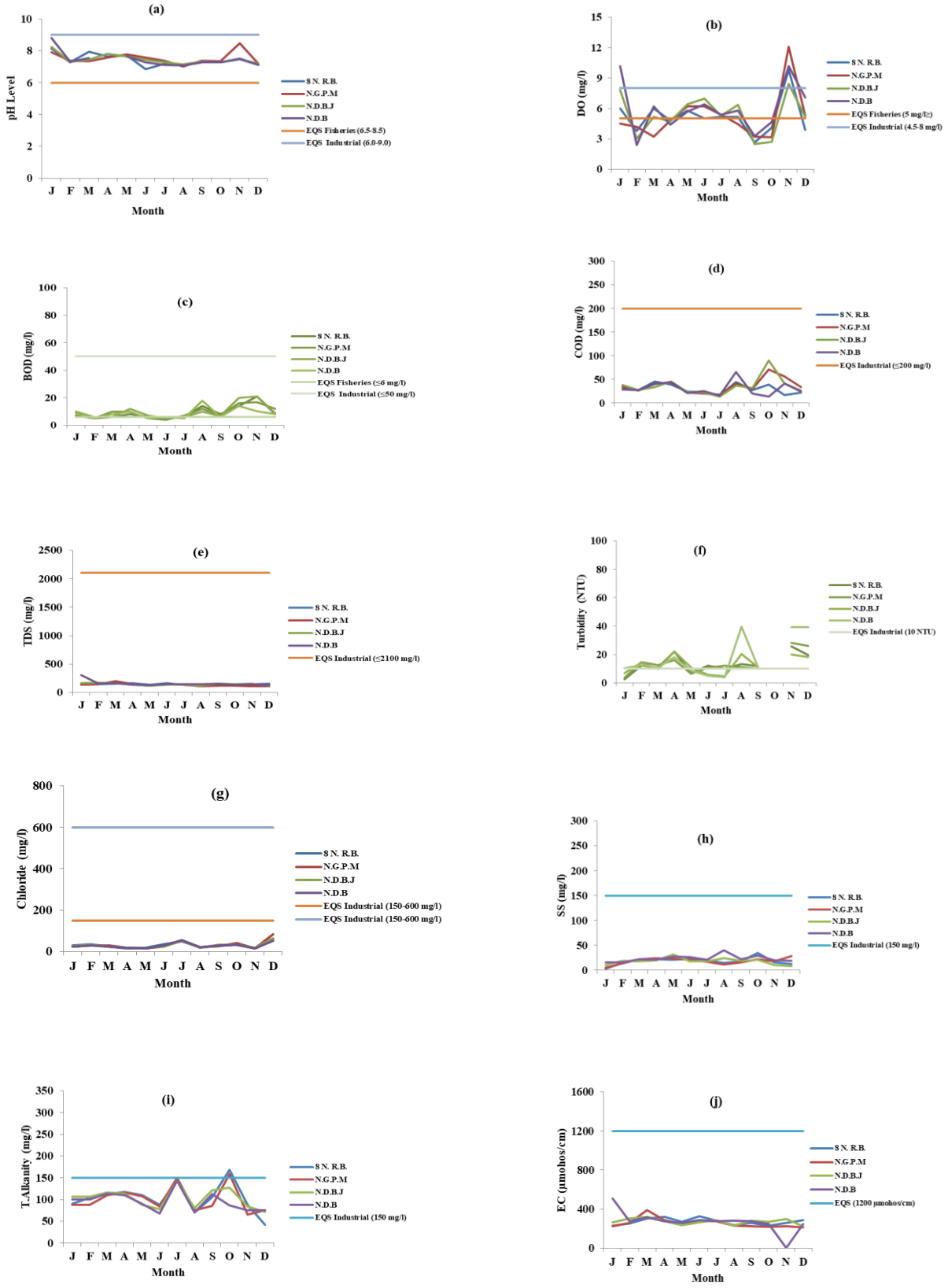

Fig 31. Status of pH, DO, BOD, COD, TDS, Turbidity , Chloride, SS, T. Alkalinity and EC of Dhamnondi Lake in 2022

5.3 Water Quality Parameters of Hatir-Jheel Lake

Hatir-Jheel is a lake front in Dhaka, Bangladesh that has been transformed into a transportation medium for minimizing traffic congestion. It is now a popular recreational spot for residents of Dhaka. Hatir Jheel, the new projects of beautification Dhaka city. It has already become an attractive location to visit in Dhaka City.

Hatirjheel is located at the centre of the capital city, Dhaka. It has latitude of 23.7495747 and a longitude of 90.3967635. In other words, the Hatirjheel has a coordinate of 23°44′58.47″N 90°23′48.35″E. The area stretches from Sonargaon Hotel in the south to all the way to Banasree in the north. The place is surrounded by Tejgaon, Gulshan, Badda, Rampura, Banasree, Niketon, and Maghbazar, and it made the transportation of the people living near these areas much easier.

Direct discharge of sewage, municipal waste and industrial effluent cause water pollution in the lake. Water samples were collected from 03 (Three) locations e.g. Badda-Gulshan Link Road Bridge (B.G.L.R), FDC More Bridge, (FDC M.B.), Raampura Bridge of the lake in 2022 for analysis of water quality. Detail data is attached Annex-2 (Table: 197-206).

In 2022, pH level of Hatir Jheel Lake water was within the EQS (6.0-9.0) for fisheries. It varied from 7.3 to 7.92 (Fig.32a). In 2019, pH level varied from 6.87 to 7.86. In 2022, DO was varied from 1.5 to 5.5 mg/l (Fig.32b). In 2019, DO was varied from 0.4 to 16.4 mg/l. In 2022, BOD was varied from 21 to 32 mg/l (Fig.32c). In 2019, BOD was varied from 6 to 66 mg/l. In 2022, COD of Hatir Jheel water varied from 39 to 117 mg/l (Fig.32d). In 2019, COD of Hatir Jheel water varied from 18 to 201 mg/l. In 2022, TDS was varied from 150 to 335 mg/l (Fig.32e). In 2019, TDS was varied from 47 to 444 mg/l. In 2022, Turbidity was varied from 8.3 to 165 NTU and was above the EQS (Fig.32f). In 2019, Turbidity was varied from 6.11 to 160 NTU. In 2022, Chloride of Hatir Jheel Lake water varied from 44 to 66 mg/l (Fig.32g). In 2019, Chloride of Hatir Jheel Lake water varied from 7 to 65 mg/l. In 2022, SS was varied from 11 to 158 mg/l (Fig.32h). In 2019, SS was varied from 21 to 367 mg/l. In 2022, Total Alkalinity was above the EQS (150 mg/l) and varied from 150 to 226 mg/l (Fig. 32i). In 2019, Total Alkalinity varied from 129 to 352 mg/l. In 2022, EC was within the EQS (1200 µmohos/cm) limit and it varied from 426 to 597 µmohos/cm (Fig. 32j). In 2019, EC varied from 288 to 855 µmohos/cm.

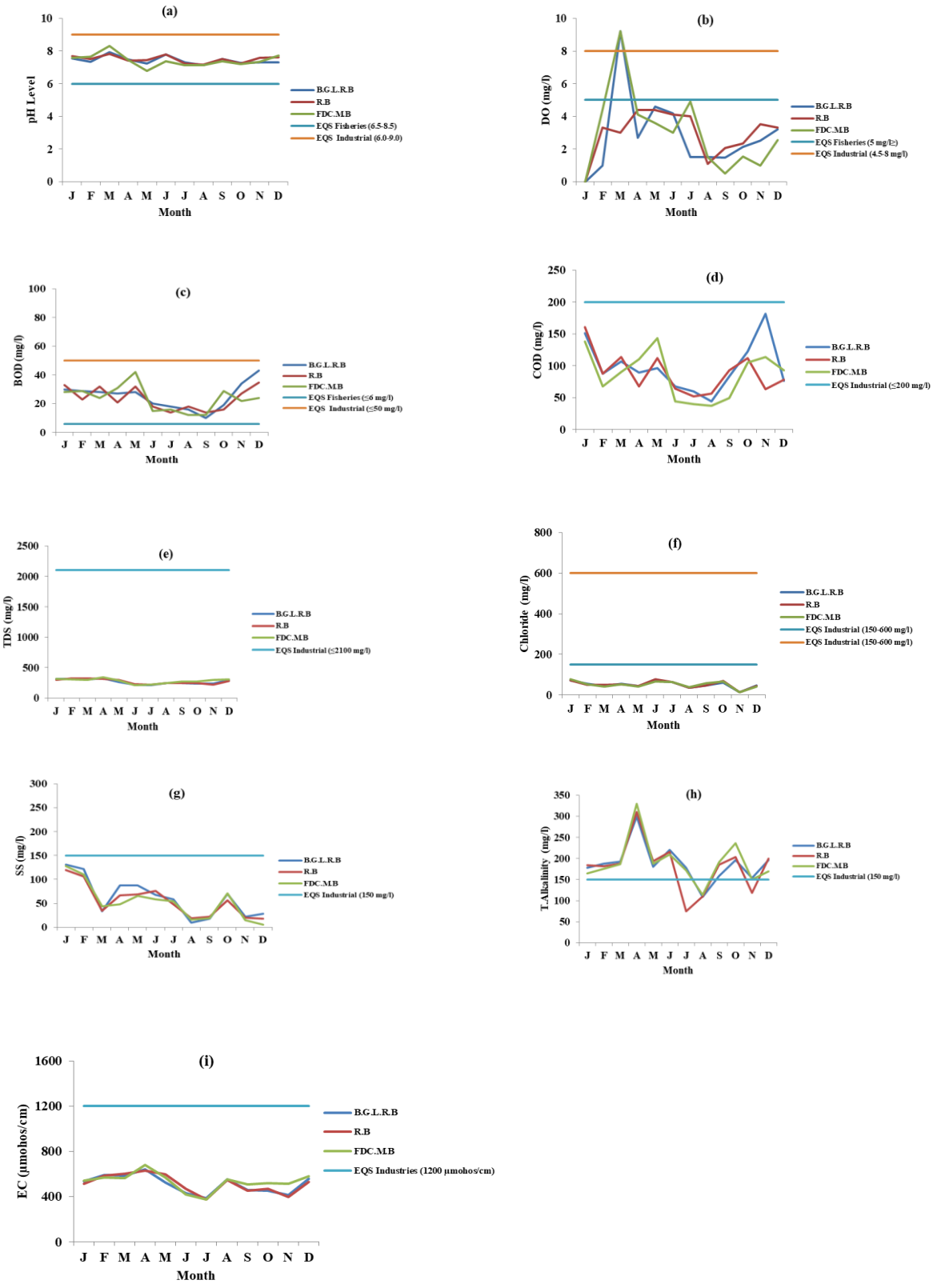

Fig 32. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Hatir Jheel Lake in 2022

CHAPTER 6: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF GROUND WATER QUALITY IN 2022

6.1 Water Quality Parameters of Ground Water in Barisal District

Barisal is a major city that lies on the bank of kirtankhola river in south-central Bangladesh. It is one of the oldest municipalities and river ports of the country. For monitoring ground water quality, samples were collected from 68 (Sixty Eight) different locations viz. Bat-ttala Bazar, Chowmatha Bazar, Rupatoly Bus Stand, Nathullabad Bus Stand, Barishal City College, Barishal Central Jail, Barishal Zila School, B.M College, Amrita Lal Dey College, Hatem Ali college, B.M. School, Sher-E-Bangla Medical College, Sadar Hospital, Upazila Office, DC Office, Khabar Bari Resturent, Bikrompur Mistanno Vander, Sriguru Mistanno Vander, Ritika Satkhira Mistanno Vander, Barishal Patuakhali Bus Stand, Jom Jom Nursing Institute, Jom Jom Diagnostic Center, Kacha Bazar, Ucco Madhomic Sikkha Board, I.T Vobon, Bivgio Pasport Office, Kali matar Mondir, Zia sarak, Humuhu Resturant, Nagar Bhaban, Dakghor, Agroni Bank Limited, Upozila Setelment Office, Upozila Vumi Office, Zila Parishad, Bivagio Zadughar, Dak Bangla, Akash Hotel, Rosh malai Hotel & Resturant, Fire Service & Civil Defence, Ghos Mistanno Vandar, Bivagio George Cort, 19 No Word, Notun Bazar, Lakutiya Sarak Notun Bazar, Sorkari Grhonthagar, Sri Sri Radha Shamshundar Mondir, Kostori Restora, Tempu Stand, Mach Bazar, Ziya Sarak, Monosa Bari Goli, Brance Road, Clab Road, Kobi Kazi Nazrul Islam Sarak, Iscon Mondir, Bon Adhidoptor, Cams, Chemist Laboratory. Detail data is attached Annex-3 (Table: 207-210). Data was not available the month of January to April and November.

In 2022, pH level of Barisal district ground water was within EQS (6.5-8.5). It varied from 6.53 to 9.33 (Fig.34a). In 2019, pH was varied from 7.12 to 7.51. In 2022, EC was within the EQS (1200 µmohos/cm) limit and it varied from 87 to 1434 µmohos/cm (Fig.34b). In 2019, EC was varied from 325 to 416 µmohos/cm. In 2022, TDS level of Barisal district ground water was within EQS (1000 mg/l). It varied from 227 mg/l to 721 mg/l (Fig.34c). In 2019, TDS was varied from 168 mg/l to 320 mg/l. In 2022, Iron level of Barisal district ground water was within EQS (0.3-1.0 mg/l). It varied from 0.25 mg/l to 0.5 mg/l (Fig.34d).

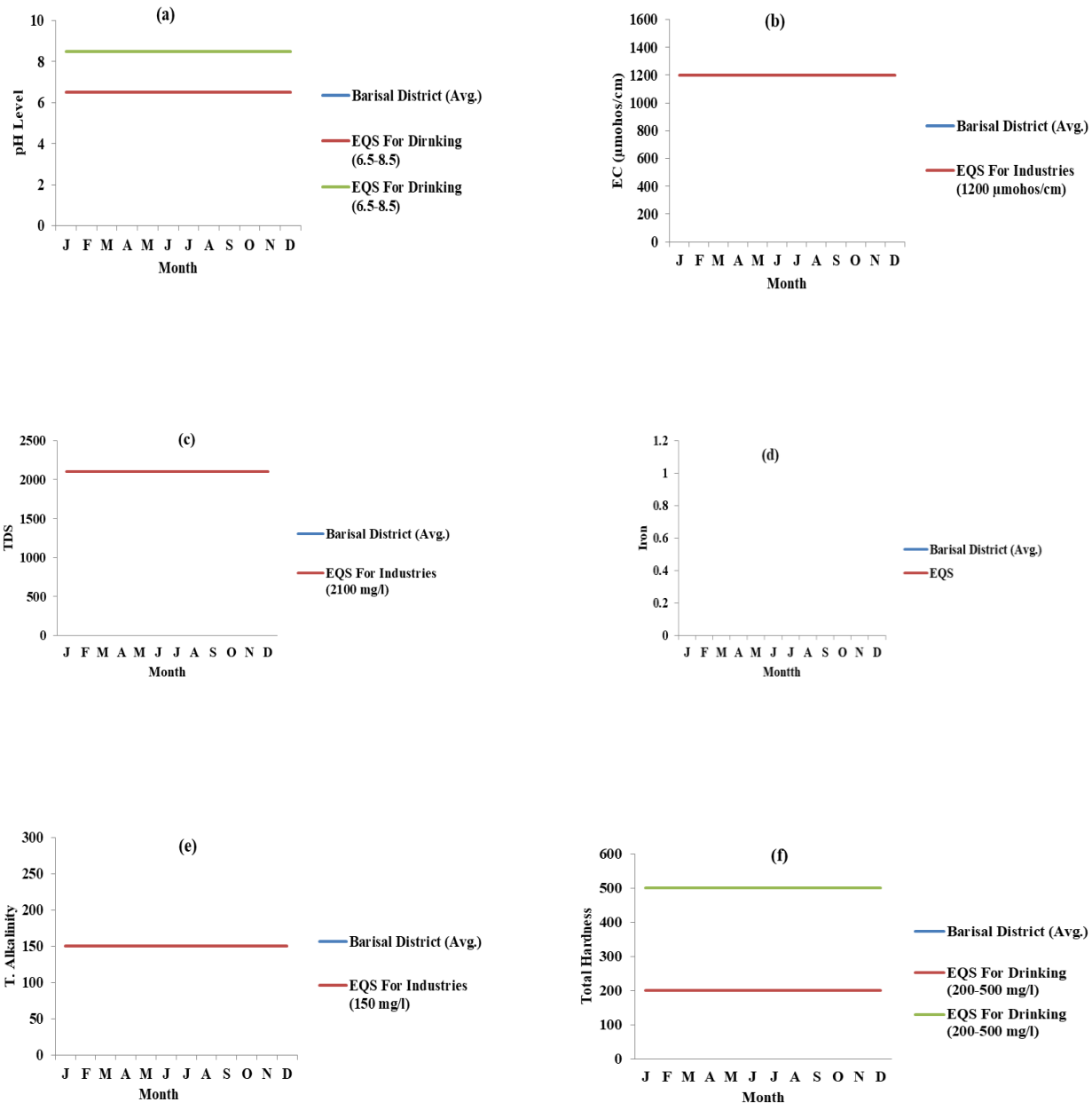

Fig 34. Status of pH, EC, TDS, Iron, T. alkalinity and Total Hardness of Barisal District Area Ground Water in 2022

6.2 Water Quality Parameters of Ground Water in Bogura District

Bogura district is a northern district of Bangladesh in the Rajshahi division. It is called the gateway to north bangal. Bogura is an industrial city where many small and mid-sized industries are sited. For monitoring ground water quality, samples were collected from 10 (Ten) different locations viz. Bogra Zilla School, Head Post Office, Commercial College, Zilla Parishad, Office of the Duputy Commissioner, Office of the Bogra Municipality, VM School, Sadar, T & T Office, Biddut Office, Bogra Sadar Thana. Data was available in the months of August and October. Detail data is attached Annex-3 (Table: 211-215).

In 2022, pH level of Bogura district ground water was within EQS (6.5-8.5) for drinking water. In 2022, It varied from 7.22 to 7.74 (Fig. 35a). In 2019, pH was varied from 7.21 to 7.78. In 2022, EC was within the EQS (1200 µmohos/cm) limit and it varied from 320 to 424 µmohos/cm (Fig. 35b). In 2019, EC was varied from 320 µmohos/cm to 422 µmohos/cm. In 2022, Iron was within the EQS (0.3-1.0 mg/l) and it varied from 0.26 to 0.42 mg/l (Fig. 35c). In 2019, Iron was varied from 0.26 to 0.42 mg/l. In 2022, Total Alkalinity was also within the EQS (150 mg/l) and varied from 26 to 34 mg/l (Fig. 35d). In 2019, Total Alkalinity was varied from 26 mg/l to 34 mg/l. In 2022, Total Hardness varied from 200 to 240 mg/l while EQS for Total Hardness (200-500 mg/l) (Fig. 35e). In 2019, Total Hardness was varied from 200 mg/l to 240 mg/l.

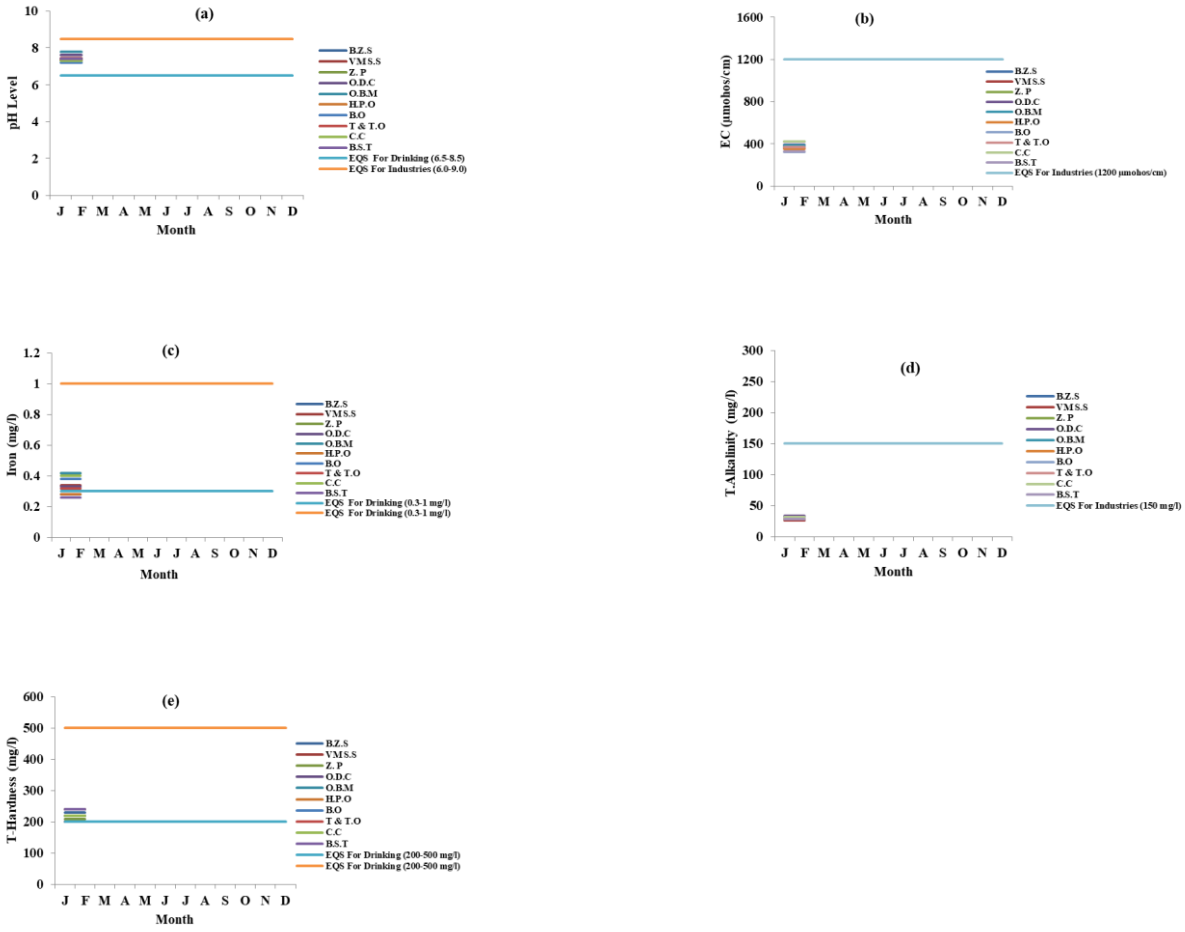

Fig 35. Status of pH, EC, Chloride, Iron, T. alkalinity and T.Hardness of Bogura District Area Ground Water in 2022

6.4 Different Water Quality Parameters of Ground Water in Sylhet District

Sylhet is the northeastern division of Bangladesh. For monitoring ground water quality, samples were collected from 05 (Five) different locations viz. Agrogami Girls High School, Durgakumar Govt. Primary School, Lalbazar-Bondorbazar, MC College-Tilagor, Kadamtoli Bus Terminal. Data was not available in the months of August and November. Detail data is attached Annex-3 (Table: 216-220).

In 2022, pH level of Sylhet district ground water is within EQS (6.5-8.5). In 2022, the maximum pH was 7.2 and the minimum was 7.01 (Fig.36a). In 2019, pH was varied from 6.9 to 7.8. In 2022, EC was within the EQS (1200 µmohos/cm) limit and it varied from 262 to 312 µmohos/cm (Fig.36b). In 2019, EC was varied from 72 µmohos/cm to 200 µmohos/cm. In 2022, Chloride was within the EQS (150-600 mg/l) and it varied from 9 to 14 mg/l (Fig.36c). In 2019, Chloride was varied from 12 to 25 mg/l. In 2022, T. Alkalinity varied from 10 to 15 mg/l (Fig.36d). In 2019, T. Alkalinity was varied from 25 to 98 mg/l. In 2022, Iron was within the EQS (150 mg/l) and it varied from 0.29 to 0.58 mg/l (Fig.36e). In 2019, Iron was varied from 0.1 mg/l to 1.07 mg/l.

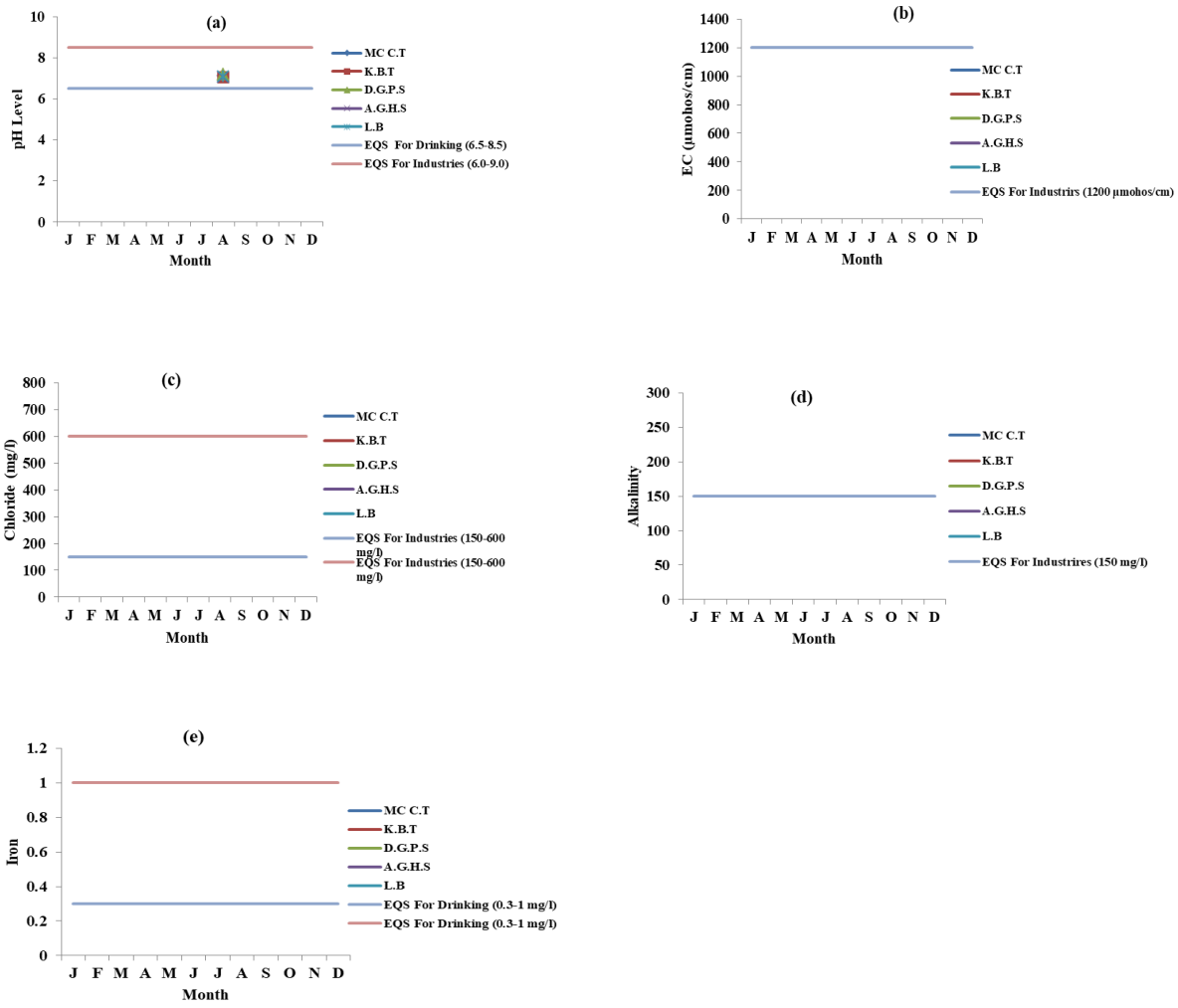

Fig 36. Status of pH, EC, Chloride, T. alkalinity and Iron of Sylhet District Area Ground Water in 2022

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

In Bangladesh, sewage and solid waste & industrial waste & effluents are the main cause of surface water pollution. Industrial pollutants are the major cause of surface water pollution in the urban region in Bangladesh. The present investigation demonstrates that most of the water bodies in Bangladesh are contaminated with several contaminants and not suitable for human consumption without proper treatment. Besides heavy metal contamination, pesticide contamination of surface water sources is the most prospective menace for the people of Bangladesh. An impact of seasonal variation of flow, industrialization and urbanization has been assumed to be responsible for poor water quality for the rivers around Dhaka city, Chattagram and Khulna city. Spatial and temporal variation in water quality has been evident from the data analysis. Ninety percent of surface water flows through the 57 transboundary rivers. Low rainfall and upstream intake of water by the neighboring countries reduces the flow of water in dry season. During monsoon water quality of most monitoring stations was improved, when compared to the Environmental Quality Standard (EQS) set in the ECR, 1997. High density of industries, poor solid waste management by the City Corporations and untreated liquid wastes including sewage are assumed to be responsible for poor quality water quality of rivers around Dhaka city, Chattagram and Khulna city. The difference in pollution level among the sampling points along a single river was also evident because of urbanization.

Long dry period and reduced upstream flow are the proximate causes of high salinity of surface water in southern region. Soil erosion from catchment area, dumping of solid wastes into rivers are the main causes of high turbidity. Salinity level reduces near to EQS during wet season. Summer rainfall and increased flow from upstream are proximate causes of salinity decrease. High salinity together with high turbidity are making river ecosystem in the southern region fragile. Salinity level of rivers in southern Bangladesh greatly increases during dry season.

Despite discontinuous sampling and measurement of a few parameters, this report provides important indication of pollution level of surface and ground water of the country. Due to limited time and restricted budget the trend analysis has been limited to certain parameters and a few rivers. Still, the report can be used as a basis for identifying the reasons of pollution and developing sustainable water resource management plans.

This report also tries to give an overview on the up-to-date information of surface water, ground water lake water and sea water, what should be monitored to assess the status of river pollution in Bangladesh. Thus, the report also discusses the role and activities of concerned ministry, departments, research organizations and on their ongoing activities, program, and projects related to environment and biodiversity conservation, linkage to other regional and international organizations.

7.2 Recommendations

To provide with useful information for policy feedback a continuous monitoring of a comprehensive set of parameters is essential. The following actions are recommended to avail comprehensive data sets:

a. Review and updating of surface water monitoring network is essential. Pollution hot-spots could be identified and monitoring stations should include those hotspots.
b. More rivers can be included in the monitoring programme;
c. Other wetlands such as hopes and baor could be included;
d. Introduction of online water quality monitoring system is essential to avoid the discontinuity of data.
e. For each river, sampling must be done from more than one location. Collection of water samples and analyses must be in a consistent way and on regular basis for assessment of water quality.
f. Monitoring of ETP outlets of major industrial zones should be intensified and data should be collected more frequently.
g. Biological indicators should be included in the monitoring programme.
h. Weather information could be collected while sampling.
i. Use of Global Positioning System (GPS) to represent monitoring results in global context is essential.
j. Enforcement programme should be increased to stop all illegal discharges to surface water.
k. Existing parameters should be revisited and new parameters should be included for a comprehensive groundwater monitoring.
l. For the sustainable management of trans-boundary rivers and to increase river flow during dry season strengthening regional cooperation is essential and Integrated Watershed Management (IWM) approach can be implemented in this regard.
m. Programmes could be initiated to develop River Health Card and establish Water Quality Index (WQI) for each river to guide the policy makers.
n. Take a comprehensive assessment of water management issues, participate in learning processes and exchange knowledge and information on better water management practices.
o. River conservation program have direct linkage with coastal habitat conservation. However, very little efforts have been made at linking river conservation program with coastal conservation activities. A comprehensive approach to river conservation in terms of land use planning, scientific urban management, industrial sitting, transportation of chemicals, and discharge of effluents needs to be adopted.
p. To initiate program for spreading awareness about scarcity of water and introduce better management practices in agriculture, urban and industrial use.
q. Increase skilled manpower at all level of water quality analysis including sample collection.
r. To take immediate measures to develop legislation for regulating with-drawl of ground water on a sustainable basis.

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Annex-1: List of Tables for Different Parameters of River Water

1.0 Buriganga River (Table: 1-10)

Table-1. Level of pH of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	7.26	7.52	7.56	7.48	6.59	7.05	6.41	7.3	7.13	7.97	7.5	7.34
Bosila Bridge	7.26	7.61	7.77	7.56	6.53	6.89	6.64	7.26	7.14	7.48	7.29	7.52
Hajaribag	7.46	7.47	7.74	7.74	6.83	6.9	6.64	7.26	7.14	7.74	7.28	7.32
Satmosjid Road	7.0	7.51	7.65	7.65	6.81	6.77	6.71	7.13	7.11	6.96	7.22	7.28
Chadnighat	7.31	7.56	7.6	7.6	6.77	6.79	6.8	7.08	7.03	7.06	7.06	7.38
Bangladesg China Friendship Bridge	7.32	7.52	7.54	7.54	6.8	6.89	6.85	7.12	7.01	6.91	7.07	7.39
Fatullah	7.32	7.64	7.69	7.69	6.76	7.02	6.71	7.16	7.04	7.01	7.31	7.39
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-2. Level of DO (mg/l) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	1.4	1.1	0.2	0.2	0.89	5.24	5.3	5.52	5.3	5.4	4.2	2.4
Bosila Bridge	1.9	0.6	0.13	0.1	3.02	2.9	5.57	5.16	5.1	5.2	4.1	1.2
Hajaribag	2.4	0.8	0.24	0.3	1.17	5.71	5.65	5.35	5.16	5.6	3.9	1.2
Satmosjid Road	1.2	1.3	0.17	0.1	0.36	2.18	5.21	5.27	5.2	3.7	3.2	1.2
Chadnighat	1.8	0.4	0.12	0.2	0.93	3.46	5.72	3.46	5.45	2.5	0.2	1.8
Bangladesg China Friendship Bridge	4.2	0.7	0.2	0.3	2.93	3.95	6.26	3.52	5	1.4	0.3	3.2
Fatullah	1.9	1.8	0.16	0.2	1.79	3.36	5.05	4.3	5	3	3	1.8
EQS Fisheries (5 mg/l≥)												

Table-3. Level of BOD (mg/l) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	18	26	26	36	8	6.2	6.4	10	8	6.2	8	10.8
Bosila Bridge	16	22	24	34	6	6.2	6.2	6.4	8.2	6.4	8.2	10.4
Hajaribag	18	28	15	26	8	6.8	6.2	10	10	6.8	8.4	10.4
Satmosjid Road	16	20	28	38	10	6.2	6.4	10	10	6.2	8.6	10.2
Chadnighat	18	22	28	38	6	6.4	6.4	6.2	12	6.2	8.4	10.2
Bangladesg China Friendship Bridge	16	24	31	42	6	6.2	6.2	6.4	12	6.4	8	12.8
Fatullah	16	22	26	38	6	6.2	6.2	6.4	8	6.4	8.2	12.6
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-4. Level of COD (mg/l) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	56	68	73	83	27	27	20	46	54	36	90	92
Bosila Bridge	93	52	54	64	22	32	22	12	68	22	22	44
Hajaribag	66	90	110	120	27	39	18	51	93	48	24	68
Satmosjid Road	60	95	115	126	46	27	20	27	85	27	22	60
Chadnighat	68	68	73	84	14	29	18	12	73	20	54	42
Bangladesg China Friendship Bridge	70	66	71	81	17	22	20	12	34	27	61	56
Fatullah	72	70	100	110	27	24	22	10	15	20	28	28
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-5. Level of TDS (mg/l) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	379	471	594	697	206	78	81	75	78	80.8	82.4	214
Bosila Bridge	378	471	543	634	171	88.4	136	77	78	83.8	84	230
Hajaribag	362	534	558	704	171	110	108	76	81	78.8	86.8	384
Satmosjid Road	531	488	555	690	214	88	84	87	81	85.6	90.7	368
Chadnighat	365	454	559	700	178	86	91	90	89	99.6	134.7	236
Bangladesg China Friendship Bridge	336	444	533	695	185	93	89	92	86	112	124.3	233
Fatullah	358	425	549	656	188	109	160	84	87	86.8	95.4	241
EQS Fisheries (≤1000 mg/l)												

Table-6. Level of Turbidiy (NTU) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	65.7	56	47.8	48	18	72.5	41.6	38.3	51.4	34.2	29.7	48
Bosila Bridge	51.3	24	18.9	20	16	50.5	39.7	32.2	42.7	34.2	30.1	57
Hajaribag	24.1	54	82	124	22.2	41.2	26.5	100.2	53.1	35	21.9	145
Satmosjid Road	86.9	67	78	112	21.4	27.6	31.2	36.3	43	32.6	26.2	158
Chadnighat	44.3	29	66.9	68	12	45.6	22.4	22.4	36.1	25.4	28.9	52
Bangladesg China Friendship Bridge	45	19	17.7	20.2	10.3	29.8	32.2	22.6	33	28.1	13.5	55
Fatullah	34.5	46	25.7	26.1	13.1	34.6	33	28.6	26.8	34.2	25.2	65
EQS Industrial (10 NTU)												

Table-7. Level of Chloride (mg/l) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	60	68	80	80	75	7.5	6.5	5.6	7.6	5.5	6	28
Bosila Bridge	59	64	85	80	71	8.5	13.5	6.8	6.2	5	5	30
Hajaribag	52	71	79	78	62	9	17.5	6	8	4.5	7	55
Satmosjid Road	88	70	100	84	68	12	9	8	10	7.5	8	46
Chadnighat	55	59	83	82	52	10	9	8.4	11.5	9.5	12	30
Bangladesg China Friendship Bridge	51	61	83	83	56	9.5	7.5	72	12	11	12	30
Fatullah	53	56	90	86	55	13.5	16	8	10.5	7	10	32
EQS Industrial (150-600 mg/l)												

Table-8. Level of SS (mg/l) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge		80	80	12	59	106		78	60	44	27	39
Bosila Bridge		82	61	80	49	83		38	53	39	32	49
Hajaribag		89	168	164	54	60		141	67	42	24	136
Satmosjid Road		90	204	178	68	62		33	51	27	23	149
Chadnighat		82	154	156	49	82		31	48	32	18	53
Bangladesg China Friendship Bridge		76	86	84	48	62		33	40	39	15	44
Fatullah		82	97	88	53	6		31	38	35	27	56
EQS Industrial (100 mg/l)												

Table-9. Level of Total Alkalinity (mg/l) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	186	204	350	348	112	54	30	30	33	30	31	99
Bosila Bridge	186	204	368	350	102	62	32	32	31	28	32	110
Hajaribag	190	216	302	310	98	68	34	31	33	29	30	221
Satmosjid Road	354	291	300	302	94	52	36	36	34	30	36	186
Chadnighat	199	186	360	344	92	60	35	36	36	33	49	118
Bangladesg China Friendship Bridge	198	184	350	360	88	70	35	32	36	40	43	112
Fatullah	182	182	370	354	124	84	34	34	34	28	38	138
EQS Industrial (10 mg/l)												

Table-10. Level of EC (µmohs/cm) of Buriganga River Water in 2022

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	664	801	1389	1392	482	149	194	154	154	163.8	148	377
Bosila Bridge	659	806	1231	1256	430	170	325	157	151	168.4	149	396
Hajaribag	630	907	1395	1401	419	212	272	155	156	159.3	154	657
Satmosjid Road	915	829	1334	1375	519	168	209	176	158	170.9	161	627
Chadnighat	634	778	1385	1397	427	165	233	183	171	202.5	273	409
Bangladesg China Friendship Bridge	631	759	1369	1388	441	181	220	160	165	224	221	399
Fatullah	620	738	1258	1308	443	211	395	172	171	177	169	418
EQS Industrial (1200 µmohs/cm)												

2.0 Shitalakhya River (Table: 11-19)

Table-11. Level of pH of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	7.72	7.61	7.67	7.11	7.21	7.03	6.64	7.61	7.69	7.18	7.49	7.4
Majhira Demra Ghat	7.34	7.47	7.77	7.72	7.24	7.37	6.34	7.2	7.4	7.23	7.37	7.35
Murapara (Rupganj)	7.4	7.75	7.79	7.8	7.38	7.1	7.34	7.31	7.29	7.04	7.31	7.32
Gorashal Fertilizer	7.16	6.76	7.95	7.25	7.61	7.65	7.47	6.76	7.57	7.47	7.78	7.68
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-12. Level of DO (mg/l) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	1.8	1	0.54	3	2.2	1	3.9	2.85	1.8	3.2	6.5	4
Majhira Demra Ghat	1.2	1.39	0.43	**0**	1.6	1.39	4.6	3.25	5.3	4.2	5.4	2
Murapara (Rupganj)	1.8	4.88	3.21	3	3.4	4.88	5	3.65	4.3	3.8	5.8	4.7
Gorashal Fertilizer	3.4	5	3.23	5	4	5.4	5.2	4.21	6.2	4.9	7.9	4.2
EQS Fisheries (5 mg/l≥)												

Table-13. Level of BOD (mg/l) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	12	24	24	10	4	8	8	8	6	8.6	5.6	6
Majhira Demra Ghat	12	14.4	16	20	6	8	8	10	6	8.4	6.1	8
Murapara (Rupganj)	10	13.2	14	17	4	10	8	8	4	6	3.6	10
Gorashal Fertilizer	8	8.6	14	5	3	4	3	8	4	4	3	4
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-14. Level of COD (mg/l) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	48	32	34	34	27	27	35	42	40	42	14	40
Majhira Demra Ghat	42	78	82	71	24	24	29	58	39	34	17	35
Murapara (Rupganj)	40	37	40	34	15	36	34	37	36	41	27	41
Gorashal Fertilizer	18	20	44	20	10	10	8	22	24	10	10	12
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-15. Level of TDS (mg/l) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	349	329	333	310	134	74	87	112	122	138	122.5	116.2
Majhira Demra Ghat	345	383	389	528	63	52	73	106	81	82	162.9	110.3
Murapara (Rupganj)	320	216	220	349	92	57	72	83.4	90	246	113.2	112
Gorashal Fertilizer	197	135	232	219	179	66	64	65.2	88	96	123.6	114.5
EQS Fisheries (≤1000 mg/l)												

Table-16. Level of Chloride (mg/l) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	41	72.5	73	28	76	16	14	18.9	19	20	12	12
Majhira Demra Ghat	48	109	110	140	74	10	11	12.5	9	9	24	14
Murapara (Rupganj)	42	26	29	95	**76**	11	12	10.5	14	18	35	10
Gorashal Fertilizer	16	22	58	23	72.5	10	43	12.4	10	8	44	16
EQS Industrial (150-600 mg/l)												

Table-17. Level of SS (mg/l) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	42	33	34	40	83	156	42	22	28	25	28	24
Majhira Demra Ghat	54	121	122	109	46	144	30	68	34	43	23	42
Murapara (Rupganj)	50	14	16	22	45	181	35	7	39	97	30	86
Gorashal Fertilizer	18	20	17	12	33	20	19	8	36	35	14	36
EQS Industrial (100 mg/l)												

Table-18. Level of EC (µmohs/cm) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	607	585	590	580	271	149	150	229	235	265	225	228
Majhira Demra Ghat	643	677	680	1007	167	99	147	106	166	157.5	289	216
Murapara (Rupganj)	626	393	397	647	184	160	1138	83.4	176	450	215	214
Gorashal Fertilizer	367	230	457	395	298	130	123	65.2	184	182.5	227	224.2
EQS Industrial (1200 µmohos/cm)												

Table-19. Level of Total Alkalinity (mg/l) of Shitalakhya River Water in 2022

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	94	126	127	104	152	23	14	32	34	37	34	40
Majhira Demra Ghat	32	211	213	320	118	22	11	22	32	31	24	42
Murapara (Rupganj)	54	190	192	229	102	15	12	18	32	37	35	36
Gorashal Fertilizer	81	102	204	178	126	29	43	22	45	40	44	28
EQS Industrial (150 mg/l)												

3.0 Turagh River (Table: 20-28)

Table-20. Level of pH of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	7.52	8.03	7.87	7.86	7.34	8.03	7.06	7.81	7.2	7.54	7.42	7.69
Ashulia	7.34	7.63	7.82	7.83	7.29	7.63	7.12	8.09	7.08	6.88	7.41	7.59
Kaliakoir	7.55	7.62	7.29	7.77	7.41	7.62	7.21	8.47	7.52	7.84	7.02	7.68
Vawal	7.49	7.74	7.79	7.49	7.75	7.04	7.23	7.04	7.32	7.46	6.69	7.02
Nama Bazar	7.49	7.47	7.57	7.52	7.38	7.26	7.22	7.16	7.36	7.54	7.64	7.64
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-21. Level of DO (mg/l) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	1.9	2.12	0.59	1.8	3.2	4.7	3.9	5	4.8	5.2	5.8	6
Ashulia	1.6	0.23	0.21	1.4	5	5.5	3.6	5.4	4.7	5	6.2	5.1
Kaliakoir	4.9	3.68	4.3	1.4	6.8	6	6.4	6.6	6.3	5.8	3.8	8.7
Vawal	3.2	3.9	0.4	3.2	6.1	5.4	5.2	5.2	7.1	6	4.9	6.1
Nama Bazar	2.4	0.28	0.3	5.2	7.2	5.2	5.4	5	7.8	4.9	5.2	5.2
EQS Fisheries (5 mg/l≥)												

Table-22. Level of BOD (mg/l) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	12	28	12	24	8	6	8	10	8	12	3	5.4
Ashulia	14	32	12	26	32	6	8.2	8	4	10	3	3.4
Kaliakoir	8	12	6	6	5	6	8.2	8	8	4	6	3.2
Vawal	8	14	4	4	3	4	8.2	8	4	2	4	2.2
Nama Bazar	16	34	12	12	9	6	8.2	8	8	7	3	3.2
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-23. Level of COD (mg/l) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	46	58	64	68	31	27	34	76	44	60	14	22
Ashulia	48	72	68	72	92	18	32	17	40	63	10	12
Kaliakoir	18	36	40	46	56	26	48	15	97	10	22	24
Vawal	39	32	38	42	10	12	32	71	39	17	10	30
Nama Bazar	61	44	38	44	34	22	12	58	73	15	10	10
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-24. Level of TDS (mg/l) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	369	652	815	356	72	652	78	75.1	84	74.7	82	145.9
Ashulia	394	641	837	367	88	641	80	86	80	74.7	77.5	148.4
Kaliakoir	177	257	375	517	51	257	144	65.9	64	67.6	64.2	124.6
Vawal	299	623	819	299	92	67	64	64.9	67	76.2	334	313
Nama Bazar	373	683	688	105.2	61	65	114	63.4	68	90.6	79.9	156.4
EQS Industrial (≤2100 mg/l)												

Table-25. Level of Chloride (mg/l) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	23	91.5	106	22	53	91.5	10	8	5.5	10	9	9
Ashulia	24	90	6	21	50	90	12	9	5.2	4	4	10
Kaliakoir	12	31	36	78	11	31	28	3	4	17	17	8
Vawal	20	82.5	83	20	36	20	28	7.5	3	9	11	10
Nama Bazar	21	104.5	16	13	45	18	30	7.5	4	6	6	11
EQS Industrial (150-600 mg/l)												

Table-26. Level of SS (mg/l) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	56	74	56	52	78	83	72	56	62	50.8	22	5
Ashulia	32	98	140	30	234	137	62	54	58	52	12	16
Kaliakoir	15	9	16	18	288	318	163	168	325	229	113	28
Vawal	38	22	76	38	144	139	138	81	229	63	49	13
Nama Bazar	34	69	70	87	372	148	140	126	192	235	82	19
EQS for Industrial Discharge (100 mg/l)												

Table-27. Level of EC (µmohs/cm) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	649	1161	1839	749	139	1161	159	148.9	171	185	159.8	274
Ashulia	699	1134	1847	706	172	1134	149	170.2	121	136.4	141.3	280
Kaliakoir	320	464	664	996	100	464	287	130.2	134	124.9	116.4	214.7
Vawal	532	1110	1554	532	172	119	126	128.2	134	141.4	669	544
Nama Bazar	653	1197	1199	192	125	116	224	124.4	133	195.6	150.5	296
EQS for Industrial Discharge (1200 µmohos/cm)												

Table-28. Level of Total Alkalinity (mg/l) of Turagh River Water in 2022

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	180	264	400	180	125	264	28	27	24	67.6	27	93
Ashulia	164	253	340	162	114	253	24	30	23	28	29	90
Kaliakoir	102	169	356	262	49	169	28	20	31	32	22	90
Vawal	106	186	321	106	81	82	26	25	32	30	39	36
Nama Bazar	184	267	296	64	70	72	30	25	26	29	28	95
EQS for Industrial Discharge (150 mg/l)												

4.0 Balu River (Table: 29-38)

Table-29. Level of pH of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	6.82	7.14	7.07	6.82	7.1	6.99	7.02	7.14	7.16	7.46	7.25	7.22
Jolshiri Abason	7.13	7.34	7.1	7.13	7.21	7.34	7.62	6.86	6.5	7.16	7.52	7.26
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-30. Level of DO (mg/l) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	0	1.26	2.18	0	0	2.7	2.3	1.2	1	0.4	0.1	0.1
Jolshiri Abason	0.43	1.87	3.35	0.83	2	2.2	2.4	2.24	4.9	2	8	2.1
EQS Fisheries (5 mg/l≥)												

Table-31. Level of BOD (mg/l) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	28	74.4	44	30	14	10	22	8.4	30	22	6	88.5
Jolshiri Abason	22	14.4	32	22	12	18	24	8.2	10	6	3	5.4
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-32. Level of COD (mg/l) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	117	120	93	117	56	28	95	22	61	53	90	222
Jolshiri Abason	80	44	137	80	73	90	127	18	51	10	12	39
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-33. Level of TDS (mg/l) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	180	470	443	180	282	107	294	264	288	271	407	446
Jolshiri Abason	138	385	422	138	135	95	160	108	122.5	96.5	90	142.3
EQS Fisheries (≤1000 mg/l)												

Table-34. Level of Chloride (mg/l) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	79	92.5	102	79	58.5	22	40	48	50	43.5	80	93
Jolshiri Abason	8	57	58.5	8	20	20	10	14	14.5	13	12	13
EQS Industrial (150-600 mg/l)												

Table-35. Level of SS (mg/l) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	69	121	69	69	102	43	75	22.2	59	81	58	48
Jolshiri Abason	8	34	220	8	8	24	24	10.1	8	14	7	33
EQS Industrial (≤100 mg/l)												

Table-36. Level of EC (µmohos/cm) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	347	818	832	347	536	201	556	469	575	506	703	842
Jolshiri Abason	248	674	792	248	260	154	306	223	243	183.3	169.4	242
EQS (1200 µmohos/cm)												

Table-37. Level of T.alkalinity (mg/l) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	336	370	300	336	102	42	82	72	78	89	124	296
Jolshiri Abason	138	141	320	138	99	32	71	40	50	42	40	104
EQS (150 mg/l)												

Table-38. Level of Turbidity (NTU) of Balu River Water in 2022

Location of Balu River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	51	71	34.4	51	78	22.9	68.4	28.3	29	34.7	65	49
Jolshiri Abason	23.4	21	86.3	18	5.35	20.2	4.9	10.4	5	12	5.68	44
EQS (10 NTU)												

5.0 Dhalaeswari River (Table: 39-44)

Table-39. Level of pH of Dhaleshwari River Water in 2022

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur	7.48	7.16	7.16	7.05		7.26		7.28		7.09	7.25	7.17
Pathorghata	7.26	7.77	7.77	7.28		7.6		7.53		6.92	7.23	7.42
Ruhitpur	7.18	7.48	7.48	8.73		7.23		7.43		7.44	7.23	7.9
Hazratpur	7.22	7.8	7.8	8.09		7.29		7.58		7.36	7.24	7.97
Utorro Mitra	7.31	7.88	7.88	8.23		7.53		8.5		6.91	7.03	7.32
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-40. Level of DO (mg/l) of Dhaleshwari River Water in 2022

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur	0	0.4	0.4	2.5		4.6		4.7		4.2	6.2	1.5
Pathorghata	6	2.5	2.5	6		4.8		5.8		5.2	5.5	5.6
Ruhitpur	5.8	2.1	2.1	15		6.4		4.8		4.6	7.4	5.7
Hazratpur	5.4	2	2	4.5		5		7		6	7.2	7.9
Utorro Mitra	4.8	10	10	7.8		4.8		6		5	6.8	5.2
EQS Fisheries (5 mg/l≥)												

Table-41. Level of BOD (mg/l) of Dhaleshwari River Water in 2022

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur	10	18	18	8		3		8		3	3	3.3
Pathorghata	12	8	8	12		6		28		3	2	4.2
Ruhitpur	10	10	10	13		10		3		3	2	1.2
Hazratpur	8	8	8	22		6		6		3	2	1.2
Utorro Mitra	8	2	2	2		8		12		6	5	2
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-42. Level of COD (mg/l) of Dhaleshwari River Water in 2022

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur	51	34	34	22		10		22		10	10	10.2
Pathorghata	36	22	22	36		18		90		20	15	10
Ruhitpur	32	28	28	46		63		10		7	10	
Hazratpur	22	34	34	70		15		60		6	8	
Utorro Mitra	20	20	10	6		46		49		10	15	6
EQS Fisheries (≤50 mg/l)												
EQS Industries (≤200 mg/l)												

Table-43. Level of TDS (mg/l) of Dhaleshwari River Water in 2022

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur	331	312	312	214		308		85.8		72.3	84.2	174.3
Pathorghata	280	411	411	280		65		70.4		62.8	82.7	250
Ruhitpur	290	348	348	356		70		71.4		64.7	85.9	246
Hazratpur	290	327	327	393		86		67.4		100.6	86.2	255
Utorro Mitra	299	280	280	293		61		64.4		74.9	95.2	258
EQS Fisheries (≤1000 mg/l)												

Table-44. Level of EC (1200µmohs/cm) of Dhaleshwari River Water in 2022

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur	608	600	600	413		583		178		126.2	156.4	342
Pathorghata	580	808	808	580		124		146		112.8	149.5	510
Ruhitpur	304	698	698	623		103		146		126.1	154.2	437
Hazratpur	610	648	648	600		165		139		196.9	154.8	455
Utorro Mitra	540	503	503	550		126		139		144.4	168.1	441
EQS industrial (1200 µmohos/cm)												

6.0 Brahmaputra River (Table: 45-50)

Table-45. Level of pH of Brahmaputra River Water in 2022

Location of Brahmaputra River	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh		7.97										
Jamalpur Bridge								6.85				7.83
Jamalpur Rail Bridge												7.93
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-46. Level of DO (mg/l) of Brahmaputra River Water in 2022

Location of Brahmaputra River	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh		11.4										
Jamalpur Bridge								7.4				7.7
Jamalpur Rail Bridge												8
EQS Fisheries (5 mg/l≥)												

Table-47. Level of BOD (mg/l) of Brahmaputra River Water in 2022

Location of Brahmaputra River	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh		7.2										
Jamalpur Bridge								5				3
Jamalpur Rail Bridge												1.8
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-48. Level of TDS (mg/l) of Brahmaputra River Water in 2022

Location of Brahmaputra River	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh		148										
Jamalpur Bridge								57.2				156.7
Jamalpur Rail Bridge												169.5
EQS Industries (≤1000 mg/l)												

Table-48. Level of SS (mg/l) of Brahmaputra River Water in 2022

Location of Brahmaputra River	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh		11										
Jamalpur Bridge								294				8
Jamalpur Rail Bridge												19.9
EQS Industrial (100 mg/l)												

Table-50. Level of Chloride (mg/l) of Brahmaputra River Water in 2022

Location of Brahmaputra River	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh		11										
Jamalpur Bridge								7.5				2
Jamalpur Rail Bridge												11.5
EQS Industrial (150-600 mg/l)												

7.0 Kaligonga River (Table: 51-56)

Table-51. Level of pH of Kaligonga River Water in 2022

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		7.72			7.63			6.95			7.65	7.7
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-52. Level of DO (mg/l) of Kaligonga River Water in 2022

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		8			7			6.1			6.1	8.8
EQS Fisheries (5 mg/l≥)												

Table-53. Level of BOD (mg/l) of Kaligonga River Water in 2022

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		12			6			4			2	
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-54. Level of TDS (mg/l) of Kaligonga River Water in 2022

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		44			22			20			8	
EQS Fisheries (≤50 mg/l)												
EQS Industries (≤200 mg/l)												

Table-55. Level of SS (mg/l) of Kaligonga River Water in 2022

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		12			63			198			46	14
EQS Industrial (100 mg/l)												

Table-56. Level of Chloride (mg/l) of Kaligonga River Water in 2022

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		21			66			5.5			8	15.5
EQS Industrial (150-600 mg/l)												

8.0 Jamuna River (Table: 57-62)

Table-57. Level of pH of Jamuna River Water in 2022

Location of Jamuna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (U)		7.54	7.52	7.52	7.52			7.56	7.55	7.52		7.54
Jamuna Eco Park (D)		7.54	7.52	7.52	7.52			7.56	7.55	7.52		7.54
Shariakandi Groin badth (U)		7.5	7.52	7.52	7.52			7.5	7.52	7.54		7.5
Shariakandi Groin badth (D)		7.5	7.52	7.52	7.52			7.5	7.52	7.54		7.5
Mohonganj (U)		7.64	7.54	7.54	7.54			7.52	7.5	7.5		7.6
Mohonganj (D)		7.64	7.54	7.54	7.54			7.52	7.5	7.5		7.6
Horipur Kheya Ghat (U)		7.74	7.72	7.72	7.72			7.66	7.6	7.56		7.62
Horipur Kheya Ghat (D)		7.74	7.72	7.72	7.72			7.66	7.6	7.56		7.62
Kakua			8.13			7.66			7.47			8.57
Tarakandi (D)			8.02			7.86			7.14			7.87
Tarakandi (U)			7.8									
EQS for Fisheries (6.0-9.0)												
EQS for Industrial Discharge (6.5-8.5)												

Table-58. Level of DO (mg/l) of Jamuna River Water in 2022

Location of Jamuna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (U)		7.62	7.64	7.64	7.64			7.62	7.62	7.64		7.6
Jamuna Eco Park (D)		7.62	7.64	7.64	7.64			7.62	7.62	7.64		7.6
Shariakandi Groin badth (U)		7.58	7.56	7.56	7.56			7.6	7.61	7.6		7.5
Shariakandi Groin badth (D)		7.58	7.56	7.56	7.56			7.6	7.61	7.6		7.5
Mohonganj (U)		7.64	7.62	7.62	7.62			7.64	7.62	7.64		7.6
Mohonganj (D)		7.64	7.62	7.62	7.62			7.64	7.62	7.64		7.6
Horipur Kheya Ghat (U)		7.64	7.62	7.62	7.62			7.62	7.6	7.62		7.62
Horipur Kheya Ghat (D)		7.64	7.62	7.62	7.62			7.62	7.6	7.62		7.62
Kakua			6			5.8			6.2			11.5
Tarakandi (D)			5.8			6.1			6.1			7.9
Tarakandi (U)			4.6									
EQS Fisheries (5 mg/l≥)												

Table-59. Level of BOD (mg/l) of Jamuna River Water in 2022

Location of Jamuna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (U)		2.2	2.3	2.3	2.3			2.3	2.4	2.4		2.4
Jamuna Eco Park (D)		2.2	2.3	2.3	2.3			2.3	2.4	2.4		2.4
Shariakandi Groin badth (U)		2.3	2.4	2.4	2.4			2.5	2.4	2.4		2.4
Shariakandi Groin badth (D)		2.3	2.4	2.4	2.4			2.5	2.4	2.4		2.4
Mohonganj (U)		2.1	2.2	2.2	2.2			2.2	2.3	2.3		2.3
Mohonganj (D)		2.1	2.2	2.2	2.2			2.2	2.3	2.3		2.3
Horipur Kheya Ghat (U)		2.3	2.4	2.4	2.4			2.3	2.4	2.4		2.4
Horipur Kheya Ghat (D)		2.3	2.4	2.4	2.4			2.3	2.4	2.4		2.4
Kakua			2.1			6.2			2			2.3
Tarakandi (D)			3			12			4			2.6
Tarakandi (U)			4									
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-60. Level of SS of Jamuna River Water in 2022

Location of Jamuna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (U)		40	40	40	40		40	40	40	40		40
Jamuna Eco Park (D)		40	40	40	40		40	40	40	40		40
Shariakandi Groin badth (U)		42	42	42	42		42	42	42	42		42
Shariakandi Groin badth (D)		42	42	42	42		42	42	42	42		42
Mohonganj (U)		38	38	38	38		38	38	38	38		38
Mohonganj (D)		38	38	38	38		38	38	38	38		38
Horipur Kheya Ghat (U)		36	36	36	36		36	36	36	36		36
Horipur Kheya Ghat (D)		36	36	36	36		36	36	36	36		36
Kakua			16			403			305			15
Tarakandi (D)			7			76			127			42
Tarakandi (U)			48									
EQS Industrial (100 mg/l)												

Table-61. Level of TDS (mg/l) of Jamuna River Water in 2022

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (U)		128	128	128	128			128	130	130		132
Jamuna Eco Park (D)		128	128	128	128			128	130	130		132
Shariakandi Groin badth (U)		133	133	133	133			133	133	133		135
Shariakandi Groin badth (D)		133	133	133	133			133	133	133		135
Mohonganj (U)		129	129	129	129			130	130	131		131
Mohonganj (D)		129	129	129	129			130	130	131		131
Horipur Kheya Ghat (U)		120	120	120	120			133	135	135		130
Horipur Kheya Ghat (D)		120	120	120	120			133	135	135		130
Kakua			82			59.1			68.9			106.4
Tarakandi (D)			231			67.7			83			225
Tarakandi (U)			222									
EQS Fisheries (≤1000 mg/l)												

Table-62. Level of Chloride (mg/l) of Jamuna River Water in 2022

Location of Jamuna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (U)		11	11	11	11		11	11	11	11		11
Jamuna Eco Park (D)		11	11	11	11		11	11	11	11		11
Shariakandi Groin badth (U)		11	11	11	11		11	11	11	11		11
Shariakandi Groin badth (D)		11	11	11	11		11	11	11	11		11
Mohonganj (U)		11	11	11	11		11	11	11	11		11
Mohonganj (D)		11	11	11	11		11	11	11	11		11
Horipur Kheya Ghat (U)		10	10	10	10		10	10	10	10		10
Horipur Kheya Ghat (D)		10	10	10	10		10	10	10	10		10
Kakua			5.5			5			3			40
Tarakandi (D)			12.5			6			5			6
Tarakandi (U)			12.5									
EQS Industrial (150-600 mg/l)												

9.0 Meghna River (Table: 63-68)

Table-63. Level of pH of Meghna River Water in 2022

Location of Meghna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	7.28		7.18		6.8		6.62		6.69		7.7	6.99
Bisnondi	7.71		7.42		6.55		6.55		7.28		7.57	7.6
Norsingdi Launch Terminal	7.56		8.01		7.26		7.39		6.65		7.58	7.41
Anondo Bazar	7.75		7.24		6.46		7.27				7.54	6.49
Bhairob Bazar	7.27		7.63		6.62		6.5		6.92		7.56	7.52
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-64. Level of DO (mg/l) of Meghna River Water in 2022

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	5.2		4.7		6		5.8		7		5.1	4.9
Bisnondi	5		5.56		5		5		5		5.4	6.4
Norsingdi Launch Terminal	5		0.5		4.5		5		4.1		5.8	6
Anondo Bazar	6.2		3.8		1.8		6.2		4.2		5.8	5.8
Bhairob Bazar	7		8		4		5		5.8		6.3	6.2
EQS Fisheries (5 mg/l≥)												

Table-65. Level of BOD (mg/l) of Meghna River Water in 2022

Location of Meghna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	4		5.4	5.4	6		6		2		2	**2.4**
Bisnondi	6		9		3		3		5		6.2	3.5
Norsingdi Launch Terminal	4		22		8		4		2		6.2	2.3
Anondo Bazar	6		8		2		4.8		4		6.2	2.2
Bhairob Bazar	4		3.2		1.2		4		2		6.7	3
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-66. Level of COD (mg/l) of Meghna River Water in 2022

Location of Meghna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	12		24		20		19		24		8	17
Bisnondi	20		28		10		8		34		51	5
Norsingdi Launch Terminal	14		64		22		12		10		14	12
Anondo Bazar	22		26		22		16		22		58	5
Bhairob Bazar	36		20		22		26		10		25	10
EQS Fisheries (≤50 mg/l)												
EQS Industries (≤200 mg/l)												

Table-67. Level of TDS (mg/l) of Meghna River Water in 2022

Location of Meghna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	68		130		40		27		30		41.7	77.5
Bisnondi	64		122		26		64		29		49.3	59.2
Norsingdi Launch Terminal	193		246		51		33		42.6		75.7	52
Anondo Bazar	77		196		28		168		158		44.7	98.5
Bhairob Bazar	60		186		110		102		26.9		39.7	54
EQS Fisheries (≤1000 mg/l)												

Table-68. Level of SS (mg/l) of Meghna River Water in 2022

Location of Meghna River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	11		8		50		24		22		25	17
Bisnondi	14		10		10		18		18		22	34
Norsingdi Launch Terminal	32		29		84		13		11		10	12
Anondo Bazar	29		12		19		19		20		53	11
Bhairob Bazar	23		6		30		30		28		32	10
EQS Industrial (100 mg/l)												

10.0 Padma River (Table: 69-74)

Table-69. Level of pH of Padma River Water in 2022

Location of Padma River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat		8.25	8.08			7.79			7.7		7.42	
Shimulia Ghat												
Barha Ghat		8.5	7.38			7.9			7.88		7.58	
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-70. Level of DO (mg/l) of Padma River Water in 2022

Location of Padma River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat		10	7.2			7			7.45		8	7.56
Shimulia Ghat												
Barha Ghat		7.8	6.9			7.3			7.53		8	8.07
EQS for Fisheries (5 mg/l≥)												

Table-71. Level of BOD (mg/l) of Padma River Water in 2022

Location of Padma River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat		8	10			6.4			3		2	3
Shimulia Ghat												
Barha Ghat		10	12			8.4			4		2	0.7
EQS for Fisheries (≤6 mg/l)												
EQS Industrial Discharge (≤30 mg/l)												

Table-72. Level of TDS (mg/l) of Padma River Water in 2022

Location of Padma River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat		133	88			76			93		75	110
Shimulia Ghat												
Barha Ghat		128	132			51			88		74	109.4
EQS for Fisheries (≤1000mg/l)												

Table-73. Level of SS (mg/l) of Padma River Water in 2022

Location of Padma River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat		55	173			331					89	68
Shimulia Ghat												
Barha Ghat		37	34			620					148	66
EQS for Industrial Discharge (≤100 mg/l)												

Table-74. Level of EC (µmohs/cm) of Padma River Water in 2022

Location of Padma River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat		245	179			143					138	202
Shimulia Ghat												
Barha Ghat		236	244			98					134	196.9
EQS for Industrial Discharge (1200 µmohos/cm)												

11.0 Korotoa River (Table: 75-80)

Table-75. Level of pH of Korotoa River Water in 2022

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		7.05	7.04	7.04	7.02		7.22	7.24	7.26	7.3		7.34
Dutta Bari Bridge, Bogra (Down stream)		7.05	7.04	7.04	7.02		7.22	7.24	7.26	7.3		7.34
Aziz Ahmed Taki Road (Up stream)		7.04	7.05	7.05	7.04		7.18	7.22	7.26	7.3		7.34
Aziz Ahmed Taki Road (Down stream)		7.04	7.05	7.05	7.04		7.18	7.22	7.26	7.3		7.34
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-76. Level of DO (mg/l) of Korotoa River Water in 2022

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		4.8	4.7	4.7	4.2		6.8	6.9	6.7	6.6		6.1
Dutta Bari Bridge, Bogra (Down stream)		4.8	4.7	4.7	4.2		6.8	6.9	6.7	6.6		6.1
Aziz Ahmed Taki Road (Up stream)		4.9	4.8	4.8	4.4		6.7	6.8	6.8	6.7		6.1
Aziz Ahmed Taki Road (Down stream)		4.9	4.8	4.8	4.4		6.7	6.8	6.8	6.7		6.1
EQS Fisheries (5 mg/l≥)												

Table-77. Level of BOD (mg/l) of Korotoa River Water in 2022

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		4.1	4	4	4		2.2	2.3	2.4	2.2		2.1
Dutta Bari Bridge, Bogra (Down stream)		4.1	4	4	4		2.2	2.3	2.4	2.2		2.1
Aziz Ahmed Taki Road (Up stream)		4.2	4.1	4.1	4.1		2.1	2.2	2.4	2.2		2.2
Aziz Ahmed Taki Road (Down stream)		4.2	4.1	4.1	4.1		2.1	2.2	2.4	2.2		2.2
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-78. Level of TDS (mg/l) of Korotoa River Water in 2022

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		180	180	180	180		195	190	195	198		196
Dutta Bari Bridge, Bogra (Down stream)		180	180	180	180		195	190	195	198		196
Aziz Ahmed Taki Road (Up stream)		164	164	164	164		160	155	155	155		160
Aziz Ahmed Taki Road (Down stream)		164	164	164	164		160	155	155	155		160
EQS Fisheries (≤1000mg/l)												

Table-79. Level of SS (mg/l) of Korotoa River Water in2022

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		58	58	58	58		58	58	58	58		58
Dutta Bari Bridge, Bogra (Down stream)		58	58	58	58		58	58	58	58		58
Aziz Ahmed Taki Road (Up stream)		54	54	54	54		54	54	54	54		54
Aziz Ahmed Taki Road (Down stream)		54	54	54	54		54	54	54	54		54
EQS Industrial (≤100 mg/l)												

Table-80. Level of EC (µmohos/cm) of Korotoa River Water in 2022

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		360	360	360	360		390	380	390	396		394
Dutta Bari Bridge, Bogra (Down stream)		360	360	360	360		390	380	390	396		394
Aziz Ahmed Taki Road (Up stream)		328	328	328	328		320	310	310	310		394
Aziz Ahmed Taki Road (Down stream)		328	328	328	328		320	310	310	310		394
EQS Induseial (1200 µmohos/cm)												

12.0 Teesta River (Table: 81-86)

Table-81. Level of pH of Teesta River Water in 2022

Location of Teesta River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		7.05	7.04	7.04	7.02		7.22	7.24	7.26	7.3		7.34
Dutta Bari Bridge, Bogra (Down stream)		7.05	7.04	7.04	7.02		7.22	7.24	7.26	7.3		7.34
Aziz Ahmed Taki Road (Up stream)		7.04	7.05	7.05	7.04		7.18	7.22	7.26	7.3		7.34
Aziz Ahmed Taki Road (Down stream)		7.04	7.05	7.05	7.04		7.18	7.22	7.26	7.3		7.34
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-82. Level of DO (mg/l) of Teesta River Water in 2022

Location of Teesta River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		4.8	4.7	4.7	4.2		6.8	6.9	6.7	6.6		6.1
Dutta Bari Bridge, Bogra (Down stream)		4.8	4.7	4.7	4.2		6.8	6.9	6.7	6.6		6.1
Aziz Ahmed Taki Road (Up stream)		4.9	4.8	4.8	4.4		6.7	6.8	6.8	6.7		6.1
Aziz Ahmed Taki Road (Down stream)		4.9	4.8	4.8	4.4		6.7	6.8	6.8	6.7		6.1
EQS Fisheries (5 mg/l≥)												

Table-83. Level of BOD (mg/l) of Teesta River Water in 2022

Location of Teesta River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		4.1	4	4	4		2.2	2.3	2.4	2.2		2.1
Dutta Bari Bridge, Bogra (Down stream)		4.1	4	4	4		2.2	2.3	2.4	2.2		2.1
Aziz Ahmed Taki Road (Up stream)		4.2	4.1	4.1	4.1		2.1	2.2	2.4	2.2		2.2
Aziz Ahmed Taki Road (Down stream)		4.2	4.1	4.1	4.1		2.1	2.2	2.4	2.2		2.2
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-84. Level of TDS (mg/l) of Teesta River Water in 2022

Location of Teesta River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		180	180	180	180		195	190	195	198		196
Dutta Bari Bridge, Bogra (Down stream)		180	180	180	180		195	190	195	198		196
Aziz Ahmed Taki Road (Up stream)		164	164	164	164		160	155	155	155		160
Aziz Ahmed Taki Road (Down stream)		164	164	164	164		160	155	155	155		160
EQS Fisheries (≤1000 mg/l)												

Table-85. Level of SS (mg/l) of Teesta River Water in 2022

Location of Teesta River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		58	58	58	58		58	58	58	58		58
Dutta Bari Bridge, Bogra (Down stream)		58	58	58	58		58	58	58	58		58
Aziz Ahmed Taki Road (Up stream)		54	54	54	54		54	54	54	54		54
Aziz Ahmed Taki Road (Down stream)		54	54	54	54		54	54	54	54		54
EQS Industrial (≤100 mg/l)												

Table-86. Level of Turbidity (NTU) of Teesta River Water in 2022

Location of Teesta River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dutta Bari Bridge, Bogra (Up stream)		14	14	14	14		14	14	14	14		14
Dutta Bari Bridge, Bogra (Down stream)		14	14	14	14		14	14	14	14		14
Aziz Ahmed Taki Road (Up stream)		12	12	12	12		12	12	12	12		12
Aziz Ahmed Taki Road (Down stream)		12	12	12	12		12	12	12	12		12
EQS for Industrial Discharge (10 NTU)												

13.0 Karnaphuli River (Table: 87-92)

Table-87. Level of pH of Karnaphuli River Water in 2022

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	7.21	7.4	6.55	7.47	7.56	7.48	7.04	7.18	7.71	7.79	6.11	7.44
TSP	7.33	7.62	7.07	7.38	7.46	7.32	6.97	6.76	8.18	7.89	6.45	7.53
Shikalbaha	7.58	7.65	7.69	7.58	7.63		7.48	7.28	7.62	7.78	7.57	7.18
Kalurghat Bridge	7.35	7.29	7.43	7.51	7.63	7.52	7.73	7.69	7.46	7.57	7.42	7.21
Mariam Nagar	7.32	7.19	7.39	7.52	7.49		7.52	7.67	7.72	7.72	7.24	7.41
Karnaphuli Paper	7.46	7.4	7.58	7.68	7.73		7.62	7.73	7.68	7.79	7.11	7.28
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-88. Level of DO (mg/l) of Karnaphuli River Water in 2022

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	7.57	7.65	7.64	7.85	7.63	7.66	7.51	7.59	7.47	7.47	6.47	8.42
TSP	7.55	7.49	7.09	8.05	7.85	7.99	7.1	7.28	7	7	5.7	7.4
Shikalbaha	7.39	7.47	7.43	7.52	7.46		7.57	7.68	7.49	7.49	7.1	7.38
Kalurghat Bridge	7.34	7.38	7.56	7.63	7.71	8.17	7.53	7.28	7.39	7.39	7.19	7.77
Mariam Nagar	7.18	7.27	7.28	7.39	7.46		7.52	7.39	7.46	7.46	7.33	7.28
Karnaphuli Paper	7.43	7.39	7.59	7.62	7.72		7.82	7.72	7.68	7.68	7.49	7.39
EQS Fisheries (5 mg/l≥)												

Table-89. Level of BOD (mg/l) of Karnaphuli River Water in 2022

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	16	12	21	12	9	16	8.2	11	10	8	7	6
TSP	13	6	13	10	8	14	7.5	9	7	7	6	7
Shikalbaha	4	5	4	5	5		5	4	5	5.6	4	5
Kalurghat Bridge	5	4	3	3	4	5	3	3	4	5	3	4
Mariam Nagar	4	4	3	4	3		4	4	3	4	3	4
Karnaphuli Paper	5	5	4	4	3		5	3	4	5	4	3
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-90. Level of COD (mg/l) of Karnaphuli River Water in 2022

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	49	28	68	42	36	68	62	88	49	45	56	48
TSP	32	26	58	37	40	64	58	67	42	38	37	32
Shikalbaha	14	16	15	15	14		14	10	15	13	10	9
Kalurghat Bridge	13	13	11	11	12	14	12	11	12	10	9	9
Mariam Nagar	14	12	12	12	11		13	10	9	11	10	8
Karnaphuli Paper	15	14	14	13	12		14	9	10	12	11	10
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-91. Level of TDS (mg/l) of Karnaphuli River Water in 2022

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	1462	1679	17230	10250	6567	9872	5320	12420	2060	2060	7960	18550
TSP	1189	1235	12980	8960	8768	8472	4940	10250	174	174	5320	11480
Shikalbaha	329	435	380	348	289		219	328	328	328	289	189
Kalurghat Bridge	149	129	159	163	179	218	119	248	248	248	312	286
Mariam Nagar	169	159	189	214	247		247	328	328	328	280	318
Karnaphuli Paper	208	223	269	287	269		242	359	359	359	345	269
EQS Fisheries (≤1000 mg/l)												

Table-92. Level of EC (mg/l) of Karnaphuli River Water in 2022

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	2800	2976	28789	18160	18160	18476	10134	23380	3830	4216	14200	36500
TSP	2300	2467	26570	16000	16000	17014	8234	20390	348	359	9570	19110
Shikalbaha	689	769	765	765	765		459	745	632	678	489	538
Kalurghat Bridge	286	249	289	289	289	414	239	546	498	512	569	459
Mariam Nagar	328	298	412	412	412		469	678	635	689	489	358
Karnaphuli Paper	512	489	439	439	439		524	679	699	748	694	523
EQS Industries (1200 µmohos/cm)												

14.0 Halda River (Table: 93-98)

Table-93. Level of pH of Halda River Water in 2022

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	7.49	7.57	7.47	7.53	7.67	6.57	6.76	6.87	7.4	8.45		
Garduara Sluice Gate	7.34	7.46	7.72	7.79	7.59	6.89	6.94	7.2	7.61	8.58		
Halda Bridge	7.45	7.55	7.64	7.72	7.85	6.62	6.72	6.84	7.77	8.63		
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-94. Level of DO (mg/l) of Halda River Water in 2022

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	7.45	6.12	6.12	5.96	5.49	5.69	5.67	5.74	7.92	8.28		
Garduara Sluice Gate	7.32	6.24	6.24	6.11	5.69	5.67	5.2	5.39	6.55	8.22		
Halda Bridge	7.11	6.12	6.12	5.89	5.63	6.19	6.2	6.43	7.74	8.21		
EQS Fisheries (5 mg/l≥)												

Table-95. Level of BOD (mg/l) of Halda River Water in 2022

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	14	16	14	11	12	13	12	9	15.5	13.4		
Garduara Sluice Gate	15	14	13	13	14	12	10	11	9	10		
Halda Bridge	12	15	16	12	11	10	9	10	14	12.5		
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-96. Level of COD (mg/l) of Halda River Water in 2022

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	14	16	14	11	12	13	12	9	15.5	13.4		
Garduara Sluice Gate	15	14	13	13	14	12	10	11	9	10		
Halda Bridge	12	15	16	12	11	10	9	10	14	12.5		
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-97. Level of TDS (mg/l) of Halda River Water in 2022

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	63.1	73.6	92.8	98.5	113.5	56.7	69.7	58.7	56.7	144		
Garduara Sluice Gate	67.1	97.1	93.3	113.3	152.3	58.1	94.1	98.5	62.6	108.7		
Halda Bridge	63.7	55.7	101.9	124.5	98.5	39.5	68.5	87.5	58.7	168.2		
EQS Fisheries (≤1000 mg/l)												

Table-98. Level of EC (mg/l) of Halda River Water in 2022

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	119.7	129.7	214.5	189.5	213.5	106.5	168.5	121.5	101.5	136.9		
Garduara Sluice Gate	131.5	141.5	219	218.5	238.5	112.4	137.5	145.5	115	124		
Halda Bridge	124.7	134.5	236	245	179.5	74.8	123.5	134.5	110.5	207.1		
EQS Industries (1200 µmohos/cm)												

15.0 Moyuri River (Table: 99-106)

Table-99. Level of pH of Moyuri River Water in 2022

Location of Moyuri River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					7.6							
Buro Moulavir Darga (M)					7.52							
Dosh Gate Jalma (M)					7.46							
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-100. Level of DO (mg/l) of Moyuri River Water in 2022

Location of Moyuri River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					0.4							
Buro Moulavir Darga (M)					0.7							
Dosh Gate Jalma (M)					5.4							
EQS Fisheries (5 mg/l≥)												

Table-101. Level of TDS (mg/l) of Moyuri River Water in 2022

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					348							
Buro Moulavir Darga (M)					1234							
Dosh Gate Jalma (M)					5842							
EQS Fisheries (≤1000 mg/l)												

Table-102. Level of Chloride (mg/l) of Moyuri River Water in 2022

Location of Moyuri River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					408							
Buro Moulavir Darga (M)					2164							
Dosh Gate Jalma (M)					7830							
EQS Industries (150-600 mg/l)												

Table-103. Level of Turbidity (NTU) of Moyuri River Water in 2022

Location of Moyuri River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					24							
Buro Moulavir Darga (M)					20							
Dosh Gate Jalma (M)					68							
EQS Industries (≤10 NTU)												

Table-104. Level of SS (mg/l) of Moyuri River Water in 2022

Location of Moyuri River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					92							
Buro Moulavir Darga (M)					112							
Dosh Gate Jalma (M)					98							
EQS Industries (100 mg/l)												

Table-105. Level of EC (µmohos/cm) of Moyuri River Water in 2022

Location of Moyuri River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					712							
Buro Moulavir Darga (M)					2474							
Dosh Gate Jalma (M)					11010							
EQS Industries (1200 µmohos/cm)												

Table-106. Level of Salinity (ppt) of Moyuri River Water in 2022

Location of Moyuri River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat (M)					3.1							
Buro Moulavir Darga (M)					1.95							
Dosh Gate Jalma (M)					6.21							
EQS (400 ppt)												

16.0 Bhairab River (Table: 107-114)

Table-107. Level of pH of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					8.26							
Noapara Ferry Ghat					8.19							
Noapara					8.09							
Fultala Ghat					7.55							
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-108. Level of DO (mg/l) of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					1.01							
Noapara Ferry Ghat					4.3							
Noapara					3.6							
Fultala Ghat					4.7							
EQS Fisheries (5 mg/l≥)												

Table-109. Level of BOD (mg/l) of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					3.5							
Noapara Ferry Ghat					1.8							
Noapara					1.6							
Fultala Ghat					1.7							
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-110. Level of TDS (mg/l) of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					229							
Noapara Ferry Ghat					476							
Noapara					481							
Fultala Ghat					655							
EQS Fisheries (≤1000 mg/l)												

Table-111. Level of Chloride (mg/l) of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					4212							
Noapara Ferry Ghat					805							
Noapara					805							
Fultala Ghat					845							
EQS Industries (150-600 mg/l)												

Table-112. Level of Turbidity (NTU) of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					12							
Noapara Ferry Ghat					75							
Noapara					66							
Fultala Ghat					75							
EQS Industries (≤10 NTU)												

Table-113. Level of EC (µmohos/cm) of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					510							
Noapara Ferry Ghat					1035							
Noapara					1048							
Fultala Ghat					1219							
EQS Industries (µmohos/cm)												

Table-114. Level of Salinity (ppt) of Bhairab River Water in 2022

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar					3.4							
Noapara Ferry Ghat					0.65							
Noapara					0.65							
Fultala Ghat					0.6							
EQS (400 ppt)												

17.0 Rupsa River (Table: 115-122)

Table-115. Level of pH of Rupsa River Water in 2022

Location of Rupsa River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					8.11							
Kalibari Ghat (M)					8.09							
Charer Hat (M)					8.06							
Gilatala					8.01							
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-116. Level of DO (mg/l) of Rupsa River Water in 2022

Location of Rupsa River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					3.8							
Kalibari Ghat (M)					3.9							
Charer Hat (M)					5.1							
Gilatala					5.9							
EQS Fisheries (5 mg/l≥)												

Table-117. Level of BOD (mg/l) of Rupsa River Water in 2022

Location of Rupsa River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					7.5							
Kalibari Ghat (M)					2.1							
Charer Hat (M)					1.3							
Gilatala					1.4							
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-118. Level of Chloride (mg/l) of Rupsa River Water in 2022

Location of Rupsa River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					570							
Kalibari Ghat (M)					655							
Charer Hat (M)					4142							
Gilatala					3640							
EQS Industrial (150-600 mg/l)												

Table-119. Level of SS (mg/l) of Rupsa River Water in 2022

Location of Rupsa River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					145							
Kalibari Ghat (M)					135							
Charer Hat (M)					136							
Gilatala					86							
EQS Industrial (100 mg/l)												

Table-120. Level of Turbidity (NTU) of Rupsa River Water in 2022

Location of Rupsa River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					69							
Kalibari Ghat (M)					80							
Charer Hat (M)					98							
Gilatala					82							
EQS Industrial (≤10 NTU)												

Table-121. Level of EC (µmohos/cm) of Rupsa River Water in 2022

Location of RupsaRupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					678							
Kalibari Ghat (M)					768							
Charer Hat (M)					1945							
Gilatala					1221							
EQS (1200 µmohos/cm)												

Table-122. Level of Salinity (ppt) of Rupsa River Water in 2022

Location of RupsaRupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (M)					0.75							
Kalibari Ghat (M)					4.55							
Charer Hat (M)					3.3							
Gilatala					3.1							
EQS (400 ppt)												

18.0 Pashur River (Table: 123-130)

Table-123. Level of pH of Pashur River Water in 2022

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					7.65							
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-124 Level of DO (mg/l) of Pashur River Water in 2022

Location of Pahsur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					5.9							
EQS Fisheries (5 mg/l≥)												

Table-125. Level of BOD (mg/l) of Pashur River Water in 2022

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					1.2							
EQS Fisheries (≤6 mg/l)												
EQS Industries (≤30 mg/l)												

Table-126. Level of TDS (mg/l) of Pashur River Water in 2022

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					9060							
EQS Fisheries (≤1000mg/l)												

Table-127. Level of Chloride (mg/l) of Pashur River Water in 2022

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					13705							
EQS Industries (150-600 mg/l)												

Table-128. Level of Turbidity (NTU) of Pashur River Water in 2022

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					130							
EQS Industries (≤10 NTU)												

Table-129. Level of EC (µmohos/cm) of Pashur River Water in 2022

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					18120							
EQS Industries (1200 µmohos/cm)												

Table-130. Level of Salinity (ppt) of Pashur River Water in 2022

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Batia Ghat, By Pass (M)					12.02							
EQS (400 ppt)												

19.0 Khakshiali River (Table: 131-138)

Table-131. Level of pH of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					7.73							
Boshontopur					7.75							
Gobindakathi					7.75							
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-6.5)												

Table-132. Level of DO (mg/l) of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					5.4							
Boshontopur					5.4							
Gobindakathi					5.1							
EQS Fisheries (5 mg/l≥)												

Table-133. Level of BOD (mg/l) of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					1.3							
Boshontopur					1.3							
Gobindakathi					1.3							
EQS Fisheries (≤6 mg/l)												
EQS Industries (≤30 mg/l)												

Table-134. Level of TDS (mg/l) of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					3265							
Boshontopur					3201							
Gobindakathi					3245							
EQS Fisheries (≤1000 mg/l)												

Table-135. Level of Chloride (mg/l) of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					4040							
Boshontopur					4024							
Gobindakathi					4068							
EQS Industries (150-600 mg/l)												

Table-136. Level of Turbidity (NTU) of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					120							
Boshontopur					118							
Gobindakathi					117							
EQS Industries (≤10 NTU)												

Table-137. Level of EC (µmohos/cm) of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					6485							
Boshontopur					6507							
Gobindakathi					6580							
EQS Industries (1200 µmohos/cm)												

Table-138. Level of Salinity (ppt) of Khakshiali River Water in 2022

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj Bazar					3.31							
Boshontopur					3.3							
Gobindakathi					3.46							
EQS (400 ppt)												

20.0 Ganges River (Table: 139-146)

Table-139. Level of pH of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		7.8	7.7	7.7	7.6		7.52	7.5	7.42	7.4		7.4
Sardah (Down Stream)		**7.8**	7.7	7.7	7.6		7.52	7.5	7.42	7.4		7.4
Nurullapur (Up Stream)		7.65	7.62	7.62	7.62		7.6	7.62	7.6	7.6		7.5
Nurullapur (Down Stream)		7.65	7.62	7.62	7.62		7.6	7.62	7.6	7.6		7.5
Kanchan Park (Up Stream)		7.62	7.64	7.64	7.62		7.62	7.6	7.62	7.62		7.6
Kanchan Park (Down Stream)		7.62	7.64	7.64	7.62		7.62	7.6	7.62	7.62		7.6
Gorai off Take					**7.19**							
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-140. Level of DO (mg/l) of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		7.6	7.5	7.5	7.5		7.6	7.6	7.62	7.64		7.64
Sardah (Down Stream)		7.6	7.5	7.5	7.5		7.6	7.6	7.62	7.64		7.64
Nurullapur (Up Stream)		7.66	7.6	7.6	7.6		7.61	7.61	7.6	7.62		7.6
Nurullapur (Down Stream)		**7.66**	7.6	7.6	7.6		7.61	7.61	7.6	7.62		7.6
Kanchan Park (Up Stream)		7.56	7.54	7.54	7.6		7.6	7.6	7.61	7.62		7.62
Kanchan Park (Down Stream)		7.56	7.54	7.54	7.6		7.6	7.6	7.61	7.62		7.62
Gorai off Take					**5.3**							
EQS Fisheries (5 mg/l≥)												

Table-141. Level of BOD (mg/l) of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		2.3	2.4	2.4	2.4		2.4	2.3	2.4	**2.5**		2.4
Sardah (Down Stream)		2.3	2.4	2.4	2.4		2.4	2.3	2.4	**2.5**		2.4
Nurullapur (Up Stream)		2.4	2.3	2.3	2.3		2.3	2.3	2.3	2.4		2.4
Nurullapur (Down Stream)		2.4	2.3	2.3	2.3		2.3	2.3	2.3	2.4		2.4
Kanchan Park (Up Stream)		2.4	2.2	2.2	2.3		2.2	2.3	2.3	2.3		2.3
Kanchan Park (Down Stream)		2.4	2.2	2.2	2.3		2.2	2.3	2.3	2.3		2.3
Gorai off Take					**1.1**							
EQS Fisheries (≤6 mg/l)												
EQS Industries (≤30 mg/l)												

Table-142. Level of TDS (mg/l) of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		136	136	136	136		137	135	140	143		143
Sardah (Down Stream)		136	136	136	136		137	135	140	143		143
Nurullapur (Up Stream)		133	133	133	133		135	135	135	135		140
Nurullapur (Down Stream)		133	133	133	133		135	135	135	135		140
Kanchan Park (Up Stream)		131	131	131	133		131	130	**130**	132		132
Kanchan Park (Down Stream)		131	131	131	133		131	130	**130**	132		132
Gorai off Take					**764**							
EQS Fisheries (≤1000mg/l)												

Table-143. Level of Chloride (mg/l) of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		10	10	10	**10**		10	10	10	10		10
Sardah (Down Stream)		10	10	10	10		10	10	10	10		10
Nurullapur (Up Stream)		10	10	10	10		10	10	10	10		10
Nurullapur (Down Stream)		10	10	10	10		10	10	10	10		10
Kanchan Park (Up Stream)		11	11	11	10		11	11	11	11		11
Kanchan Park (Down Stream)		11	11	11	10		11	11	11	11		11
Gorai off Take					**1202**							
EQS Industries (150-600 mg/l)												

Table-144. Level of Turbidity (NTU) of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		12	12	12	12		12	12	12	12		12
Sardah (Down Stream)		12	12	12	12		12	12	12	12		12
Nurullapur (Up Stream)		12	12	12	12		12	12	12	12		12
Nurullapur (Down Stream)		12	12	12	12		12	12	12	12		12
Kanchan Park (Up Stream)		12	12	12	12		12	12	12	12		12
Kanchan Park (Down Stream)		12	12	12	12		12	12	12	12		12
Gorai off Take		12	12	12	12		12	12	12	12		12
EQS Industries (≤10 NTU)												

Table-145. Level of EC (µmohos/cm) of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		272	272	272			274	270	280	286		286
Sardah (Down Stream)		272	272	272			274	270	280	286		286
Nurullapur (Up Stream)		266	266	266			270	270	270	270		280
Nurullapur (Down Stream)		266	266	266			270	270	270	270		280
Kanchan Park (Up Stream)		262	262	262			262	**260**	**260**	264		264
Kanchan Park (Down Stream)		262	262	262			262	260	260	264		264
Gorai off Take					**1647**							
EQS Industries (1200µmohos/cm)												

Table-146. Level of SS (mg/l) of Ganges River Water in 2022

Location of Ganges River	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up Stream)		44	44	44			44	44	44	44		44
Sardah (Down Stream)		44	44	44			44	44	44	44		44
Nurullapur (Up Stream)		42	42	42			42	42	42	42		42
Nurullapur (Down Stream)		42	42	42			42	42	42	42		42
Kanchan Park (Up Stream)		40	40	40			40	**40**	40	40		40
Kanchan Park (Down Stream)		40	40	40			40	40	40	40		40
Gorai off Take					**84**							
EQS Industries (100 mg/l)												

21.0 Kirtankhola River (Table: 147-151)

Table-147. Level of pH of Kirtankhola River Water in 2022

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)					8.34			8.34	8.24	8.42	8.92	
Launch Ghat (M)					6.92			6.92	7.92	8.43	8.47	
Kaower Char (S)					6.27			8.11	8.16	8.28	8.2	
Kaower Char (M)					6.4			7.58	7.86	8.24	8.18	
Dopdopia Kheyaghat (S)					5.85			8.98	7.37	8.99	8.56	
Dopdopia Kheyaghat (M)					6.23			8.1	7	8.52	8.88	
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-148. Level of DO (mg/l) of Kirtankhola River Water in 2022

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)					6.21			6.39	6.16	6.86	7	
Launch Ghat (M)					7.6			6.62	5.36	6.77	7.14	
Kaower Char (S)					6.39			7.74	6.21	6.83	6.32	
Kaower Char (M)					7.46			6.55	5.79	6.59	6.53	
Dopdopia Kheyaghat (S)					6.21			5.78	6.64	7.11	7.01	
Dopdopia Kheyaghat (M)					7.6			6.19	6.68	6.91	6.89	
EQS Fisheries (5 mg/l≥)												

Table-149. Level of COD (mg/l) of Kirtankhola River Water in 2022

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)					-68			87				
Launch Ghat (M)					-142			54				
Kaower Char (S)					181			41				
Kaower Char (M)					696			122				
Dopdopia Kheyaghat (S)					523			29				
Dopdopia Kheyaghat (M)					408			53				
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-150. Level of TDS (mg/l) of Kirtankhola River Water in 2022

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)						802		84.2	807	84.3	827	
Launch Ghat (M)						802		76.7	739	84.5	852	
Kaower Char (S)						791		78.4	703	83.6	899	
Kaower Char (M)						788		77.6	692	92.4	957	
Dopdopia Kheyaghat (S)						840		72.3	832	87.1	891	
Dopdopia Kheyaghat (M)						789		71.9	826	89.2	884	
EQS Fisheries (≤1000mg/l)												

Table-151. Level of EC (µmohos/cm) of Kirtankhola River Water in 2022

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)					1604			186.4	1901	130.3	1527	
Launch Ghat (M)					1604			171.3	1860	181.1	1482	
Kaower Char (S)					1582			178	1961	180	1663	
Kaower Char (M)					1576			171.9	1762	199.3	1729	
Dopdopia Kheyaghat (S)					1689			167.3	1858	183.4	1875	
Dopdopia Kheyaghat (M)					1577			169.9	1833	190.2	1921	
EQS Industries (≤1200 µmohos/cm)												

22.0 Tatulia River (Table: 152-155)

Table-152. Level of pH of Tatulia River Water in 2022

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)							8.77					
Vadura Launch Ghat (M)							8.43					
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-153. Level of DO (mg/l) of Tatulia River Water in 2022

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)							6.3					
Vadura Launch Ghat (M)							5.06					
EQS Fisheries (5 mg/l≥)												

Table-154. Level of COD (mg/l) of Tatulia River Water in 2022

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)							**128**					
Vadura Launch Ghat (M)							**112**					
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-155. Level of TDS (mg/l) of Tatulia River Water in 2022

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)							75.6					
Vadura Launch Ghat (M)							73.5					
EQS Fisheries (≤1000 mg/l)												

23.0 Sughanda River (Table: 156-160)

Table-156. Level of pH of Sugandha River Water in 2022

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gabkhan Lounch Terminal (S)						9.38		8.36				
Gabkhan Lounch Terminal (M)						9.1		9.39				
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-157. Level of DO (mg/l) of Sugandha River Water in 2022

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gabkhan Lounch Terminal (S)						7.35		6.14				
Gabkhan Lounch Terminal (M)						7.5		6.46				
EQS Fisheries (5 mg/l≥)												

Table-158. Level of COD (mg/l) of Sugandha River Water in 2022

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gabkhan Lounch Terminal (S)						105		6.14				
Gabkhan Lounch Terminal (M)						109		6.46				
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-159. Level of TDS (mg/l) of Sugandha River River Water in 2022

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gabkhan Lounch Terminal (S)						86.3		79.4				
Gabkhan Lounch Terminal (M)						69.6		79.7				
EQS Fisheries (≤1000mg/l)												

Table-160. Level of EC (µmohos/cm) of Sugandha River Water in 2022

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gabkhan Lounch Terminal (S)						192.1		182.4				
Gabkhan Lounch Terminal (M)						151.3		184.5				
EQS Industries (1200 µmohos/cm)												

24.0 Lohalia River (Table: 161-164)

Table-161. Level of pH of Lohalia River Water in 2022

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)										9.01		
Patuakhali Launch Ghat (M)										8.62		
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-162. Level of DO (mg/l) of Lohalia River Water in 2022

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)									7.15			
Patuakhali Launch Ghat (M)									6.61			
EQS Fisheries (5 mg/l≥)												

Table-163. Level of TDS (mg/l) of Lohalia River River Water in 2022

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)										94.4		
Patuakhali Launch Ghat (M)										94.3		
EQS Fisheries (≤1000 mg/l)												

Table-164. Level of EC (µmohos/cm) of Lohalia River Water in 2022

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)										210		
Patuakhali Launch Ghat (M)										206		
EQS Industries (1200 µmohos/cm)												

25.0 Surma River (Table: 165-170)

Table-165. Level of pH of Surma River Water in 2022

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point					6.61							
Kin Bridge Point					6.68							
Sheaik Ghat					6.67							
Chhatak					6.84							
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

Table-166. Level of DO (mg/l) of Surma River Water in 2022

	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point					7.02							
Kin Bridge Point					6.92							
Sheaik Ghat					7.06							
Chhatak					6.98							
EQS Fisheries (5 mg/l≥)												

Table-167. Level of BOD (mg/l) of Surma River Water in 2022

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point					2.1							
Kin Bridge Point					2.3							
Sheaik Ghat					2.8							
Chhatak					2.5							
EQS Fisheries (≤6 mg/l)												
EQS Industries (≤30 mg/l)												

Table-168. Level of COD (mg/l) of Surma River Water in 2022

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point					11							
Kin Bridge Point					13							
Sheaik Ghat					15							
Chhatak					10							
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-169. Level of TDS (mg/l) of Surma River Water in 2022

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point					64							
Kin Bridge Point					66							
Sheaik Ghat					68							
Chhatak					49							
EQS Fisheries (≤1000mg/l)												

Table-170. Level of EC (µmohos/cm) of Surma River Water in 2022

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point					122							
Kin Bridge Point					118							
Sheaik Ghat					120							
Chhatak					86							
EQS Industries (≤1200µmohos/cm)												

26.0 Kushiara River (Table: 171-176)

Table-171. Level of pH of Kushiara River Water in 2022

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point					6.89							
Fenchuganj Fertilizer Industry Point					8.5							
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-172. Level of DO (mg/l) of Kushiara River Water in 2022

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point					7.24							
Fenchuganj Fertilizer Industry Point					3.83							
EQS Fisheries (5 mg/l≥)												

Table-173. Level of BOD (mg/l) of Kushiara River Water in 2022

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point					2.3							
Fenchuganj Fertilizer Industry Point					2.6							
EQS Fisheries (≤6 mg/l)												
EQS Industries (≤30 mg/l)												

Table-174. Level of COD (mg/l) of Kushiara River Water in 2022

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point					15							
Fenchuganj Fertilizer Industry Point					14							
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-175. Level of TDS (mg/l) of Kushiara River Water in 2022

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point					63							
Fenchuganj Fertilizer Industry Point					152							
EQS Fisheries (1000 mg/l)												

Table-176. Level of EC (µmohos/cm) of Kushiara River Water in 2022

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point					124							
Fenchuganj Fertilizer Industry Point					364							
EQS Industries (1200 µmohos/cm)												

Annex-2: List of Tables for different parameters of Lake Water

I. Gulshan Lake (Table: 177-186)

Table-177. Level of pH of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		7.34			7.19			7.01			7.27	
Near Housing, South Bridge		7.5			7.12			7.25			7.28	
Near Lake View Clinic		7.32			7.41			7.12			7.32	
North Side Gulshan Baridhara Lake		8.11			7.16			7.18			7.62	
Taltola Shooting Complex, South Side		7.73			7.42			7.42			7.49	
South Side Gulshan Baridhara Lake		7.61			7.24			7.56			7.57	
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-178. Level of DO (mg/l) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		3.82			5.7			0.12			5.4	
Near Housing, South Bridge		9.34			8.5			0.16			5.2	
Near Lake View Clinic		5.47			9.4			2.1			5	
North Side Gulshan Baridhara Lake		10.26			2			1.3			6.2	
Taltola Shooting Complex, South Side		6.68			5.8			2			6	
South Side Gulshan Baridhara Lake		2.22			2.3			2			5.5	
EQS for fisheries ≥5 mg/l												

Table-179. Level of BOD (mg/l) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		40			45			22			42	
Near Housing, South Bridge		31			35			20			34	
Near Lake View Clinic		32			35			22			38	
North Side Gulshan Baridhara Lake		27			16			20			33	
Taltola Shooting Complex, South Side		28			64			22			32	
South Side Gulshan Baridhara Lake		30			41			22			34	
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-180. Level of COD (mg/l) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		130			134			83			76	
Near Housing, South Bridge		134			129			78			54	
Near Lake View Clinic		122			129			75			78	
North Side Gulshan Baridhara Lake		118			107			76			49	
Taltola Shooting Complex, South Side		120			343			90			85	
South Side Gulshan Baridhara Lake		124			197			76			68	
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-181. Level of TDS (mg/l) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		293			204			41			267	
Near Housing, South Bridge		273			204			42			266	
Near Lake View Clinic		280			201			41			269	
North Side Gulshan Baridhara Lake		277			247			44			264	
Taltola Shooting Complex, South Side		315			254			42			288	
South Side Gulshan Baridhara Lake		305			256			41			261	
EQS for Fisheries 1000 mg/l												

Table-182. Level of Turbidity (NTU) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		43.6			63.2			47.1			67	
Near Housing, South Bridge		51			54.8			38.3			58.3	
Near Lake View Clinic		61.4			54.5			37.1			61.4	
North Side Gulshan Baridhara Lake		33.4			48.2			55.5			44.6	
Taltola Shooting Complex, South Side		25.8			208			38.7			50.7	
South Side Gulshan Baridhara Lake		22.2			148			38.4			53.2	
EQS for wastewater after treatment from industrial units 10 NTU												

Table-183. Level of Chloride (mg/l) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		42			39			41			40	
Near Housing, South Bridge		42			40			42			42	
Near Lake View Clinic		42			33			41			44	
North Side Gulshan Baridhara Lake		44			34			44			43	
Taltola Shooting Complex, South Side		42			48			42			40	
South Side Gulshan Baridhara Lake		43			43			41			38	
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-184. Level of SS (mg/l) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur		136			192			92			136	
Near Housing, South Bridge		155			202			64			155	
Near Lake View Clinic		159			199			77			159	
North Side Gulshan Baridhara Lake		100			125			108			100	
Taltola Shooting Complex, South Side		52			253			81			52	
South Side Gulshan Baridhara Lake		33			213			55			33	
EQS for wastewater after treatment from industrial units 100 mg/l												

Table-185. Level of Total Alkalinity (mg/l) of Gulshan Lake Water in 2022

Near United Hospital, Kalachadpur	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near Housing, South Bridge		222			204			158			156	
Near Lake View Clinic		189			198			162			158	
North Side Gulshan Baridhara Lake		191			212			160			172	
Taltola Shooting Complex, South Side		183			184			170			164	
South Side Gulshan Baridhara Lake		224			182			162			166	
Near United Hospital, Kalachadpur		204			195			161			160	
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-186. Level of EC (µmohos/cm) of Gulshan Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	**418**	**484**	**488**	**588**	**388**	**-**	**264**	**415**	**365**	**449**	**360**	**449**
Near Housing, South Bridge	**492**	**475**	**570**	**488**	**396**	**-**	**288**	**439**	**361**	**369**	**358**	**473**
Near Lake View Clinic	**462**	**486**	**491**	**526**	**394**	**-**	**256**	**443**	**362**	**376**	**356**	**446**
North Side Gulshan Baridhara Lake	**461**	**491**	**541**	**476**	**420**	**-**	**248**	**446**	**364**	**436**	**360**	**528**
Taltola Shooting Complex, South Side	**462**	**524**	**588**	**466**	**440**	**-**	**254**	**430**	**423**	**403**	**365**	**484**
South Side Gulshan Baridhara Lake												
EQS (1200 µmohos/cm)												

II. Dhanmondi Lake (Table: 187-196)

Table-187. Level of pH of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		7.49			7.35			7.46			7.62	
Near Gigatola Pilkhana More		7.54			7.19			7.39			7.49	
Dhanmondi Lake near Road No 28 at the end of Lake		7.43			7.41			7.49			7.52	
Dhanmondi Lake near Bridge Road No 32		7.68			7.39			7.52			7.65	
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-188. Level of DO (mg/l) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		5.27			4.5			5.86			4.3	
Near Gigatola Pilkhana More		5.71			3.2			5			2.1	
Dhanmondi Lake near Road No 28 at the end of Lake		5.17			1.5			5.29			2.2	
Dhanmondi Lake near Bridge Road No 32		7.14			4.9			5			3.3	
EQS for fisheries ≥5 mg/l												

Table-189. Level of BOD (mg/l) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		6			4			8			2.8	
Near Gigatola Pilkhana More		8			6			6			1.4	
Dhanmondi Lake near Road No 28 at the end of Lake		6			6			6			2.2	
Dhanmondi Lake near Bridge Road No 32		6			4			6			3.3	
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-190. Level of COD (mg/l) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		27			26			34			30	
Near Gigatola Pilkhana More		58			32			73			10	
Dhanmondi Lake near Road No 28 at the end of Lake		51			29			19			16	
Dhanmondi Lake near Bridge Road No 32		34			41			76			41	
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

Table-191. Level of TDS (mg/l) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		138			142			132			121.7	
Near Gigatola Pilkhana More		134			146			136			127.2	
Dhanmondi Lake near Road No 28 at the end of Lake		185			201			175			199.5	
Dhanmondi Lake near Bridge Road No 32		161			160			150			148.9	
EQS for Fisheries 1000 mg/l												

Table-192. Level of Turbidity (NTU) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		5.6			5.33			1.6			56	
Near Gigatola Pilkhana More		4.5			18.4			1.9			7	
Dhanmondi Lake near Road No 28 at the end of Lake		4.2			4.5			2.1			8	
Dhanmondi Lake near Bridge Road No 32		6.7			6.22			1.5			70	
EQS for wastewater after treatment from industrial units 10 NTU												

Table-193. Level of Chloride (mg/l) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		29			51			33			29	
Near Gigatola Pilkhana More		26			47			29			31	
Dhanmondi Lake near Road No 28 at the end of Lake		24			45			40			39	
Dhanmondi Lake near Bridge Road No 32		28			56			35			35	
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-194. Level of SS (mg/l) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		9			42			12			48	
Near Gigatola Pilkhana More		8			67			14			5	
Dhanmondi Lake near Road No 28 at the end of Lake		8			39			17			5	
Dhanmondi Lake near Bridge Road No 32		13			47			15			62	
EQS for wastewater after treatment from industrial units 100 mg/l												

Table-195. Level of Total Alkalinity (mg/l) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		86			101			89			89	
Near Gigatola Pilkhana More		95			114			92			91	
Dhanmondi Lake near Road No 28 at the end of Lake		90			94			98			112	
Dhanmondi Lake near Bridge Road No 32		89			102			90			105	
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-196. Level of EC (µmohos/cm) of Dhanmondi Lake Water in 2022

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		251			277			302			222	
Near Gigatola Pilkhana More		242			281			268			233	
Dhanmondi Lake near Road No 28 at the end of Lake		331			387			345			362	
Dhanmondi Lake near Bridge Road No 32		290			311			294			274	
EQS for wastewater after treatment from industrial units 1200 µmohos/cm												

III. Hatir Jheel Lake (Table: 197-206)

Table-197. Level of pH of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		7.53			7.25			7.49			7..91	
Raampura Bridge		7.92			7.34			7.3			7.92	
FDC More Bridge		7.65			7.34			7.4			7.72	
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

Table-198. Level of DO (mg/l) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		2.43			1.8			4.5			4.3	
Raampura Bridge		4			1.5			3.65			5.5	
FDC More Bridge		2.75			3.9			8			2.1	
EQS for fisheries ≥5 mg/l												

Table-199. Level of BOD (mg/l) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		32			25			24			28	
Raampura Bridge		25			23			22			21	
FDC More Bridge		30			32			22			26	
EQS for fisheries 6≤mg/l												

Table-200. Level of COD (mg/l) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		112			90			161			96	
Raampura Bridge		117			95			63			39	
FDC More Bridge		80			80			58			115	
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

Table-201. Level of TDS (mg/l) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		335			272			251			280	
Raampura Bridge		315			273			162			235	
FDC More Bridge		289			261			150			284	
EQS for wastewater after treatment from industrial units 2100 mg/l												

Table-202. Level of Turbidity (NTU) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		40.2			82.7			40			165	
Raampura Bridge		26.1			67.8			67.6			35	
FDC More Bridge		8.3			58.5			72.2			123	
EQS for wastewater after treatment from industrial units 10 NTU												

Table-203. Level of Chloride (mg/l) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		44			51			50			63	
Raampura Bridge		47			46			44			45	
FDC More Bridge		44			61			48			66	
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-204. Level of SS (mg/l) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		103			133			86			158	
Raampura Bridge		58			121			110			29	
FDC More Bridge		11			87			116			116	
EQS for wastewater after treatment from industrial units 100 mg/l												

Table-205. Level of Total Alkalinity (mg/l) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		226			214			151			202	
Raampura Bridge		226			175			162			189	
FDC More Bridge		186			151			150			218	
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-206. Level of EC (µmohos/cm) of Hatir Jheel Lake Water in 2022

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		597			521			493			508	
Raampura Bridge		559			517			497			426	
FDC More Bridge		514			496			474			555	
EQS for wastewater after treatment from industrial units 1200 µmohos/cm												

Annex-3: List of Tables for different parameters of Ground Water

IV. Ground Water (Deep Tubewell) in Barisal district (Table: 207-210)

Table-207: Level of pH of Ground Water at Barisal District in 2022

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Bat-ttala Bazar												7.41
Chowmatha Bazar												7.4
Rupatoly Bus Stand												7.92
Nathullabad Bus Stand								8.13				7.33
Barishal City College												7.21
Barishal Central Jail					7.01				8.01			7.56
Barishal Zila School												7.11
B.M College								7.72	8.04			7.62
Amrita Lal Dey College					7.03				8.06			7.86
Hatem Ali college												7.72
B.M. School												7.98
Sher-E-Bangla Medical College												7.39
Sadar Hospital									8.07			7.12
Upazila Office												7.77
DC Office							8.33					7.37
Khabar Bari Resturent								8.57		7.74		
Bikrompur Mistanno Vander								8.19		7.73		
Sriguru Mistanno Vander								8.1		7.68		
Ritika Satkhira Mistanno Vander								**9.33**		7.78		
Barishal Patuakhali Bus Stand								8.27		7.62		
Jom Jom Nursing Institute								8.05		7.7		
Jom Jom Diagnostic Center								8.09		7.43		
Kacha Bazar					6.94			8.64				
Ucco Madhomic Sikkha Board								7.76	8.01			
I.T Vobon								7.57	8.04			
Bivgio Pasport Office								7.3	8.29			
Kali matar Mondir							8.41	7.48	8.06			
Zia sarak					6.91			7.44				
Humuhu Resturant										7.68		
Nagar Bhaban							8.76			7.75		
Dakghor							8.65			7.71		
Agroni Bank Limited							8.56			7.32		
Upozila Setelment Office							8.49			7.62		
Upozila Vumi Office							8.39			7.68		
Zila Parishad							8.55			7.81		
Bivagio Zadughar							8.46			7.72		
Dak Bangla							8.52					
Akash Hotel							9					
Rosh malai Hotel & Resturant							8.25					
Fire Service & Civil Defence							8.46					
Ghos Mistanno Vandar							8.79					
Bivagio George Cort							8.11					
19 No Word, Notun Bazar					7.16							
Lakutiya Sarak Notun Bazar					6.94							
Sorkari Grhonthagar					7.3				8.12			
Sri Sri Radha Shamshundar Mondir					6.94							
Kostori Restora					6.96							
Tempu Stand					6.84							
Mach Bazar					6.86							
Ziya Sarak					6.91			7.44	8.12			
Monosa Bari Goli					6.98							
Brance Road					**6.53**							
Clab Road					6.76							
Kobi Kazi Nazrul Islam Sarak									8.09			
Iscon Mondir									8.06			
Bon Adhidoptor									8.11			
Cams									7.09			
Chemist Laboratory									7.03			
EQS (6.5-8.5) for drinking												

Table-208: Level of EC of Ground Water at Barisal District in 2022

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Bat-ttala Bazar												862
Chowmatha bazar												551
Rupatoly Bus stand												1021
Nathullabad Bus Stand								780				902
Barishal City College												827
Barishal Central Jail					766				1319			1200
Barishal Zila School												981
B.M College								661	1329			665
Amrita Lal Dey College					833				1429			1032
Hatem Ali college												973
B.M. School												1221
Sher-E-Bangla medical college												811
Sadar Hospital					1009				1339			1032
Upazila Office												702
DC Office							731					1135
Khabar bari Resturent								591		958		
Bikrompur Mistanno vander								**87**		965		
Sriguru mistanno vander								1397		956		
Ritika satkhira mistanno vander								705		984		
Barishal Patuakhali Bus Stand								941		743		
Jom Jom Nursing Institute								1387		756		
Jom Jom Diagnostic center								1155		936		
Kacha Bazar					862			781				
Ucco Madhomic Sikkha Board								663	1387			
I.T Vobon								655	1421			
Bivgio Pasport Office								761	1377			
Kali matar Mondir							801	659	1333			
Zia sarak								659				
Humuhu Resturant										940		
Nagar Bhaban							792			954		
Dakghor							615			959		
Agroni Bank Limited							806			881		
Upozila Setelment office							722			989		
Upozila Vumi office							718			933		
Zila Parishad							713			946		
Bivagio Zadughar							729			975		
Dak Bangla							710					
Akash Hotel							525					
Rosh malai Hotel & Resturant							802					
Fire Service & Civil Defence							791					
Ghos Mistanno Vandar							803					
Bivagio George Cort							767					
19 No Word, Notun Bazar					692							
Lakutiya sarak notun bazar					706							
Sorkari Grhonthagar					774				1381			
Sri Sri Radha shamshundar Mondir					832							
Kostori Restora					769							
Tempu Stand					768							
Mach Bazar					674							
Ziya Sarak					878			649	1353			
Monosa bari goli					756							
Brance road					792							
Clab road					782							
Kobi Kazi Nazrul Islam Sarak									1358			
Iscon Mondir									**1434**			
Bon Adhidoptor									1385			
Cams									1359			
Chemist Laboratory									1431			
EQS for wastewater after treatment from industrial units 1200 µmohos/cm												

Table-209: Level of TDS of Ground Water at Barisal District in 2022

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	Jun e	Aug	Sep	Oct	Nov	Dec
Bat-ttala Bazar												452
Chowmatha bazar												399
Rupatoly Bus stand												573
Nathullabad Bus Stand								343				428
Barishal City College												411
Barishal Central Jail					383				624			595
Barishal Zila School												472
B.M College								291	646			301
Amrita Lal Dey College					416				621			509
Hatem Ali college												497
B.M. School												519
Sher-E-Bangla medical college												401
Sadar Hospital					504				609			529
Upazila Office												309
DC Office							354					552
Khabar bari Resturent								265		465		
Bikrompur Mistanno vander								408		469		
Sriguru mistanno vander								648		465		
Ritika satkhira mistanno vander								309		460		
Barishal Patuakhali Bus Stand								433		355		
Jom Jom Nursing Institute								647		364		
Jom Jom Diagnostic center								536		452		
Kacha Bazar								347				
Ucco Madhomic Sikkha Board								291	691			
I.T Vobon								290	601			
Bivgio Pasport Office								345	648			
Kali matar Mondir							364	295	**721**			
Zia sarak								291				
Humuhu Resturant										456		
Nagar Bhaban										467		
Dakghor							368			463		
Agroni Bank Limited							365			383		
Upozila Setelment office							326			433		
Upozila Vumi office							324			475		
Zila Parishad							321			423		
Bivagio Zadughar							331			431		
Dak Bangla							318					
Akash Hotel							**227**					
Rosh malai Hotel & Resturant							339					
Fire Service & Civil Defence							358					
Ghos Mistanno Vandar							351					
Bivagio George Cort							346					
19 No Word, Notun Bazar					346							
Lakutiya sarak notun bazar					353							
Sorkari Grhonthagar					387				634			
Sri Sri Radha shamshundar Mondir					416							
Kostori Restora					384							
Tempu Stand					384							
Mach Bazar					337							
Ziya Sarak					439			291	647			
Monosa bari goli					378							
Brance road					396							
Clab road					399							
Kobi Kazi Nazrul Islam Sarak									651			
Iscon Mondir									681			
Bon Adhidoptor									620			
Cams									631			
Chemist Laboratory									664			
EQS for Drinling 1000 mg/l												

Table-210: Level of Iron of Ground Water at Barisal District in 2022

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Bat-ttala Bazar												0.25
Chowmatha bazar												0
Rupatoly Bus stand												0
Nathullabad Bus Stand								0.5				0.5
Barishal City College												0.5
Barishal Central Jail					0.25			0.5	0.5			0.5
Barishal Zila School												0.5
B.M College								0.25	0.5			0.25
Amrita Lal Dey College					0.05				0.25			0.25
Hatem Ali college												0.5
B.M. School												0.25
Sher-E-Bangla medical college												0.5
Sadar Hospital					0.25				**0.25**			0.25
Upazila Office												0.5
DC Office							0.25					0.25
Khabar bari Resturent								0.5		**0.5**		
Bikrompur Mistanno vander								0.25		**0.5**		
Sriguru mistanno vander								0.5		**0.5**		
Ritika satkhira mistanno vander								0.05		**0.5**		
Barishal Patuakhali Bus Stand								0.5		**0.5**		
Jom Jom Nursing Institute								0.25		**0.5**		
Jom Jom Diagnostic center								0.25		0.25		
Kacha Bazar					0.25			0.5				
Ucco Madhomic Sikkha Board								0.05	0.5			
I.T Vobon								0.5	0.5			
Bivgio Pasport Office								0.2	0.5			
Kali matar Mondir							0.25	0.25	0.5			
Zia sarak								0.25				
Humuhu Resturant										0.25		
Nagar Bhaban										0.5		
Dakghor							0.5			0.25		
Agroni Bank Limited							0.25			0.5		
Upozila Setelment office							0.5			0.5		
Upozila Vumi office							0.25			0.5		
Zila Parishad							0.5			0.5		
Bivagio Zadughar							0.2			0.5		
Dak Bangla							0.05					
Akash Hotel							0.25					
Rosh malai Hotel & Resturant							0.05					
Fire Service & Civil Defence							0.5					
Ghos Mistanno Vandar							0.5					
Bivagio George Cort							0.25					
19 No Word, Notun Bazar					0.2							
Lakutiya sarak notun bazar					0.5							
Sorkari Grhonthagar					0.25				0.5			
Sri Sri Radha shamshundar Mondir					0.5							
Kostori Restora					0.25							
Tempu Stand					0.25							
Mach Bazar					0.5							
Ziya Sarak					0.5			0.25	0.25			
Monosa bari goli					0.5							
Brance road					0.25							
Clab road					0.25							
Kobi Kazi Nazrul Islam Sarak									0.25			
Iscon Mondir									0.5			
Bon Adhidoptor									0.5			
Cams									0.5			
Chemist Laboratory									0.5			
EQS For Drinking (0.3-1 mg/l)												

V. Ground water (Deep Tubewell) in Bogura District (Table: 211-215)

Table-211. Level of pH of Ground Water at Bogura District in 2022

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								7.4		7.41		
Head Post Office								7.36		7.38		
Commercial College								7.32		7.34		
Zilla Parishad								7.36		7.34		
Office of the Duputy Commissioner								7.6		7.58		
Office of the Bogra Municipality								7.74		7.7		
VM School, Sadar								7.45		7.42		
T & T Office								7.36		7.34		
Biddut Office								7.22		7.3		
Bogra Sadar Thana								7.4		7.38		
EQS (6.5-8.5) for drinking												

Table-212. Level of EC of Ground Water at Bogura District in 2022

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								372		370		
Head Post Office								356		358		
Commercial College								420		410		
Zilla Parishad								424		420		
Office of the Duputy Commissioner								390		380		
Office of the Bogra Municipality								390		400		
VM School, Sadar								350		356		
T & T Office								360		362		
Biddut Office								320		340		
Bogra Sadar Thana								320		340		
EQS For Industries (1200 µmohos/cm)												

Table-213. Level of Iron of Ground Water at Bogura District in 2022

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								0.26		0.28		
Head Post Office								0.26		0.28		
Commercial College								0.4		0.42		
Zilla Parishad								0.42		0.4		
Office of the Duputy Commissioner								0.33		0.32		
Office of the Bogra Municipality								0.42		0.4		
VM School, Sadar								0.34		0.36		
T & T Office								0.32		0.34		
Biddut Office								0.38		0.36		
Bogra Sadar Thana								0.26		0.28		
EQS For Drinking (0.3-1 mg/l)												

Table-214. Level of T. Alkalinity of Ground Water at Bogura District in 2022

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								32		32		
Head Post Office								30		30		
Commercial College								32		32		
Zilla Parishad								28		28		
Office of the Duputy Commissioner								34		34		
Office of the Bogra Municipality								28		28		
VM School, Sadar								26		26		
T & T Office								28		28		
Biddut Office								32		32		
Bogra Sadar Thana								28		28		
EQS For Industries (150 mg/l)												

Table-215. Level of T. Hardness of Ground Water at Bogura District in 2022

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								240		240		
Head Post Office								240		240		
Commercial College								210		210		
Zilla Parishad								210		210		
Office of the Duputy Commissioner								200		200		
Office of the Bogra Municipality								220		220		
VM School, Sadar								240		240		
T & T Office								210		210		
Biddut Office								220		220		
Bogra Sadar Thana								220		220		
EQS For Drinking (200-500 mg/l)												

VI. Ground water (Deep Tubewell) in Sylhet district (Table: 216-220)

Table-216. Level of pH of Ground Water at Sylhet District in 2022

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Agrogami Girls High School								7.05			7.01	
Durgakumar Govt. Primary School								7.2			7.19	
Lalbazar, Bondorbazar								7.09			7.08	
MC College, Tilagor								7.12			7.13	
Kadamtoli Bus Terminal								7.06			7.08	
EQS (6.5-8.5) for drinking												

Table-217. Level of EC of Ground Water at Sylhet District in 2022

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Agrogami Girls High School								281			262	
Durgakumar Govt. Primary School								292			287	
Lalbazar, Bondorbazar								301			301	
MC College, Tilagor								308			307	
Kadamtoli Bus Terminal								312			306	
EQS for wastewater after treatment from industrial units 1200 µmohos/cm												

Table-218. Level of Chloride of Ground Water at Sylhet District in 2022

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Agrogami Girls High School								11			10	
Durgakumar Govt. Primary School								14			12	
Lalbazar, Bondorbazar								10			13	
MC College, Tilagor								9			9	
Kadamtoli Bus Terminal								13			11	
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-219. Level of Alkalinity of Ground Water at Sylhet District in 2022

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Agrogami Girls High School								13			12	
Durgakumar Govt. Primary School								10			11	
Lalbazar, Bondorbazar								14			12	
MC College, Tilagor								11			15	
Kadamtoli Bus Terminal								12			14	
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-220. Level Iron of Ground Water at Sylhet District in 2022

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Agrogami Girls High School								0.34			0.36	
Durgakumar Govt. Primary School								0.41			0.42	
Lalbazar, Bondorbazar								0.56			0.58	
MC College, Tilagor								0.29			0.3	
Kadamtoli Bus Terminal								0.36			0.39	
EQS For Drinking (0.3-1 mg/l)												

******** End ********