

# **SURFACE AND GROUND WATER QUALITY REPORT 2023**



**Department of Environment**  
Ministry of Environment, Forest & Climate Change  
Government of the People's Republic of Bangladesh

# Surface and Ground Water Quality Report 2023

Published by the Department of Environment  
Natural Resource Management

## **Editors:**

Dr Abdul Hamid  
Director General  
Department of Environment

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

AKM Rafiqul Islam  
Deputy Director (Water & Bio)  
Natural Resources Management  
Department of Environment

## **Technical Guidance and Supervision**

Zawata Afnan  
Assistant Director (Water & Bio)  
Natural Resources Management  
Department of Environment

## **Report Compilation:**

Md. Abubakar Ahmed (Biplob)  
Junior Consultant

ISBN: 978-984-35-1028-0

**Note:** *The information contained in this report can be used for study, research and training purposes subject to acknowledgement of the source or else prior. Permission is required for other uses from the Director General of the Department of Environment.*

## MESSAGE

Rivers and wetlands are lifeline of Bangladesh. Three major river systems namely the Ganges, the Brahmaputra and the Meghna 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. Water is a major need for a growing economy with a continuous growth rate of more than 7 percent a year. Water is also important for irrigation, health, domestic use and for fisheries and other biodiversity.

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 2023 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, the quality of water of large rivers such as the Padma, the Meghna, the Jamuna, the Brahmaputra 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 specially in the dry season. In addition, this report includes the water quality of three lakes (namely Dhanmondi, Gulshan and Hatir Jheel) and 63 ground water stations of four 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 document 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 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 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 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.

The surface and ground water quality report 2023 contains data and some basic statistical analysis of a number of water quality parameters of 102 points of 29 rivers, 03 lakes and 63 stations of 04 districts of ground water for the period from January to December 2023. 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 were 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 stretch 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 is an essential element for industrial as well as agricultural development. Water quality refers to the chemical, physical, biological, and radiological characteristics of water. 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  $p^H$ , 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 2023. 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 2023 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

In chemistry, **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. More precisely it is the negative of the base 10 logarithm of the activity of the hydrogen ion. At 25 °C, solutions with a pH less than 7 are acidic and solutions with a pH greater than 7 are basic. The neutral value of the pH depends on the temperature, being lower than 7 if the temperature increases. Pure water is neutral, pH 7 at (25 °C), being neither an acid nor a base. Contrary to popular belief, the pH value can be less than 0 or greater than 14 for very strong acids and bases respectively. Measurements of pH are important in agronomy, medicine, chemistry, water treatment, and many other applications. The pH scale is traceable to a set of standard solutions whose pH is established by international agreement. Primary pH standard values are determined using a concentration cell with transference, by measuring the potential difference between a hydrogen electrode and a standard electrode such as the silver chloride electrode. 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<sub>2</sub>) 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. Water temperature and the volume of moving water can affect dissolved oxygen levels. Oxygen dissolves easier in cooler water than warmer water. 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<sub>5</sub>)

Biochemical Oxygen Demand (BOD<sub>5</sub>), 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. BOD is similar in function to chemical oxygen demand (COD), in that both measure the amount of organic compounds in water. However, COD is less specific, since it measures everything that can be chemically oxidized, rather than just levels of biodegradable organic matter.

**Methods-** There are two commonly recognized methods for the measurement of BOD.

#### Dilution method

This standard method is recognized by U.S. EPA, which is labeled Method 5210B in the Standard Methods for the Examination of Water and Wastewater. In order to obtain BOD<sub>5</sub>, dissolved oxygen (DO) concentrations in a sample must be measured before and after the incubation period, and appropriately adjusted by the sample corresponding dilution factor. This analysis is performed using 300 ml incubation bottles in which buffered dilution water is dosed with seed microorganisms and stored for 5 days in the dark room at 20 °C to prevent DO production via photosynthesis. In addition to the various dilutions of BOD samples, this procedure requires dilution water blanks, glucose glutamic acid (GGA) controls, and seed controls. The dilution water blank is used to confirm the quality of the dilution water that is used to dilute the other samples. This is necessary because impurities in the dilution water may cause significant alterations in the results. The GGA control is a standardized solution to determine the quality of the seed, where its recommended BOD<sub>5</sub> concentration is 198 mg/l ± 30.5 mg/l. For measurement of carbonaceous BOD (cBOD), a nitrification

inhibitor is added after the dilution water has been added to the sample. The inhibitor hinders the oxidation of ammonia nitrogen, which supplies the nitrogenous BOD (nBOD). When performing the BOD<sub>5</sub> test, it is conventional practice to measure only cBOD because nitrogenous demand does not reflect the oxygen demand from organic matter. This is because nBOD is generated by the breakdown of proteins, whereas cBOD is produced by the breakdown of organic molecules.

BOD<sub>5</sub> is calculated by: 
$$\text{Seeded : } BOD_5 = \frac{(D_0 - D_5) - (B_0 - B_5)f}{P} \quad \text{Unseeded : } BOD_5 = \frac{(D_0 - D_5)}{P}$$

where:

$D_0$  is the dissolved oxygen (DO) of the diluted solution after preparation (mg/l)

$D_5$  is the DO of the diluted solution after 5 days incubation (mg/l)

$P$  is the decimal dilution factor

$B_0$  is the DO of diluted seed sample after preparation (mg/l)

$B_5$  is the DO of diluted seed sample after 5 days incubation (mg/l)

$f$  is the ratio of seed volume in dilution solution to seed volume in BOD test on seed

### Manometric method

This method is limited to the measurement of the oxygen consumption due only to carbonaceous oxidation. Ammonia oxidation is inhibited. The sample is kept in a sealed container fitted with a pressure sensor. A substance that absorbs carbon dioxide (typically lithium hydroxide) is added in the container above the sample level. The sample is stored in conditions identical to the dilution method. Oxygen is consumed and, as ammonia oxidation is inhibited, carbon dioxide is released. The total amount of gas, and thus the pressure, decreases because carbon dioxide is absorbed. From the drop of pressure, the sensor electronics computes and displays the consumed quantity of oxygen.

The main advantages of this method compared to the dilution method are:

simplicity: no dilution of sample required, no seeding, no blank sample.

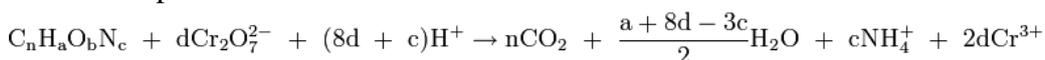
direct reading of BOD value.

continuous display of BOD value at the current incubation time.

### Chemical Oxygen Demand (COD)

In environmental chemistry, the 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). A COD test can be used to easily quantify the amount of organics in water. The most common application of COD is in quantifying the amount of oxidizable pollutants found in surface water (e.g. lakes and rivers) or wastewater. 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).

Using potassium dichromate: Potassium dichromate is a strong oxidizing agent under acidic conditions. (Acidity is usually achieved by the addition of sulfuric acid.) Most commonly, a 0.25 N solution of potassium dichromate is used for



COD determination, although for samples with COD below 50 mg/L, a lower concentration of potassium dichromate is preferred. In the process of oxidizing the organic substances found in the water sample, potassium dichromate is reduced (since in all redox reactions, one reagent is oxidized and the other is reduced), forming Cr<sup>3+</sup>. The amount of Cr<sup>3+</sup> is determined after oxidization is complete, and is used as an indirect measure of the organic contents of the water sample.

## **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. Generally, the operational definition is that the solids must be small enough to survive filtration through a filter with two-micrometer (nominal size, or smaller) pores. Total dissolved solids are normally discussed only for freshwater systems, as salinity includes some of the ions constituting the definition of TDS. The principal application of TDS is in the study of water quality for streams, rivers and lakes, although TDS is not generally considered a primary pollutant (e.g. it is not deemed to be associated with health effects) it is used as an indication of aesthetic characteristics of drinking water and as an aggregate indicator of the presence of a broad array of chemical contaminants.

### **Measurement**

The two principal methods of measuring total dissolved solids are gravimetry and conductivity. Gravimetric methods are the most accurate and involve evaporating the liquid solvent and measuring the mass of residues left. This method is generally the best, although it is time-consuming. If inorganic salts comprise the great majority of TDS, gravimetric methods are appropriate. Electrical conductivity of water is directly related to the concentration of dissolved ionized solids in the water. Ions from the dissolved solids in water create the ability for that water to conduct an electrical current, which can be measured using a conventional conductivity meter or TDS meter. When correlated with laboratory TDS measurements, conductivity provides an approximate value for the TDS concentration, usually to within ten-percent accuracy. The relationship of TDS and specific conductance of groundwater can be approximated by the following equation:

$TDS = k_e EC$ , where TDS is expressed in mg/L and EC is the electrical conductivity in microsiemens per centimeter at 25 °C. The correlation factor  $k_e$  varies between 0.55 and 0.8.

### **Electrical Conductivity (EC):**

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

### **Units of Electrical Conductivity**

Electrical conductivity is denoted by the symbol  $\sigma$  and has SI units of siemens per meter (S/m). In electrical engineering, the Greek letter  $\kappa$  is used. Sometimes the Greek letter  $\gamma$  represents conductivity. In water, conductivity is often reported as specific conductance, which is a measure compared to that of pure water at 25°C. The electrical conductivity of the water depends on the water temperature: the higher the temperature, the higher the electrical conductivity would be. The electrical conductivity of water increases by 2-3% for an increase of 1 degree Celsius of water temperature. Many EC meters nowadays automatically standardize the readings to 25°C. While the electrical conductivity is a good indicator of the total salinity, it still does not provide any information about the ion composition in the water. The same electrical conductivity values can be measured in low quality water (e.g. water rich with Sodium, Boron and Fluorides) as well as in high quality irrigation water (e.g. adequately fertilized water with appropriate nutrient concentrations and ratios). The commonly used units for measuring EC of water are:  $\mu\text{S}/\text{cm}$  (microSiemens/cm) or  $\text{dS}/\text{m}$  (deciSiemens/m), Where:  $1000 \mu\text{S}/\text{cm} = 1 \text{dS}/\text{m}$

### **Relationship between TDS and EC**

Since the electrical conductivity is a measure to the capacity of water to conduct electrical current, it is directly related to the concentration of salts dissolved in water, and therefore to the Total Dissolved Solids (TDS). Salts dissolve into positively charged ions and negatively charged ions, which conduct electricity. Since, it is difficult to measure TDS in the field, the electrical conductivity of the water is

used as a measure. The electrical conductivity of the water can be determined in a quick and inexpensive way, using portable meters. Distilled water does not contain dissolved salts and, as a result, it does not conduct electricity and has an electrical conductivity of zero. Nevertheless, when the salt concentration reaches a certain level, electrical conductivity is no longer directly related to salts concentration. This is because ion pairs are formed. Ion pairs weaken each other's charge, so that above this level, higher TDS will not result in equally higher electrical conductivity.

EC can be converted to TDS using the following calculation:

$$\text{TDS (ppm)} = 0.64 \times \text{EC } (\mu\text{S/cm}) = 640 \times \text{EC (dS/m)}$$

This relation provides an estimate only.

### **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. It is sometimes abbreviated SS, but is not to be confused with settleable solids, also abbreviated SS, which contribute to the blocking of sewer pipes.

### **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. It is listed as a conventional pollutant in the U.S. Clean Water Act. Total dissolved solids is another parameter acquired through a separate analysis which is also used to determine water quality based on the total substances that are fully dissolved within the water, rather than undissolved suspended particles. TSS was previously called non-filterable residue (NFR), but was changed to TSS because of ambiguity in other scientific disciplines.

TSS in mg/L can be calculated as:

$$(\text{dry weight of residue and filter} - \text{dry weight of filter alone, in grams}) / \text{mL of sample} * 1,000,000$$

TSS of a water or wastewater sample is determined by pouring a carefully measured volume of water (typically one litre; but less if the particulate density is high, or as much as two or three litres for very clean water) through a pre-weighed filter of a specified pore size, then weighing the filter again after drying to remove all water. Filters for TSS measurements are typically composed of glass fibres.<sup>[2]</sup> The gain in weight is a dry weight measure of the particulates present in the water sample expressed in units derived or calculated from the volume of water filtered (typically milligrams per litre or mg/L).

### **Chloride**

The chloride ion is the anion (negatively charged ion)  $\text{Cl}^-$ . 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. (It should not be confused with basicity which is an absolute measurement on the pH scale.) 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. Fluids can contain suspended solid matter consisting of particles of many different sizes. While some suspended material will be large enough and heavy enough to settle rapidly to the bottom of the container if a liquid sample is left to stand (the settleable solids), very small particles will settle only very slowly or not at all if the sample is regularly agitated or the particles are colloidal. These small solid particles cause the liquid to appear turbid. 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  $2.5^\circ$  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.

Salinity is the saltiness or dissolved salt content of a water body. 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. Seawater typically has a salinity of around 35 g/kg, although lower values are typical near coasts where rivers enter the ocean. Rivers and lakes can have a wide range of salinities, from less than 0.01 g/kg to a few g/kg, although there are many places where higher salinities are found. The Dead Sea has a salinity of more than 200 g/kg.

## **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.

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>24</b>
<b>CHAPTER 1: INTRODUCTION .....</b>	<b>25</b>
1.1 Background.....	25
1.2 Major objectives of the report .....	25
1.3 Limitation of the report .....	26
<b>CHAPTER 2: AN OVERVIEW OF BANGLADESH'S SURFACE AND GROUND WATER. 27</b>	
2.1 Surface Water Sources and Rivers of Bangladesh.....	27
2.2 Ground water of Bangladesh.....	29
<b>CHAPTER 3: METHODS FOR MEASUREMENT AND ANALYSIS OF WATER QUALITY 31</b>	
3.1 Water Quality Parameters .....	31
3.2 Sampling Locations .....	31
3.3 Methods of Analysis .....	31
3.4 Surface Water Monitoring Stations .....	32
<b>CHAPTER 4: RIVER WATER QUALITY IN 2023 .....</b>	<b>34</b>
4.1 Buriganga River .....	34
4.2 Shitalakhya River.....	36
4.3 Turag River.....	39
4.4 Dhaleshwari River .....	41
4.5 Brahmaputra River.....	43
4.6 Kaliganga River .....	44
4.7 Jamuna River .....	45
4.8 Meghna River .....	46
4.9 Padma River.....	47
4.10 Korotoa River .....	49
4.11 Teesta River .....	50
4.12 Karnaphuli River.....	51
4.13 Halda River.....	52
4.14 Moyuri River.....	53
4.15 Bhairab River.....	54
4.16 Rupsa River.....	56
4.17 Mathavanga River.....	57
4.18 Pashur River.....	59
4.19 Khakshiali River .....	60
4.20 Gorai River .....	62
4.21 Modhumoti River.....	63
4.22 Ganges River.....	65

4.23 Kirtankhola River.....	66
4.24 Tatulia River .....	67
4.25 Kalabodar River.....	68
4.26 Lohalia River/Laukathi River.....	69
4.27 Surma River .....	70
4.28 Kushiara River .....	71
4.29 Balu River.....	72
<b>CHAPTER 5: WATER QUALITY PARAMETERS OF LAKE WATER.....</b>	<b>74</b>
5.1 Water Quality Parameters of Gulshan Lake Water .....	74
5.2 Water Quality Parameters of Dhanmondi Lake.....	76
5.3 Water Quality Parameters of Hatir-Jheel Lake.....	78
<b>CHAPTER 6: WATER QUALITY PARAMETERS OF GROUND WATER .....</b>	<b>80</b>
6.1 Water Quality Parameters of Ground Water in Chittagong District .....	80
6.2 Water Quality Parameters of Ground Water in Barisal District .....	81
6.3 Water Quality Parameters of Ground Water in Bogura District .....	82
6.4 Different Water Quality Parameters of Ground Water in Sunamgonj District .....	83
<b>CHAPTER 7: CONCLUSION AND RECOMMENDATIONS .....</b>	<b>84</b>
7.1 Conclusion .....	84
7.2 Recommendations.....	85
<b>CHAPTER 8: REFERENCE .....</b>	<b>86</b>
<b><i>ANNEX-1: LIST OF TABLES FOR DIFFERENT PARAMETERS OF RIVER WATER .....</i></b>	<b><i>87</i></b>
<b><i>ANNEX-2: LIST OF TABLES FOR DIFFERENT PARAMETERS OF LAKE WATER.....</i></b>	<b><i>121</i></b>
<b><i>ANNEX-3: LIST OF TABLES FOR DIFFERENT PARAMETERS OF GROUND WATER....</i></b>	<b><i>128</i></b>

## LIST OF TABLES

Table- A: Water Quality Monitoring Stations of DoE for Selected 29 Rivers .....	32
Table-1. Level of pH of Buriganga River Water in 2023 .....	88
Table-2. Level of DO (mg/l) of Buriganga River Water in 2023 .....	88
Table-3. Level of BOD (mg/l) of Buriganga River Water in 2023 .....	88
Table-4. Level of COD (mg/l) of Buriganga River Water in 2023 .....	88
Table-5. Level of TDS (mg/l) of Buriganga River Water in 2023 .....	89
Table-6. Level of Turbidity (NTU) of Buriganga River Water in 2023 .....	89
Table-7. Level of Chloride (mg/l) of Buriganga River Water in 2023 .....	89
Table-8. Level of SS (mg/l) of Buriganga River Water in 2023 .....	89
Table-9. Level of Total Alkalinity (mg/l) of Buriganga River Water in 2023 .....	90
Table-10. Level of EC ( $\mu\text{mohs/cm}$ ) of Buriganga River Water in 2023 .....	90
Table-11. Level of pH of Shitalakhya River Water in 2023 .....	90
Table-12. Level of DO (mg/l) of Shitalakhya River Water in 2023 .....	90
Table-13. Level of BOD (mg/l) of Shitalakhya River Water in 2023 .....	90
Table-14. Level of COD (mg/l) of Shitalakhya River Water in 2017 .....	91
Table-15. Level of TDS (mg/l) of Shitalakhya River Water in 2023 .....	91
Table-16. Level of Chloride (mg/l) of Shitalakhya River Water in 2023 .....	91
Table-17. Level of SS (mg/l) of Shitalakhya River Water in 2023 .....	91
Table-18. Level of EC ( $\mu\text{mohs/cm}$ ) of Shitalakhya River Water in 2023 .....	91
Table-19. Level of Total Alkalinity (mg/l) of Shitalakhya River Water in 2023 .....	91
Table-20. Level of pH of Turagh River Water in 2023 .....	92
Table-21. Level of DO (mg/l) of Turagh River Water in 2023 .....	92
Table-22. Level of BOD (mg/l) of Turagh River Water in 2023 .....	92
Table-23. Level of COD (mg/l) of Turagh River Water in 2023 .....	92
Table-24. Level of TDS (mg/l) of Turagh River Water in 2023 .....	92
Table-25. Level of Chloride (mg/l) of Turagh River Water in 2023 .....	93
Table-26. Level of SS (mg/l) of Turagh River Water in 2023 .....	93
Table-27. Level of EC ( $\mu\text{mohs/cm}$ ) of Turagh River Water in 2023 .....	93
Table-28. Level of Total Alkalinity (mg/l) of Turagh River Water in 2023 .....	93
Table-29. Level of pH of Dhaleshwari River Water in 2023 .....	93
Table-30. Level of DO (mg/l) of Dhaleshwari River Water in 2023 .....	94
Table-31. Level of BOD (mg/l) of Dhaleshwari River Water in 2023 .....	94
Table-32. Level of COD (mg/l) of Dhaleshwari River Water in 2023 .....	94
Table-33. Level of TDS (mg/l) of Dhaleshwari River Water in 2023 .....	94
Table-34. Level of Chloride (mg/l) of Dhaleshwari River Water in 2023 .....	94
Table-35. Level of SS (mg/l) of Dhaleshwari River Water in 2023 .....	95
Table-36. Level of EC ( $1200\mu\text{mohs/cm}$ ) of Dhaleshwari River Water in 2023 .....	95
Table-37. Level of Total Alkalinity (mg/l) of Dhaleshwari River Water in 2023 .....	95
Table-38. Level of pH of Brahmaputra River Water in 2023 .....	95

Table-39. Level of DO (mg/l) of Brahmaputra River Water in 2023.....	95
Table-40. Level of BOD (mg/l) of Brahmaputra River Water in 2023 .....	95
Table-41. Level of TDS (mg/l) of Brahmaputra River Water in 2023 .....	96
Table-42. Level of SS (mg/l) of Brahmaputra River Water in 2023 .....	96
Table-43. Level of Chloride (mg/l) of Brahmaputra River Water in 2023.....	96
Table-44. Level of pH of Kaligonga River Water in 2023 .....	96
Table-45. Level of DO (mg/l) of Kaligonga River Water in 2023.....	96
Table-46. Level of BOD (mg/l) of Kaligonga River Water in 2023 .....	96
Table-47. Level of TDS (mg/l) of Kaligonga River Water in 2023 .....	96
Table-48. Level of COD (mg/l) of Kaligonga River Water in 2023 .....	96
Table-49. Level of Chloride (mg/l) of Kaligonga River Water in 2023.....	97
Table-50. Level of pH of Jamuna River Water in 2023.....	97
Table-51. Level of DO (mg/l) of Jamuna River Water in 2023 .....	97
Table-52. Level of BOD (mg/l) of Jamuna River Water in 2023.....	97
Table-53. Level of SS of Jamuna River Water in 2023 .....	98
Table-54. Level of TDS (mg/l) of Jamuna River Water in 2023 .....	98
Table-55. Level of EC ( $\mu$ mhos/cm) of Jamuna River Water in 2023 .....	98
Table-56. Level of pH of Meghna River Water in 2023 .....	98
Table-57. Level of DO (mg/l) of Meghna River Water in 2023 .....	99
Table-58. Level of BOD (mg/l) of Meghna River Water in 2023.....	99
Table-59. Level of TDS (mg/l) of Meghna River Water in 2023.....	99
Table-60. Level of COD (mg/l) of Meghna River Water in 2023.....	99
Table-61. Level of Chloride (mg/l) of Meghna River Water in 2023 .....	99
Table-62. Level of pH of Padma River Water in 2023 .....	99
Table-63. Level of DO (mg/l) of Padma River Water in 2023 .....	100
Table-64. Level of BOD (mg/l) of Padma River Water in 2023 .....	100
Table-65. Level of TDS (mg/l) of Padma River Water in 2023.....	100
Table-66. Level of SS (mg/l) of Padma River Water in 2023.....	100
Table-67. Level of EC ( $\mu$ mhos/cm) of Padma River Water in 2023.....	100
Table-68. Level of pH of Korotoa River Water in 2023 .....	100
Table-69. Level of DO (mg/l) of Korotoa River Water in 2023 .....	100
Table-70. Level of BOD (mg/l) of Korotoa River Water in 2023.....	101
Table-71. Level of TDS (mg/l) of Korotoa River Water in 2023.....	101
Table-72. Level of SS (mg/l) of Korotoa River Water in 2023.....	101
Table-73. Level of EC ( $\mu$ mhos/cm) of Korotoa River Water in 2023.....	101
Table-74. Level of pH of Teesta River Water in 2023.....	101
Table-75. Level of DO (mg/l) of Teesta River Water in 2023 .....	101
Table-76. Level of BOD (mg/l) of Teesta River Water in 2023 .....	102
Table-77. Level of TDS (mg/l) of Teesta River Water in 2023 .....	102
Table-78. Level of SS (mg/l) of Teesta River Water in 2023 .....	102
Table-79. Level of Chloride (mg/l) of Teesta River Water in 2023.....	102

Table-80. Level of pH of Karnaphuli River Water in 2023 .....	102
Table-81. Level of DO (mg/l) of Karnaphuli River Water in 2023.....	103
Table-82. Level of BOD (mg/l) of Karnaphuli River Water in 2023 .....	103
Table-83. Level of COD (mg/l) of Karnaphuli River Water in 2023 .....	103
Table-84. Level of TDS (mg/l) of Karnaphuli River Water in 2023.....	103
Table-85. Level of SS (mg/l) of Karnaphuli River Water in 2023 .....	103
Table-86. Level of pH of Halda River Water in 2023.....	104
Table-87. Level of DO (mg/l) of Halda River Water in 2023 .....	104
Table-88. Level of BOD (mg/l) of Halda River Water in 2023 .....	104
Table-89. Level of COD (mg/l) of Halda River Water in 2023 .....	104
Table-90. Level of EC (µmhos/cm) of Halda River Water in 2023 .....	104
Table-91. Level of SS (mg/l) of Halda River Water in 2023 .....	104
Table-92. Level of pH of Moyuri River Water in 2023 .....	105
Table-93. Level of DO (mg/l) of Moyuri River Water in 2023 .....	105
Table-94. Level of TDS (mg/l) of Moyuri River Water in 2023.....	105
Table-95. Level of Chloride (mg/l) of Moyuri River Water in 2023 .....	105
Table-96. Level of Turbidity (NTU) of Moyuri River Water in 2023 .....	105
Table-97. Level of BOD (mg/l) of Moyuri River Water in 2023.....	105
Table-98. Level of EC (µmhos/cm) of Moyuri River Water in 2023.....	106
Table-99. Level of Salinity (mg/l) of Moyuri River Water in 2023 .....	106
Table-100. Level of pH of Bhairab River Water in 2023 .....	106
Table-101. Level of DO (mg/l) of Bhairab River Water in 2023.....	106
Table-102. Level of BOD (mg/l) of Bhairab River Water in 2023 .....	106
Table-103. Level of TDS (mg/l) of Bhairab River Water in 2023 .....	106
Table-104. Level of Chloride (mg/l) of Bhairab River Water in 2023.....	107
Table-105. Level of Turbidity (NTU) of Bhairab River Water in 2023.....	107
Table-106. Level of EC (µmhos/cm) of Bhairab River Water in 2023 .....	107
Table-107. Level of Salinity (ppt) of Bhairab River Water in 2023 .....	107
Table-108. Level of pH of Rupsa River Water in 2023 .....	107
Table-109. Level of DO (mg/l) of Rupsa River Water in 2023 .....	107
Table-110. Level of BOD (mg/l) of Rupsa River Water in 2023.....	108
Table-111. Level of Chloride (mg/l) of Rupsa River Water in 2023 .....	108
Table-112. Level of SS (mg/l) of Rupsa River Water in 2023.....	108
Table-113. Level of Turbidity (NTU) of Rupsa River Water in 2023 .....	108
Table-114. Level of EC (µmhos/cm) of Rupsa River Water in 2023.....	108
Table-115. Level of Salinity (ppt) of Rupsa River Water in 2023 .....	108
Table-116. Level of pH of Mathavanga River Water in 2023.....	109
Table-117. Level of DO (mg/l) of Mathavanga River Water in 2023.....	109
Table-118. Level of BOD (mg/l) of Mathavanga River Water in 2023 .....	109
Table-119. Level of TDS (mg/l) of Mathavanga River Water in 2023 .....	109
Table-120. Level of Chloride (mg/l) of Mathavanga River Water in 2023.....	109

Table-121. Level of Turbidity (NTU) of Mathavanga River Water in 2023 .....	109
Table-122. Level of EC ( $\mu$ mhos/cm) of Mathavanga River Water in 2023 .....	109
Table-123. Level of Salinity (ppt) of Mathavanga River Water in 2023 .....	109
Table-124. Level of pH of Pashur River Water in 2023 .....	110
Table-125 Level of DO (mg/l) of Pashur River Water in 2023.....	110
Table-126. Level of BOD (mg/l) of Pashur River Water in 2023 .....	110
Table-127. Level of TDS (mg/l) of Pashur River Water in 2023.....	110
Table-128. Level of Chloride (mg/l) of Pashur River Water in 2023 .....	110
Table-129. Level of Turbidity (NTU) of Pashur River Water in 2023.....	110
Table-130. Level of EC ( $\mu$ mhos/cm) of Pashur River Water in 2023.....	110
Table-131. Level of SS (mg/l) of Pashur River Water in 2023.....	111
Table-132. Level of pH of Khakshiali River Water in 2023.....	111
Table-133 Level of DO (mg/l) of Khakshiali River Water in 2023 .....	111
Table-134. Level of BOD (mg/l) of Khakshiali River Water in 2023.....	111
Table-135. Level of TDS (mg/l) of Khakshiali River Water in 2023 .....	111
Table-136. Level of Chloride (mg/l) of Khakshiali River Water in 2023 .....	111
Table-137. Level of Turbidity (NTU) of Khakshiali River Water in 2023 .....	111
Table-138. Level of EC ( $\mu$ mhos/cm) of Khakshiali River Water in 2023 .....	112
Table-139. Level of SS (mg/l) of Khakshiali River Water in 2023 .....	112
Table-140. Level of pH of Gorai River Water in 2023 .....	112
Table-141. Level of DO (mg/l) of Gorai River Water in 2023 .....	112
Table-142. Level of BOD (mg/l) of Gorai River Water in 2023.....	112
Table-143. Level of TDS (mg/l) of Gorai River Water in 2023.....	112
Table-144. Level of Chloride (mg/l) of Gorai River Water in 2023 .....	112
Table-145. Level of Turbidity (NTU) of Gorai River Water in 2023 .....	112
Table-146. Level of EC ( $\mu$ mhos/cm) of Gorai River Water in 2023.....	113
Table-147. Level of SS (mg/l) of Gorai River Water in 2023.....	113
Table-148. Level of pH of Modhumoti River Water in 2023 .....	113
Table-149. Level of DO (mg/l) of Modhumoti River Water in 2023.....	113
Table-150. Level of BOD (mg/l) of Modhumoti River Water in 2023 .....	113
Table-151. Level of TDS (mg/l) of Modhumoti River Water in 2023 .....	113
Table-152. Level of Chloride (mg/l) of Modhumoti River Water in 2023.....	113
Table-153. Level of Turbidity (NTU) of Modhumoti River Water in 2023.....	113
Table-154. Level of EC ( $\mu$ mhos/cm) of Modhumoti River Water in 2023 .....	114
Table-155. Level of SS (mg/l) of Modhumoti River Water in 2023 .....	114
Table-156. Level of pH of Ganges River Water in 2023 .....	114
Table-157. Level of DO (mg/l) of Ganges River Water in 2023 .....	114
Table-158. Level of BOD (mg/l) of Ganges River Water in 2023.....	114
Table-159. Level of TDS (mg/l) of Ganges River Water in 2023.....	114
Table-160. Level of Chloride (mg/l) of Ganges River Water in 2023 .....	114
Table-161. Level of Turbidity (NTU) of Ganges River Water in 2023 .....	114

Table-162. Level of EC ( $\mu$ mohos/cm) of Ganges River Water in 2023.....	114
Table-163. Level of SS (mg/l) of Ganges River Water in 2023.....	115
Table-164. Level of pH of Kirtankhola River Water in 2023.....	115
Table-165. Level of DO (mg/l) of Kirtankhola River Water in 2023.....	115
Table-166. Level of TDS (mg/l) of Kirtankhola River Water in 2023.....	115
Table-167. Level of EC ( $\mu$ mohos/cm) of Kirtankhola River Water in 2023.....	115
Table-168. Level of pH of Tatulia River Water in 2023.....	116
Table-169. Level of DO (mg/l) of Tatulia River Water in 2023.....	116
Table-170. Level of TDS (mg/l) of Tatulia River Water in 2023.....	116
Table-171. Level of EC ( $\mu$ mohos/cm) of Tatulia River Water in 2023.....	116
Table-172. Level of pH of Kalabodar River Water in 2023.....	116
Table-173. Level of DO (mg/l) of Kalabodar River Water in 2023.....	116
Table-174. Level of TDS (mg/l) of Kalabodar River River Water in 2023.....	116
Table-175. Level of EC ( $\mu$ mohos/cm) of Kalabodar River Water in 2023.....	116
Table-176. Level of pH of Lohalia River Water in 2023.....	117
Table-177. Level of DO (mg/l) of Lohalia River Water in 2023.....	117
Table-178. Level of TDS (mg/l) of Lohalia River River Water in 2023.....	117
Table-179. Level of EC ( $\mu$ mohos/cm) of Lohalia River Water in 2023.....	117
Table-180. Level of pH of Surma River Water in 2023.....	117
Table-181. Level of DO (mg/l) of Surma River Water in 2023.....	117
Table-182. Level of BOD (mg/l) of Surma River Water in 2023.....	118
Table-183. Level of SS (mg/l) of Surma River Water in 2023.....	118
Table-184. Level of TDS (mg/l) of Surma River Water in 2023.....	118
Table-185. Level of EC ( $\mu$ mohos/cm) of Surma River Water in 2023.....	118
Table-186. Level of pH of Kushiara River Water in 2023.....	118
Table-187. Level of DO (mg/l) of Kushiara River Water in 2023.....	118
Table-188. Level of BOD (mg/l) of Kushiara River Water in 2023.....	119
Table-189. Level of COD (mg/l) of Kushiara River Water in 2023.....	119
Table-190. Level of TDS (mg/l) of Kushiara River Water in 2023.....	119
Table-191. Level of EC ( $\mu$ mohos/cm) of Kushiara River Water in 2023.....	119
Table-192. Level of pH of Balu River Water in 2023.....	119
Table-193. Level of DO (mg/l) of Balu River Water in 2023.....	119
Table-194. Level of BOD (mg/l) of Balu River Water in 2023.....	119
Table-195. Level of COD (mg/l) of Balu River Water in 2023.....	120
Table-196. Level of TDS (mg/l) of Balu River Water in 2023.....	120
Table-197. Level of Chloride (mg/l) of Balu River Water in 2023.....	120
Table-198. Level of SS (mg/l) of Balu River Water in 2023.....	120
Table-199. Level of EC ( $\mu$ mohos/cm) of Balu River Water in 2023.....	120
Table-200. Level of T.alkalinity (mg/l) of Balu River Water in 2023.....	120
Table-201. Level of Turbidity (NTU) of Balu River Water in 2023.....	120
Table-202. Level of pH of Gulshan Lake Water in 2023.....	122

Table-203. Level of DO (mg/l) of Gulshan Lake Water in 2023 .....	122
Table-204. Level of BOD (mg/l) of Gulshan Lake Water in 2023 .....	122
Table-205. Level of COD (mg/l) of Gulshan Lake Water in 2023 .....	122
Table-206. Level of TDS (mg/l) of Gulshan Lake Water in 2023 .....	123
Table-207. Level of Turbidity (NTU) of Gulshan Lake Water in 2023 .....	123
Table-208. Level of Chloride (mg/l) of Gulshan Lake Water in 2023 .....	123
Table-209. Level of SS (mg/l) of Gulshan Lake Water in 2023 .....	123
Table-210. Level of Total Alkalinity (mg/l) of Gulshan Lake Water in 2023.....	124
Table-211. Level of EC ( $\mu$ mohos/cm) of Gulshan Lake Water in 2023 .....	124
Table-212. Level of pH of Dhanmondi Lake Water in 2023 .....	124
Table-213. Level of DO (mg/l) of Dhanmondi Lake Water in 2023.....	124
Table-214. Level of BOD (mg/l) of Dhanmondi Lake Water in 2023 .....	124
Table-215. Level of COD (mg/l) of Dhanmondi Lake Water in 2023 .....	125
Table-216. Level of TDS (mg/l) of Dhanmondi Lake Water in 2023 .....	125
Table-217. Level of Turbidity (NTU) of Dhanmondi Lake Water in 2023.....	125
Table-218. Level of Chloride (mg/l) of Dhanmondi Lake Water in 2023 .....	125
Table-219. Level of SS (mg/l) of Dhanmondi Lake Water in 2023 .....	125
Table-220. Level of Total Alkalinity (mg/l) of Dhanmondi Lake Water in 2023 .....	125
Table-221. Level of EC ( $\mu$ mohos/cm) of Dhanmondi Lake Water in 2023.....	126
Table-222. Level of pH of Hatir Jheel Lake Water in 2023.....	126
Table-223. Level of DO (mg/l) of Hatir Jheel Lake Water in 2023 .....	126
Table-224. Level of BOD (mg/l) of Hatir Jheel Lake Water in 2023 .....	126
Table-225. Level of COD (mg/l) of Hatir Jheel Lake Water in 2023 .....	126
Table-226. Level of TDS (mg/l) of Hatir Jheel Lake Water in 2023 .....	126
Table-227. Level of Turbidity (NTU) of Hatir Jheel Lake Water in 2023 .....	127
Table-228. Level of Chloride (mg/l) of Hatir Jheel Lake Water in 2023 .....	127
Table-229. Level of SS (mg/l) of Hatir Jheel Lake Water in 2023 .....	127
Table-230. Level of Total Alkalinity (mg/l) of Hatir Jheel Lake Water in 2023 .....	127
Table-231. Level of EC ( $\mu$ mohos/cm) of Hatir Jheel Lake Water in 2023 .....	127
Table-232. Level of pH of Ground Water at Chittagong District in 2023.....	129
Table-233. Level of TDS (mg/l) of Ground Water at Chittagong District in 2023 .....	129
Table-234. Level of EC ( $\mu$ mohos/cm) of Ground Water at Chittagong District in 2023 .....	129
Table-235. Level of Salinity (ppt) of Ground Water at Chittagong District in 2023.....	129
Table-236: Level of pH of Ground Water at Barisal District in 2023.....	130
Table-237: Level of EC of Ground Water at Barisal District in 2023.....	131
Table-238: Level of TDS of Ground Water at Barisal District in 2023 .....	132
Table-239: Level of Iron of Ground Water at Barisal District in 2023 .....	133
Table-240. Level of pH of Ground Water at Bogura District in 2023.....	134
Table-241. Level of EC of Ground Water at Bogura District in 2023 .....	134
Table-242. Level of Iron of Ground Water at Bogura District in 2023.....	134
Table-243. Level of T. Hardness of Ground Water at Bogura District in 2023 .....	135

Table-244. Level of pH of Ground Water at Sunamgonj District in 2023 .....	135
Table-245. Level of EC of Ground Water at Sunamgonj District in 2023 .....	135

## LIST OF FIGURES

Figure-A: Riverr system of Bangladesh (Source: BWDB, 2011).....	30
Figure-B: Location of Surface Water Monitoring Stations .....	33
Fig.1.1: Status of pH, DO, BOD, COD and TDS of Buriganga River in 2023.....	35
Fig.1.2: Status of Chloride, SS, T. Alkalinity, EC and Turbidity of Buriganga River in 2023 .....	36
Fig.2: Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC and T.Alkalinity of Shitalakhya River in 2023	38
Fig.3. Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC and T.Alkalinity of Turag River in 2023 .....	40
Fig.4. Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC and T. Alkalinity of Dhaleshwari River in 2023	42
Fig.5. Graphical presentation of pH, DO, BOD, TDS, SS and Chloride of Brahmaputra River in 2023.....	43
Fig.6. Status of pH, DO, BOD, COD, TDS and SS of Kaliganga Rriver in 2023 .....	44
Fig.7. Status of pH, DO, BOD,TDS, EC and SS of Jamuna Rriver in 2023.....	45
Fig.8. Status of pH, DO, BOD, TDS, SS and Chloride of Meghna River in 2023 .....	46
Fig.9. Status of pH, DO, BOD, TDS, SS and EC of Padma River in 2023 .....	48
Fig.10. Status of pH, DO, BOD, TDS, SS and EC of Korotoa River in 2023 .....	49
Fig.11. Status of pH, DO, BOD, TDS, SS and Chloride of Teesta River in 2023 .....	50
Fig.12. Status of pH, DO, BOD, COD, SS, TDS of Karnaphuli River in 2023.....	51
Fig.13. Status of pH, DO, COD, SS and EC of Halda River in 2023 .....	52
Fig.14. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Moyuri River in 2023 .....	53
Fig.15. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Bhairab River in 2023 .....	55
Fig.16. Status of pH, DO, BOD, Chloride, Turbidity, EC, SS and Salinity of Rupsa River in 2023 .....	56
Fig.17. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Mathavanga River in 2023 ...	58
Fig.18. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and SS of Pashur River in 2023.....	59
Fig.19. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and SS of Khakshiali River in 2023.....	61
Fig.20. Status of pH, DO BOD, TDS, Chloride, Turbidity, EC and SS of Gorai River in 2023.....	62
Fig.21. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and SS of Modhumoti River in 2023 .....	64
Fig.22. Status of pH, DO, BOD, TDS, Chloride, Turbidity, SS and EC of Ganges River in 2023.....	65
Fig.23. Status of pH, DO, TDS and EC of Kirtankhola River in 2023 .....	66
Fig.24.Status of pH, DO, TDS and EC of Tatulia River in 2023 .....	67
Fig.25. Status of pH, DO, TDS and EC of Kalabodar River in 2023 .....	68
Fig.26. Status of pH, DO, TDS and EC of Lohalia River in 2023.....	69
Fig.27. Status of pH, DO, BOD, COD, TDS and EC of Surma River in 2023 .....	70
Fig 28. Status of pH, DO, BOD, COD, TDS and EC of Kushiara River in 2023 .....	71
Fig 29. Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC, T.alkalinity and Turbidity of Balu River in 2023 .....	73
Fig 30. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Gulshan Lake in 2023 .....	75

Fig 31. Status of pH, DO, BOD, COD, TDS, Turbidity , Chloride, SS, T. Alkalinity and EC of Dhamnondi Lake in 2023 .....	77
Fig 32. Status of pH, DO, BOD, COD, TDS, Chloride, SS, T. Alkalinity, Turbidity and EC of Hatir Jheel Lake in 2023 .....	79
Fig 33. Status of pH, EC, TDS and Salinity of Chittagong District area ground water in 2023 .....	80
Fig 34. Status of pH, EC, TDS and Iron of Barisal district area ground water in 2023 .....	81
Fig 35. Status of pH, EC, Iron and T.Hardness of Bogura District area ground water in 2023 .....	82
Fig 36. Status of pH and EC of Sunamgonj District area ground water in 2023 .....	83

## 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 Brahmaputra and the Meghna) and their tributaries and distributaries, perennial 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 within 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 2023, Water quality-monitoring programme of DoE covered sampling from 102 points of 29 rivers, 13 points of 3 Lakes (Gulshan, Dhanmondi and Hatir Jheel lakes) of Dhaka and 63 groundwater points of 4 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.

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 2023. In the Meghna River DO and BOD level were found within the EQS which varied from 0.0 mg/l to 8.11 mg/l and 0.6 mg/l to 17 mg/l, respectively. In the Jamuna River, DO and BOD levels were found from 6.1 mg/l to 7.62 mg/l and 2.2 to 4.8 mg/l, respectively. On the other hand, rivers around greater Dhaka were highly polluted specially in the first three months of 2023 in terms of DO, BOD and COD values. High levels of Turbidity (90.5 mg/l), Total Alkalinity (281 mg/l), BOD (34 mg/l) and COD (122 mg/l) were found in the Buriganga River from January to December in 2023. High BOD (68 mg/l) and Turbidity (83.9 NTU) was found in the Balu River. High BOD (29 mg/l) and Turbidity (198 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 (3062 mg/l), TDS (6123 mg/l) and Turbidity (97 NTU) were also very high in the Pashur River. Highest value of Chloride (4110 mg/l), Turbidity (96 NTU), Salinity (8.61 ppt) and EC (16440  $\mu$ mhos/cm) was found in the Kakshiali River. High COD (64 mg/l), SS (439 mg/l) and TDS (19140 mg/l) was found in the Karnapuli River. High DO (7.48 mg/l) and EC (1701  $\mu$ mhos/cm) was found in the Kirtankhola River. High DO (8.81 mg/l) and BOD (23 mg/l) was found in the Kushiara 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 Sixty Three (63) different locations of four 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 2023.

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”. A part of that responsibility the Government 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 flows 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 2023, the monitoring program covered sampling of 102 points of 29 rivers, 13 points of 3 Lakes (Gulshan, Dhanmondi and Hatir Jheel lakes) of Dhaka and 63 points of ground water of 4 districts in Bangladesh.

### 1.2 Major objectives of the report

Major 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 2023. 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 BANGLADESH'S SURFACE AND GROUND WATER

### 2.1 Surface Water Sources and Rivers of Bangladesh

Rivers, canals, streams, lakes, Haors, Baors, Beels and ponds as surface water sources are the most important elements of physiographic features of Bangladesh and play a crucial 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 river 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 Jahnvi, 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 3,960m 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 Kushiya.

Between the Surma and the Kushiya, 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.

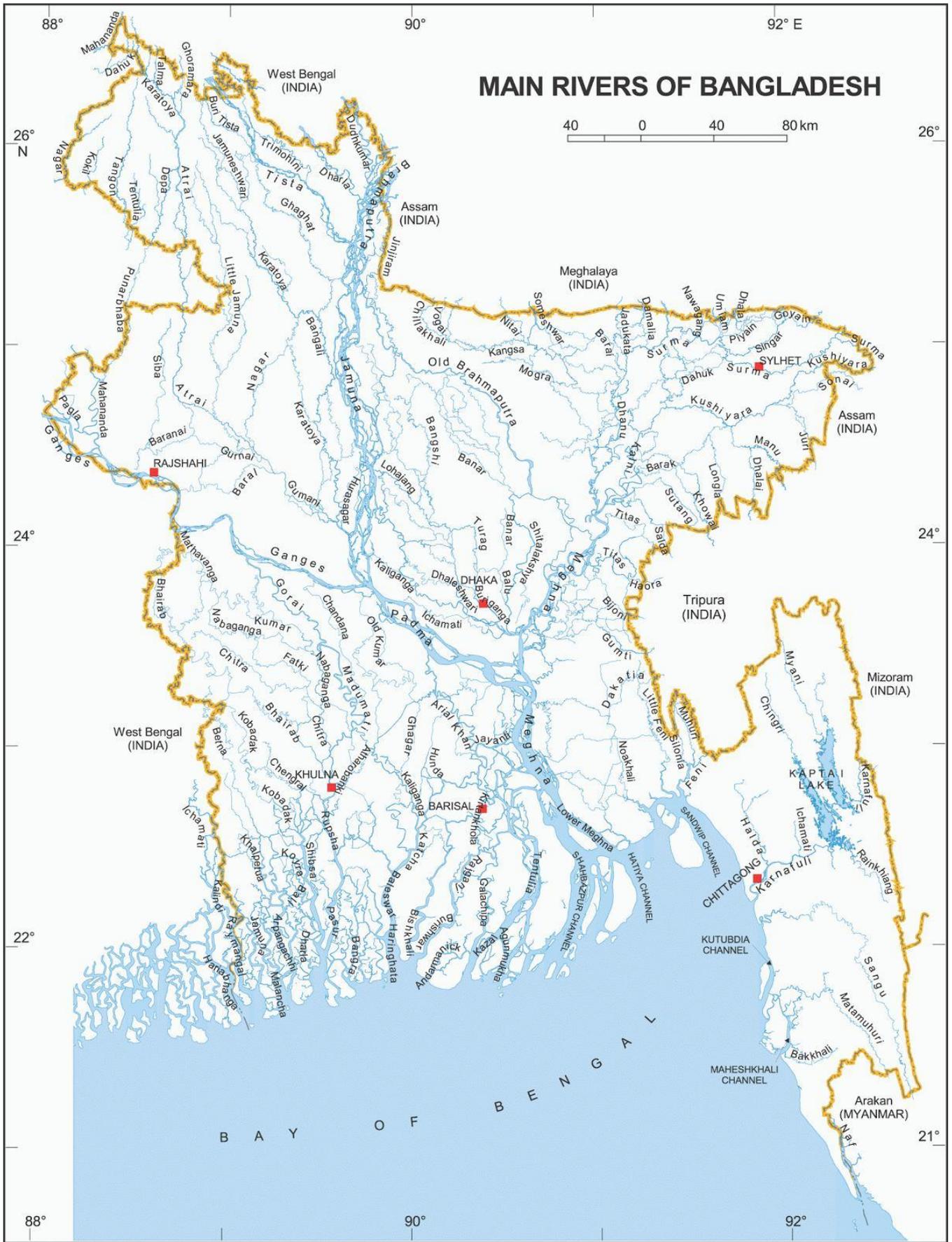
**Chittagong Region River System:** Chittagong Region River System the Chittagong region consists of the 5 hilly districts of Chittagong division namely Chittagong, Cox's Bazar, Bandarban, Rangamati and Khagrachhari. It is bounded by the Bay of Bengal on the south and west, the Naf river with Myanmar 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 of Bangladesh

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: Riverr 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 2023, the monitoring program covered sampling of 102 points of 29 rivers, 16 points of 3 Lakes (Gulshan, Dhanmondi and Hatir Jheel lakes) of Dhaka and 63 stations (Chittagong Dist.-9 points, Barisal Dist.-42 points Stations, Sunamgonj Dist.-02 points, Rajshahi Dist.-10 points) of 4 districts, Nearly 50% of these locations were monitored on monthly basis (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 methods are followed for analysis :

Parameters	Methods
Dissolved Oxygen (DO)	Modified Winkler's Method/Titrimetric Method
Biochemical Oxygen Demand (BOD <sub>5</sub> )	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

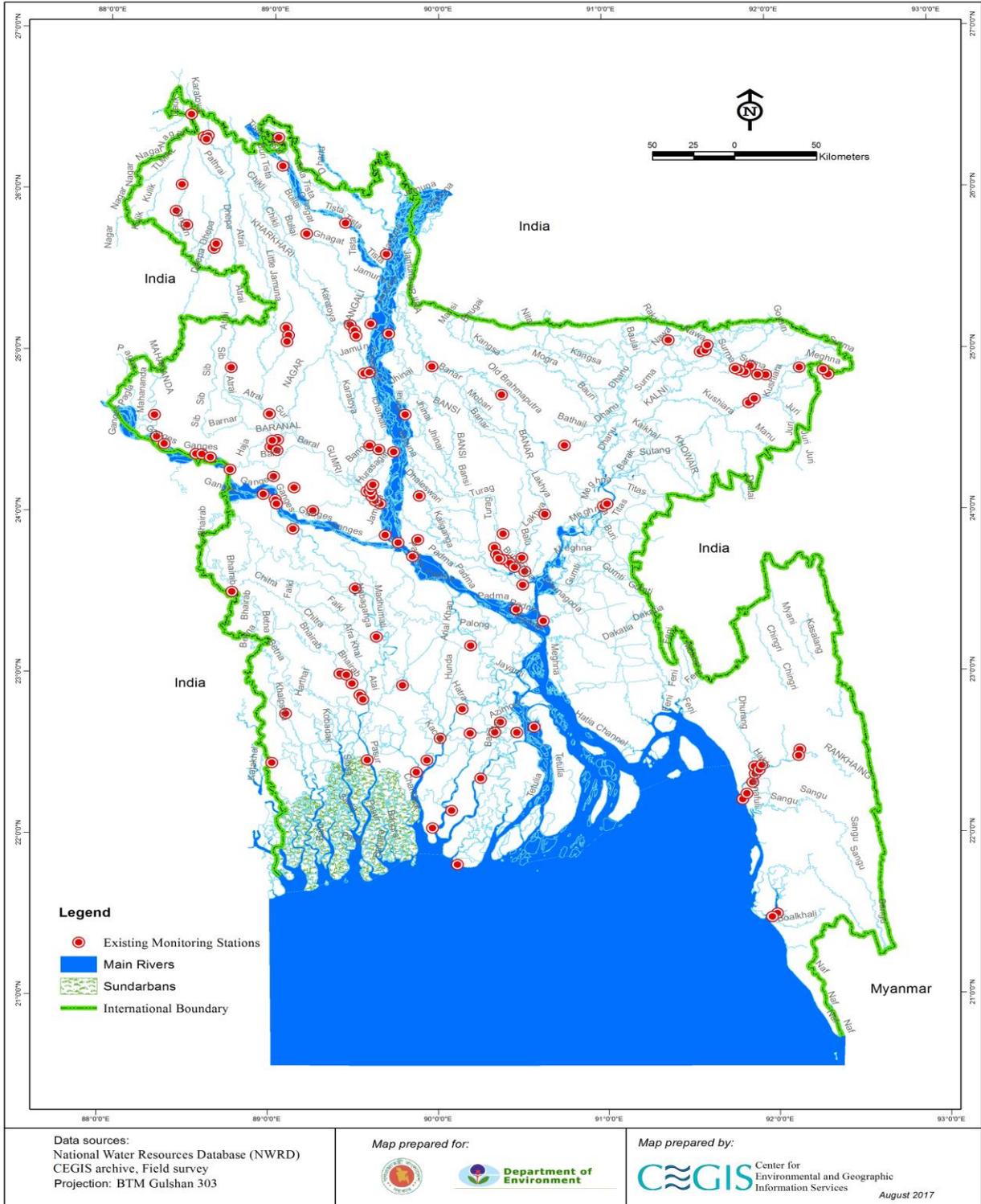
### 3.4 Surface Water Monitoring Stations

In 2023, sample from 102 monitoring points of both rivers and inland waterbodies were collected. The following table lists all monitoring stations in selected 29 rivers (Table A, Figure-B).

**Table- A: Water Quality Monitoring Stations of DoE for Selected 29 Rivers**

Sl	River Name	Monitoring Stations	No. of Stations
1	Buriganga	Mirpur Bridge, Bosila Bridge, Hazaribagh, Satmosjid Road, Chandni Ghat, Fatullah, Bangladesh China Friendship Bridge	07
2	Shitalakhya	Port Road, Majira Demra Ghat, Murapara (Rupgonj), Gorashal	04
3	Turag	Turag (Tongi) Bridge, Ashulia, Kaliakoir, Vawal, Nama Bazar	05
4	Dhaleshwari	Mukterpur, Pathorghata, Ruhitpur, Hazaratpur, Utorro Mitra	05
5	Brahmaputra	Rail Bridge (Shamvoganj), Mymensingh	02
6	Kaliganga	Veuta Ghat, Manikgonj	01
7	Jamuna	Jamuna Eco Park (Up), Jamuna Eco Park (Dn), Shariakand Kheya Ghat (Up), Shariakand Kheya Ghat (Dn), MohonGanj (Up), Mohon Ganj (Dn), Horipur Kheya ghat (Up), Horipur Kheya ghat (Dn), Tarakandi, Kakua	09
8	Meghna	Meghna Ghat, Annondo Bazar, Bishondi Ferry Ghat, Narshingdi Launch Ghat, Bairob Bazar	05
9	Padma	Barha Ghat, Mawa Ghat	02
10	Korotoa	Dottobari Bridge (UP), Dottobari Bridge (Down), Aziz Ahmed Taki Road (UP), Aziz Ahmed Taki Road (Down)	04
11	Teesta	Teesta Bridge (Up), Teesta Bridge (Dn), Nohali Sapmari (Up), Nohali Sapmari (Dn), Teesta Barrage (Up), Teesta Barrage (Dn)	06
12	Karnaphuli	CUFL, TSP, Shikalbaha, Kalurghat Bridge, Mariam Nagar, Karnafully Paper	06
13	Halda	Maduna Ghat, Garduara Sluice Gate, Halda Bridge	03
14	Moyuri	Shoshan Ghat, Buro Moulavir Darga, Doshgate Jalma	03
15	Bhairab	Basundia Bazar (Aladipur), Noapara Ferry Ghat Abhaynagar, Noapara Jafarpur, Fultala Ghat (Dhulgram)	04
16	Rupsa	Gilatola (Nadan Pratap), Kalibari Ghat, Charer Hat (Sulpur Aijgati), Rupsa Ghat	04
17	Mathavanga	Pipe Ghat (M.P), Pipe Ghat (U.S), PipeGhat (D.S)	03
18	Passur	Rampal Power Plant, Banishanta, Batiaghata By Pass	03
19	Khakshiali	Uzirpur, Kaliganj Bazar, Boshontopur	03
20	Gorai	Kamarkhali Bridge	01
21	Modhumoti	Dhalaitala	01
22	Ganges	Gorai off Take	01
23	Kirtankhola	Launch Ghat (S), Launch Ghat (M), Kaower Char (S), Kaower Char (M), Dopdopia Kheyaghat (S), Dopdopia Kheyaghat (M)	06
24	Tetulia	Vadura Launch Ghat (S), Vadura Launch Ghat (M)	02
25	Kalabodar	Kalabodar Ferry Ghat (S), Kalabodar Ferry Ghat (M)	02
26	Lohalia river	Patuakhali Launch Ghat (PLG) (Side and Middle)	02
27	Surma	Mendibag Point, Kin Bridge Point, Sheaik Ghat, Chhatak	04
28	Kushiara	Fenchuganj Bridge Point, Fenchuganj Fertilizer Industry Point	02
29	Balu	Trimohoni Bridge, Jolshiri Abason	02

### Map of Existing Monitoring Station of DoE



**Figure-B: Location of Surface Water Monitoring Stations**

## CHAPTER 4: RIVER WATER QUALITY IN 2023

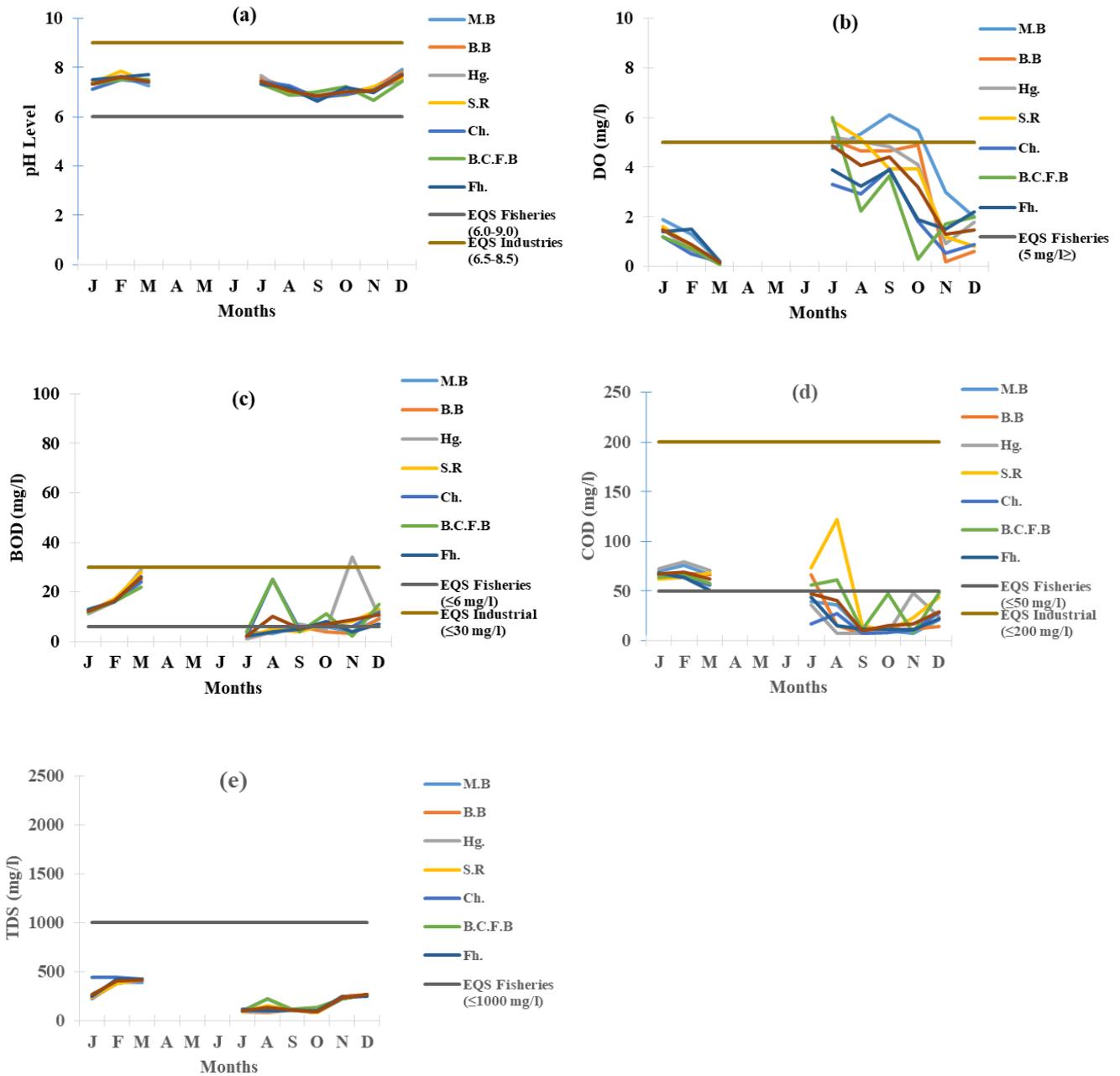
### 4.1 Buriganga River

Buroganga river starts from Turag River at Amin Bazar of Savar and 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 seven different locations viz. Mirpur Bridge (M.B), Bosila Bridge (B.B), Hazaribagh (Hg.), Satmosjid Road (S.R), Chandni Ghat (C.G), Fatullah (Fh), Bangladesh China Friendship Bridge (B.C.F.B) along the river. Detail data is attached Annex-1 (Table:1-10).

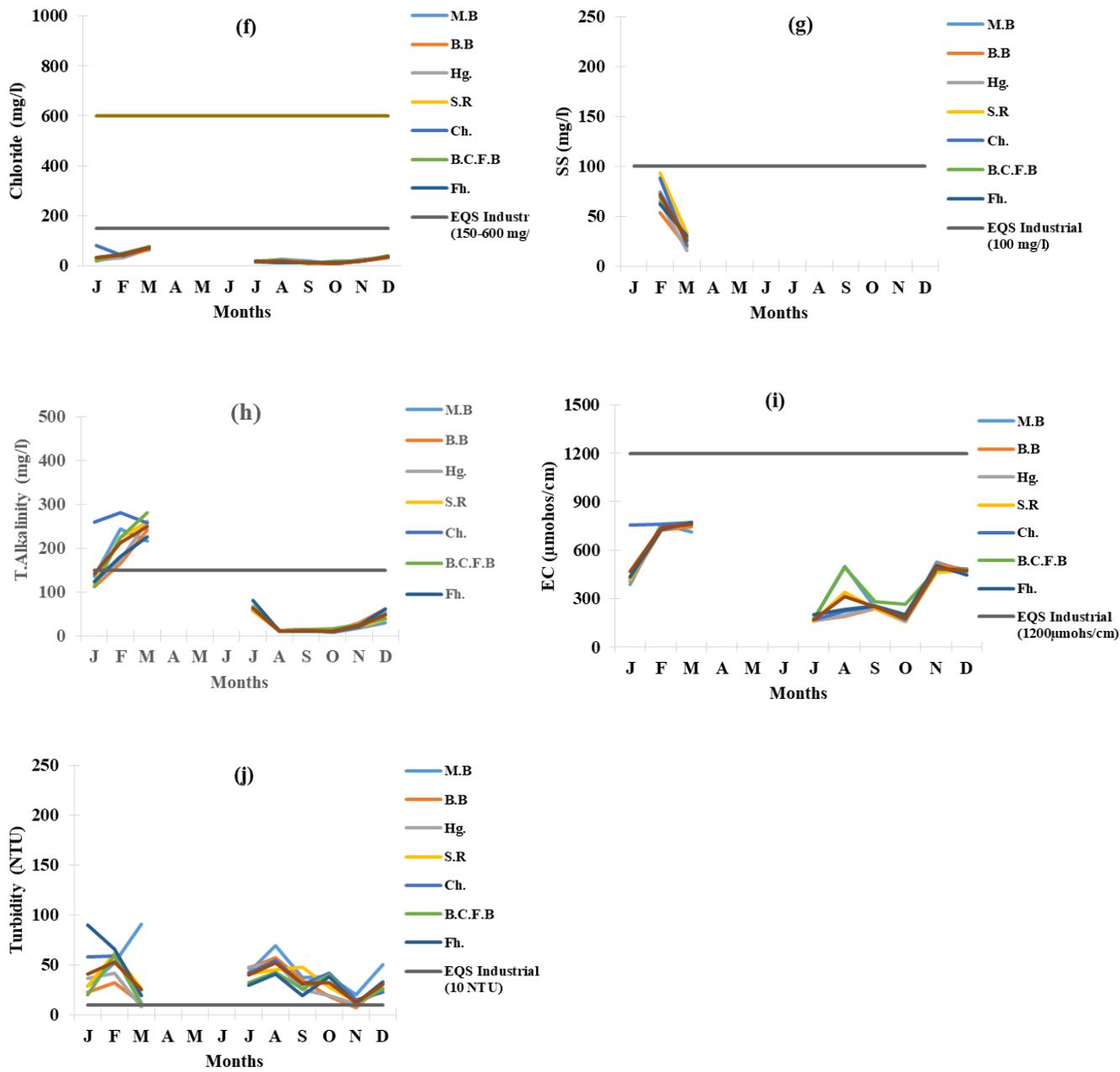
In 2023, pH among different locations varied from 6.65 to 7.92 (Fig.1.1 a) while standard pH range for inland surface water for fisheries 6.5 to 8.5. In 2022, pH range varied from 6.41 to 7.97. In 2023, the maximum DO (6.09 mg/l) was found at Mirpur Bridge in September and the minimum (0.1 mg/l) was at Bosila Bridge (B.B) and Hazaribagh (Hg.) point in March (Fig.1.1 b). Direct discharge of untreated effluent from industries, reduced flow of river water, municipal wastes and tannery wastes into the river are the proximate causes for depletion of DO in dry season. DO level was slightly increased in wet season (July to October) at all locations of the river. In 2022, DO level varied from 0.1 mg/l to 6.26 mg/l. In 2023, BOD of Buriganga river water was higher than EQS ( $\leq 6$  mg/l). The maximum BOD (34 mg/l) was found at Hazaribagh (Hg.) Point in November and the minimum (1.0 mg/l) was at Bosila Bridge (B.B) and Hazaribagh (Hg.) point in July (Fig.1.1 c). In 2022, BOD range was 6.0 to 42 mg/l. In 2023, COD level was mostly higher the EQS (50 mg/l) set for fisheries for the month of January to March and July to August. The maximum and the minimum COD concentration of Buriganga river was 122 mg/l at Satmosjid Road (S.R) Point in August and 7 mg/l at Hazaribagh (Hg.) Point in August and September (Fig.1d). In 2022, COD varied from 10 mg/l to 126 mg/l. In 2023, TDS of Buriganga river varied from 79.2 to 444 mg/l (Fig.1.1 e) against the EQS of 1000 mg/l for fisheries. In 2022, TDS concentration varied from 75 to 704 mg/l.

In 2023, Chloride concentration of the Buriganga river was below the EQS for industrial wastewater after treatment. The maximum concentration was 82 mg/l at Chandni Ghat (C.G) point in January and the minimum 9.0 mg/l at Hazaribagh (Hg.) pint in October (Fig.1.2 f). In 2022, Chloride concentration varied from 4.5 mg/l to 100 mg/l. In 2023, SS of Buriganga river water at different locations was below the EQS (100 mg/l) for wastewater after treatment from industrial units. The maximum SS was 93 mg/l in February at Satmosjid Road (S.R) point and the minimum 16 mg/l in March at Hazaribagh (Hg.) Point (Fig.1.2 g). In 2022, SS varied from 6.0 mg/l to 204 mg/l. In 2023, the maximum and the minimum Total Alkalinity of Buriganga river water was 281 mg/l at B.C.F.B point in March and 09 mg/l at Mirpur Bridge in October (Fig.1.2 h). In 2022, T. Alkalinity varied from 28 mg/l to 370 mg/l. In 2023, the maximum EC of Buriganga river water was 773  $\mu\text{mhos/cm}$  in March at Fatullah (Fh) point and the minimum 156  $\mu\text{mhos/cm}$  in October at Mirpur Bridge (M.B) point (Fig.1.2 i). In 2022, EC varied from 148  $\mu\text{mhos/cm}$  to 1401  $\mu\text{mhos/cm}$ . In 2023, the maximum and the minimum Turbidity of Buriganga river water was 90.5 NTU at Mirpur Bridge (M.B) in March and 6.9 NTU at Bosila Bridge (B.B) in November while EQS is 10 NTU (Fig.1.2 j). In 2022, Turbidity range varied from 10.3 to 158 NTU.



**Fig.1.1: Status of pH, DO, BOD, COD and TDS of Buriganga River in 2023**

Note: Mirpur Bridge (M.B), Bosila Bridge (B.B), Hazaribagh (Hg.), Satmosjid Road (S.R), Chandni Ghat (C.G), Fatullah (Fh), Bangladesh China Friendship Bridge (B.C.F.B).



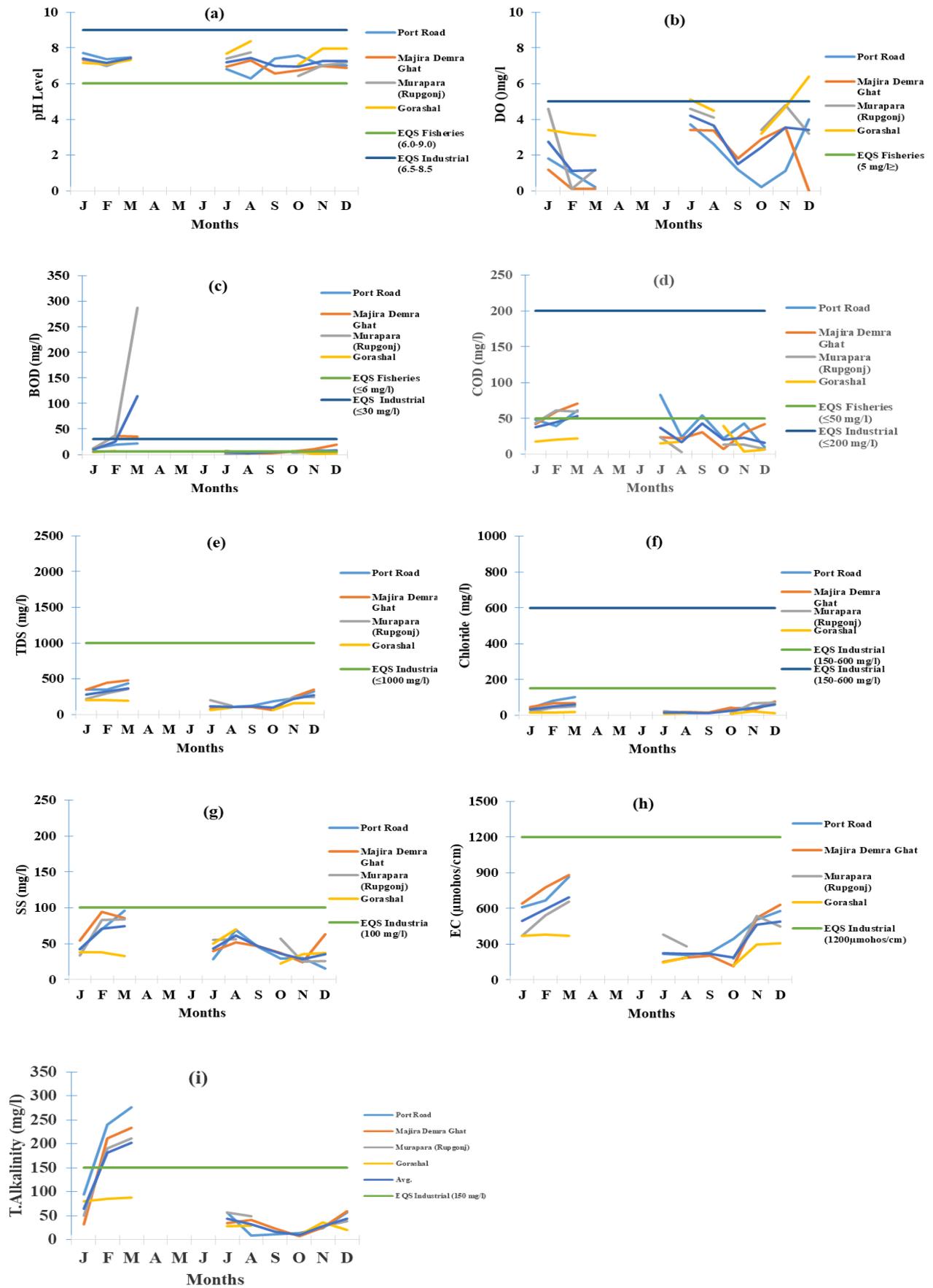
**Fig.1.2: Status of Chloride, SS, T. Alkalinity, EC and Turbidity of Buriganga River in 2023**

Note: Mirpur Bridge (M.B), Bosila Bridge (B.B), Hazaribagh (Hg.), Satmosjid Road (S.R), Chandni Ghat (C.G), Fatullah (Fh), Bangladesh China Friendship Bridge (B.C.F.B).

## 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 collected from four different locations viz. Port Road, Majira Demra Ghat, Murapara (Rupgonj), Gorashal. Detail data is attached Annex-1 (Table:11-19).

In 2023, pH of Shitalakhya river water was within the EQS (6.5-8.5) range for inland surface water. The maximum pH was 8.38 in August at Ghorasal and the minimum P<sup>H</sup> was 6.3 in August at Port Road point (Fig.2a). In 2022, pH varied from 6.34 to 7.95. In 2023, the maximum DO (6.4 mg/l) was found at Ghorasal point in December and the minimum (0.0 mg/l) was found at Majira Demra Ghat point in December (Fig.2b). In 2022, DO varied from 0.0 to 7.9 mg/l. In 2023, BOD at Demra Ghat was very high during dry season and was above the EQS ( $\leq 6$  mg/l) for fisheries. Highest value of BOD (287 mg/l) was found Murapara (Rupgonj) in march and lowest (1.0 mg/l) was in July at the same point (Fig.2c). In 2022, BOD concentration varied from 3.0 mg/l to 24 mg/l. In 2023, COD level was slightly higher the EQS (50 mg/l) for wastewater for fisheries at maximum locations of Shitalakhya river. The maximum COD (83 mg/l) was at Port Road in July and the minimum COD (4.0 mg/l) was at Ghorasal in November (Fig.2d). In 2022, COD level varied from 8 mg/l to 82 mg/l. In 2023, TDS of Shitalakhya river water varied from 59.1 to 478 mg/l against the EQS (1000 mg/l) for fisheries. The maximum TDS (478 mg/l) was at Majira Demra Ghat point in March and the minimum (59.1 mg/l) in October at the same location (Fig.2e). In 2022, TDS range was from 52 to 528 mg/l. In 2023, Chloride concentration of the Shitalakhya river water was below the EQS (600 mg/l) for wastewater after treatment from industrial units. The maximum Chloride (101 mg/l) was found at Port Road in March and the minimum was 8.5 mg/l at Ghorasal in October (Fig.2f). In 2022, Chloride concentration varied from 8.0 mg/l to 140 mg/l. In 2023, SS of Shitalakhya river water at different sampling locations was within the EQS (100 mg/l). Maximum SS concentration of Shitalakhya river was 96 mg/l at Port Road point in March and the minimum was 15 mg/l in December at the same location (Fig.2g). In 2022, SS varied from 7.0 mg/l to 181 mg/l. In 2023, EC of Shitalakhya river at different locations was mostly within the EQS (1200  $\mu$ mhos/cm) for treated wastewater from industrial units (Fig.2h). The maximum EC (879  $\mu$ mhos/cm) was at Majira Demra Ghat point in March and the minimum EC (112.4  $\mu$ mho/cm) was at Majira Demra Ghat point in October. In 2022, EC varied from 65.2  $\mu$ mhos/cm to 1138  $\mu$ mhos/cm. In 2023, Maximum Total Alkalinity (276 mg/l) was at Port Road in March and that the minimum was (8 mg/l) at Majira Demra Ghat point in October (Fig.2i). In 2022, Total Alkalinity varied from 22 mg/l to 320 mg/l.

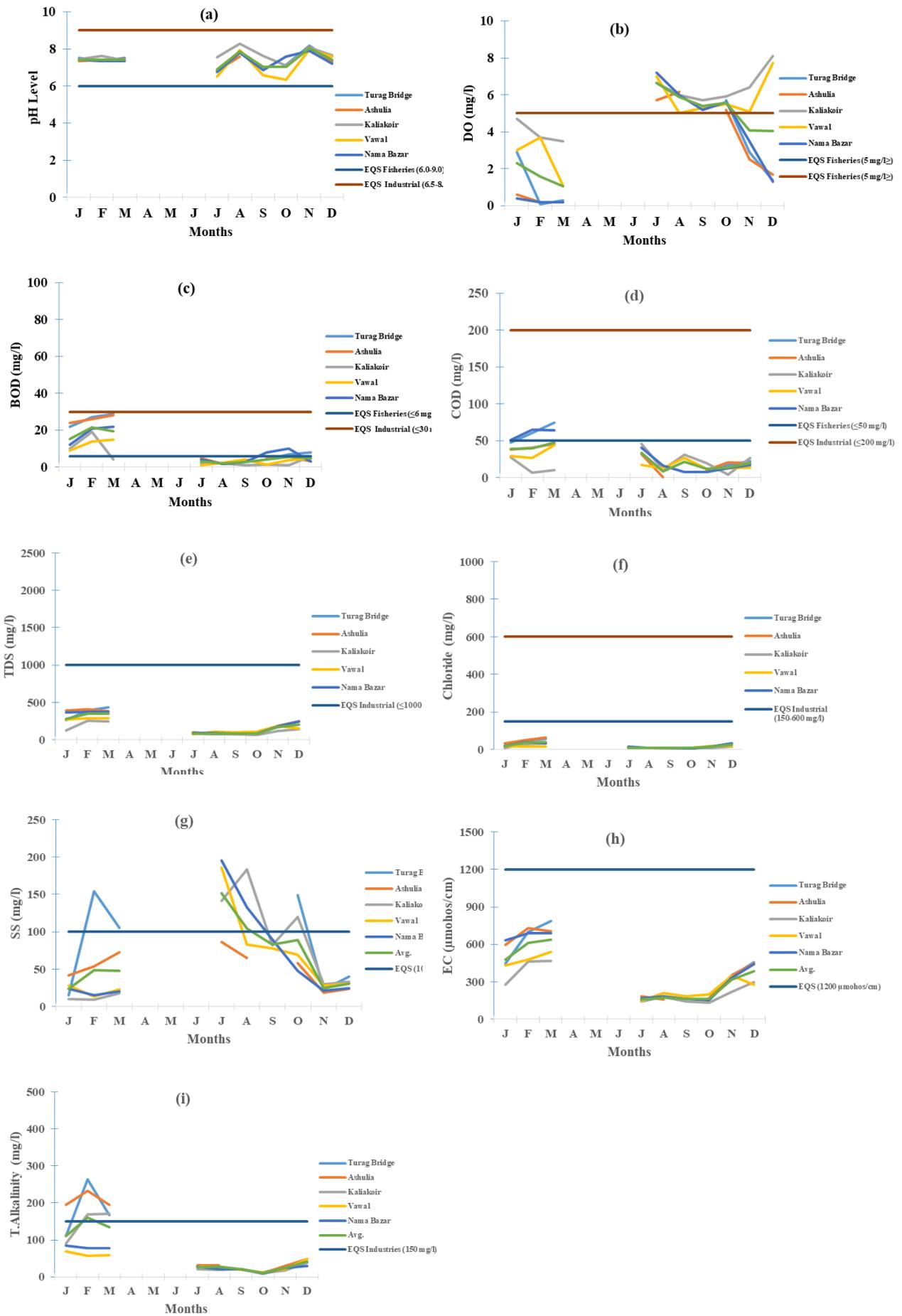


**Fig.2: Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC and T.Alkalinity of Shitalakhya River in 2023**

### 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 2023, water samples were collected from five locations such as Turag Bridge, Ashulia, Kaliakoir, Vawal, Nama Bazar. Detail data is attached Annex-1 (Table: 20-28).

In 2023, the pH range (6.34 - 8.27) (Fig.3a) of Turag River was within EQS (6.5 -8.5). The maximum pH 8.27 was found in August at Kaliakoir point and the minimum pH 6.34 was found in October at Vawal Point. In 2022, pH range was 6.69-8.47. In 2023, the maximum DO (8.12 mg/l) found at Kaliakoir in December and the minimum DO (0.1) mg/l was found in February at Turag Bridge point (Fig.3b). In 2022, DO was varied from 0.21 to 8.7. In 2023, BOD of Turag River water was higher the EQS ( $\leq 6$  mg/l) for the months of January to March. The maximum BOD was 29 mg/l in March at Turag Bridge and the minimum was 0.9 mg/l in September at Kaliakoir (Fig.3c). In 2022, BOD varied from 2.0 mg/l to 34 mg/l. In 2023, COD at almost all locations of Turag River was higher the EQS (50 mg/l) for fisheries in the month of January to March. The maximum and the minimum COD content of Turag River water was 75 mg/l at Turag Bridge in March and 0.87 mg/l at Ashulia in August (Fig.3d). In 2022, COD range was from 10.0 mg/l to 97 mg/l. In 2023, TDS was below the EQS (1000 mg/l) for fisheries (Fig.3e) at all the sampling points. The maximum TDS was 433 mg/l in March at Turag Bridge while that of minimum was 66.5 in October at Kaliakoir point. In 2022, TDS varied from 51 mg/l to 837 mg/l. In 2023, Chloride content of Turag River water was below the EQS (150-600 mg/l). The maximum Chloride was (21 mg/l) found in December at Vawal point and the minimum Chloride was (6.0 mg/l) in October at Ashulia point (Fig.3f). In 2022, Chloride varied from 3.0 mg/l to 106 mg/l. In 2023, the maximum SS (195 mg/l) was at Nama Bazar in July and the minimum (9 mg/l) in February at Kaliakoir point (Fig.3g). In 2022, SS varied from 5.0 mg/l to 372 mg/l. In 2023, the maximum EC (788  $\mu$ mhos/cm) was in March at Turag Bridge and the minimum (131.2  $\mu$ mhos/cm) was in October (Fig.3h) at Kaliakoir point. In 2022, EC varied from 100  $\mu$ mhos/cm to 1847  $\mu$ mhos/cm. In 2023, the maximum Total Alkalinity (232 mg/l) was at Ashulia in February and the minimum (9 mg/l) in October at Nama Bazar (Fig.3i). In 2022, Total Alkalinity varied from 20 mg/l to 400 mg/l.



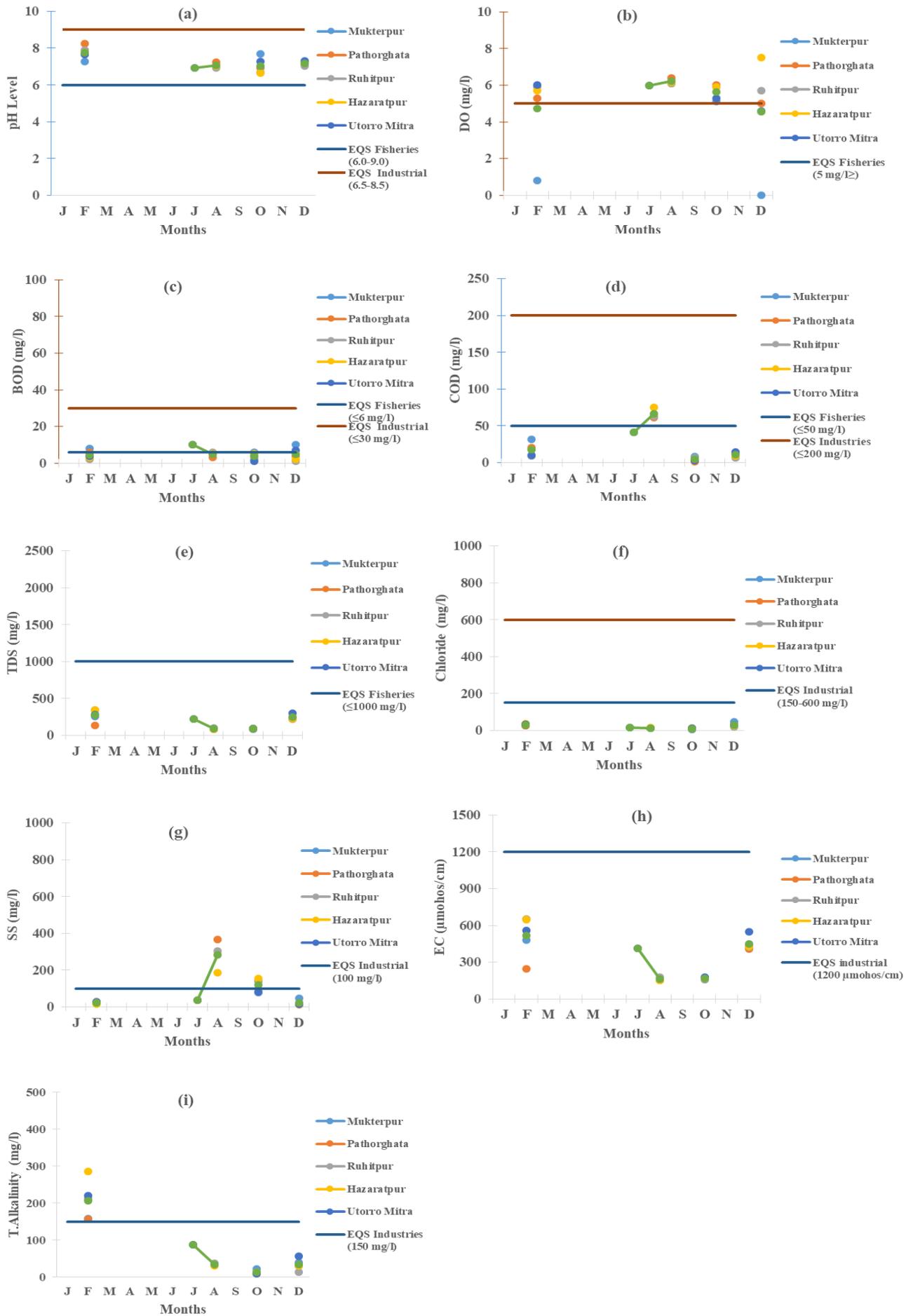
**Fig.3. Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC and T. Alkalinity of Turag River in 2023**

#### 4.4 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 2023, water samples were collected from five locations namely Mukterpur, Pathorghata, Ruhitpur, Hazaratpur, Utorro Mitra for analyses. Data was not available in the months of January, March to June September and November. Detail data is attached Annex-1 (Table: 29-37).

In 2023, Dhaleshwari river water was almost neutral and pH varied from 6.63 to 8.25 (Fig.4a). In 2022, pH level varied from 6.91 to 8.73. In 2023, the maximum DO concentration (7.5 mg/l) was at Hazaratpur in December and the minimum (0.0 mg/l) at Mukterpur in December (Fig.4b). In 2022, DO concentration varied from 0.0 to 15 mg/l. In 2023, BOD varied from 1.0 to 10.0 mg/l (Fig.4c) while EQS for fisheries is  $\leq 6$  mg/l. The maximum BOD was 10.0 mg/l in July and December at Hazaratpur, Utorro Mitra and Mukterpur and the minimum BOD was 1.0 mg/l in December at Ruhitpur. In 2022, BOD varied from 1.2 to 28 mg/l. Level of COD of Dhaleshwari river water was within the EQS except the month of August. The maximum COD of Dhaleshwari river water was 75 mg/l in August at Hazartpur and the minimum was 3 mg/l in October at Utorro Mitra point (Fig.4d) against the EQS (50 mg/l) for fisheries. In 2022, COD varied from 6.0 to 90 mg/l. In 2023, TDS concentration varied from 83 to 244 mg/l (Fig.4e) while standard TDS level 1000 mg/l for fisheries. The maximum TDS was 344 mg/l in February at Ruhitpur and the minimum TDS was 83 mg/l in August at Pathorghata and Hazaratpur. In 2022, TDS varied from 61 to 411 mg/l. In 2023, Chloride concentration ranged from 10 to 48 mg/l (Fig.4f), which is far below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2022, Chloride concentration range of Dhaleshwari river water was from 5.0 to 101 mg/l mg/l. In 2023, SS concentration ranged from 13 to 365 mg/l (Fig.4g), which some location is not within the EQS (150 mg/l) for wastewater after treatment from industrial units. In 2022, SS concentration range of Dhaleshwari river water was from 5.0 to 470 mg/l mg/l. In 2023, Electrical Conductivity (EC) of Dhaleshwari river water at different locations was mostly within the EQS (1200  $\mu$ mhos/cm). The maximum and the minimum EC of Dhaleshwari river water was 650  $\mu$ mhos/cm in February at Ruhitpur and 153.5  $\mu$ mhos/cm in August at Pathorghata (Fig.4h). In 2022, EC of Dhaleshwari river water was from 103  $\mu$ mhos/cm to 808  $\mu$ mhos/cm. In 2023, the maximum Total Alkalinity of Dhaleshwari river water was 286 mg/l in February at Hazartpur and the minimum was 10 mg/l in October at Pathorghata and Utorro Mitra (Fig.4i). In 2022, Total Alkalinity of Dhaleshwari river water was from 21 to 324 mg/l.



**Fig.4. Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC and T. Alkalinity of Dhaleshwari River in 2023**

## 4.5 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 two location (e.g. Mymensingh, Rail Bridge, Shamvoganj) of the river. Date was not available for the months of January, March to June, September, October and December of the river. Detail data is attached Annex-1 (Table: 38-43).

In 2023, pH level of Brahmaputra River water varied from 7.25 to 7.97 (Fig.5a), while standard range for fisheries 6.5 to 8.5. In 2022, pH level varied from 6.85 to 7.97. In 2023, DO concentration varied from 2.67 to 7.6 mg/l (Fig.5b). The highest and the lowest DO was found in August and November respectively, while EQS for DO for fisheries is  $\geq 5$  mg/l. In 2022, DO varied from 7.4 to 11.4 mg/l. In 2023, BOD concentration varied from 1.0 to 10.0 mg/l (Fig.5c) while EQS for fisheries is  $\leq 6$  mg/l. In 2022, BOD varied from 3.0 to 7.2 mg/l. In 2023, TDS level ranged from 84 to 218 mg/l (Fig.5d) and was within the EQS (1000 mg/l) for fisheries. In 2022, TDS level varied from 97.2 to 169.5 mg/l. In 2023, SS was varied from 11 to 267 mg/l (Fig.5e). In 2022, SS was 8.0 to 294 mg/l. In 2023, Chloride level was from 10.0 to 24.0 mg/l (Fig.5f) and which is less than EQS (150-600 mg/l) for treated wastewater from industrial units. In 2022, Chloride concentration varied from 2.0 to 11.5 mg/l.

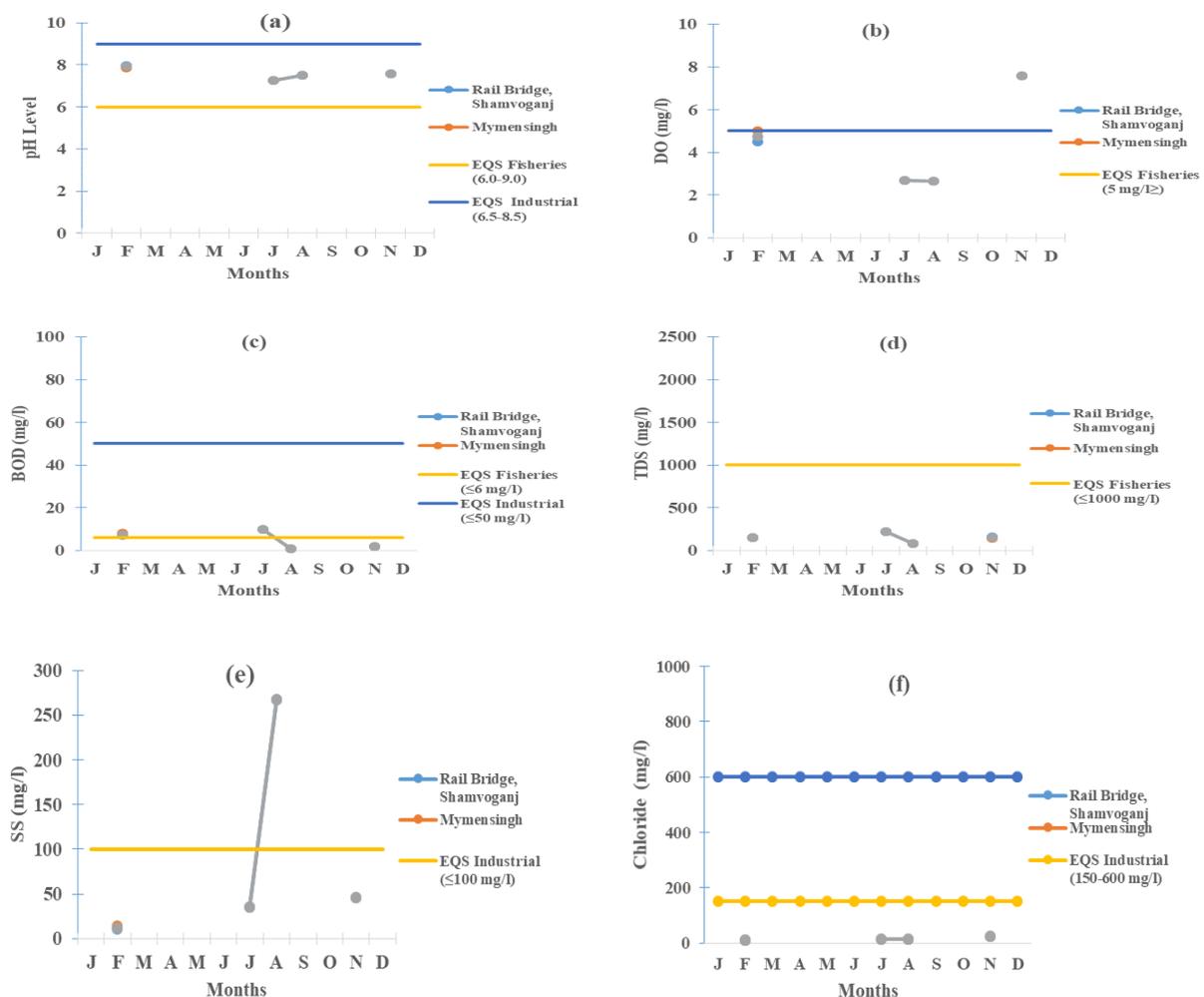


Fig.5. Graphical presentation of pH, DO, BOD, TDS, SS and Chloride of Brahmaputra River in 2023

## 4.6 Kaliganga River

The Kaliganga river flows by Manikganj district. For monitoring of water quality, water samples were collected from one location (e.g. Bheutha Ghat, Manikganj) of the river. Data was collected for the months of February, August and November of the river. Detail data is attached Annex-1 (Table: 44-49).

In 2023, pH of Kaliganga river varied from 7.27 to 7.81 (Fig.6a). The maximum and the minimum pH was found in November and February, respectively. In 2022, pH level varied from 6.95 to 7.72. In 2023, DO range was from 4.7 to 7.2 mg/l (Fig.6b). In 2022, DO was from 6.1 to 8.8 mg/l. In 2023, BOD varied within a range of 1.8 to 16.0 mg/l (Fig.6c). In 2022, BOD varied from 2.0 to 12.0 mg/l. In 2023, COD varied within a range of 9.0 to 48.0 mg/l (Fig.6d). In 2023, TDS concentration was within the limit of EQS (1000 mg/l) for fisheries. The maximum TDS was 316 mg/l in February and the minimum TDS was 211.5 mg/l in November (Fig.6e). In 2022, TDS concentration varied from 89.7 to 432 mg/l. In 2023, SS of Kaliganga river water was within the EQS (100 mg/l). The maximum and the minimum SS was 198 mg/l and 10.0 mg/l, respectively (Fig.6f). In 2022, SS varied from 12 to 198 mg/l.

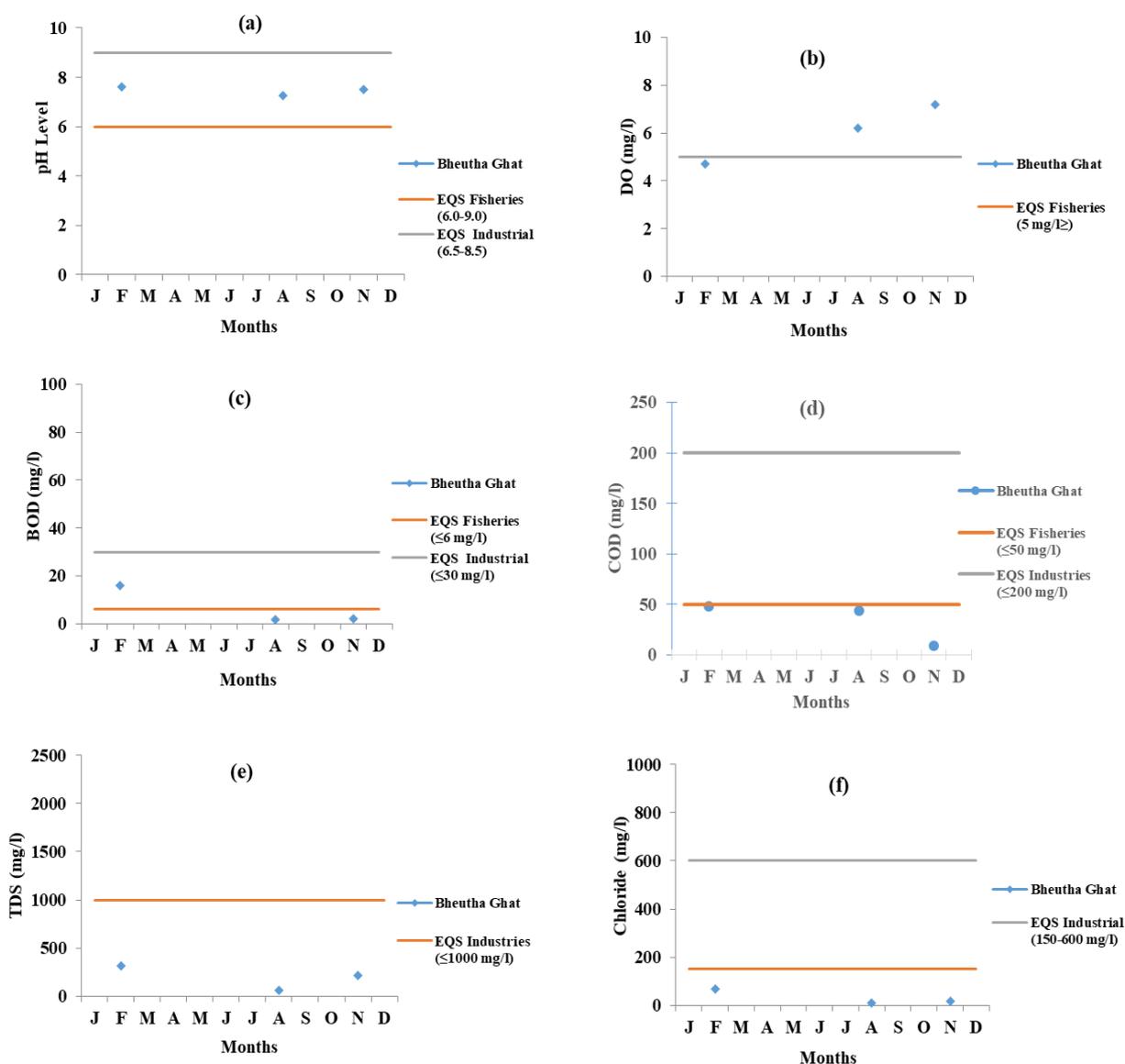


Fig.6. Status of pH, DO, BOD, COD, TDS and SS of Kaliganga River in 2023

## 4.7 Jamuna River

To monitor water quality, samples were collected only from ten locations e.g. Jamuna Eco Park, J.E.P (Up), Jamuna Eco Park, J.E.P (Dn), Shariakand Kheya Ghat, S.K.G (Up), Shariakand Kheya Ghat, S.K.G (Dn), Mohon Ganj, M.G (Up), Mohon Ganj, M.G (Dn), Horipur Kheya Ghat, H.K.G (Up), Horipur Kheya Ghat, H.K.G (Dn), Tarakandi and Kakua. Data was not available for the months of March. Detail data is attached Annex-1 (Table: 50-55).

In 2023, pH varied from 7.4 to 7.6 and it was within the EQS limits (6.5 to 8.5) (Fig.7a). In 2022, pH was varied from 7.14 to 8.57. In 2023, DO concentrations ranged from 6.1 to 7.62 mg/l (Fig.7b) and it was within the EQS ( $\geq 5$  mg/l) for fisheries. In 2022, DO concentration varied from 4.6 to 11.5 mg/l. In 2023, the maximum BOD level was 4.8 mg/l in August at Tarakandi and the minimum BOD level was 2.2 mg/l in May at Jamuna Eco Park, J.E.P (Up) (Fig.7c). BOD was below the EQS ( $\leq 6$  mg/l) for fisheries (Fig.7c). In 2022, BOD concentration varied from 2.0 to 6.2 mg/l. In 2023, SS concentration varied 82.4 mg/l to 352 mg/l and was below the EQS (1000 mg/l) except the Kakua point ((Fig.7d). In 2022, SS was from 7.0 mg/l to 403 mg/l. In 2023, level of TDS of Jamuna River water varied from 157 to 175 mg/l (Fig.7e), while EQS for TDS 1000 mg/l for fisheries. In 2022, TDS level varied from 59.1 to 231 mg/l. In 2023, SS content varied from 33 mg/l to 163 mg/l (Fig.7f). In 2022, SS concentration varied from 7.0 mg/l to 403 mg/l.

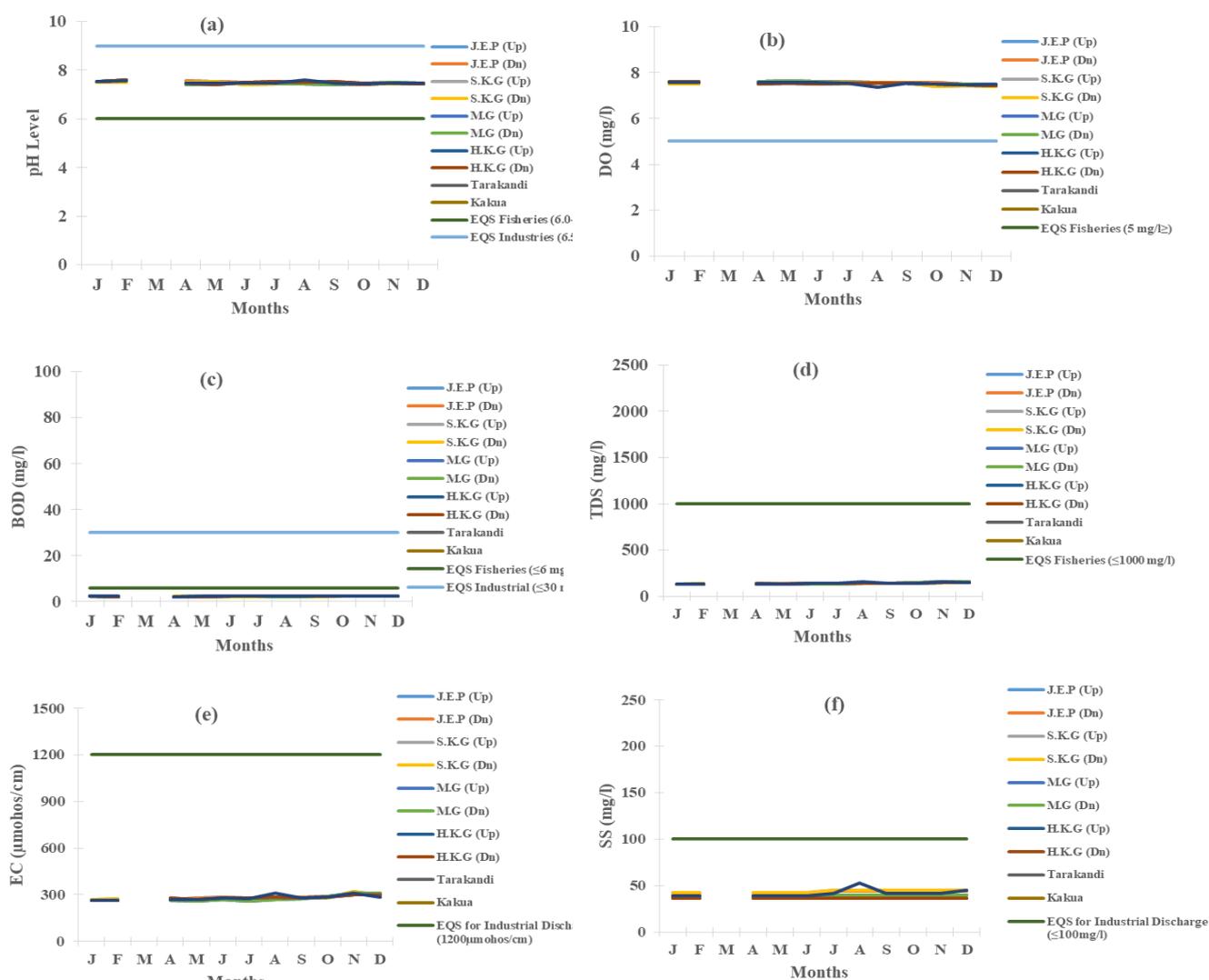


Fig.7. Status of pH, DO, BOD, TDS, EC and SS of Jamuna River in 2023

## 4.8 Meghna River

To monitor water quality, water samples were collected from five locations of Meghna Ghat, Annondo Bazar, Bishondi Ferry Ghat, Narshingdi Launch Ghat and Bairob Bazar of the Meghna River. Detail data is attached Annex-1 (Table: 56-61).

In 2023, the highest pH was 8.17 in September at Narshingdi Launch Ghat point and the minimum pH was 6.35 at the same location in October (Fig.8a). In 2022, pH level varied from 6.46 to 8.01. In 2023, DO level of Meghna River varied 0.9 mg/l to 8.11 mg/l while the EQS ( $\geq 5$  mg/l) for fisheries (Fig.8b). In 2022, DO level varied from 0.5 mg/l to 8.0 mg/l. In 2023, at all the sampling locations of the river, BOD was below the EQS ( $\leq 6$  mg/l) for fisheries round the year. The maximum and the minimum BOD load was 17 mg/l in November at Bairob Bazar and 0.6 mg/l in september at Bishondi Ferry Ghat point (Fig.8c). In 2022, BOD concentration varied from 2.0 to 22 mg/l. In 2023, COD of Meghna River water range varied from 0.9 to 100 mg/l (Fig.8d). In 2022, COD concentration varied from 5.0 to 64 mg/l. In 2023, TDS of Meghna River varied from 28.7 to 258 mg/l (Fig.7e). In 2022, TDS was varied from 26 to 246 mg/l. In 2023, Chloride concentration at all the sampling locations was within the EQS (150-600 mg/l) for waste water after treatment from industrial units. The maximum Chloride (54 mg/l) was found in January at Annondo Bazar and the minimum (4.0 mg/l) was in July at Annondo Bazar, Bishondi Ferry Ghat point (Fig.8f). In 2022, Chloride concentration varied from 2.0 to 42.5 mg/l.

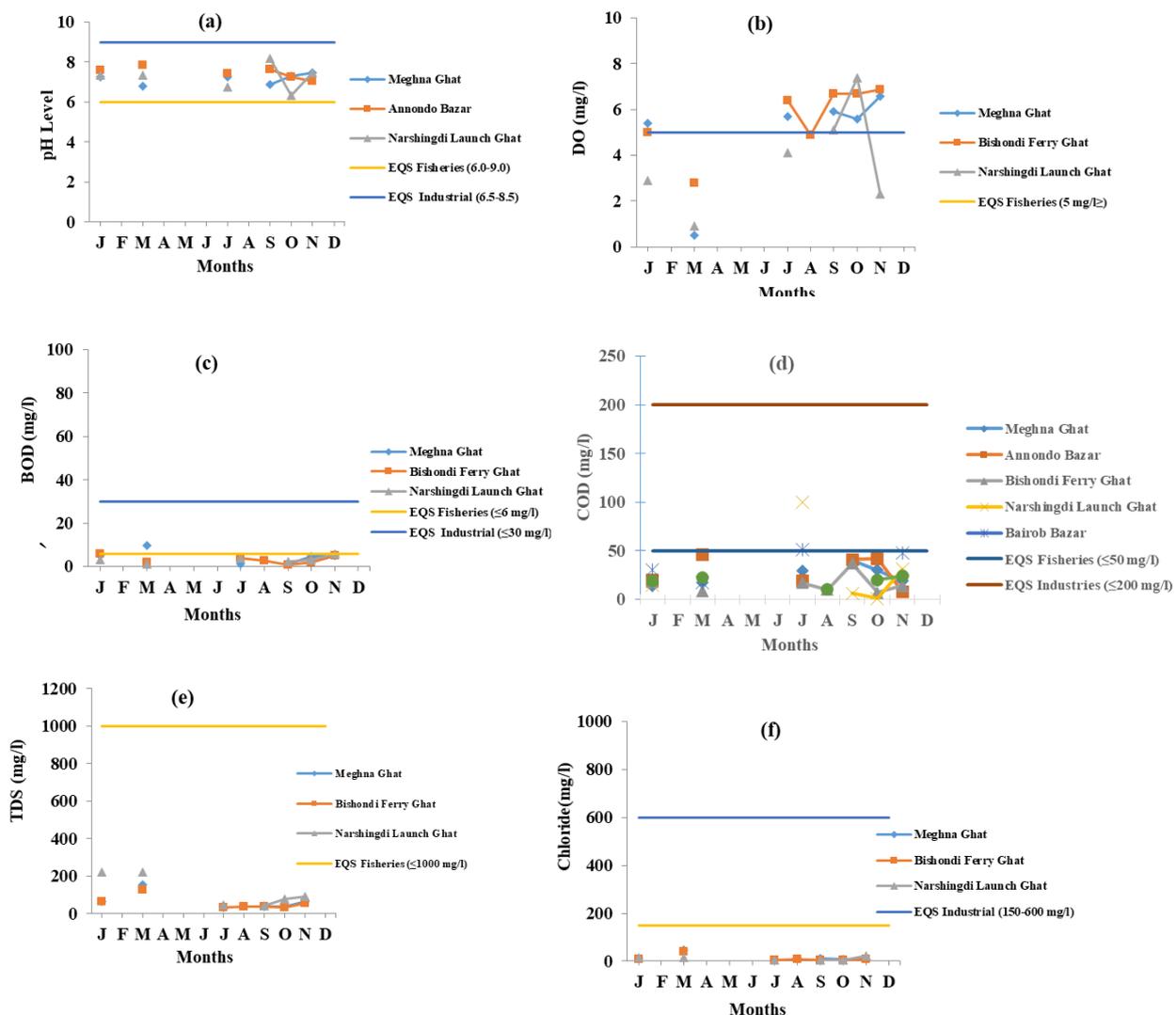


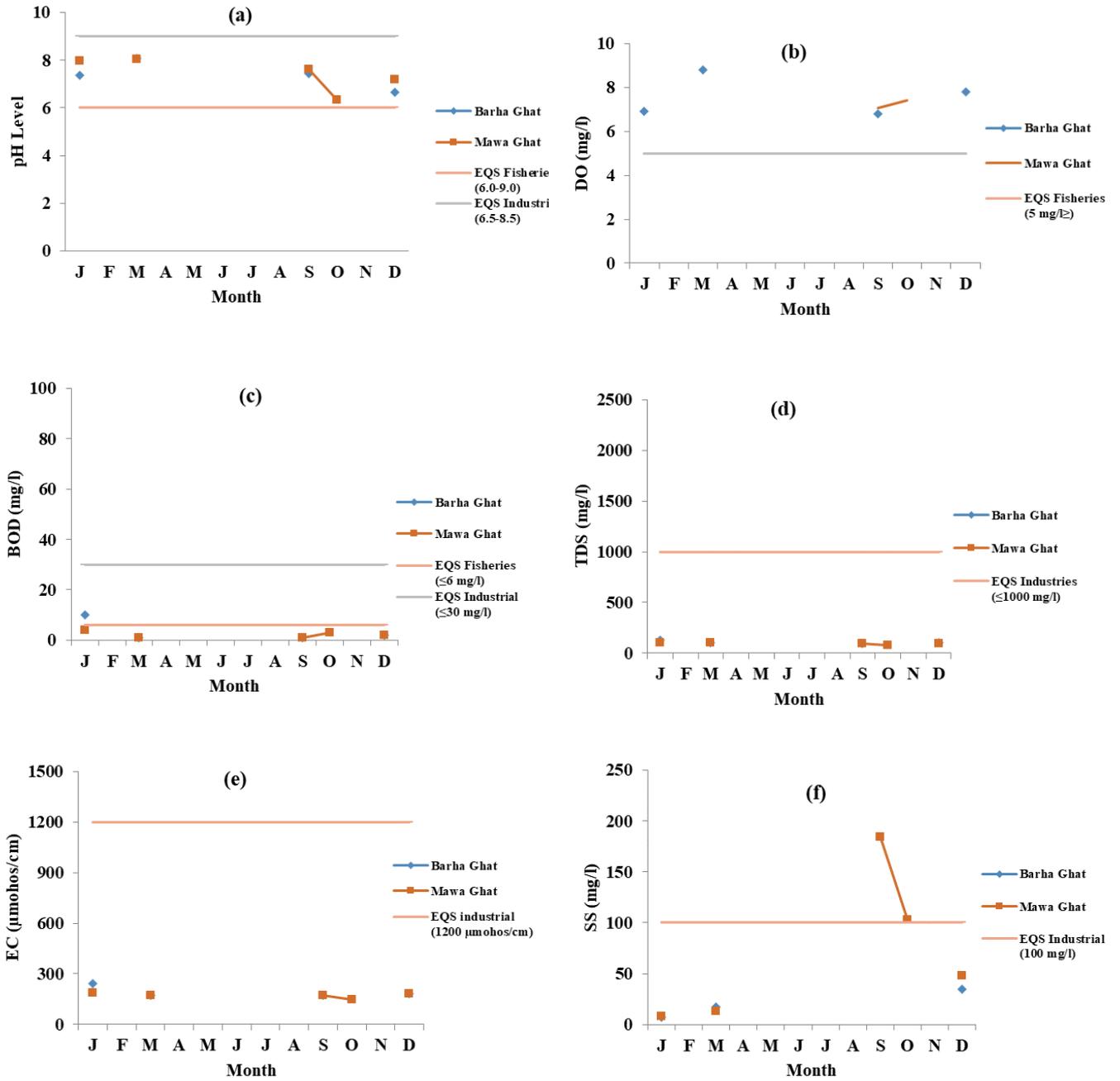
Fig.8. Status of pH, DO, BOD, TDS, SS and Chloride of Meghna River in 2023

## 4.9 Padma River

Padma River is the main distributary of the Ganges, originates from the Gangotri Glacier of Himalay. It 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 two locations of the river namely Barha Ghat and Mawa Ghat, points were used in the analysis. For analysis, average values of two points were considered. Date was available for the months of January, March, April, September, October and December of the river. Detail data is attached Annex-1 (Table: 62-67).

In 2023, pH of Padma River water was mostly neutral and varied from 6.35 to 8.06 (Fig.9a) while standard pH for fisheries 6.0 to 9.0. The maximum pH was found at Barha Ghat in March and the minimum pH level was at Mawa Ghat in October. In 2022, pH level varied from 7.38 to 8.25. In 2023, DO level of Padma River was above EQS ( $\geq 5$  mg/l) for fisheries at almost all the locations and it varied from 6.78 to 8.9 mg/l (Fig.9b). In 2022, DO concentration ranged from 6.9 to 10.0 mg/l. In 2023, BOD load was within the EQS ( $\leq 6$  mg/l) for fisheries at all locations. The maximum BOD was found 10 mg/l in January at Barha Ghat and the minimum was 0.9 mg/l in September at Mawa Ghat (Fig.9c). In 2022, BOD load varied from 2.0 to 12.0 mg/l. In 2023, TDS level of Padma River water was within EQS throughout the year and it varied from 77.9 to 132 mg/l (Fig.9d). In 2022, TDS concentration varied from 51 to 133 mg/l. In 2023, the maximum and the minimum EC of Padma River water was 244  $\mu\text{mhos/cm}$  in January at Barha Ghat and 147  $\mu\text{mhos/cm}$  in October at Mawa Ghat (Fig.9e), while EQS 1200  $\mu\text{mhos/cm}$  wastewater after treatment from industrial units. In 2022, EC varied from 98  $\mu\text{mhos/cm}$  to 245  $\mu\text{mhos/cm}$ . In 2023, SS level of Padma River water was within EQS throughout the year and it varied from 7.38 to 377 mg/l (Fig.9f). In 2022, SS varied from 34 to 620 mg/l.

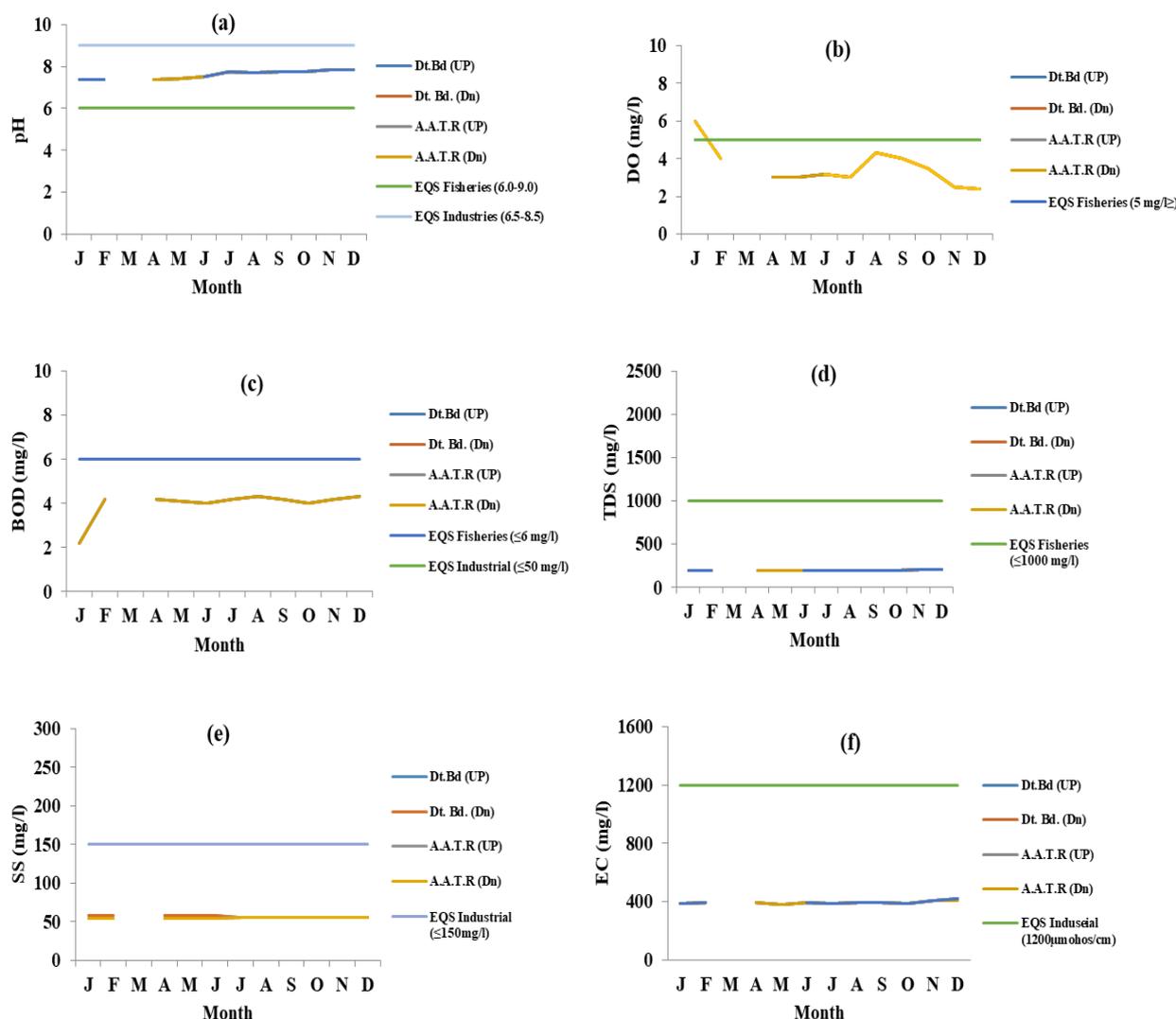


**Fig.9. Status of pH, DO, BOD, TDS, SS and EC of Padma River in 2023**

## 4.10 Korotoa River

To monitor water quality of Korotoa river in 2023, water samples were collected from four locations of the river e.g. Dottobari Bridge, Dt.Bd. (UP), Dt. Bd. (Dn), Aziz Ahmed Taki Road, A.A.T.R.(UP), Aziz Ahmed Taki Road, A.A.T.R.(Dn). Data was not available in the months of March of the river. Detail data is attached Annex-1 (Table: 68-73).

In 2023, pH level of Korotoa river water varied from 7.36 to 7.85 (Fig.10a) and was within EQS limit. In 2022, pH level varied from 7.02 to 7.34. In 2023, DO level of Korotoa river water was lower than EQS ( $\geq 5$  mg/l) for fisheries Shahjadpur Point. DO varied from 2.4 to 6.0 mg/l (Fig.10b). In 2022, DO concentration varied from 4.2 to 6.9 mg/l. In 2023, the minimum BOD was 2.2 in January at Dottobari Bridge, Dt.Bd. (UP) and the maximum BOD was 4.3 mg/l in December at at the sale location (Fig.10c). In 2022, BOD concentration varied from 2.1 to 4.2 mg/l. In 2023, TDS varied from 190 mg/l to 210 mg/l (Fig.10d). In 2022, TDS range varied from 155 mg/l to 198 mg/l. In 2023, level of SS of Korotoa river water at different locations was within the EQS. The maximum and the minimum SS was 58 mg/l in January at Dottobari Bridge, Dt.Bd. (UP) and 54 mg/l in January at Aziz Ahmed Taki Road, A.A.T.R.(UP) (Fig.10e). In 2022, SS concentration varied from 54 mg/l to 58 mg/l. In 2023, average EC varied from 380  $\mu$ mhos/cm to 420  $\mu$ mhos/cm (Fig.10f) and was within the EQS limit. In 2022, EC concentration varied from 210  $\mu$ mhos/cm to 396  $\mu$ mhos/cm.

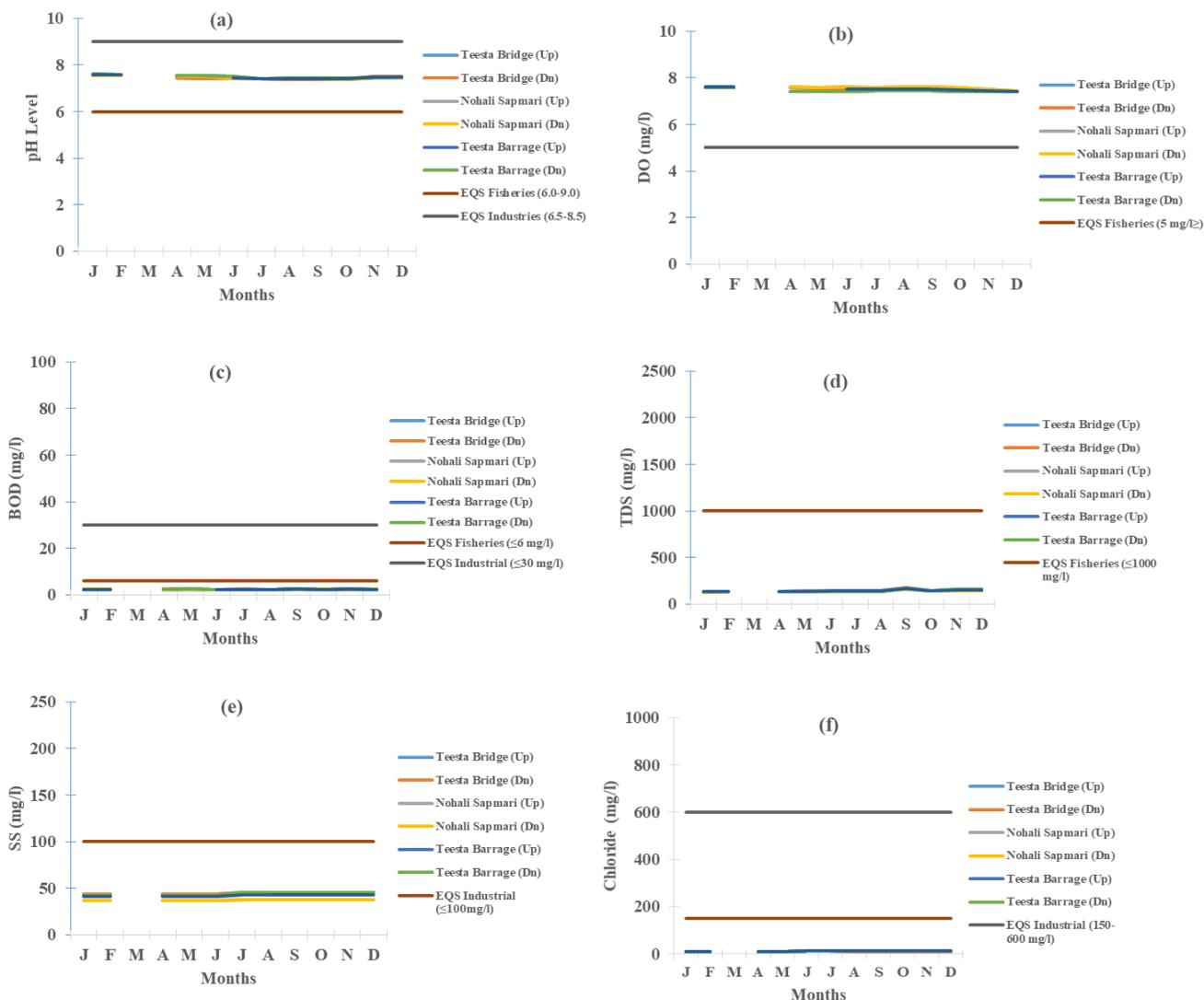


**Fig.10. Status of pH, DO, BOD, TDS, SS and EC of Korotoa River in 2023**

### 4.11 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. It drains an area of 12,540 km<sup>2</sup>. It forms the border between Sikkim and West Bengal. Water samples were collected from six locations near Tista Bridge (up Stream and down stream), Nohali Sapmari (up Stream and down stream), Teesta Barrage (Teesta Barrage (Up)) of Teesta River for monitoring of water quality in 2023. Detail data is attached Annex-1 (Table: 74-79).

In 2023, pH level of Teesta River water varied from 7.38 to 7.62 (Fig.11a) and was within the EQS limit. In 2022, pH level varied from 7.56 to 7.9. In 2023, DO level of Teesta River water was above the EQS ( $\geq 5$  mg/l) for fisheries. DO varied from 7.45 to 7.62 mg/l (Fig.11b). In 2022, DO level varied from 7.6 to 7.88 mg/l. In 2023, the maximum BOD was 2.5 mg/l in February and the minimum BOD was 2.1 mg/l in May (Fig.11c). In 2022, BOD level varied from 2.2 to 2.4 mg/l. In 2023, TDS varied from 127 mg/l to 175 mg/l (Fig.10d). In 2022, TDS level varied from 127 mg/l to 132 mg/l. In 2023, Level of SS of Teesta River at different locations was within the EQS. The maximum and the minimum SS was 45 mg/l in July and 37 mg/l in April (Fig.11e). In 2022, SS level varied from 37 to 44 mg/l. In 2023, the maximum and the minimum Chloride was 14.0 mg/l in October and 10 mg/l in may (Fig.11f). In 2022, Chloride level was 10.0 al over the year.

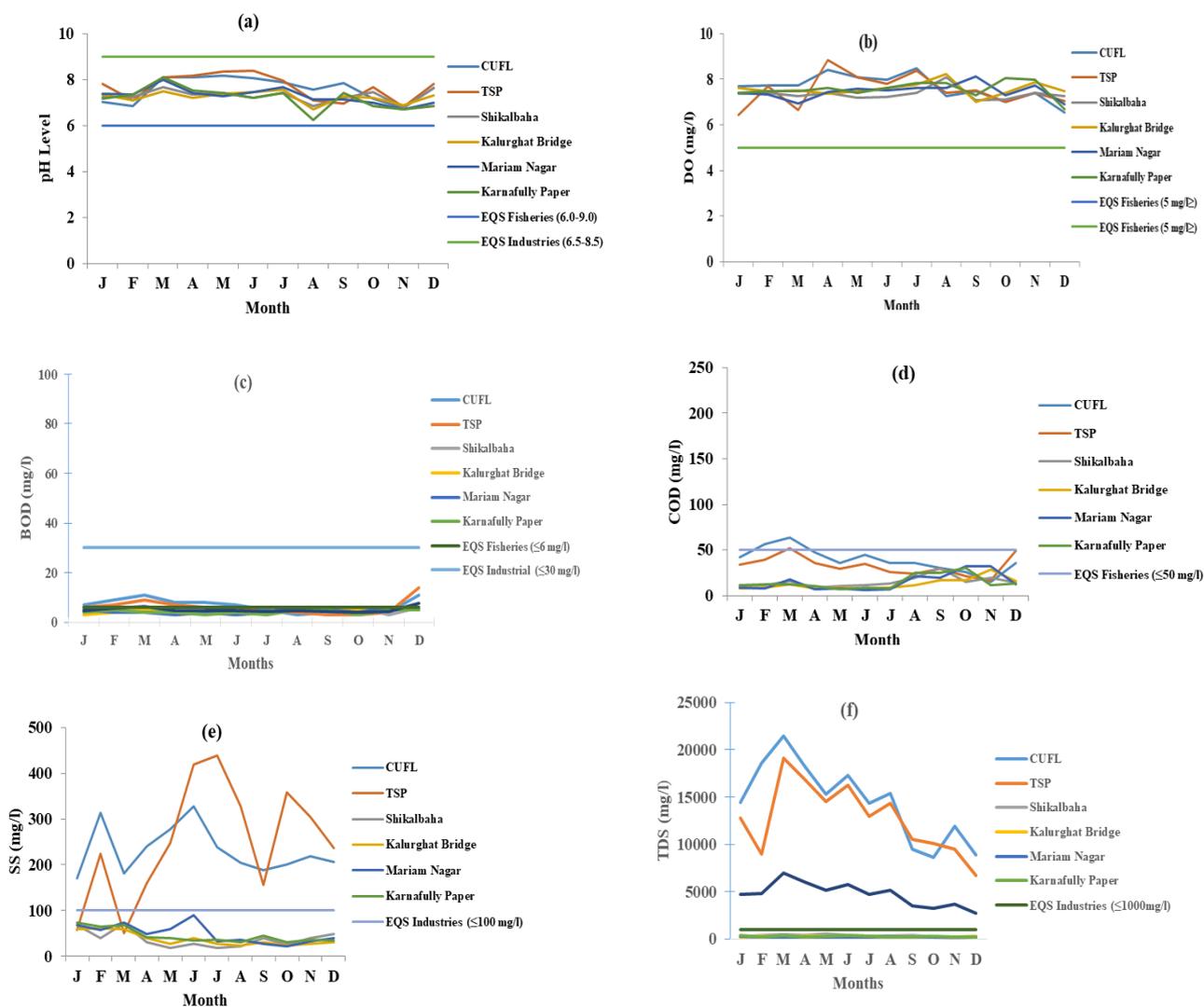


**Fig.11. Status of pH, DO, BOD, TDS, SS and Chloride of Teesta River in 2023**

## 4.12 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 six locations (e.g. CUFL, TSP, Shikalbaha, Kalurghat Bridge, Mariam Nagar, Karnafully Paper of Karnaphuli river for monitoring of water quality in 2023. Detail data is attached Annex-1 (Table: 80-85).

In 2023, pH level at the sampling points of the Karnaphuli river varied from 6.81 to 8.39 (Fig.12a), while standard pH for inland surface water for fisheries 6.0 to 9.0. In 2022, pH level varied from 6.11 to 8.18. DO level of Karnaphuli river was within the EQS althrough the year of 2023 and met the standard of DO for fisheries ( $\geq 5$  mg/l). DO varied from 6.42 to 8.85 mg/l (Fig.12b). In 2022, DO concentration varied from 5.7 to 8.42 mg/l. In 2023, BOD value varied from 3 to 14 mg/l (fig.11c), while EQS ( $\leq 6$  mg/l mg/l) for fisheries units. In 2022, BOD value varied from 3.0 to 21 mg/l. In 2023, COD value varied from 17 to 64 mg/l (fig.11d), while EQS (50 mg/l) for fisheries units. In 2022, COD value varied from 9.0 to 88 mg/l. In 2023, level of SS of Karnaphuli river water at different points was beyond the EQS (150 mg/l). The maximum and the minimum SS was 439 mg/l in July at TSP point and 18 mg/l in May at Shikalbaha point (Fig.12e). In 2022, SS value varied from 12 to 1700 mg/l. In 2023, the maximum TDS was 19140 mg/l in March at TSP point and the minimum was 118 mg/l in november at Shikalbaha point (Fig.12f). In 2022, TDS concentration varied from 119 to 18550 mg/l.



**Fig.12. Status of pH, DO, BOD, COD, SS, TDS of Karnaphuli River in 2023**

### 4.13 Halda River

The Halda river passes through the South-Eastern part of Bangladesh. Water sampling three locations (e.g. Maduna Ghat, Garduara Sluice gate, Halda Bridge) of Halda River. Detail data is attached Annex-1 (Table: 86-91).

In 2023, pH of Halda river water varied from 5.98 to 7.31 (Fig.13a) while standard pH for inland surface water for fisheries 6.0 to 9.0. In 2022, pH level varied from 6.57 to 8.63. In 2023, DO varied from 5.02 to 8.46 mg/l (Fig.13b). In 2022, DO range varied from 5.2 to 8.28 mg/l. In 2023, BOD varied from 2 mg/l to 5 mg/l (Fig.13c). In 2022, BOD range varied from 3.0 mg/l to 9.1 mg/l. In 2023, COD varied from 5 mg/l to 13 mg/l (Fig.13d). In 2022, COD value varies from 9.0 mg/l to 16 mg/l. In 2023, SS level of Halda River was within the EQS (100 mg/l) for fisheries. SS concentration varied from 28 to 114.4 mg/l (Fig.13e). In 2022, SS concentration varied from 12 to 187 mg/l. In 2023, the maximum and the minimum EC was 790  $\mu$ mhos/cm in May at Moduna Ghat point and 181  $\mu$ mhos/cm in December at WASA Intake point (fig.13f). In 2022, EC concentration varied from 74.8 to 245  $\mu$ mhos/cm.

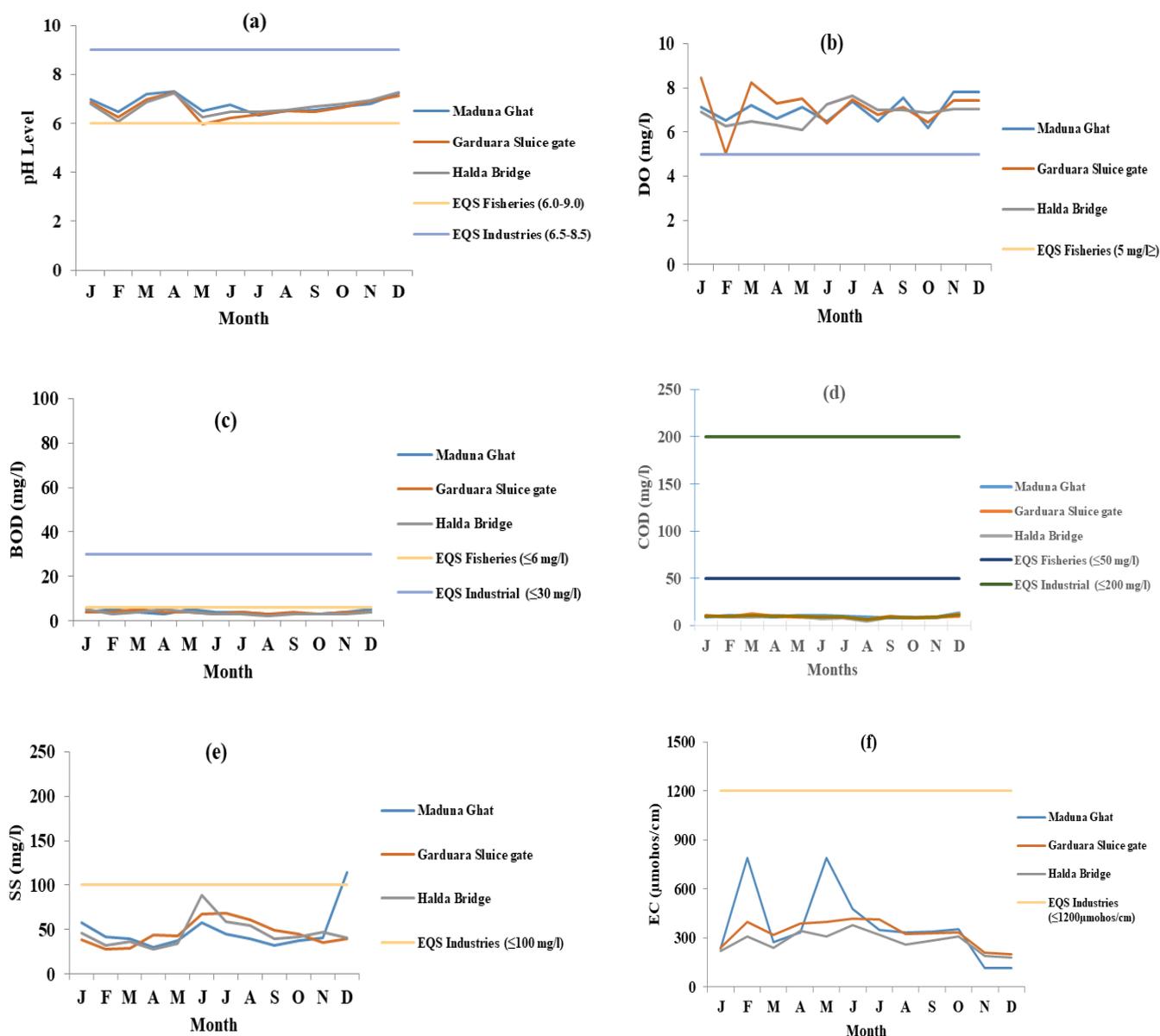


Fig.13. Status of pH, DO, COD, SS and EC of Halda River in 2023

## 4.14 Moyuri River

The Moyuri River is situated at the back swamp of the Bhairab-Rupsa River. For monitoring water samples were collected from three location named Shoshan Ghat, Buro Moulavir Darga, Doshgate Jalma of the river. Average value of those three points was used in the analysis. Detail data is attached Annex-1 (Table: 92-99).

In 2023, pH level of Moyuri River water varied from 4.14 to 7.95 (Fig.14a) and was within the EQS limit. The Maximum pH 7.95 at Shoshan Ghat in February and the minimum pH 4.14 at Shoshan Ghat in December. In 2022, pH level varied from 7.46 to 7.6.

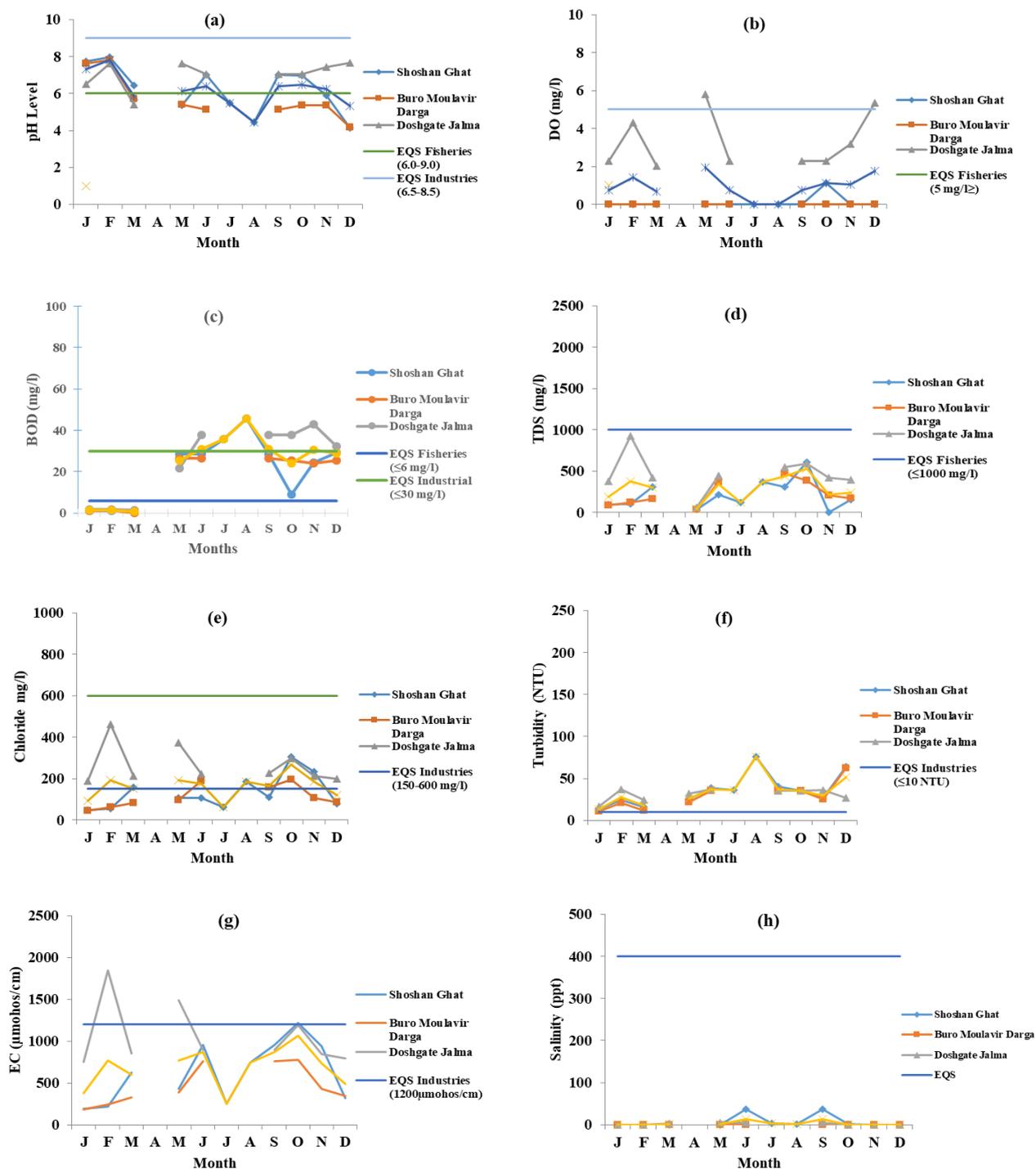


Fig.14. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Moyuri River in 2023

In 2023, DO concentration of Moyuri River water varied from 0.0 to 5.8 (Fig.14b) and the maximum value was lower than the EQS ( $\geq 5$  mg/l) for fisheries at the Shoshan Ghat and Buro Moulavir Darga points. In 2022, DO varied from 0.4 to 5.4 mg/l. In 2023, BOD level of the Moyuri River water varied from 0.05 to 45.6 mg/l (Fig.14c) while EQS for fisheries units is  $\leq 6$  mg/l. The maximum BOD was 45.6 mg/l in August at Shoshan Ghat and the minimum BOD Was 0.05 mg/l in March at Buro Moulavir Darga point. In 2022, BOD range varied from 2.5 to 84 mg/l. In 2023, TDS level of the Moyuri River water varied from 38 to 923 mg/l (Fig.14d) while EQS (1000 mg/l) for fisheries. In 2022, TDS range was from 348 to 5842 mg/l. In 2023, Chloride range was from 46 to 461 mg/l (Fig.14e) while EQS (150-600 mg/l). Highest Chloride was found in February. In 2022, Chloride level varied from 408 to 7830 mg/l. In 2023, the maximum Turbidity was 76 NTU in August at Shoshan Ghat point and the minimum Turbidity was 11 NTU in January at Buro Moulavir Darga point (Fig.14f) while EQS is 10 NTU. In 2022, Turbidity level varied from 20 to 68 NTU. In 2023, the maximum EC content of Moyuri River water was 1845  $\mu$ mhos/cm in February at Doshgate Jalma and the monimum EC was 186  $\mu$ mhos/cm in January at Buro Moulavir Darga (Fig.14g) where the EQS (1200  $\mu$ mhos/cm). In 2022, EC was from 712  $\mu$ mhos/cm to 1110  $\mu$ mhos/cm. In 2023, Salinity varied from 0.02 to 36.4 ppt (Fig.14h). In 2022, Salinity varied from 1.95 to 6.21 ppt.

#### 4.15 Bhairab River

The Bhairab river flows in the south of Bangladesh. Its water carries plenty of silt. Water samples were collected from three locations comprising four different points [e.g. Basundia Bazar, Aladipur, Noapara Ferry Ghat, Abhaynagar, Noapara Jafarpur, Fultala Ghat, Dhulgram] of Bhairab River for monitoring water quality in 2023. Detail data is attached Annex-1 (Table: 100-107).

In 2023, pH at different locations of the Bhairab river varied from 6.08 to 8.29 (Fig.15a) while EQS for inland surface water 6.5 to 8.5. In 2022, pH varied from 7.55 to 8.26. In 2023. maximum DO was around the EQS ( $\geq 5$  mg/l) for fisheries. DO was from 1.69 to 7.52 mg/l (Fig.15b). In 2022, DO varied from 1.01 to 4.7 mg/l. In 2023, BOD varied from 2.7 to 24.2 mg/l the EQS ( $\leq 6$  mg/l) for fisheries (Fig.15c). In 2022, BOD level varied from 1.6 to 3.5 mg/l. In 2023, the maximum and the minimum TDS was 1175 mg/l in July at Basundia Bazar, Aladipur and 98 mg/l in October at Noapara Ferry Ghat, Abhaynagar (Fig.15d) while EQS is 1000 mg/l for fisheries. In 2022, TDS varies from 229 to 655 mg/l. In 2023, Chloride was varied from 65 to 1068 mg/l (Fig.15e) while EQS for Chloride is 150-600 mg/l. Highest Chloride (1068 mg/l) was found in July at Noapara Ferry Ghat, Abhaynagar and lowest was 65 mg/l in October at Noapara Jafarpur and Fultala Ghat, Dhulgram points. In 2022, Chloride level varied from 805 to 4212 mg/l. Turbidity of Bhairab river water at maximum locations was very high in 2023. It varied from 0.08 to 74 NTU while the EQS is 10 NTU (Fig.15f). The prime reason may be of carrying huge silt by the river throughout the year. In 2022, Turbidity level varied from 12 to 75 NTU. In 2023, the maximum EC was 4270  $\mu$ mhos/cm in July at Noapara Ferry Ghat, Abhaynagar and the minimum Ec was 195  $\mu$ mhos/cm in October at the same location (Fig.15g). In 2022, EC varied from 510  $\mu$ mhos/cm to 1219  $\mu$ mhos/cm. In 2023, maximum Salinity was 90.9 ppt in June at Noapara Ferry Ghat, Abhaynagar and minimum Salinity was 0.04 mg/l in January at Basundia Bazar, Aladipur point (Fig.15h). In 2022, Salinity varied 0.6 ppt to 3.4 ppt.

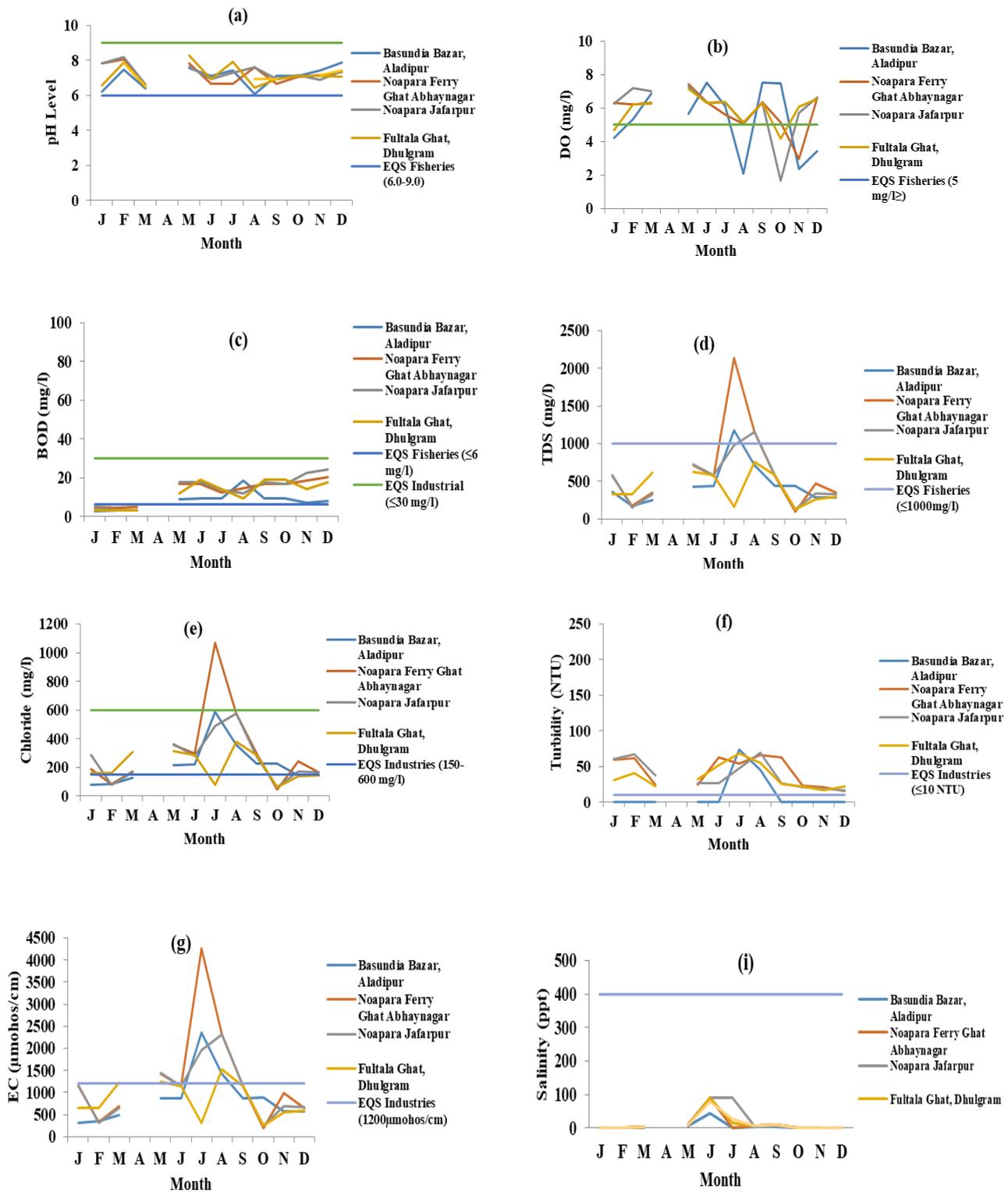


Fig.15. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Bhairab River in 2023

## 4.16 Rupsa River

The Rupsa river forms from the confluence of the Bhairab and Atrai rivers, and flows into the Pasur River. Its entire length is affected by tides. Water samples were collected from four different locations [e.g. Gilatola, Nadan Pratap (M), Kalibari Ghat (M), Charer Hat, Sulpur Aijgati (M), Rupsa Ghat (M)] of Rupsa River for monitoring water quality in 2023. For analysis, average of three points of a location were considered. Detail data is attached Annex-1 (Table: 108-115).

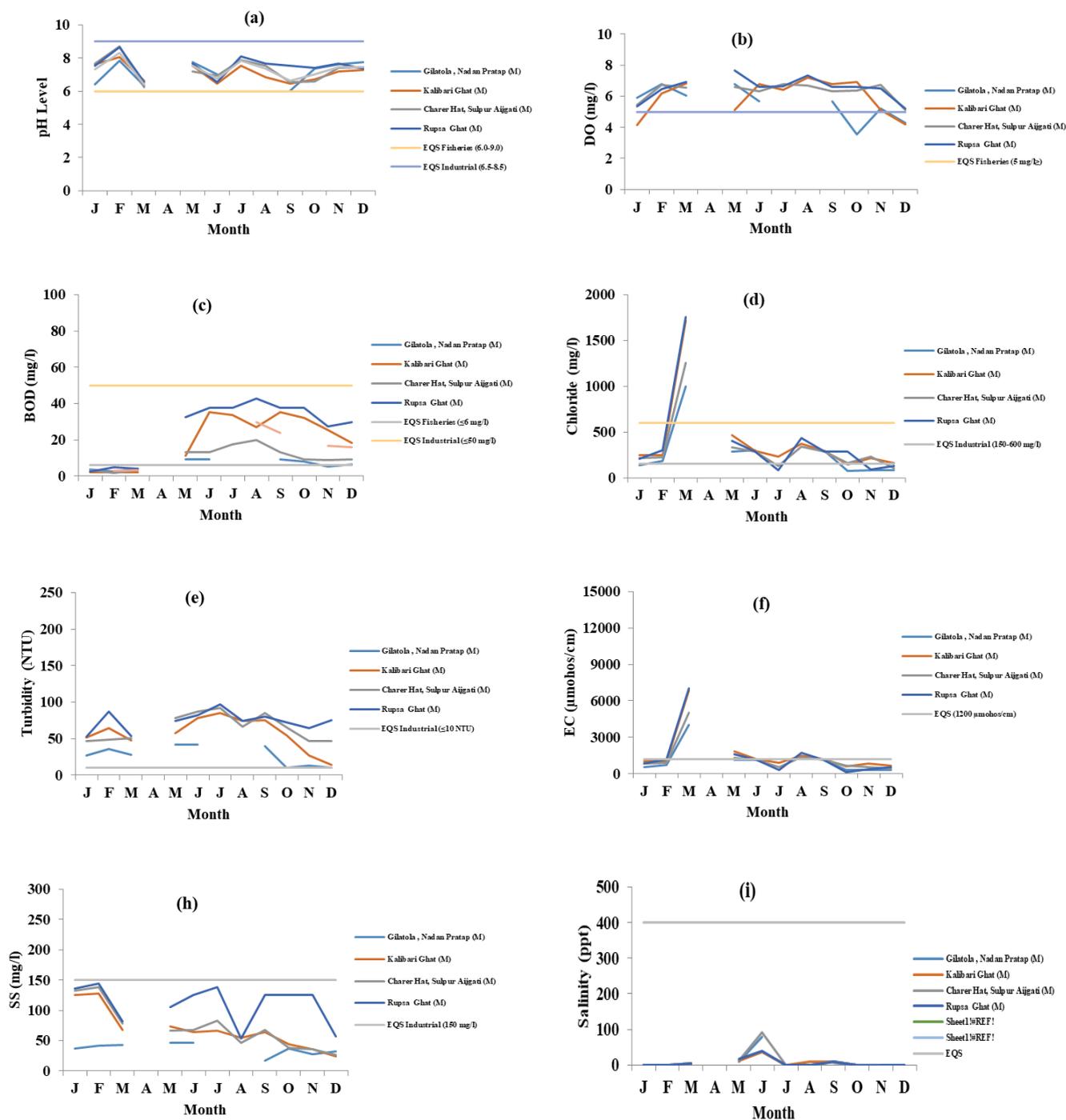


Fig.16. Status of pH, DO, BOD, Chloride, Turbidity, EC, SS and Salinity of Rupsa River in 2023

In 2023, pH varied from 6.04 to 8.72 (Fig.16a) while standard pH for inland surface water 6.0 to 9.0. In 2022, pH level varied from 8.01 to 8.11. In 2023, the maximum and the minimum DO content was 7.66 in May at Rupsa Ghat (M) and 3.55 mg/l in October at Gilatola, Nadan Pratap (M) (Fig.16b). In 2022, DO level was varied from 3.8 to 5.9 mg/l. In 2023, the maximum and the minimum BOD was 42.4 mg/l in August at Rupsa Ghat (M) and 1.9 mg/l in February at Charer Hat, Sulpur Aijgati (M) (Fig.16c). In 2022, BOD level varied from 1.3 to 7.5 mg/l. In 2023, Chloride level was much higher the months of March than the EQS (150-600 mg/l) for treated wastewater from industrial units. Chloride content varied from 74 to 1755 mg/l (Fig.16d). In 2022, Chloride varied from 570 to 4142 mg/l. In 2023, Turbidity level of Rupsa River was very high all over the year. Turbidity varied from 10 to 97 NTU (Fig.15e) while EQS (10 NTU). In 2022, Turbidity range was from 69 to 98 NTU. In 2023, EC level varied from 127 to 7020  $\mu\text{mhos/cm}$  (Fig.16f) while standard EC for treated wastewater from industrial units 1200  $\mu\text{mhos/cm}$ . In 2022, EC level varied from 678 to 1945  $\mu\text{mhos/cm}$ . In 2023, SS varied from 17 to 144 mg/l (Fig.16h) where the EQS (100 mg/l). In 2022, SS varied from 86 to 145 mg/l. In 2023, Salinity varied from 0.05 to 90.9 mg/l (Fig.16i). In 2022, Salinity varied from 0.75 to 4.55 ppt.

#### **4.17 Mathavanga River**

For monitoring water quality of Mathavanga river, water samples were collected from a single location i.e Pipeghat. Data was not available in the month of April, May and June. Detail data is attached Annex-1 (Table: 116-123).

In 2023, pH varied from 6.84 to 7.87 (Fig.17a) while standard pH for inland surface water 6.0 to 9.0. In 2023, DO level varied from 2.45 to 7.89 mg/l (Fig.17b) while EQS ( $\geq 5$  mg/l) for fisheries. In 2023, BOD varied 1.1 to 50 mg/l (Fig.17c). The maximum was BOD 50 mg/l in June and the monimum was 1.1 mg/l in February. In 2023, TDS varied from 50 to 269 mg/l (Fig.17d). In 2023, Chloride of Mathavanga river water varied from 25 to 123 mg/l (Fig.17e) while EQS for Chloride 150-600 mg/l. In 2023, Turbidity level was higher than EQS (10 NTU) and varied from 24 to 69 NTU (Fig.17f). In 2023, the maximum EC was 493  $\mu\text{mhos/cm}$  in November and the minimum EC was 99  $\mu\text{mhos/cm}$  in March at pipe ghat point (Fig.17g). In 2023, Salinity varied from 0.04 to 0.29 ppt (Fig.17H).

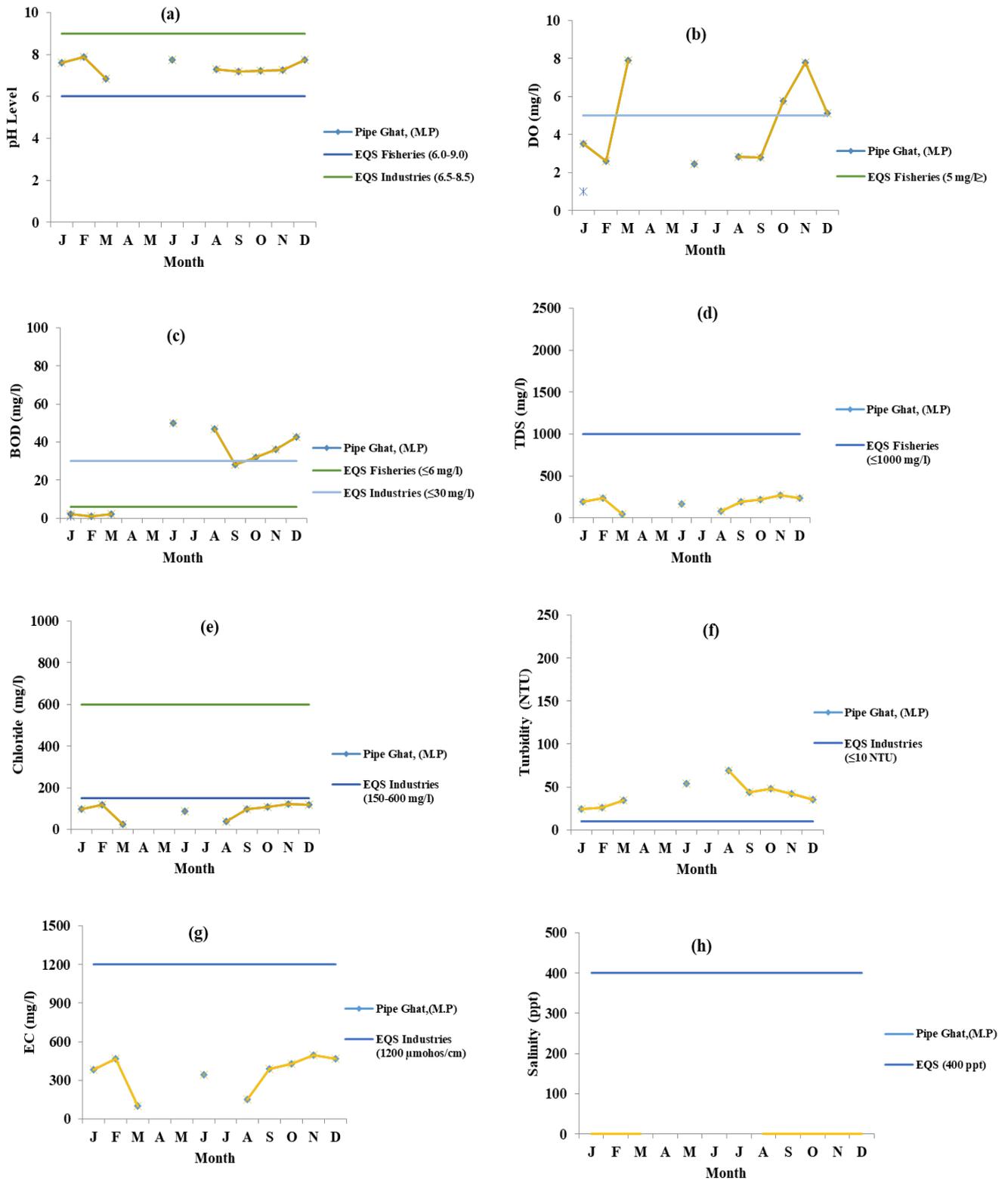


Fig.17. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Mathavanga River in 2023

## 4.18 Pashur River

The Pashur river located in South-western Bangladesh, and a distributary of the Ganges, continues the Rupsa river. All its distributaries are tidal. It meets the Shibsra 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 three locations i.e. Rampal Power Plant, Banishanta and Batiaghata By Pass of Pashur river. For analysis, average values of three points were taken. Detail data is attached Annex-1 (Table: 124-131).

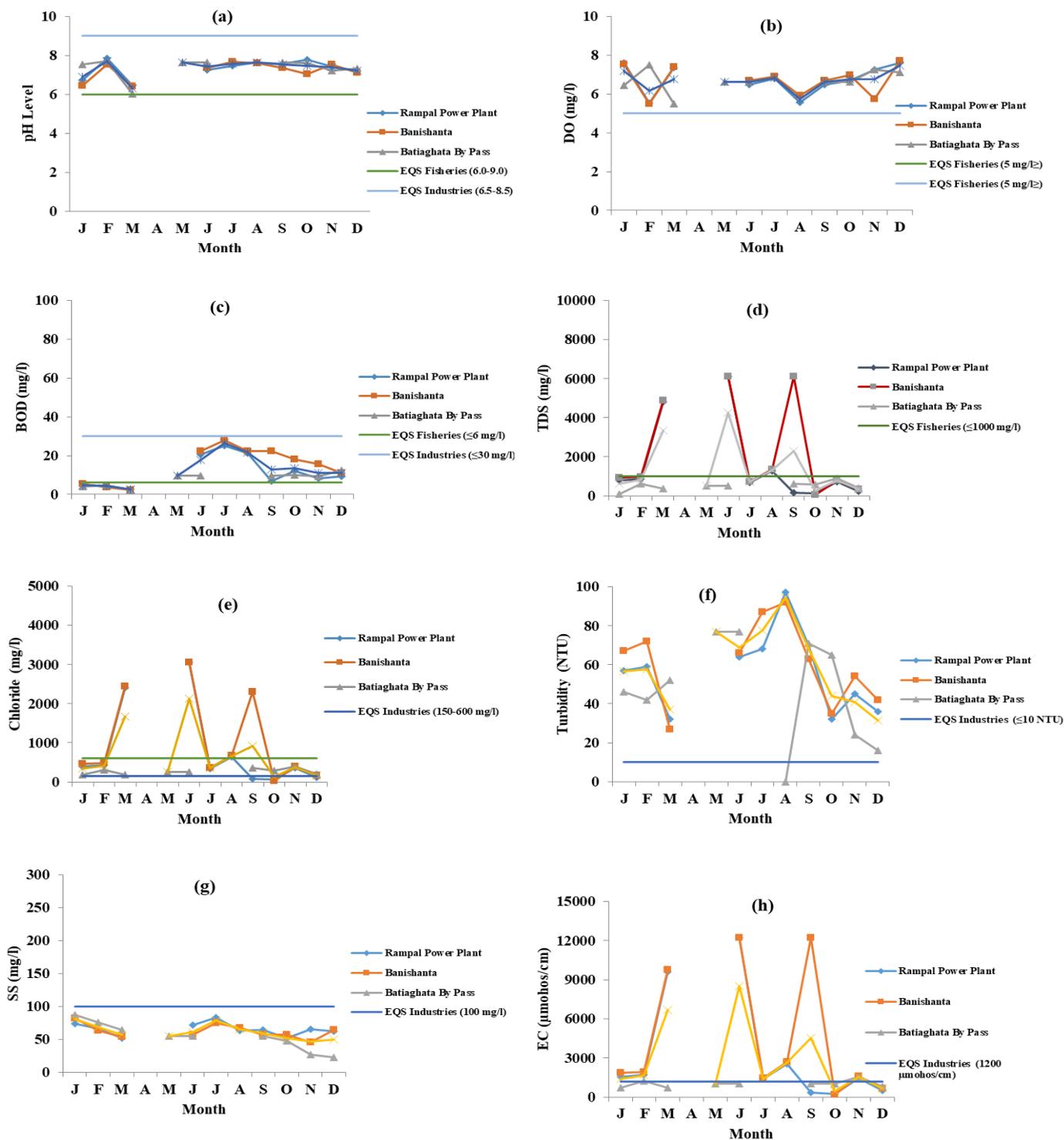


Fig.18. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and SS of Pashur River in 2023

In 2023, pH level varied from 6.04 to 7.87 (Fig.18a) and was within the EQS (6.5 to 8.5) though slightly alkaline. In 2022, pH was 7.65. In 2023, DO level was above the EQS ( $\geq 5$  mg/l) for fisheries all over the year. The maximum and the minimum concentration of DO was 7.72 mg/l in December at Banishanta and 5.5 mg/l in March at Batiaghata By Pass (Fig/18b). In 2022, DO was 5.9 mg/l. In 2023, BOD level was within the EQS ( $\leq 6$  mg/l) for fisheries. The maximum and the minimum value of BOD was 27.9 mg/l in July at Banishanta and 2.3 mg/l in March respectively (Fig.18c). In 2022, BOD level was 1.2 mg/l. In 2023, the maximum TDS 6123 mg/l in September at Banishanta point and the minimum TDS was 61 mg/l in October at the same location Fig.17d). In 2022, TDS level was 960 mg/l. In 2023, Chloride level of Passur river water varied from 31 to 3062 mg/l. Chloride concentration was higher at Banishanta point in July (Fig.18e). In 2022, Chloride level was 13705 mg/l. In 2023, Turbidity level varied from 16 to 97 NTU (Fig.18f) against the EQS (10 NTU) for industrial discharge. Turbidity concentration was very high all over the year. In 2022, Turbidity level was 130 NTU. In 2023, the maximum SS was 87 mg/l in January at Batiaghata By Pass and the minimum SS was 23 mg/l in December at the same point (Fig.18g). In 2022, SS was 164 mg/l. In 2023, the maximum EC was 12246  $\mu$ mhos/cm in June and the minimum EC was 216  $\mu$ mhos/cm in October (Fig.18g). In 2022, EC was 18120  $\mu$ mhos/cm (Fig.18h).

#### **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 three different points of Kaligonj location e.g. Uzirpur, Kaliganj Bazar, Boshontopur in 2023. Detail data is attached Annex-1 (Table: 132-139).

In 2023, pH level was within the EQS (6.0-9.0) for fisheries and was varied from 6.67 to 8.47 (Fig.19a). In 2022, pH was from 7.73 to 7.75. In 2023, DO level varied from 3.34 to 6.73 mg/l (Fig.19b) throughout the year while EQS for fisheries is  $\geq 5$  mg/l. In 2022, DO level varied from 5.1 to 5.4 mg/l. In 2023, BOD was far below the EQS ( $\leq 6$  mg/l). It varied from 2.6 to 9.7 mg/l (Fig.19c). In 2022, BOD level was 1.3 mg/l. In 2023, the minimum TDS was 614 mg/l in February and March and the maximum TDS was 8220 mg/l in July (Fig.19d). In 2022, TDS level varied from 3201 to 3265 mg/l. In 2023, Chloride concentration was very high from January to June and varied from 237 to 4110 mg/l (Fig.19e) while standard for treated wastewater from industrial units is 150-600 mg/l. The highest Chloride was found in July at Boshontopur point and the lowest value was in March at Kaliganj Bazar. In 2022, Chloride level varied from 4024 to 4068 mg/l. In 2023, Turbidity level was above the EQS (10 NTU) limit all the year that varied from 24 to 96 NTU (Fig.19f). In 2022, Turbidity level varied from 117 to 120 NTU. In 2023, the maximum EC was 16440  $\mu$ mhos/cm in June at Boshontopur and the minimum 946  $\mu$ mhos/cm in March at Kaliganj Bazar while EQS for EC is 1200  $\mu$ mhos/cm (Fig.19g). In 2022, EC varied from 6485 to 6580  $\mu$ mhos/cm. In 2023, SS varied from 34 mg/l to 87 mg/l (Fig.19h). In 2022, SS varied from 161 mg/l to 168 mg/l.

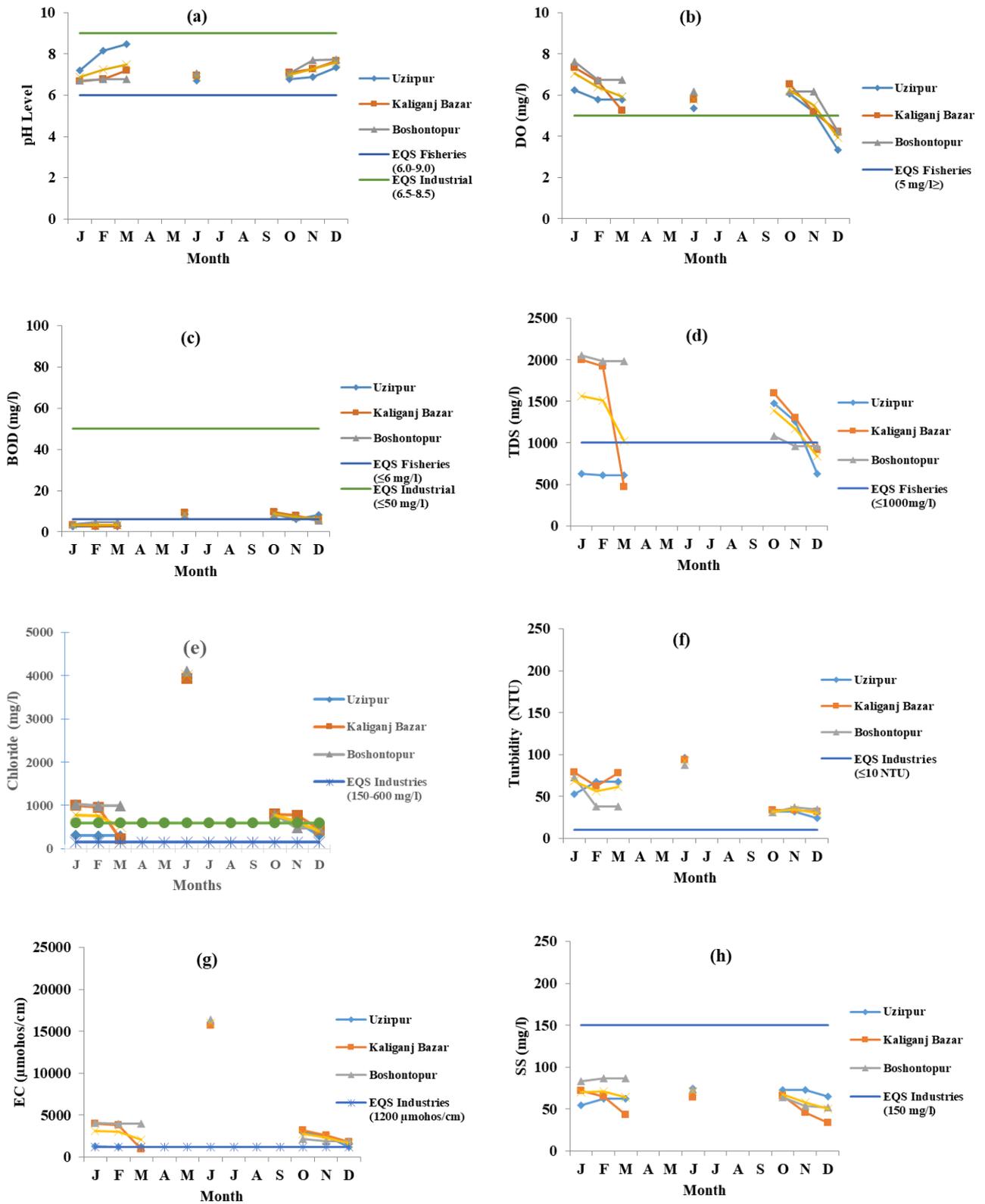


Fig.19. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and SS of Khakshiali River in 2023

## 4.20 Gorai River

The Gorai River is located in Kushtia district in Khulna division. Water samples were collected from one location viz. Kamarkhali Bridge. Detail data is attached Annex-1 (Table:140-147).

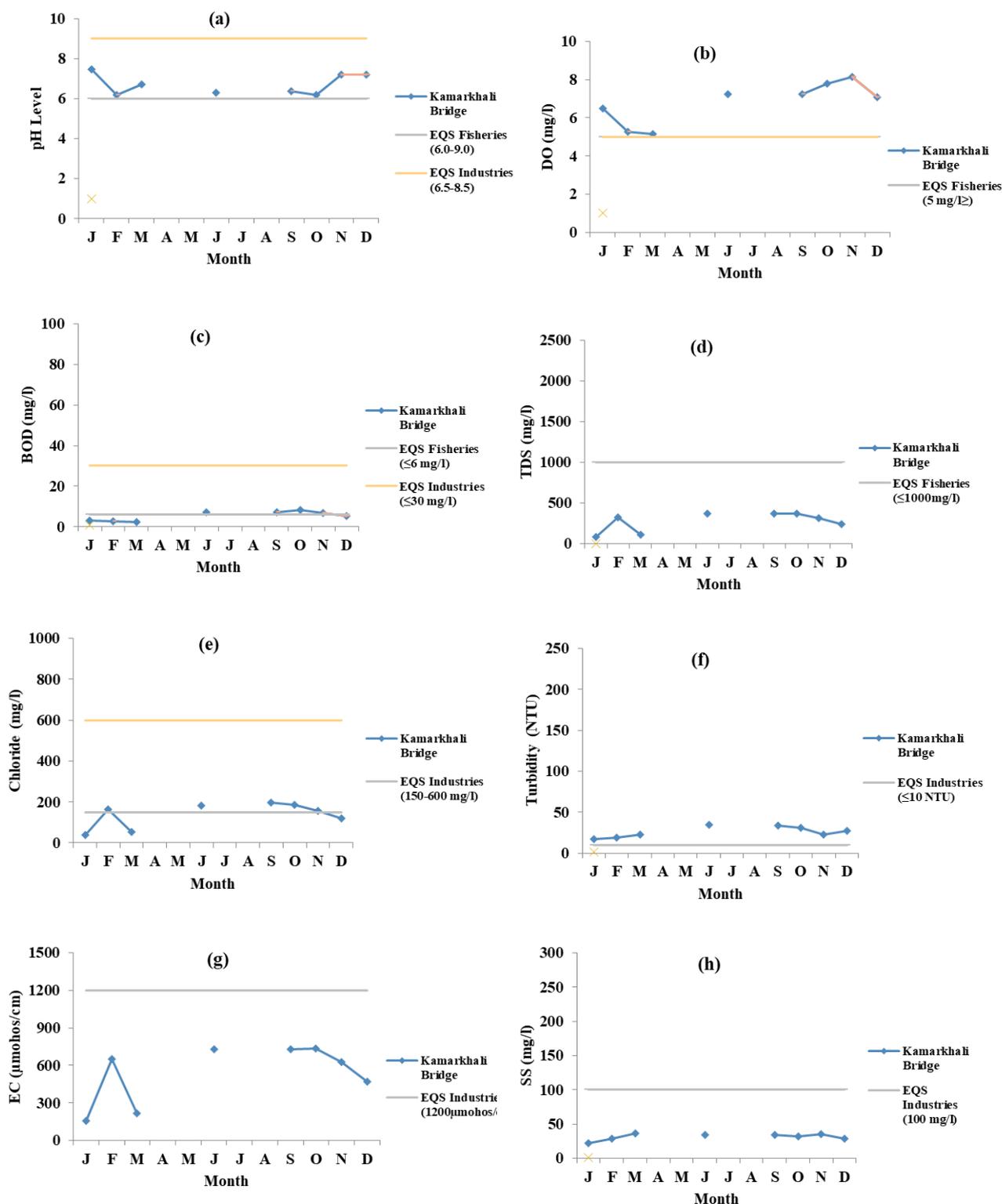


Fig.20. Status of pH, DO BOD, TDS, Chloride, Turbidity, EC and SS of Gorai River in 2023

In 2023, pH of Gorai River water varied from 6.18 to 7.48 (Fig.20a) and was within the EQS (6.0-9.0) for fisheries. In 2023, DO was above the EQS ( $\geq 5$  mg/l) limit for fisheries. Level of DO varied from 5.17 to 8.16 mg/l (Fig.20b). In 2023, BOD level was within the EQS ( $\leq 6$  mg/l) and varied from 2.47 to 8.3 mg/l (Fig.20c). In 2023, TDS level of Gorai River water was within the limit while comparing to the EQS (1000 mg/l) for fisheries. It varied from 79 to 368 mg/l (Fig.20d). In 2023, the maximum and the minimum Chloride values was 39 and 198 mg/l (Fig.20e). In 2023, Turbidity level was relatively higher throughout the year than the EQS (10 NTU). It varied from 17 to 35 NTU (Fig.20f). In 2023, the maximum EC was 736  $\mu\text{mhos/cm}$  in October and the minimum 216  $\mu\text{mhos/cm}$  in March while EQS for EC 1200  $\mu\text{mhos/cm}$  (Fig.20g). In 2023, SS varied from 22 mg/l to 36 mg/l (Fig.20 h).

#### **4. 21 Modhumoti River**

The Madhumati river, distributary of the upper Padma River, flowing through South-western Bangladesh. It leaves the Padma just north of Kushtia and flows 306 km southeast before turning south across the swampy Sundarbans region to empty into the Bay of Bengal. In its upper course it is called the Garai; in its lower course it is known as the Baleswar; and its estuary mouth, which is some 14 km wide, is called the Haringhata. The Madhumati is one of the largest of the Padma distributaries in the southern part of the Gangetic Plain, and it offers the best navigation conditions of any river at the head of the Bay of Bengal. To monitor water quality of Modhumoti river in 2023, samples were collected from one location i.e Dhalaitala of Bagerhat. Detail data is attached Annex-1 (Table: 148-155).

In 2023, pH level of Modhumoti river was within the EQS and varied from 6.23 to 8.07 (Fig.21a). In 2023, DO varied from 5.2 to 7.8 mg/l while EQS is  $\geq 5$  mg/l for fisheries (Fig.21b). In 2023, BOD varied from 2.04 mg/l to 6.7 mg/l (Fig.21c). In 2023, TDS of Modhumoti river water was within EQS (1000 mg/l). The maximum and the minimum value was 471 mg/l in June and 86 mg/l in March (Fig.21d). In 2023, Chloride level varied from 43 to 236 mg/l while EQS for treated wastewater from industrial units is 600 mg/l (Fig.20e). In 2023, Turbidity varied from 26 to 58 NTU (Fig.21f). In 2023, the maximum EC was 942  $\mu\text{mhos/cm}$  in June and the minimum 171  $\mu\text{mhos/cm}$  in March while EQS for EC 1200  $\mu\text{mhos/cm}$  (Fig.21g). In 2023, SS varied from 38 mg/l to 65 mg/l (Fig.21 h).

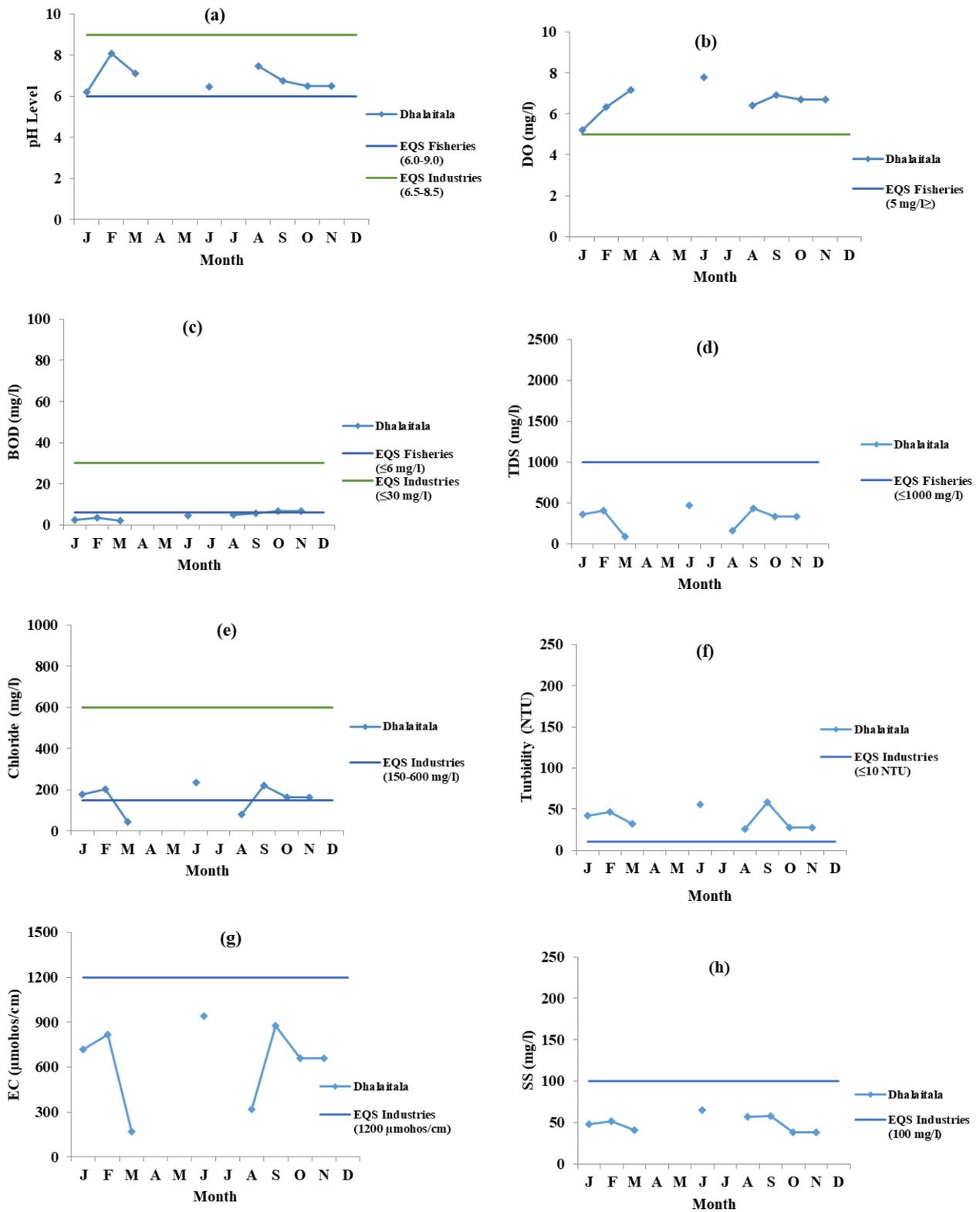


Fig.21. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and SS of Modhumoti River in 2023

## 4.22 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 one location i.e. Gorai off Take. Detail data is attached Annex-1 (Table: 156-163).

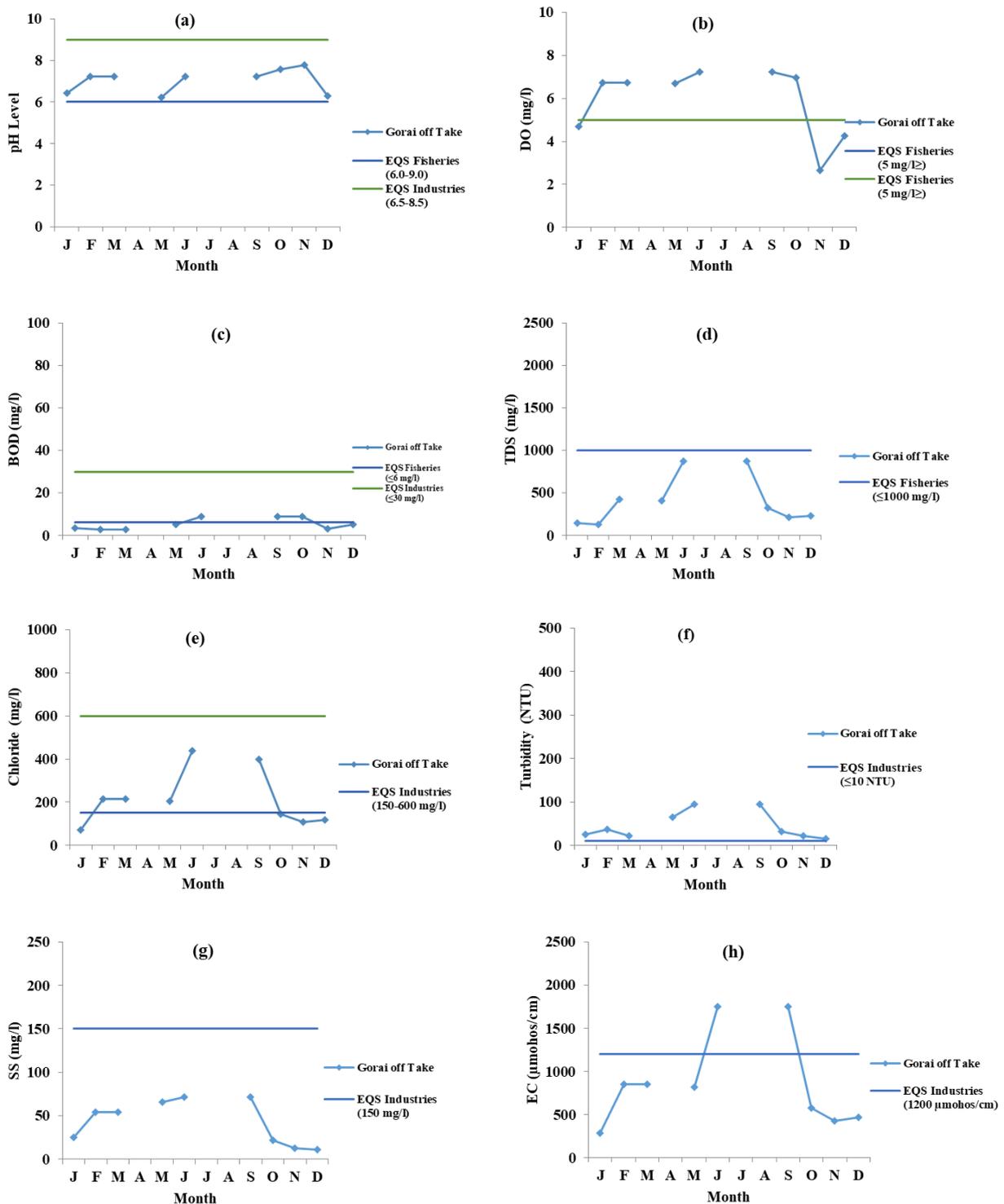


Fig.22. Status of pH, DO, BOD, TDS, Chloride, Turbidity, SS and EC of Ganges River in 2023

In 2023, pH level was within the EQS and varied from 6.22 to 7.78 (Fig.22a). DO varied from 2.65 to 7.23 mg/l (Fig.22b) and was closer to the EQS for fisheries ( $\geq 5$  mg/l). BOD Concentration varied from 2.6 to 8.9 mg/l (Fig.22c). The maximum and the minimum TDS was 877 mg/l in June and 127 mg/l in February (Fig.22d). Chloride level varied from 70.5 mg/l to 439 mg/l while EQS for treated wastewater from industrial units 150-600 mg/l. The maximum value was found in June and the minimum was in January (Fig.22e). Turbidity varied from 16 to 95 NTU (Fig.22f) and was higher than EQS (10 NTU). SS varied from 11 mg/l to 72 mg/l (Fig.22 g). In 2023, the maximum EC was 1754  $\mu\text{mhos/cm}$  in June and the minimum 282  $\mu\text{mhos/cm}$  in January while EQS for EC 1200  $\mu\text{mhos/cm}$  (Fig.22h).

### 4.23 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 six locations i.e. Launch Ghat (S), Launch Ghat (M), Kaower Char (S), Kaower Char (M), Dopdopia Kheyaghat (S), Dopdopia Kheyaghat (M) of the river. Data was not available in the month of February to August and November. Detail data is attached Annex-1 (Table:164-167).

In 2023, pH level of Kirtankhola river water varied from 7.74 to 8.82 (Fig.23a) and was within the EQS. In 2022, pH range was from 8.24 to 8.99. In 2023, DO level of Kirtankhola river was above the EQS ( $\geq 5$  mg/l) for fisheries. DO varied from 7.37 mg/l to 7.48 mg/l (Fig.23b). In 2022, DO level varied from 6.19 mg/l to 7.74 mg/l. In 2023, TDS of Kirtankhola river water was also within the EQS (1000 mg/l) throughout the year and the range was from 81.6 to 897 mg/l (Fig.23c). In 2022, TDS level varied from 71.9 to 957 mg/l. In 2023, EC level of the Kirtankhola river varied from 161.3 to 1701  $\mu\text{mhos/cm}$  against the EQS for treated wastewater from industrial units 1200  $\mu\text{mhos/cm}$  (Fig.23d). In 2022, EC varied from 130.3 to 1961  $\mu\text{mhos/cm}$ .

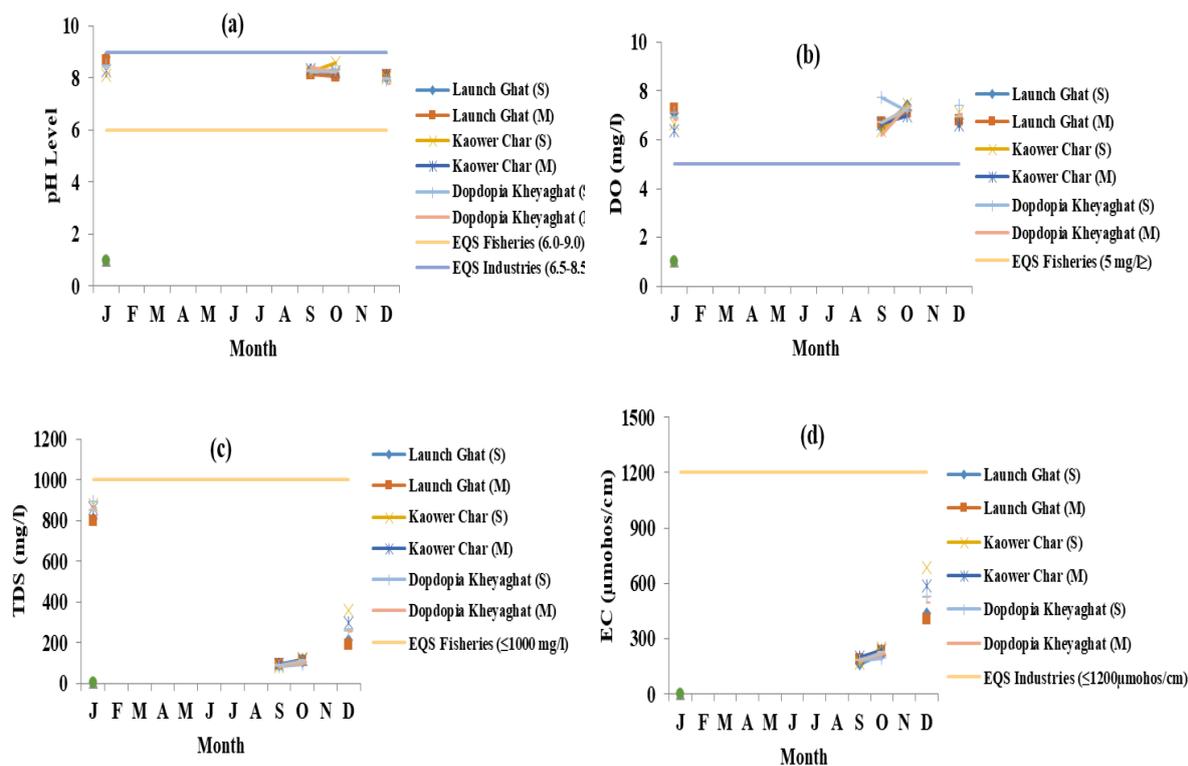


Fig.23. Status of pH, DO, TDS and EC of Kirtankhola River in 2023

## 4.24 Tatulia River

For monitoring of water quality of Tatulia river water samples was collated from Vedhoria Feri Ghat (VFG) location (side and middle point). For analysis, average of two points were used. Data was not available in the month of February to November. Detail data is attached Annex-1 (Table: 168-171).

In 2023, pH level of the Tatulia river water ranged from 8.16 to 8.52 mg/l (Fig.24a) while in 2022, the pH range varied from 8.43 to 8.77. In 2023, DO varied from 6.02 to 7.87 mg/l (Fig.24b) while standard limit for fisheries ( $\geq 5$  mg/l). In 2022, DO level varied from 5.06 to 6.3 mg/l. In 2023, TDS range varied from 67.3 to 229 mg/l (Fig.24c). In 2022, TDS range was 73.5 mg/l to 75.6 mg/l. In 2023, EC varied from 155.4  $\mu\text{mhos/cm}$  to 257  $\mu\text{mhos/cm}$  (Fig.24d).

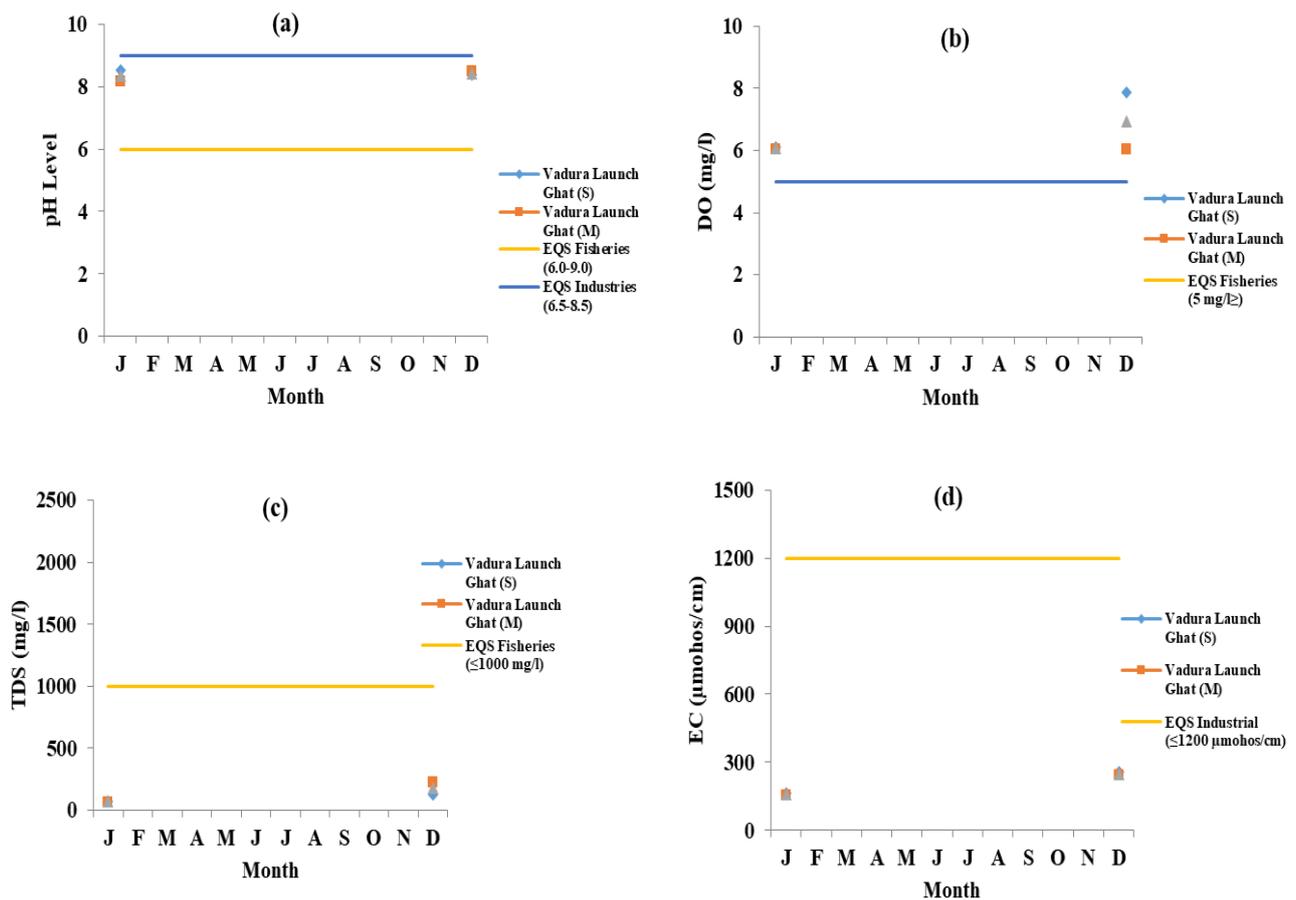


Fig.24.Status of pH, DO, TDS and EC of Tatulia River in 2023

## 4.25 Kalabodar River

The Kalabodar river is the South and South-eastern region of Bangladesh. To monitor water quality of Kalabodar river water samples were collected for analysis from one location i.e Kalabodar Ferry Ghat (S) of the river. Data was collected for the month of January. Detail data is attached Annex-1 (Table: 172-175).

In 2023, pH level of the Kalabodar river water varied from 7.3 to 7.8. (Fig.25a) while EQS for fisheries 6.0 to 9.0. DO level varied from 5.1 mg/l to 5.3 mg/l (Fig.25b) and was above the EQS ( $\geq 5$  mg/l) for fisheries. TDS level of the Kalabodar river water was from 124 mg/l to 148 mg/l (Fig.25c) while corresponding EQS (1000 mg/l) for fisheries. EC of the Kalabodar river water was from 306  $\mu\text{mhos/cm}$  to 332  $\mu\text{mhos/cm}$  (Fig.25d) while corresponding EQS (1200  $\mu\text{mhos/cm}$ ) for treated wastewater from industrial units.

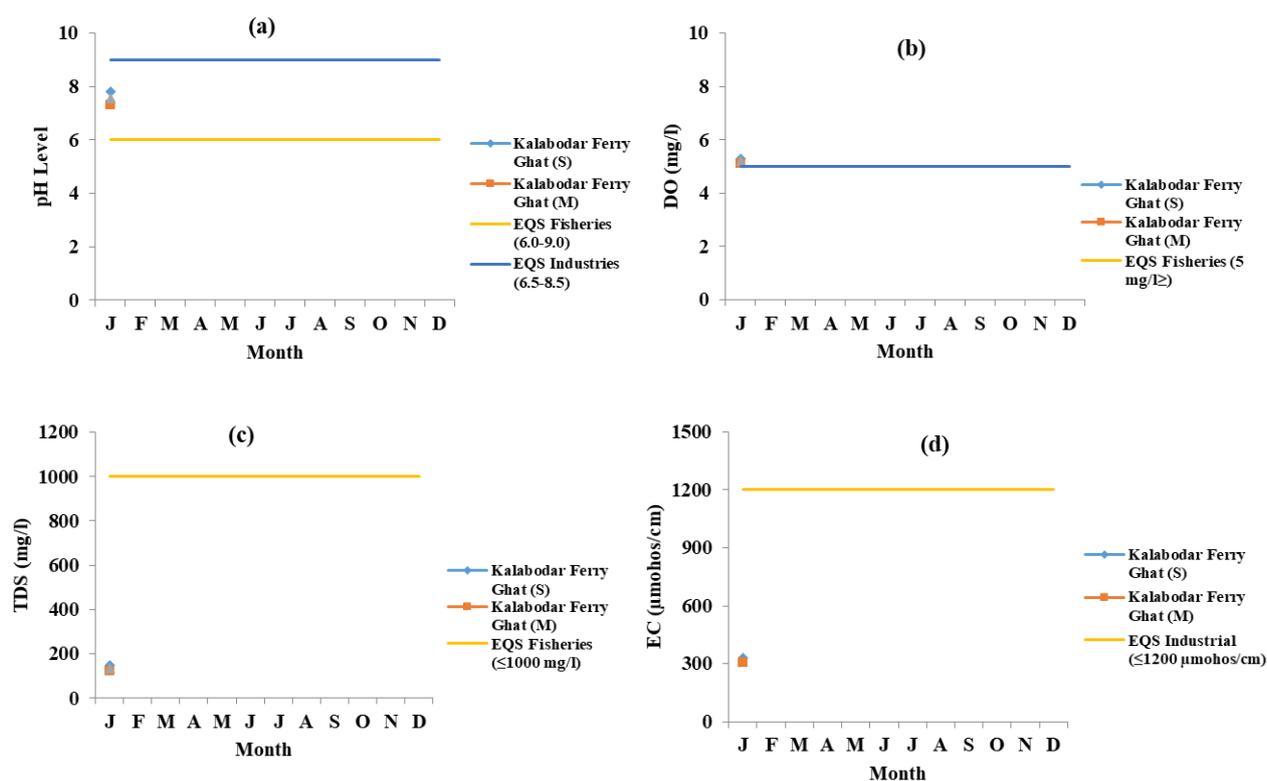


Fig.25. Status of pH, DO, TDS and EC of Kalabodar River in 2023

## 4.26 Lohalia River/Laukathi 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 Patuakhali Launch Ghat (PLG) (side and middle). For analysis, average of two points were used. Data was not available in the month of February to August and October to December. Detail data is attached Annex-1 (Table: 176-179).

In 2023, pH level of the Lohalia river water varied from 8.35 to 9.03. (Fig.26a) while EQS for fisheries 6.0 to 9.0. In 2022, pH was varied from 8.62 to 9.01. In 2023, DO level varied from 6.34 to 7.27 mg/l (Fig.25b) and was above the EQS ( $\geq 5$  mg/l) for fisheries. In 2022, DO was varied from 6.61 to 7.15 mg/l. In 2023, TDS level of the Lohalia river water was from 93.7 mg/l to 114 mg/l (Fig.25c) EQS is 2100 mg/l. In 2022, TDS was varied from 94.3 mg/l to 94.4 mg/l. In 2023, EC level of the Lohalia river water varied from 204.3 to 265  $\mu\text{mhos/cm}$  (Fig.25d) EQS is 1200  $\mu\text{mhos/cm}$ . In 2022, EC level varied from 206 to 210  $\mu\text{mhos/cm}$ .

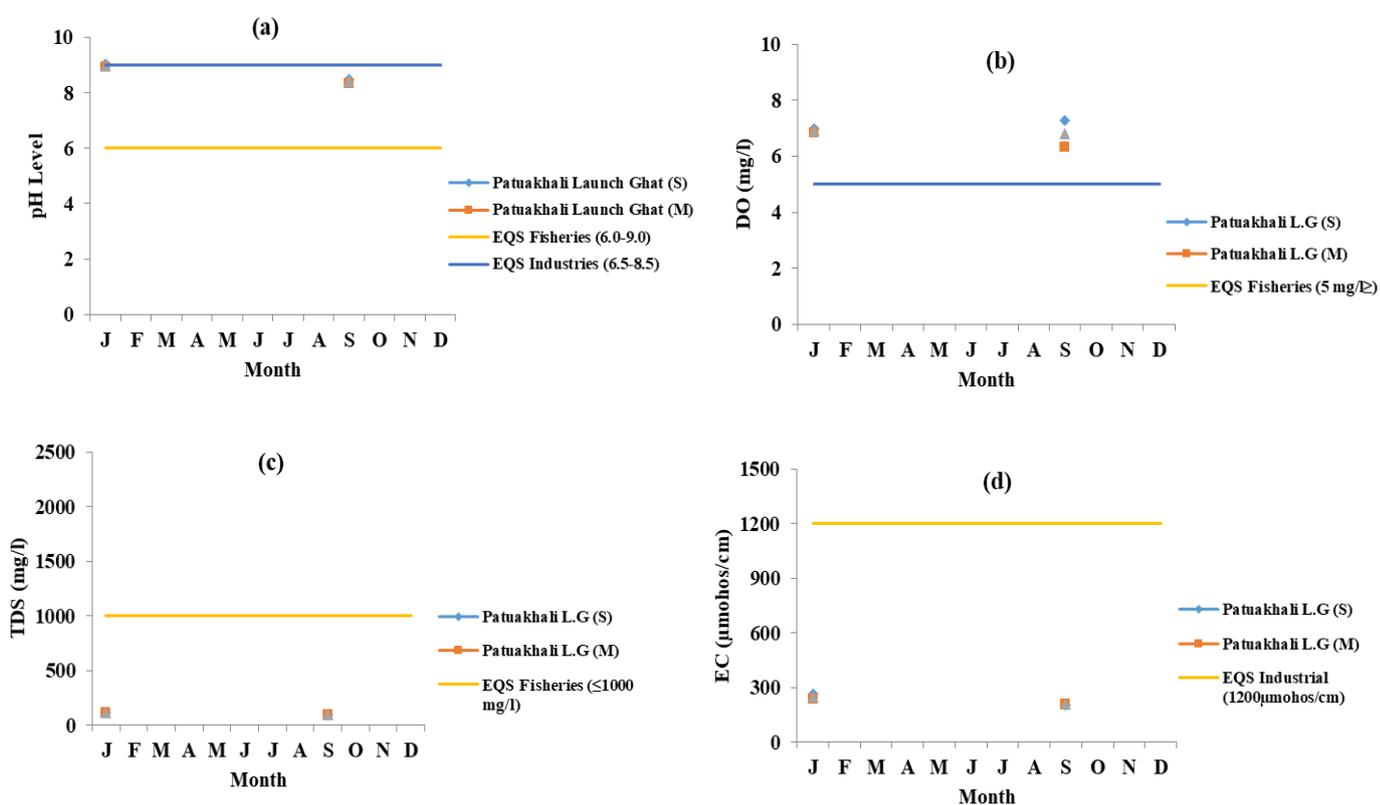


Fig.26. Status of pH, DO, TDS and EC of Lohalia River in 2023

## 4.27 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 North-east 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 four different locations of the river namely Mendibag Point, Kin Bridge, Shak Ghat and Chattak. Data was collected in the months of March and June. Detail data is attached Annex-1 (Table: 180-185).

In 2023, pH level of the Surma river water varied from 7.12 to 7.69 (Fig. 27a) while in 2022, pH varied from 6.61 to 6.84. In 2023, DO content was mostly above the EQS ( $\geq 5$  mg/l). It varied from 7.13 to 8.27 mg/l (Fig. 27b). In 2022, DO level varied from 6.92 to 7.06 mg/l. In 2023, BOD value was also within the EQS at all locations. The maximum and the minimum BOD was 3.6 mg/l in March at Sheaik Ghat point and 2.3 mg/l in June at Mendibag point (Fig. 27c). In 2022, BOD level varied from 2.1 to 2.8 mg/l. In 2023, TDS range varied from 85 to 151 mg/l (Fig. 27d) where EQS for TDS 1000 mg/l for fisheries. In 2022, TDS level was varied from 49 to 68 mg/l. In 2023, SS varied from 52 mg/l to 72 mg/l (Fig. 27e). In 2022, SS varies from 38 mg/l to 66 mg/l. In 2023, EC level of Surma river water was within the EQS limit for treated wastewater from industrial unit. It varied from 172 to 306  $\mu$ mhos/cm (Fig. 27f). In 2022, EC varied from 86 to 122  $\mu$ mhos/cm.

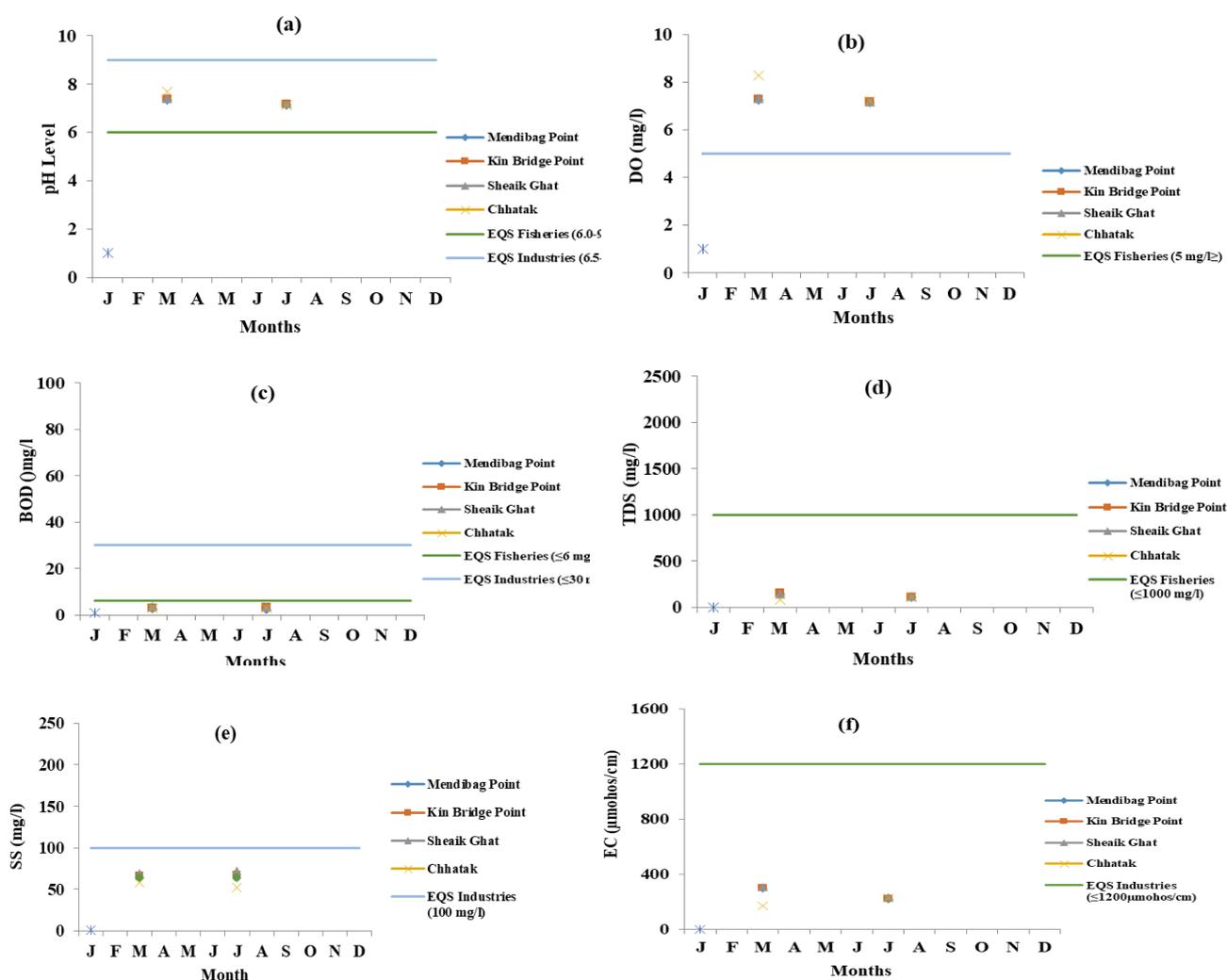


Fig.27. Status of pH, DO, BOD, COD, TDS and EC of Surma River in 2023

## 4.28 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 Kushiara reaches upto 10m. Water samples were collected Fenchugonj point among the two locations (e.g. Fenchuganj Bridge Point (F.B.P.) and Fenchuganj Fertilizer Industry Point (F.F.I.P.) of the river in 2023 for analysis of water quality. Data was collected only in the months of March and July. Detail data is attached Annex-1 (Table: 186-191).

In 2023, pH level of Kushiara river water was within EQS (6.0-9.0) for inland surface water. It varied from 7.48 to 8.79 (Fig. 28a). In 2022, pH level varied from 6.89 to 8.5. In 2023, DO was above the EQS ( $\geq 5$  mg/l) for fisheries and varied from 7.65 to 8.81 mg/l (Fig. 28b). In 2022, DO level varied from 3.83 to 7.24 mg/l. In 2023, BOD level was from 2.7 mg/l to 23 mg/l while EQS for fisheries  $\leq 6$  mg/l (Fig. 28c). In 2022, BOD level varied from 2.3 mg/l to 2.6 mg/l. In 2023, COD content was within the EQS (50 mg/l) for fisheries and varied from 14 mg/l to 82 mg/l (Fig. 28d). In 2022, COD level varied from 14 mg/l to 15 mg/l. In 2023, TDS level of Kushiara river water was below the EQS for fisheries and varied from 70 to 111 mg/l (Fig. 28e). In 2022, TDS level varied from 63 to 152 mg/l. In 2023, EC was within the EQS limit and it varied from 143 to 218  $\mu\text{mhos/cm}$  (Fig. 28f). In 2022, EC varied from 124 to 364  $\mu\text{mhos/cm}$ .

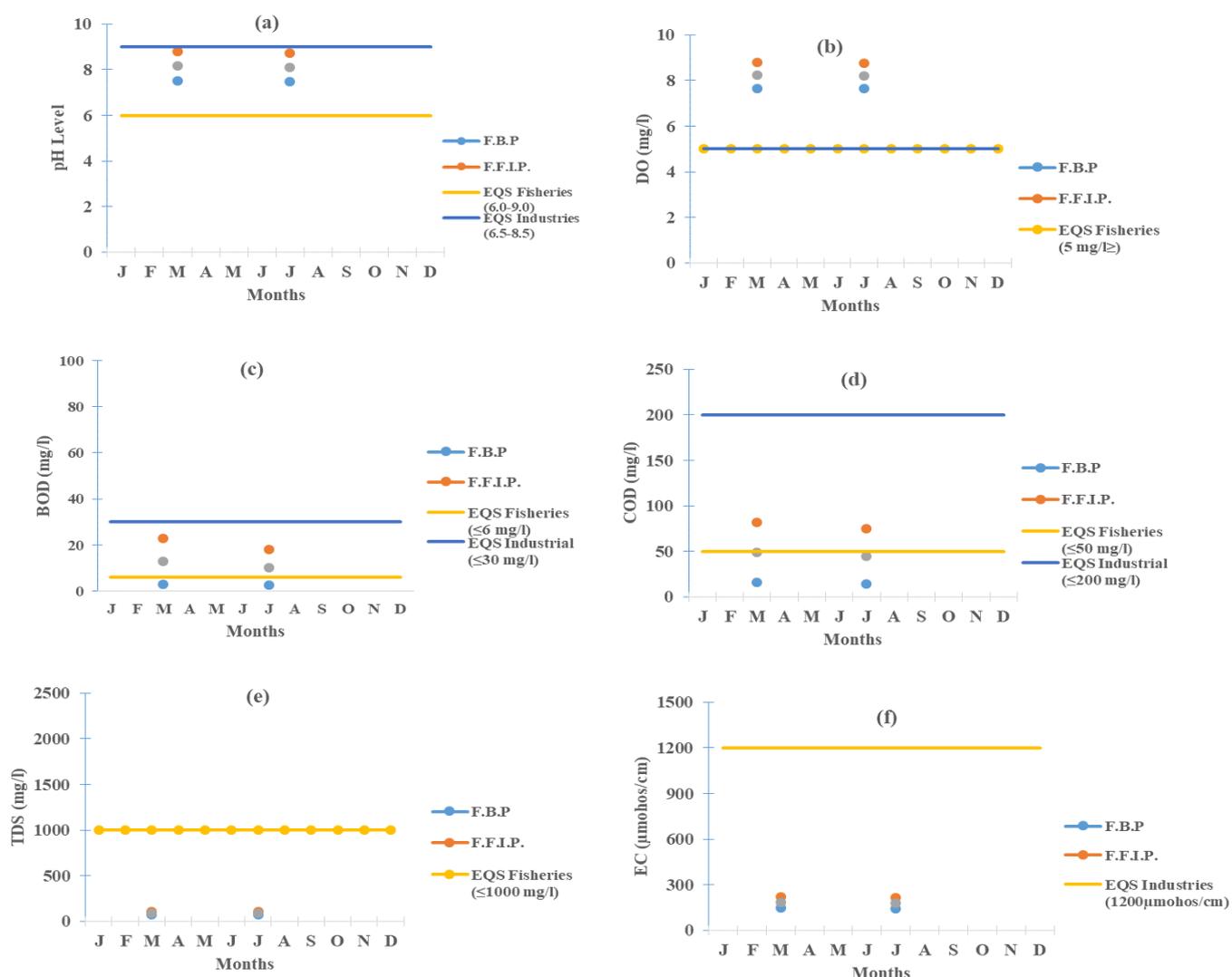
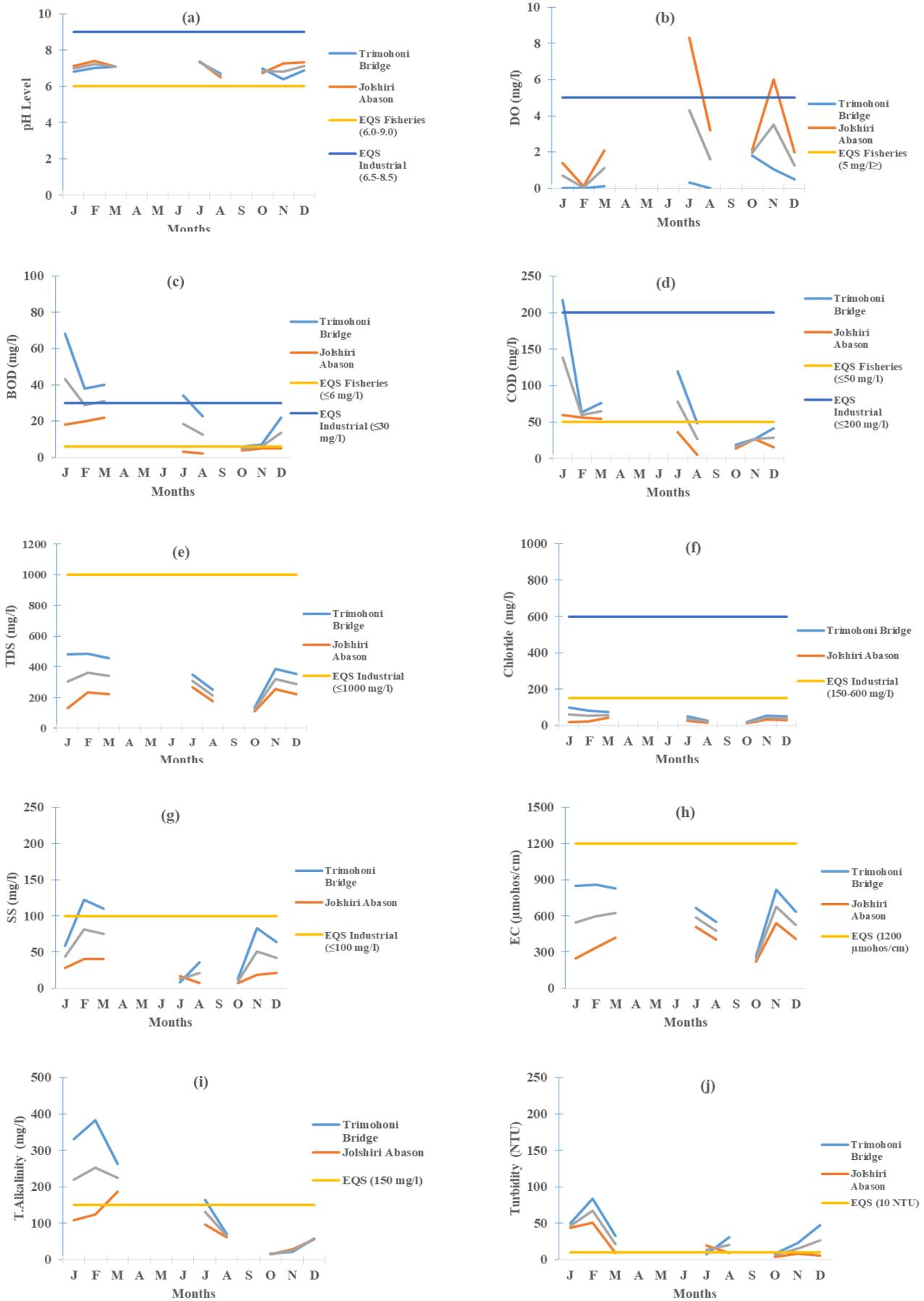


Fig 28. Status of pH, DO, BOD, COD, TDS and EC of Kushiara River in 2023

## 4.29 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 2023, water samples were collected from two locations such as Trimohoni Bridge, Jolshiri Abason of the river. Data was not available in the months of April to June and September. Detail data is attached Annex-1 (Table:192-201).

In 2023, the pH range (6.39 to 7.41) (Fig.29a) of Balu River was within EQS (6.0 -9.0). The maximum pH 7.41 was found in February at Jolshiri Abason point and the minimum pH 6.39 was found in November at Trimohoni Bridge point. In 2022, pH level varied from 6.50 to 7.62. In 2023, DO concentration of Balu River water was very low during dry season. The maximum DO (8.3 mg/l) found at Jolshiri Abason point in July and the minimum DO (0.0) mg/l was found in August at Trimohoni Bridge point (Fig.29b). In 2022, DO level varied from 0.0 to 8.0 mg/l. In 2023, the maximum BOD was 68 mg/l in January at Trimohoni Bridge point and the minimum was 2.1 mg/l in August at Jolshiri Abason point (Fig.29c). In 2022, BOD level varied from 3.0 to 88.5 mg/l. In 2023, COD of Balu River was over the EQS ( $\leq 50$  mg/l) in dry season for fisheries. The maximum and the minimum COD content of Balu River water was 217 mg/l at Trimohoni Bridge point in January and 5 mg/l at Jolshiri Abason point in August (Fig.29d). In 2022, COD level varied from 10.0 to 222 mg/l. In 2023, TDS was below the EQS (1000 mg/l) for fisheries (Fig.29e) at all the sampling points. The maximum TDS was 487 mg/l in February at Trimohoni Bridge point while that of minimum was 112 in October at Jolshiri Abason point. In 2022, TDS level varied from 90 to 470 mg/l. In 2023, the maximum Chloride was (99 mg/l) found in January at Trimohoni Bridge point and the minimum Chloride was (13 mg/l) in October at Jolshiri Abason point (Fig.29f). In 2022, Chloride level varied from 8.0 to 102 mg/l. In 2023, the maximum SS was 122 mg/l at Trimohoni Bridge point in February and the minimum was 7 mg/l in August and October at Jolshiri Abason point. (Fig.29g). In 2022, SS level varied from 7.0 to 220 mg/l. In 2023, the maximum EC (858  $\mu\text{mhos/cm}$ ) was in February at Trimohoni Bridge point and the minimum (219.2  $\mu\text{mhos/cm}$ ) was in October at Jolshiri Abason point (Fig.29h). In 2022, EC level varied from 154 to 842  $\mu\text{mhos/cm}$ . In 2023, the maximum Total Alkalinity (382 mg/l) was at Trimohoni Bridge point in February and the minimum (14 mg/l) in October at Jolshiri Abason point (Fig.29i). In 2022, Total Alkalinity level varied from 32 to 370 mg/l. In 2023, the maximum Turbidity of Balu River was (83.9 mg/l) at Trimohoni Bridge point in February and the minimum (4.0 mg/l) in October at Jolshiri Abason point (Fig.29j). In 2022, Turbidity level varied from 4.9 to 86.3 NTU.



**Fig 29. Status of pH, DO, BOD, COD, TDS, Chloride, SS, EC, T.alkalinity and Turbidity of Balu River in 2023**

### 5.1 Water Quality Parameters of Gulshan Lake Water

It is an important urban water body in Dhaka city providing environmental services. However, the lake 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 six locations e.g. United Hospital, South Bridge, Lake View Clinic, Taltola Shooting Complex, South Side of Gulsan Baridhara Lake, North Side of Gulsan Baridhara Lake of the lake in 2023 for analysis of water. Data was not available in the month of January, March to July, September, October and December. Detail data is attached Annex-2 (Table:202-211).

In 2023, pH of Gulshan Lake water varied from 7.05 to 7.69. The maximum pH was in August at South Bridge point and the minimum pH was in November at South Side of Gulsan Baridhara Lake point (Fig. 30a). In 2022, pH of Gulshan Lake water varied from 7.01 to 7.73. In 2023, DO content of Gulshan Lake widely varied among the sampling locations as well as among sampling months. DO of Gulshan Lake water varied from 1.12 to 9.48 mg/l. The maximum DO (9.48 mg/l) was in November at Lake View Clinic and the minimum DO (1.12 mg/l) was in September at North Side of Gulsan Baridhara Lake point (Fig. 30b). In 2022, DO concentration of Gulshan Lake water varied from 0.12 to 10.26 mg/l. In 2023, BOD of Gulshan Lake water varied from 11.1 to 37 mg/l. The maximum BOD (37 mg/l) was in February at Lake View Clinic point and the minimum BOD (11.1) was in August at South Bridge point (Fig. 30c). BOD was higher than EQS for fisheries throughout the year of 2023. In 2022, BOD of Gulshan Lake water varied from 16.0 to 45 mg/l. In 2023, COD of Gulshan Lake water varied from 62 to 153 mg/l. The maximum COD (153 mg/l) was in November at United Hospital point and the minimum COD (62) mg/l was in August at Lake View Clinic point (Fig. 30d). In 2022, COD of Gulshan Lake water varied from 49 to 343 mg/l. In 2023, TDS of Gulshan Lake water varied from 212 to 358 mg/l. The maximum TDS (358 mg/l) was in February at Taltola Shooting Complex point and the minimum TDS (212 mg/l) was in August at North Side of Gulsan Baridhara Lake point (Fig. 30e). In 2022, TDS of Gulshan Lake water varied from 41 to 315 mg/l. In 2023, Turbidity of Gulshan Lake water varied from 9.89 to 107 NTU. The maximum Turbidity (107 NTU) was in February at Lake View Clinic point and the minimum Turbidity (9.89 NTU) was in August at South Side of Gulsan Baridhara Lake point (Fig. 30f). In 2022, Turbidity of Gulshan Lake water varied from 22.2 to 208 NTU and it was higher than EQS throughout the year. In 2023, Chloride of Gulshan Lake water varied from 40 to 66 mg/l. The maximum Chloride (66 mg/l) was in February at Taltola Shooting Complex point and the minimum Chloride (40 mg/l) was in August at United Hospital point (Fig. 30g). In 2022, Chloride of Gulshan Lake water varied from 38 to 48 mg/l. In 2023, SS of Gulshan Lake water varied from 14 mg/l to 208 mg/l. The maximum SS (208 mg/l) was in February at South Side of Gulsan Baridhara Lake and the minimum SS (14 mg/l) was in August at United Hospital (Fig. 30h). In 2022, SS of Gulshan Lake water varied from 64 mg/l to 253 mg/l. In 2023, Total Alkalinity of Gulshan Lake water varied from 36 mg/l to 280 mg/l. The maximum Total Alkalinity (280 mg/l) was in February at Taltola Shooting Complex point and the minimum Total Alkalinity (36 mg/l) was in November at Lake View Clinic point (Fig. 30i). In 2022, Total Alkalinity of Gulshan Lake water varied from 156 mg/l to 224 mg/l. In 2023, the maximum EC 665  $\mu\text{mhos/cm}$  was in February at Taltola Shooting Complex point and the minimum EC 470  $\mu\text{mhos/cm}$  was in August at North Side of Gulsan Baridhara Lake point (Fig. 30j). In 2022, EC of Gulshan Lake water varied from 387  $\mu\text{mhos/cm}$  to 561  $\mu\text{mhos/cm}$ .

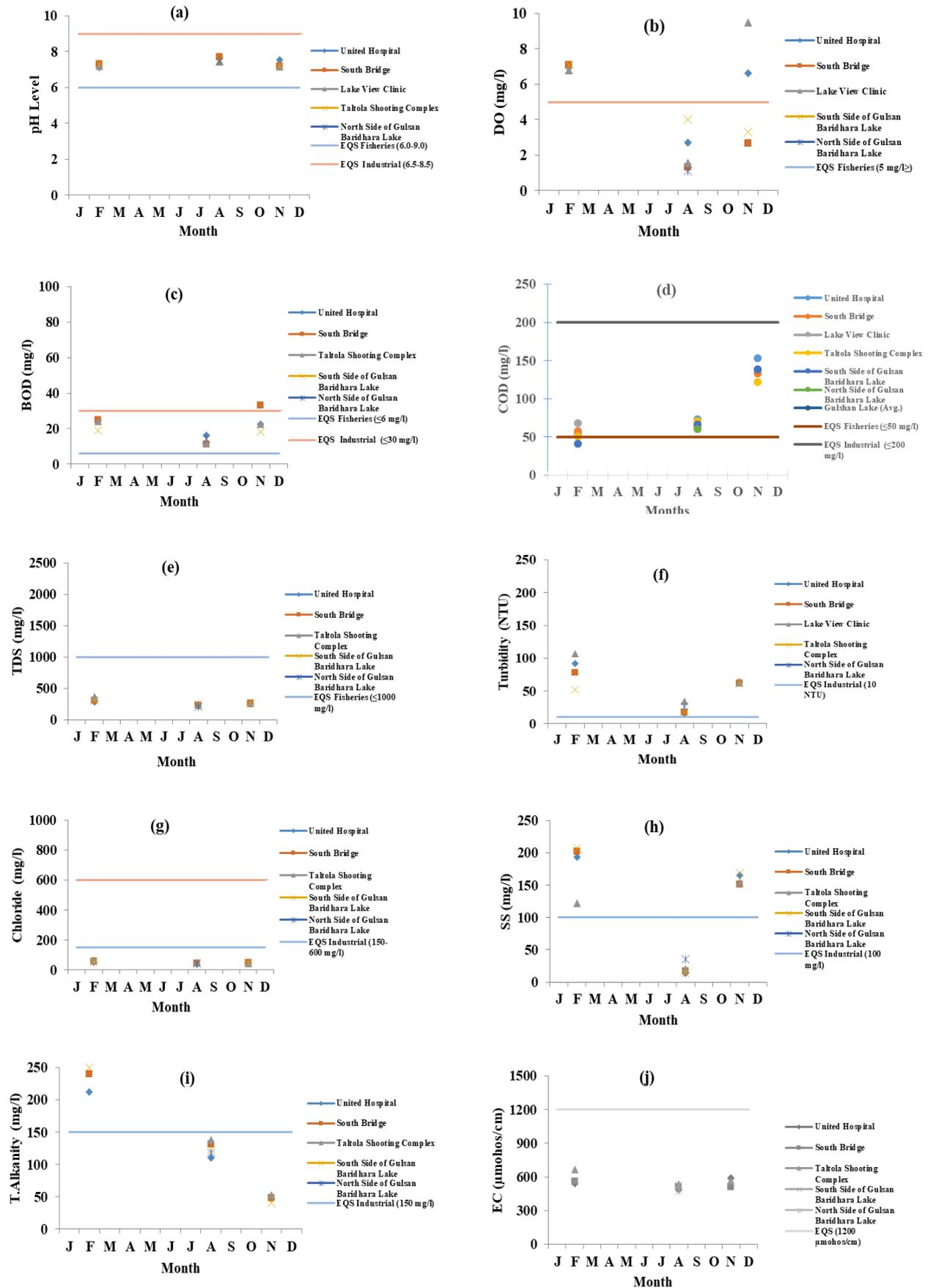


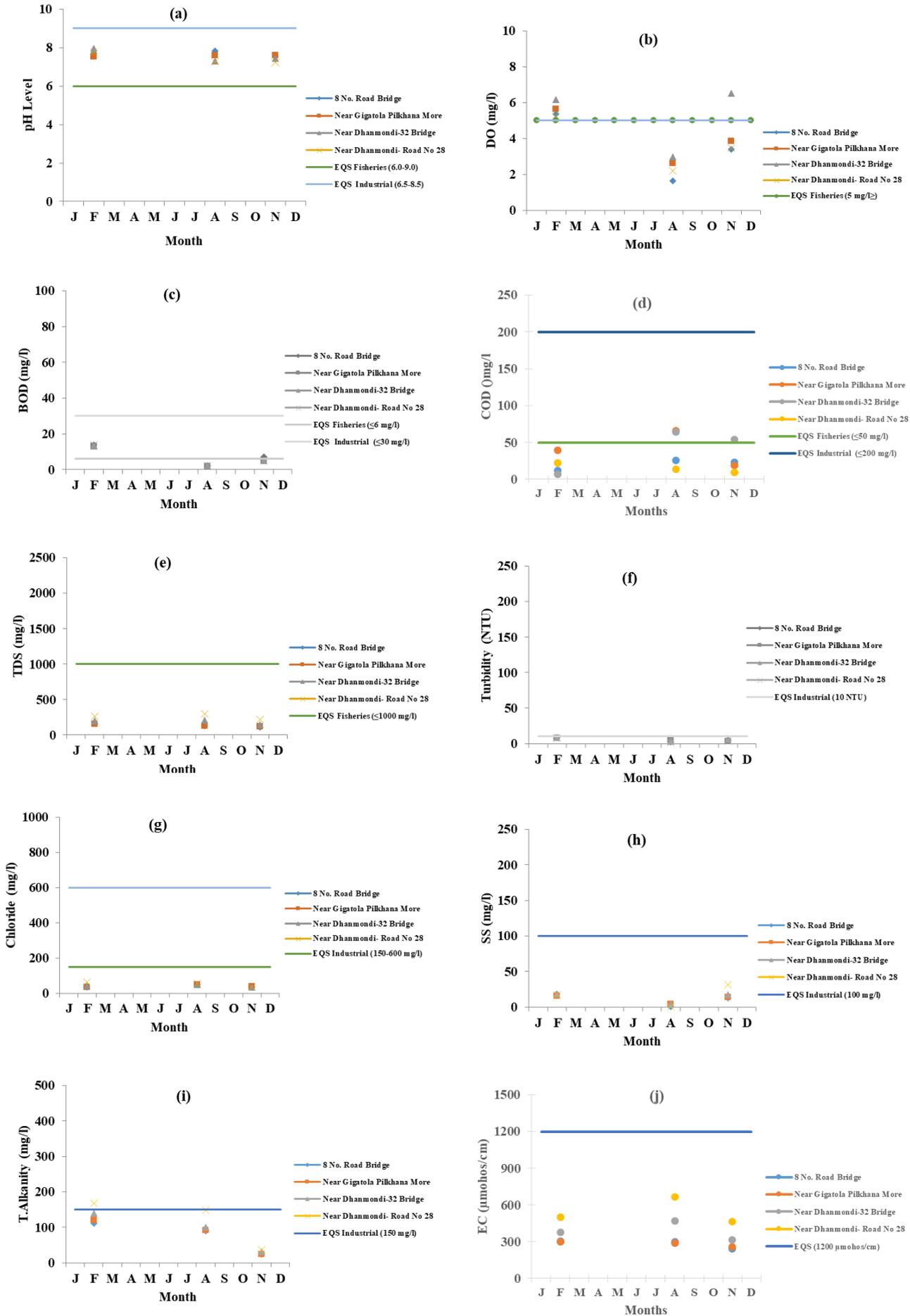
Fig 30. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Gulshan Lake in 2023

## 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. Data was available in the months of February, August and November. Detail data is attached Annex-2 (Table: 212-221).

Water samples were collected from four locations e.g. 8 No. Road Bridge, Near Gigatola Pilkhana More, Near Dhanmondi-32 Bridge, Near Dhanmondi- Road No 28 of the lake in 2023 for analysis of water quality.

In 2023, pH level of Dhanmondi Lake water was within the EQS (6.0-9.0) for fisheries. It varied from 7.23 to 7.96 (Fig. 31a). In 2022, pH level varied from 7.19 to 7.68. In 2023, DO was varied from 2.64 to 5.27 mg/l (Fig. 31b). In 2022, DO was varied from 1.5 to 7.14 mg/l. In 2023, BOD varied from 2.1 to 14 mg/l (Fig. 31c). In 2022, BOD was varied from 1.4 to 8.0 mg/l. In 2023, COD was varied from 7 to 66 mg/l COD was within the EQS (Fig. 31d). In 2022, COD was varied from 10 to 76 mg/l. In 2023, TDS varied from 113.4 mg/l to 299 mg/l and was within the EQS (Fig. 31e). In 2022, TDS was varied from 121.7 to 201 mg/l. In 2023, Turbidity was varied from 1.59 to 9.0 (Fig. 31f). In 2022, Turbidity was varied from 1.5 to 70 NTU. In 2023, Chloride was varied from 33 to 63 mg/l and was within the EQS (Fig. 31g). In 2022, Chloride was varied from 24 to 56 mg/l. In 2023, SS was varied from 1.0 mg/l to 32 mg/l and was within the EQS (Fig. 31h). In 2022, SS varied from 5.0 to 67 mg/l. In 2023, Total Alkalinity varied from 24 to 168 mg/l (Fig. 31i). In 2022, Total Alkalinity varied from 86 to 114 mg/l. In 2023, EC was within the EQS (1200  $\mu$ mhos/cm) limit and it varied 242 to 664  $\mu$ mhos/cm (Fig. 31j). In 2022, EC varied  $\mu$ mhos/cm 222 to 311  $\mu$ mhos/cm. Overall condition of the lake was good.



**Fig 31. Status of pH, DO, BOD, COD, TDS, Turbidity , Chloride, SS, T. Alkalinity and EC of Dhamnondi Lake in 2023**

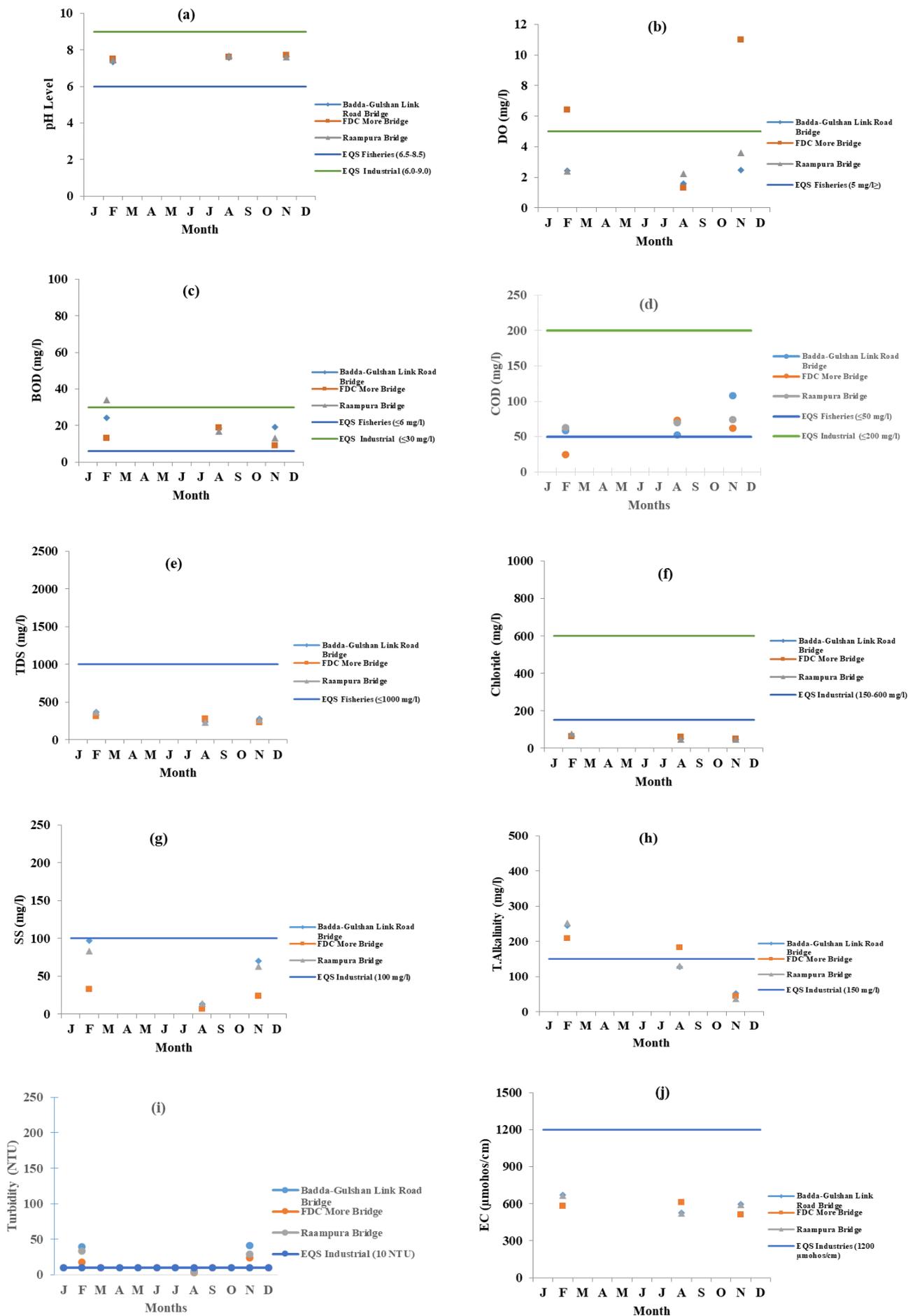
### 5.3 Water Quality Parameters of Hatir-Jheel Lake

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 a 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 three locations e.g. Badda-Gulshan Link Road Bridge, FDC More Bridge and Raampura Bridge of the lake in 2023 for analysis of water quality. Data was available in the months of February, August and November. Detail data is attached Annex-2 (Table: 222-231).

In 2023, pH level of Hatir Jheel Lake water was within the EQS (6.0-9.0) for fisheries. It varied from 7.34 to 7.68 (Fig.32a). In 2022, pH level varied from 7.3 to 7.92. In 2023, DO varied from 1.3 to 10.98 mg/l (Fig.32b). In 2022, DO was varied from 1.5 to 5.5 mg/l. In 2023, BOD was varied from 9 to 34 mg/l (Fig.32c). In 2022, BOD was varied from 21 to 32 mg/l. In 2023, COD of Hatir Jheel water varied from 24 to 108 mg/l (Fig.32d). In 2022, COD of Hatir Jheel water varied from 39 to 117 mg/l. In 2023, TDS varied from 230 to 369 mg/l (Fig.32e). In 2022, TDS varied from 150 to 335 mg/l. In 2023, Chloride of Hatir Jheel Lake water varied from 47 to 75 mg/l (Fig.32f). In 2022, Chloride of Hatir Jheel Lake water varied from 44 to 66 mg/l. In 2023, SS was varied from 7 to 97 mg/l (Fig.32g). In 2022, SS varied from 11 to 158 mg/l. In 2023, Total Alkalinity was above the EQS (150 mg/l) and varied from 36 mg/l to 252 mg/l (Fig. 32h). In 2022, Total Alkalinity varied from 150 to 226 mg/l. In 2023, Turbidity varied from 2.52 to 40.8 NTU and was above the EQS (Fig.32i). In 2022, Turbidity varied from 8.3 to 165 NTU. In 2023, EC was within the EQS (1200  $\mu$ mhos/cm) limit and it varied from 511  $\mu$ mhos/cm to 673  $\mu$ mhos/cm (Fig. 32j). In 2022, EC varied from 426 to 597  $\mu$ mhos/cm.



**Fig 32. Status of pH, DO, BOD, COD, TDS, Chloride, SS, T. Alkalinity, Turbidity and EC of Hatir Jheel Lake in 2023**

## CHAPTER 6: WATER QUALITY PARAMETERS OF GROUND WATER

### 6.1 Water Quality Parameters of Ground Water in Chittagong District

Chittagong is the second largest city of Bangladesh. It is a sea port city and faces various environmental challenges like industrial pollution, land slide, municipal wastes dumping, etc. There is possibility of increasing ground water salinity as the city is on the sea coast. For monitoring ground water quality, samples were collected from nine different locations viz. MES College Area, CEPS Area, Karnafully EPZ Area, Patenga Area, Agrabad Area, Halishahar Area, Akbarshah Residential Area, Chawkbazar Area and GEC point. For analysis, average points were used. Detail data is attached Annex-3 (Table: 232-235).

In 2023, pH level of ground water of Chittagong District area was within EQS (6.5-8.5) for drinking water. It varied from 6.0 to 9.56 (Fig. 33a). The maximum pH was 9.56 in April at Chawkbazar Area and the minimum pH was 6.0 in March at Patenga Area. In 2023, EC varied from 124.2  $\mu\text{mhos/cm}$  to 1668  $\mu\text{mhos/cm}$  (Fig.33b) while EQS (1200  $\mu\text{mhos/cm}$ ). In 2023, TDS level of Chittagong District area ground water was below the EQS (1000 mg/l) for treated wastewater from drinking unit and varied from 62.5 to 885 mg/l (Fig. 33c). In 2023, Salinity varied from 0.06 to 0.9 ppt (Fig. 33d).

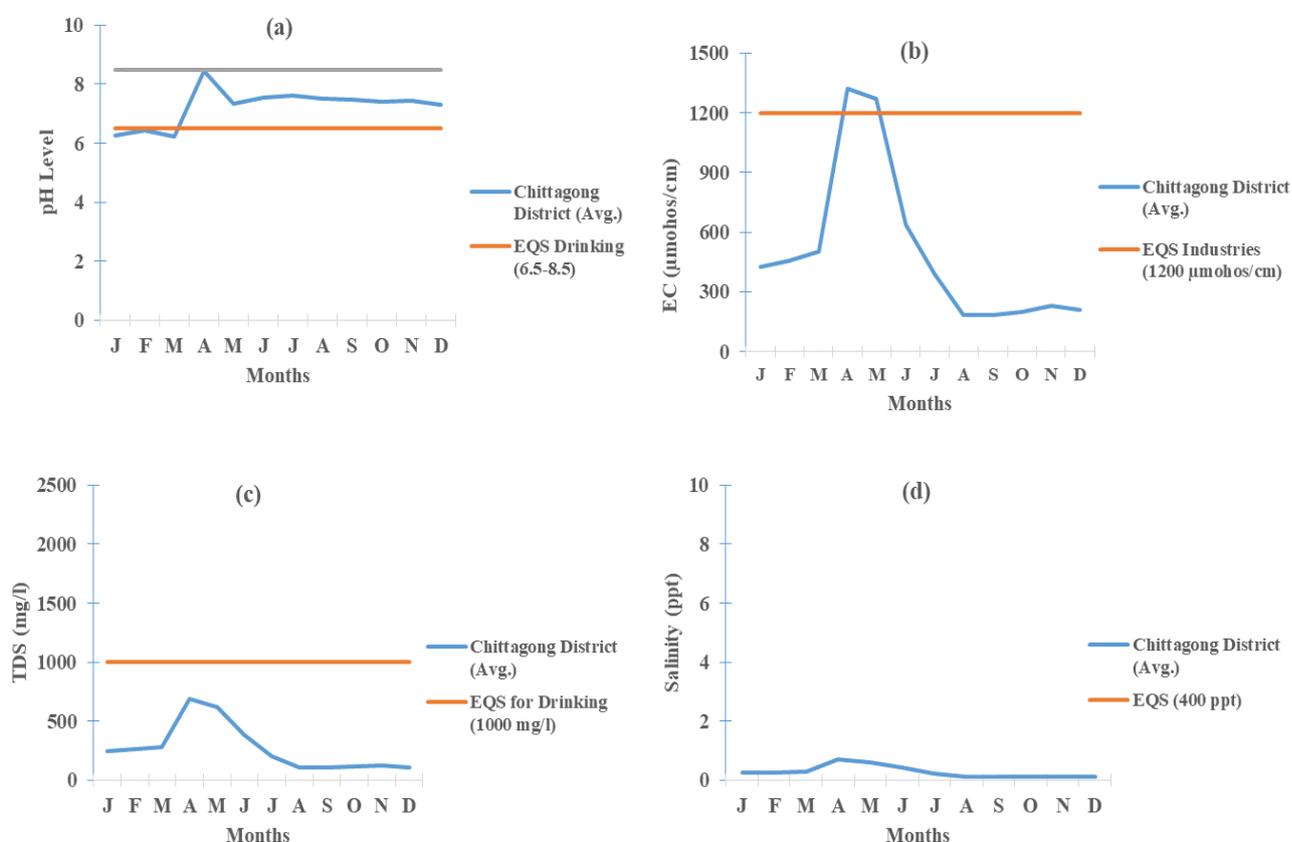


Fig 33. Status of pH, EC, TDS and Salinity of Chittagong District area ground water in 2023

## 6.2 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 forty-two different locations viz. Kali Matar Mondir, Zia Sarak, I.T Bhovon, Bikrompur Mistanno Vandar, Bivgio Passport Office, Ucco Madhomic Sikkha Board, Barishal Potuakhali Bus Stand, Kacha Bazar, Notullabad Bus Stand, Ritika Satkhira Mistanno Vandar, Jom Jom Nursing Institute, Sriguru Mistanno Vandar, Jom Jom Diagnostic Center, Khabar Bari restaurant, B.M College, Nagar Bhaban, Bivagio Zadughar, Zila Parishad, Dak Banglo, Sri Sri Kali mata Thakurani Mondiri, Akash Hotel, Upozila Vumi office, Upozila Stelment office, Agrani Bank Limited, Rosh malai Hotel & Restaurant, Fire Service & Civil Defence, Dakghor, Ghos Mistanno Vandar, Bivagio George Cort, D.C Office, Upozilla office, Sadar Hospital, Sher-e Bangla Medical College, Sayad Hatem Ali College, Amrita Lal Dey College, B.M School, Barishal Zila School, Barishal Central Jail, Barishal City College, Rupatoli Bus Stand, Choumatha Bazar and Bat Tala Bazar. For analysis, average points were used. Detail data is attached Annex-3 (Table: 236-239).

In 2023, pH level of Barisal district ground water was within EQS (6.5-8.5). It varied from 6.98 to 9.42 (Fig.35a). In 2022, pH was varied from 6.53 to 9.33. In 2023, EC varied from 510 to 1437  $\mu\text{mhos/cm}$  (Fig.35b) while EQS (1200  $\mu\text{mhos/cm}$ ). In 2022, EC was varied from 87 to 1434  $\mu\text{mhos/cm}$ . In 2023, TDS level of Barisal district ground water was within EQS (1000 mg/l). It varied from 221 mg/l to 691 mg/l (Fig.35c). In 2022, TDS was varied from 227 mg/l to 721 mg/l. In 2023, Iron level of Barisal district ground water was within EQS (0.3-1.0 mg/l). It varied from 0.0 mg/l to 0.5 mg/l (Fig.35d). In 2022, Iron was varied from 0.25 mg/l to 0.5 mg/l.

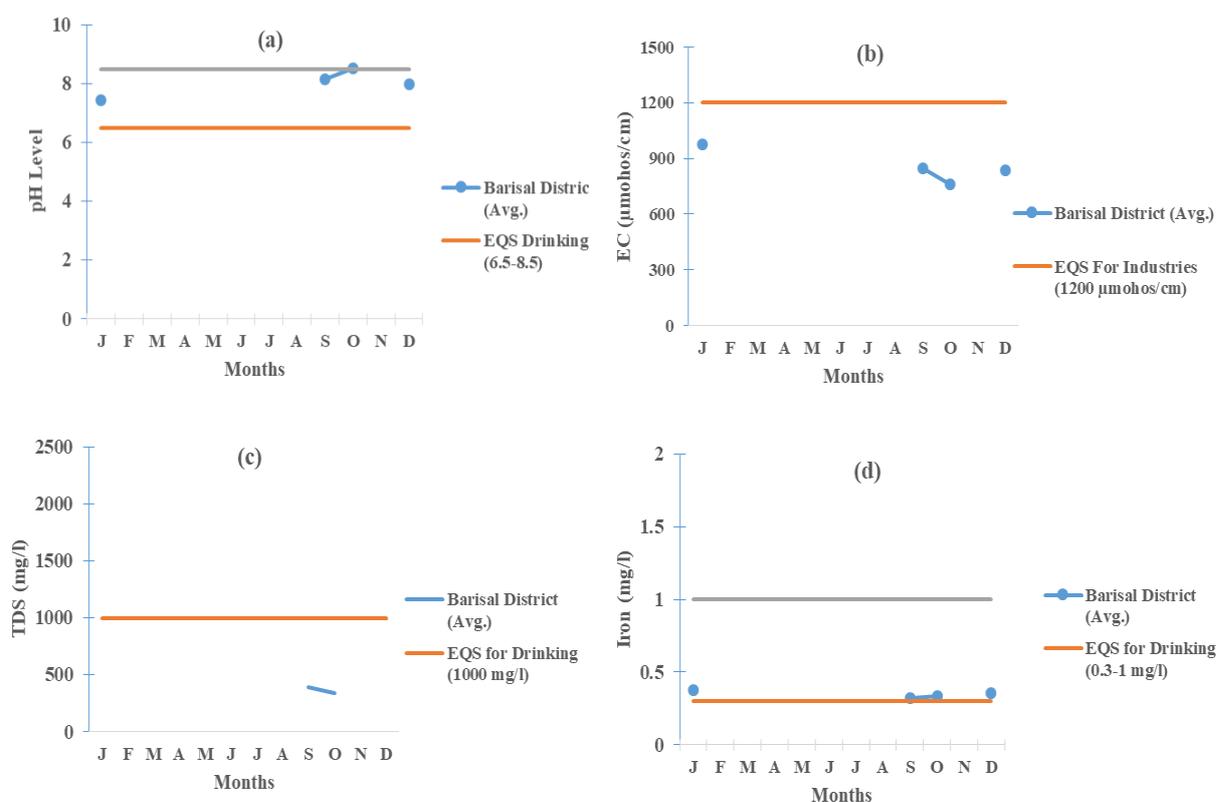


Fig 34. Status of pH, EC, TDS and Iron of Barisal district area ground water in 2023

### 6.3 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 Ten different locations viz. Bogra Zilla School, Head Post Office, Commercial College, Zilla Parishad, Office of the Duputy Commissioner, Porosovha, VM School, Sadar, T & T Office, Biddut Office, Bogra sadar thana. For analysis, average points were used. Data was available in the month of August. Detail data is attached Annex-3 (Table: 240-243).

In 2023, pH level of Bogura district ground water was within EQS (6.5-8.5) for drinking water. It varied from 7.3 to 7.46 (Fig. 35a). In 2023, EC was within the EQS (1200  $\mu\text{mohos/cm}$ ) limit and it varied from 310 to 420  $\mu\text{mohos/cm}$  (Fig. 35b). In 2023, Iron was within the EQS (0.3-1.0 mg/l) and it varied from 0.3 to 0.4 mg/l (Fig. 35c). In 2023, Total Hardness varied from 200 to 240 mg/l while EQS for Total Hardness (200-500 mg/l) ((Fig. 35d)).

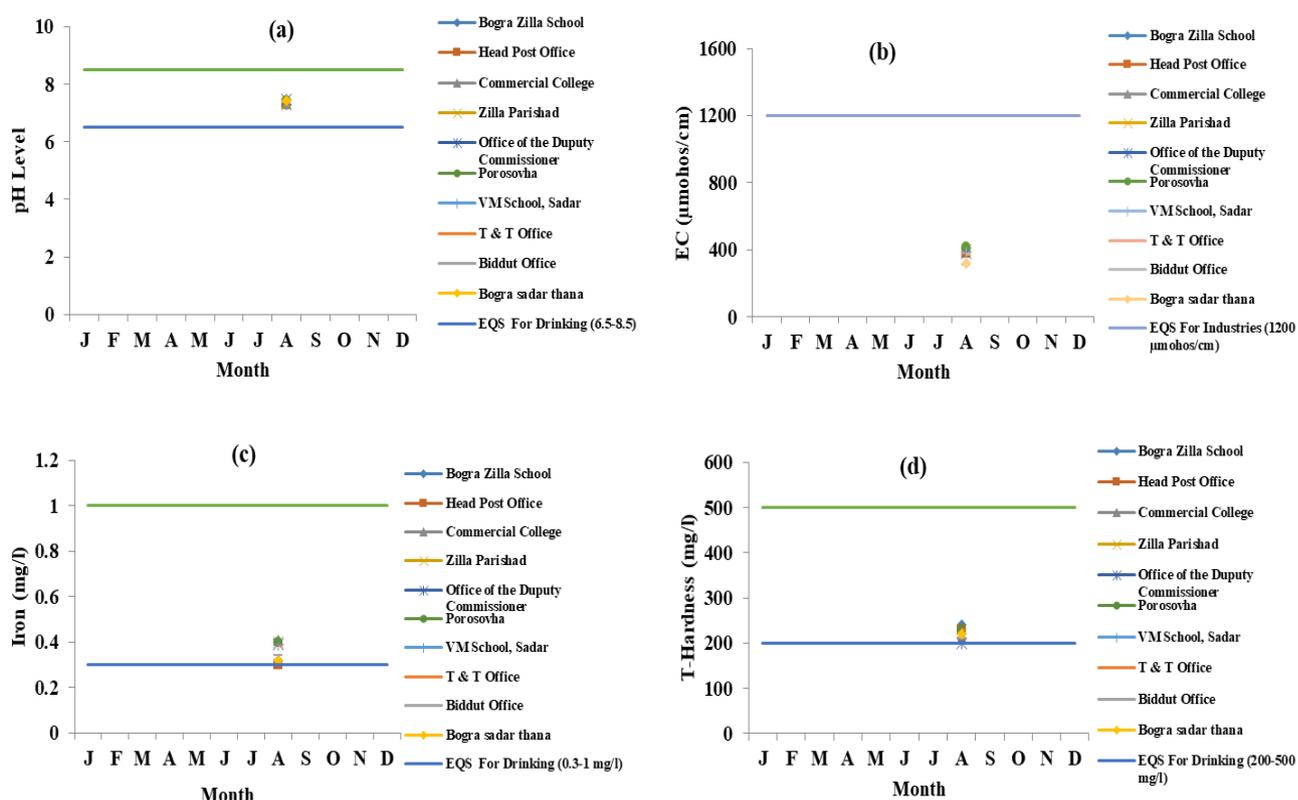
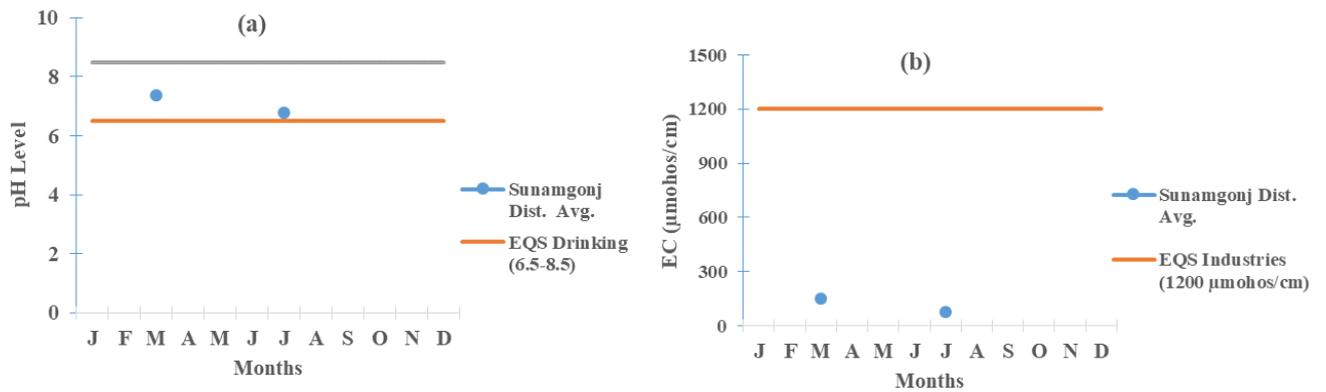


Fig 35. Status of pH, EC, Iron and T. Hardness of Bogura District area ground water in 2023

## 6.4 Different Water Quality Parameters of Ground Water in Sunamgonj District

Sunamgonj is a district located in North-eastern Bangladesh in the Sylhet Division. For monitoring ground water quality samples were collected from two different locations viz. Sunamgonj Launch Ghat and Jamalganj Point. Detail data is attached Annex-3 (Table: 244-245).

In 2023, pH level of Sunamgonj district ground water was within EQS (6.5-8.5). It varied from 6.69 to 7.89 (Fig.37a). In 2022, pH level varied from 6.9 to 7.6. In 2023, EC was within the EQS (1200  $\mu\text{mohos/cm}$ ) limit and it varied from 58 to 155  $\mu\text{mohos/cm}$  (Fig.37b). In 2022, EC varied from 376 to 428  $\mu\text{mohos/cm}$ .



**Fig 36. Status of pH and EC of Sunamgonj District area ground water in 2023**

## CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

### 7.1 Conclusion

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. 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. Impacts 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.

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. 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.

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. Introduction of online water quality monitoring system is essential to avoid the discontinuity of data.
- b. Review and updating of surface water monitoring network is essential. Pollution hot-spots could be identified and monitoring stations should include those hotspots.
- c. 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.
- d. More rivers can be included in the monitoring programme;
- e. Other wetlands such as hopes and baor could be included;
- f. Biological indicators should be included in the monitoring programme.
- g. Weather information could be collected while sampling.
- h. Use of Global Positioning System (GPS) to represent monitoring results in global context is essential.
- i. Monitoring of ETP outlets of major industrial zones should be intensified and data should be collected more frequently.
- 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. Increase skilled manpower at all level of water quality analysis including sample collection.
- q. To initiate program for spreading awareness about scarcity of water and introduce better management practices in agriculture, urban and industrial use.
- r. To take immediate measures to develop legislation for regulating with-drawl of ground water on a sustainable basis.

## CHAPTER 8: REFERENCE

- Ahmed, A. U., 2009. River pollution: Concerns and Expectations. Bangladesh Environmental Lawyers Association (BELA), Dhaka, Bangladesh. pp 52.
- Ahmed, T. 2006. Kushiya River, Banglapedia. Asiatic Society of Bangladesh. Retrieved 05-07-2010. [http://www.banglapedia.org/httpdocs/HT/K\\_0324.HTM](http://www.banglapedia.org/httpdocs/HT/K_0324.HTM)
- Ahmed, T. 2006. Kushiya River, Banglapedia. Asiatic Society of Bangladesh. Retrieved 05-07-2010. [http://www.banglapedia.org/httpdocs/HT/K\\_0324.HTM](http://www.banglapedia.org/httpdocs/HT/K_0324.HTM)
- Ahmed, M. H. 2006. Brahmaputra River, Banglapedia. Asiatic Society of Bangladesh. Retrieved 05-07-2010. [http://www.banglapedia.org/httpdocs/HT/B\\_0615.HTM](http://www.banglapedia.org/httpdocs/HT/B_0615.HTM)
- Alam, M. S. and Chowdhury, M. H., 2006. River, Banglapedia. Asiatic Society of Bangladesh. Retrieved 05-07-2010. [http://www.banglapedia.org/httpdocs/HT/R\\_0207.HTM](http://www.banglapedia.org/httpdocs/HT/R_0207.HTM)
- Banglapedia, 2006. Asiatic Society of Bangladesh. Retrieved 05-07-2010. [http://www.banglapedia.org/httpdocs/HT/R\\_0207.HTM](http://www.banglapedia.org/httpdocs/HT/R_0207.HTM)
- Bangladesh Bureau of Statistics (BBS), 1999. Statistical Year Book of Bangladesh 1998, BBS, Dhaka.
- Bangladesh Meteorological Department (BMD), 2012. Retrieved 05-04-2012.
- Brammer, H. (2012). The Physical Geography of Bangladesh. University Press Limited.
- Chowdhury, M. H. 2006. Brahmaputra River, Banglapedia. Asiatic Society of Bangladesh. Retrieved 05-07-2010. [http://www.banglapedia.org/httpdocs/HT/J\\_0054.HTM](http://www.banglapedia.org/httpdocs/HT/J_0054.HTM)
- Chowdhury, S. R. (2015). Map of the Coastal Zone of Bangladesh. University of Chittagong.
- "G"lshan Lake", "availavle at [https://en.wikipedia.org/wiki/Gulshan\\_lakes](https://en.wikipedia.org/wiki/Gulshan_lakes), Retrieved 05-08-2023.
- "L"st of Rivers of Bangladesh" "vailavle at [https://en.wikipedia.org/wiki/list\\_of\\_rivers\\_of\\_Bangladesh](https://en.wikipedia.org/wiki/list_of_rivers_of_Bangladesh), Retrieved 05-08-2023.
- Murshed, M. M. 2006. Kirtankhola River, Banglapedia. Asiatic Society of Bangladesh. Retrieved 05-07-2010. [http://www.banglapedia.org/httpdocs/HT/K\\_0268.HTM](http://www.banglapedia.org/httpdocs/HT/K_0268.HTM)
- Rahaman, M. M. and Varis, O. 2009. Integrated Water Management of the Brahmaputra Basin: Perspectives and Hope for Regional Developmen, Natural Resources Forum, Vol. 33, No. 1. pp. 60-75. DOI :10.1111/j.1477-8947.2009.01209.x
- Sifatul Quader Chowdhury (2012). "B"lu River"."In Sirajul Islam and Ahmed A. Jamal. [\*Banglapedia: National Encyclopedia of Bangladesh\*](#) (Second ed.). Asiatic Society of Bangladesh.
- [visitourbd.blogspot.com/2012/10/kirtanakhola-river\\_2127.html](http://visitourbd.blogspot.com/2012/10/kirtanakhola-river_2127.html)
- Standard Methods for the examination of water and wastewater . American Public Health Association.

*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 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	7.35	7.63	7.26				7.47	7.06	6.84	7.07	7.09	<b>7.92</b>
Bosila Bridge (B.B)	7.37	7.65	7.41				7.56	7.17	6.87	6.97	7.18	7.82
Hajaribag (Hg.)	7.39	7.6	7.36				7.69	6.87	6.87	6.93	7.07	7.49
Satmosjid Road (S.R)	7.37	7.84	7.4				7.35	7.02	6.85	6.89	7.21	7.57
Chadnighat (Cg.)	7.11	7.5	7.39				7.42	7.27	6.76	6.92	7.08	7.73
Bangladesg China Frenship Bridge (B.C.F.B)	7.32	7.5	7.51				7.32	6.87	7.01	7.24	6.66	7.42
Fatullah (Fh)	7.51	7.61	7.72				7.33	7.17	<b>6.65</b>	7.18	6.99	7.73
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

**Table-2. Level of DO (mg/l) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	1.9	1.31	0.2				4.77	5.34	<b>6.09</b>	5.5	2.99	2
Bosila Bridge (B.B)	1.5	0.7	<b>0.1</b>				5.09	4.64	4.66	4.89	0.19	0.6
Hajaribag (Hg.)	1.5	0.63	<b>0.1</b>				5.2	5.05	4.83	4.11	0.93	1.8
Satmosjid Road (S.R)	1.6	0.81	0.2				5.86	5.13	3.94	3.94	1.21	0.8
Chadnighat (Cg.)	1.2	0.5	0.2				3.3	2.94	3.93	1.82	0.53	0.9
Bangladesg China Frenship Bridge (B.C.F.B)	1.2	0.7	<b>0.1</b>				6.01	2.23	3.66	0.3	1.73	2
Fatullah (Fh)	1.4	1.5	0.2				3.89	3.25	3.89	1.9	1.49	2.2
EQS Fisheries (5 mg/l≥)												

**Table-3. Level of BOD (mg/l) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	12	16	26				4	3	6	6	4	9
Bosila Bridge (B.B)	12	17	25				<b>1</b>	4	6	4	3	9
Hajaribag (Hg.)	11	16	29				<b>1</b>	4	7	5	<b>34</b>	10
Satmosjid Road (S.R)	12	17	28				2	5	4	7	8	13
Chadnighat (Cg.)	13	16	24				2	25	5	7	6	12
Bangladesg China Frenship Bridge (B.C.F.B)	12	16	22				4	25	4	11	2	15
Fatullah (Fh)	13	16	26				2	4	5	8	4	7
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤30 mg/l)												

**Table-4. Level of COD (mg/l) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	70	76	66				39	36	11	10	7	21
Bosila Bridge (B.B)	66	68	66				66	15	<b>7</b>	11	12	14
Hajaribag (Hg.)	72	79	71				36	<b>7</b>	<b>7</b>	8	48	24
Satmosjid Road (S.R)	62	64	68				73	<b>122</b>	15	10	23	44
Chadnighat (Cg.)	66	64	56				17	27	7	8	11	28
Bangladesg China Frenship Bridge (B.C.F.B)	64	66	58				56	61	11	47	8	48
Fatullah (Fh)	68	64	51				44	15	12	12	11	22
EQS Fisheries (≤50 mg/l)												
EQS Industrial (≤200 mg/l)												

**Table-5. Level of TDS (mg/l) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	217	400	384				95	225	105	<b>79.2</b>	244	258
Bosila Bridge (B.B)	232	376	411				91	82	105	81	243	263
Hajaribag (Hg.)	243	378	425				90	85	105	82	218.4	263
Satmosjid Road (S.R)	242	381	426				90	150	103	83	218	261
Chadnighat (Cg.)	437	<b>444</b>	424				94	97	109	86	224	266
Bangladesg China Friendship Bridge (B.C.F.B)	245	411	422				97	220	118	134	223	266
Fatullah (Fh)	248	420	427				113	100	110	102.1	239	246
<b>EQS for Fisheries (<math>\leq 1000</math> mg/l)</b>												

**Table-6. Level of Turbidiy (NTU) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	29	51.8	<b>90.5</b>				42.5	69.4	36.9	38.1	20.2	49.8
Bosila Bridge (B.B)	23	32.3	11.4				47.1	56.8	34.4	17.9	<b>6.9</b>	31.4
Hajaribag (Hg.)	36	41.4	8.15				47.7	53.2	25.5	19.4	10.6	25.1
Satmosjid Road (S.R)	29	61.1	26.1				40.9	45.4	47.6	28.1	13.2	26.4
Chadnighat (Cg.)	58	59.2	11.3				41.7	54.6	30.6	41.2	14.6	22.8
Bangladesg China Friendship Bridge (B.C.F.B)	20	59.3	10.5				34.5	42.1	26.4	39.9	11.4	26.2
Fatullah (Fh)	90	66.1	18.8				29.5	40.6	19	37.9	11.6	33.3
<b>EQS Industrial (10 NTU)</b>												

**Table-7. Level of Chloride (mg/l) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	21	49	63				17	25.5	18	7.5	19	33
Bosila Bridge (B.B)	30	32	66				16	14.5	11	8.5	20	34
Hajaribag (Hg.)	22	33	76				15	14	15	<b>9</b>	25	34
Satmosjid Road (S.R)	28	49	76				14	18.5	15	8	17.5	39
Chadnighat (Cg.)	<b>82</b>	40	75				16	12.5	15	9.5	19	35
Bangladesg China Friendship Bridge (B.C.F.B)	20	51	74				18	24	10	18	19.5	40
Fatullah (Fh)	32	46	75				20	13.5	12	12	20	35
<b>EQS Industrial (150-600 mg/l)</b>												

**Table-8. Level of SS (mg/l) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	76	103	126	-	31	36	100	100	26	57	120	11
Bosila Bridge (B.B)		74	28									
Hajaribag (Hg.)		54	19									
Satmosjid Road (S.R)		65	<b>16</b>									
Chadnighat (Cg.)		<b>93</b>	33									
Bangladesg China Friendship Bridge (B.C.F.B)		88	21									
Fatullah (Fh)		69	27									
<b>EQS Industrial (100 mg/l)</b>												

**Table-9. Level of Total Alkalinity (mg/l) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	136	244	216				63	10	12	8	18	30
Bosila Bridge (B.B)	112	164	242				59	11	12	9	29	60
Hajaribag (Hg.)	120	172	262				58	10	11	10	26	54
Satmosjid Road (S.R)	122	224	259				57	12	13	9	20	38
Chadnighat (Cg.)	260	280	257				63	12	14	8	20	50
Bangladesg China Frenship Bridge (B.C.F.B)	112	224	281				67	11	13	15	26	40
Fatullah (Fh)	124	180	226				80	10	10	10	24	60
<b>EQS Industrial (150 mg/l)</b>												

**Table-10. Level of EC (µmohs/cm) of Buriganga River Water in 2023**

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge (M.B)	389	759	715				170	500	243	156	526	469
Bosila Bridge (B.B)	407	724	747				164	188.4	241	157	516	476
Hajaribag (Hg.)	426	735	766				166	194.3	243	159	467	475
Satmosjid Road (S.R)	420	744	773				160	341	240	164	464	473
Chadnighat (Cg.)	757	760	770				167	224	256	168	478	482
Bangladesg China Frenship Bridge (B.C.F.B)	431	730	772				174	495	279	265	477	481
Fatullah (Fh)	436	730	773				201	235	257	203.7	507	444
<b>EQS Industrial (1200µmohs/cm)</b>												

## 2.0 Shitalakhya River (Table: 11-19)

**Table-11. Level of pH of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	7.72	7.36	7.48				6.81	6.3	7.41	7.57	7.03	7.02
Majira Demra Ghat	7.34	7.18	7.41				6.94	7.32	6.57	6.75	7	6.88
Murapara (Rupgonj)	7.4	6.99	7.47				7.41	7.75		6.42	7.02	7.21
Gorashal	7.16	7.1	7.34				7.69	8.38		7.05	7.96	7.96
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-12. Level of DO (mg/l) of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	1.8	1	0.2				3.73	2.6	1.2	0.2	1.1	4
Majira Demra Ghat	1.2	0.1	0.1				3.4	3.39	1.8	2.9	3.54	0
Murapara (Rupgonj)	4.6	0.1	1.2				4.6	4.1		3.4	4.79	3.2
Gorashal	3.4	3.2	3.1				5.1	4.5		3.2	4.7	6.4
<b>EQS Fisheries (5 mg/l≥)</b>												

**Table-13. Level of BOD (mg/l) of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	12	20	22				7	4.2	6	6	9	7
Majira Demra Ghat	12	37	36				4	3	3	6	11	19
Murapara (Rupgonj)	11	38	287				1	2.3		4	5	5
Gorashal	5	7					7	1.8		7	1	2
<b>EQS for Fisheries (≤6 mg/l)</b>												
<b>EQS for Industrial (≤30 mg/l)</b>												

**Table-14. Level of COD (mg/l) of Shitalakhya River Water in 2017**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	48	39	61				<b>83</b>	24	54	22	43	10
Majira Demra Ghat	42	59	71				24	22	31	7	30	42
Murapara (Rupgonj)	44	61	59				24	3		13	13	7
Gorashal	18	20	22				15	18		39	<b>4</b>	6
<b>EQS for Fisheries (<math>\leq 50</math> mg/l)</b>												
<b>EQS for Industrial (<math>\leq 200</math> mg/l)</b>												

**Table-15. Level of TDS (mg/l) of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	349	352	437				114	108	123.3	180.6	225	325
Majira Demra Ghat	345	440	<b>478</b>				80	104	108.7	<b>59.1</b>	242	345
Murapara (Rupgonj)	214	300	359				198	123		88.9	243	246
Gorashal	197	200	189				64	97		63	158.8	159
<b>EQS for Fisheries (<math>\leq 1000</math> mg/l)</b>												

**Table-16. Level of Chloride (mg/l) of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	41	80	<b>101</b>				21	12	12	39.5	38	73
Majira Demra Ghat	48	66	68				15	18	14	44.5	26	77
Murapara (Rupgonj)	19	43	49				22	14		11.5	68.5	72
Gorashal	16	17	18				9	11		<b>8.5</b>	22	13
<b>EQS for Industrial (150-600 mg/l)</b>												

**Table-17. Level of SS (mg/l) of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	42	70	<b>96</b>				28	69	46	29	30	<b>15</b>
Majira Demra Ghat	54	94	86				40	52	47	37	24	63
Murapara (Rupgonj)	34	83	84				55	56		57	25	26
Gorashal	38	38	33				50	70		22	35	37
<b>EQS for Industrial (100 mg/l)</b>												

**Table-18. Level of EC ( $\mu$ mhos/cm) of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	607	667	864				216	209	230	341	503	578
Majira Demra Ghat	643	775	<b>879</b>				148	189	201.4	<b>112.4</b>	520	628
Murapara (Rupgonj)	372	544	656				380	281		175.1	535	450
Gorashal	367	380	370				144	186		120	298	306
<b>EQS for Industrial (1200 <math>\mu</math>mhos/cm)</b>												

**Table-19. Level of Total Alkalinity (mg/l) of Shitalakhya River Water in 2023**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Port Road	94	240	<b>276</b>				57	9	11	14	24	57
Majira Demra Ghat	32	212	234				35	41	23	<b>8</b>	26	60
Murapara (Rupgonj)	50	191	212				57	49		11	28	39
Gorashal	81	85	88				29	30		10	36	21
<b>EQS for Industrial (150 mg/l)</b>												

### 3.0 Turagh River (Table: 20-28)

**Table-20. Level of pH of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	7.52	7.33	7.5					7.7		7.12	8.16	7.35
Ashulia	7.34	7.41	7.44				6.83	7.58		7.03	8.1	7.3
Kaliakoir	7.45	7.62	7.38				7.56	<b>8.27</b>	7.61	7.11	8.08	7.67
Vawal	7.4	7.34	7.33				6.5	7.93	6.58	<b>6.34</b>	7.96	7.57
Nama Bazar	7.4	7.34	7.34				6.75	7.81	6.87	7.57	7.91	7.2
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

**Table-21. Level of DO (mg/l) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	2.9	<b>0.1</b>	0.3					6.29		5.7	2.9	1.38
Ashulia	0.6	0.2	0.2				5.71	6.17		5.2	2.5	1.69
Kaliakoir	4.7	3.68	3.5				6.64	6	5.7	5.9	6.4	<b>8.12</b>
Vawal	3	3.7	1.1				7	5	5.3	5.5	5.1	7.73
Nama Bazar	0.4	0.2	0.2				7.2	6	5.2	5.6	3.5	1.31
EQS Fisheries (5 mg/l $\geq$ )												

**Table-22. Level of BOD (mg/l) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	22	27	<b>29</b>					1.5		4	7	8
Ashulia	24	26	28				5	1.8		5	6	3
Kaliakoir	10	19	4				2	2.1	<b>0.9</b>	1.5	1	6
Vawal	9	14	15				1	2.4	4	1.4	3.7	5
Nama Bazar	12	21	22				4	1.8	2.9	8	10	3
EQS Fisheries ( $\leq$ 6 mg/l)												
EQS Industrial ( $\leq$ 30 mg/l)												

**Table-23. Level of COD (mg/l) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	48	61	<b>75</b>					1.74		8	17	22
Ashulia	38	41	46				32	<b>0.87</b>		10	21	20
Kaliakoir	28	7	10				46	11	31	20	4	27
Vawal	29	27	44				17	13	27	12	13	14
Nama Bazar	51	65	64				41	16	7.5	8	13	17
EQS Fisheries ( $\leq$ 50 mg/l)												
EQS Industrial ( $\leq$ 200 mg/l)												

**Table-24. Level of TDS (mg/l) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	260	391	<b>433</b>					76.8		85	185.6	250
Ashulia	395	413	381				97	81.5		87	189.6	245
Kaliakoir	127	257	244				80	72	74.7	<b>66.5</b>	118.2	146
Vawal	270	285	293				76	109	99.3	107.6	187.6	150
Nama Bazar	370	377	377				91	95	84.2	79	180	242
EQS Fisheries ( $\leq$ 1000 mg/l)												

**Table-25. Level of Chloride (mg/l) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	20	48	56					14		7.5	15	33
Ashulia	34	50	64				11	11		<b>6</b>	16.5	29
Kaliakoir	10	31	32				9	8	7	9	10	18
Vawal	20	16	16				8	11	10	11	18.5	<b>21</b>
Nama Bazar	21	42	32				16	10	10	7	16	32
<b>EQS Industrial (150-600 mg/l)</b>												

**Table-26. Level of SS (mg/l) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	15	154	105					59		149	23	40
Ashulia	42	54	73				86	65		58	19	24
Kaliakoir	10	<b>9</b>	18				141	183	82	120	30	33
Vawal	28	13	23				186	83	78	69	28	31
Nama Bazar	24	15	20				<b>195</b>	133	90	48	21	25
<b>EQS for Industrial Discharge (100 mg/l)</b>												

**Table-27. Level of EC (µmhos/cm) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	449	697	<b>788</b>					148		168.4	346	460
Ashulia	599	731	703				183	158		171.2	353	446
Kaliakoir	280	464	470				143	180	141.3	<b>131.2</b>	221	298
Vawal	432	476	538				147	209	184	200.7	349	277
Nama Bazar	633	688	688				168	183	163	155	335	442
<b>EQS for Industrial Discharge (1200 µmhos/cm)</b>												

**Table-28. Level of Total Alkalinity (mg/l) of Turagh River Water in 2023**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Turag Bridge	110	264	168					41		12	26	40
Ashulia	194	<b>232</b>	194				31	32		10	30	49
Kaliakoir	90	169	170				21	19	21	11	18	39
Vawal	70	57	59				28	27	19	12	21	49
Nama Bazar	84	78	78				28	21	21	<b>9</b>	24	30
<b>EQS for Industrial Discharge (150 mg/l)</b>												

#### 4.0 Dhalaeswari River (Table: 29-37)

**Table-29. Level of pH of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		7.27								7.68		7.13
Pathorghata		<b>8.25</b>						7.25		6.94		7.19
Ruhitpur		7.88						6.93		6.69		7.04
Hazaratpur		7.75						7.04		<b>6.63</b>		7.21
Utorro Mitra		7.65					6.92			7.28		7.3
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-30. Level of DO (mg/l) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		0.8								5.1		<b>0</b>
Pathorghata		5.3						6.41		6		5
Ruhitpur		5.9						6.09		5.9		5.7
Hazaratpur		5.7						6.15		5.9		<b>7.5</b>
Utorro Mitra		6					5.98			5.3		4.6
<b>EQS Fisheries (5 mg/l<math>\geq</math>)</b>												

**Table-31. Level of BOD (mg/l) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		8								6		<b>10</b>
Pathorghata		6						3		4.2		4
Ruhitpur		2						6		2.4		<b>1</b>
Hazaratpur		3						5.4		5.1		2
Utorro Mitra		4					<b>10</b>			<b>1</b>		7
<b>EQS Fisheries (<math>\leq</math>6 mg/l)</b>												
<b>EQS Industrial (<math>\leq</math>30 mg/l)</b>												

**Table-32. Level of COD (mg/l) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		32								8		14
Pathorghata		20						61		1.5		11
Ruhitpur		9						63		6		6
Hazaratpur		18						<b>75</b>				9
Utorro Mitra		10					41			<b>3</b>		14
<b>EQS Fisheries (<math>\leq</math>50 mg/l)</b>												
<b>EQS Industries (<math>\leq</math>200 mg/l)</b>												

**Table-33. Level of TDS (mg/l) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		255								91		242
Pathorghata		133						<b>83</b>		88		222
Ruhitpur		<b>344</b>						95.3		83.5		232
Hazaratpur		340						<b>83</b>		90		231
Utorro Mitra		284					218			89.7		301
<b>EQS Fisheries (<math>\leq</math>1000 mg/l)</b>												

**Table-34. Level of Chloride (mg/l) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		25								6.5		<b>48</b>
Pathorghata		26						12		<b>10</b>		26
Ruhitpur		31						11.5		12		20
Hazaratpur		35						16		10.5		26
Utorro Mitra		32					16			11		28
<b>EQS Industrial (150-600 mg/l)</b>												

**Table-35. Level of SS (mg/l) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		22								77		46
Pathorghata		20						365		140		13
Ruhitpur		28						303		141		17
Hazaratpur		17						185		155		15
Utorro Mitra		26					35			83		16
<b>EQS Industrial (100 mg/l)</b>												

**Table-36. Level of EC (1200µmohs/cm) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		478								173.4		434
Pathorghata		245						153.5		166		409
Ruhitpur		650						176		158.3		421
Hazaratpur		648						154		169		429
Utorro Mitra		560					415			176.4		548
<b>EQS industrial (1200 µmohs/cm)</b>												

**Table-37. Level of Total Alkalinity (mg/l) of Dhaleshwari River Water in 2023**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mukterpur		159								23		39
Pathorghata		156						34		10		30
Ruhitpur		212						37		8		13
Hazaratpur		286						30		14		30
Utorro Mitra		220					88			10		56
<b>EQS Industries (150 mg/l)</b>												

**5.0 Brahmaputra River (Table: 38-43)****Table-38. Level of pH of Brahmaputra River Water in 2023**

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Rail Bridge, Shamvoganj		7.97					7.25	7.52			7.59	
Mymensingh		7.85										
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-39. Level of DO (mg/l) of Brahmaputra River Water in 2023**

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Rail Bridge, Shamvoganj		4.5					2.7	2.67			7.6	
Mymensingh		5										
<b>EQS Fisheries (5 mg/l≥)</b>												

**Table-40. Level of BOD (mg/l) of Brahmaputra River Water in 2023**

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Rail Bridge, Shamvoganj		7.2					10	1			2	
Mymensingh		8										
<b>EQS Fisheries (≤6 mg/l)</b>												
<b>EQS Industrial (≤30 mg/l)</b>												

**Table-41. Level of TDS (mg/l) of Brahmaputra River Water in 2023**

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Rail Bridge, Shamvoganj		148					218	84			158.9	
Mymensingh		150									141	
EQS Fisheries ( $\leq 1000$ mg/l)												

**Table-42. Level of SS (mg/l) of Brahmaputra River Water in 2023**

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Rail Bridge, Shamvoganj		11					35	267			46	
Mymensingh		14										
EQS Industrial (150 mg/l)												

**Table-43. Level of Chloride (mg/l) of Brahmaputra River Water in 2023**

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Rail Bridge, Shamvoganj		11					16	14			24	
Mymensingh		10										
EQS Industrial (150-600 mg/l)												

**6.0 Kaligonga River (Table: 44-49)****Table-44. Level of pH of Kaligonga River Water in 2023**

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		7.61						7.27			7.51	
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

**Table-45. Level of DO (mg/l) of Kaligonga River Water in 2023**

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		4.7						6.2			7.2	
EQS Fisheries (5 mg/l $\geq$ )												

**Table-46. Level of BOD (mg/l) of Kaligonga River Water in 2023**

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		16						1.8			2	
EQS Fisheries ( $\leq 6$ mg/l)												
EQS Industrial ( $\leq 30$ mg/l)												

**Table-47. Level of TDS (mg/l) of Kaligonga River Water in 2023**

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		316						64			211.5	
EQS Fisheries ( $\leq 1000$ mg/l)												

**Table-48. Level of COD (mg/l) of Kaligonga River Water in 2023**

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		48						44			9	
EQS Industrial (100 mg/l)												

**Table-49. Level of Chloride (mg/l) of Kaligonga River Water in 2023**

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat		68						11			18	
<b>EQS Industrial (150-600 mg/l)</b>												

**7.0 Jamuna River (Table: 50-55)**

**Table-50. Level of pH of Jamuna River Water in 2023**

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (Up)	7.52	7.52		7.56	7.52	7.5	7.48	7.46	7.44	7.4	7.46	7.45
Jamuna Eco Park (Dn)	7.52	7.52		7.56	7.52	7.5	7.48	7.46	7.44	7.4	7.46	7.45
Shariakand Kheya Ghat (Up)	7.5	7.5		7.5	7.54	7.4	7.42	7.44	7.45	7.42	7.44	7.42
Shariakand Kheya Ghat (Dn)	7.5	7.5		7.5	7.54	7.4	7.42	7.44	7.45	7.42	7.44	7.42
MohonGanj (Up)	7.54	7.6		7.4	7.42	7.5	7.45	7.42	7.4	7.45	7.5	7.48
MohonGanj (Dn)	7.54	7.6		7.4	7.42	7.5	7.45	7.42	7.4	7.45	7.5	7.48
Horipur Kheya ghat (Up)	7.52	7.6		7.45	7.4	7.5	7.52	7.5	7.52	7.45	7.45	7.44
Horipur Kheya ghat (Dn)	7.52	7.6		7.45	7.4	7.5	7.52	7.5	7.52	7.45	7.45	7.44
Tarakandi								9				7.58
Kakua								7.46				7.47
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industries (6.5-8.5)</b>												

**Table-51. Level of DO (mg/l) of Jamuna River Water in 2023**

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (Up)	7.6	7.6		7.6	7.62	7.6	7.6	7.58	7.58	7.55	7.5	7.45
Jamuna Eco Park (Dn)	7.6	7.6		7.6	7.62	7.6	7.6	7.58	7.58	7.55	7.5	7.45
Shariakand Kheya Ghat (Up)	7.5	7.5		7.55	7.56	7.54	7.5	7.52	7.52	7.4	7.41	7.4
Shariakand Kheya Ghat (Dn)	7.5	7.5		7.55	7.56	7.54	7.5	7.52	7.52	7.4	7.41	7.4
MohonGanj (Up)	7.6	7.6		7.6	7.62	7.6	7.56	7.54	7.54	7.5	7.48	7.45
MohonGanj (Dn)	7.6	7.6		7.6	7.62	7.6	7.56	7.54	7.54	7.5	7.48	7.45
Horipur Kheya ghat (Up)	7.6	7.6		7.5	7.52	7.5	7.52	7.52	7.52	7.5	7.45	7.44
Horipur Kheya ghat (Dn)	7.6	7.6		7.5	7.52	7.5	7.52	7.52	7.52	7.5	7.45	7.44
Tarakandi								6.1				7.8
Kakua								7.3				7.6
<b>EQS Fisheries (5 mg/l<math>\geq</math>)</b>												

**Table-52. Level of BOD (mg/l) of Jamuna River Water in 2023**

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (Up)	2.4	2.4		2.2	2.2	2.4	2.3	2.3	2.3	2.4	2.4	2.3
Jamuna Eco Park (Dn)	2.4	2.4		2.2	2.2	2.4	2.3	2.3	2.3	2.4	2.4	2.3
Shariakand Kheya Ghat (Up)	2.3	2.3		2.4	2.4	2.2	2.2	2.4	2.2	2.3	2.4	2.4
Shariakand Kheya Ghat (Dn)	2.3	2.3		2.4	2.4	2.2	2.2	2.4	2.2	2.3	2.4	2.4
MohonGanj (Up)	2.3	2.2		2.2	2.3	2.4	2.3	2.2	2.3	2.4	2.5	2.3
MohonGanj (Dn)	2.3	2.2		2.2	2.3	2.4	2.3	2.2	2.3	2.4	2.5	2.3
Horipur Kheya ghat (Up)	2.5	2.2		2.1	2.2	2.4	2.5	2.4	2.5	2.4	2.5	2.5
Horipur Kheya ghat (Dn)	2.5	2.2		2.1	2.2	2.4	2.5	2.4	2.5	2.4	2.5	2.5
Tarakandi								4.8				2
Kakua								2.4				2
<b>EQS Fisheries (<math>\leq</math>6 mg/l)</b>												
<b>EQS Industrial (<math>\leq</math>30 mg/l)</b>												

**Table-53. Level of SS of Jamuna River Water in 2023**

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (Up)	40	40		40	40	40	44	44	44	44	44	44
Jamuna Eco Park (Dn)	40	40		40	40	40	44	44	44	44	44	44
Shariakand Kheya Ghat (Up)	42	42		42	42	42	45	45	45	45	45	45
Shariakand Kheya Ghat (Dn)	42	42		42	42	42	45	45	45	45	45	45
MohonGanj (Up)	38	38		38	38	38	40	40	40	40	40	40
MohonGanj (Dn)	38	38		38	38	38	40	40	40	40	40	40
Horipur Kheya ghat (Up)	36	36		36	36	36	36	36	36	36	36	36
Horipur Kheya ghat (Dn)	36	36		36	36	36	36	36	36	36	36	36
Tarakandi								<b>33</b>				34
Kakua								<b>163</b>				84
<b>EQS Industrial (100 mg/l)</b>												

**Table-54. Level of TDS (mg/l) of Jamuna River Water in 2023**

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (Up)	132	132		133	140	143	140	141	142	145	150	153
Jamuna Eco Park (Dn)	132	132		133	140	143	140	141	142	145	150	153
Shariakand Kheya Ghat (Up)	135	136		135	135	140	140	140	140	140	160	150
Shariakand Kheya Ghat (Dn)	135	136		135	135	140	140	140	140	140	160	150
MohonGanj (Up)	131	131		131	130	133	130	140	138	145	155	154
MohonGanj (Dn)	131	131		131	130	133	130	140	138	145	155	154
Horipur Kheya ghat (Up)	131	132		140	135	140	140	142	140	142	150	151
Horipur Kheya ghat (Dn)	131	132		140	135	140	140	142	140	142	150	151
Tarakandi								<b>352</b>				107.2
Kakua								<b>82.4</b>				121.6
<b>EQS Fisheries (<math>\leq</math>1000 mg/l)</b>												

**Table-55. Level of EC ( $\mu$ mhos/cm) of Jamuna River Water in 2023**

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jamuna Eco Park (Up)	264	264		266	280	286	280	282	284	290	300	306
Jamuna Eco Park (Dn)	264	264		266	280	286	280	282	284	290	300	306
Shariakand Kheya Ghat (Up)	270	272		270	270	280	280	280	280	280	320	300
Shariakand Kheya Ghat (Dn)	270	272		270	270	280	280	280	280	280	320	300
MohonGanj (Up)	262	262		262	260	266	260	270	276	290	310	308
MohonGanj (Dn)	262	262		262	260	266	260	270	276	290	310	308
Horipur Kheya ghat (Up)	262	264		280	270	280	280	284	280	284	300	302
Horipur Kheya ghat (Dn)	262	264		280	270	280	280	284	280	284	300	302
Tarakandi								<b>679</b>				201.1
Kakua								<b>164</b>				225
<b>EQS Industrial (1200 <math>\mu</math>mhos/cm mg/l)</b>												

**8.0 Meghna River (Table: 56-61)****Table-56. Level of pH of Meghna River Water in 2023**

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	7.26		6.79				7.25		6.88	7.31	7.46	
Annondo Bazar	7.61		7.86				7.42		7.65	7.27	7.05	
Bishondi Ferry Ghat	7.69		7				6.75	7.9	7.74	7.65	7.88	
Narshingdi Launch Ghat	7.34		7.34				6.73		<b>8.17</b>	<b>6.35</b>	7.48	
Bairob Bazar	7.31		7.24				6.89				7.41	
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-57. Level of DO (mg/l) of Meghna River Water in 2023**

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	5.4		0.5				5.7		5.9	5.6	6.59	
Annondo Bazar	7		0.9				6.7		6.1	7.4	<b>8.11</b>	
Bishondi Ferry Ghat	5		2.8				6.4	4.9	6.7	6.7	6.87	
Narshingdi Launch Ghat	2.9		<b>0.9</b>				4.1		5.1	7.4	2.3	
Bairob Bazar	7.4		7.2				5.57				4.2	
<b>EQS Fisheries (5 mg/l≥)</b>												

**Table-58. Level of BOD (mg/l) of Meghna River Water in 2023**

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	5		9.9				1		1.2	4.5	5	
Annondo Bazar	6		9.6				2		0.8	3.5	5	
Bishondi Ferry Ghat	6		2				4	2.8	<b>0.6</b>	1.8	5	
Narshingdi Launch Ghat	3		1				4		2.2	3.1	6	
Bairob Bazar	4		4				5				<b>17</b>	
<b>EQS Fisheries (≤6 mg/l)</b>												
<b>EQS Industrial (≤30 mg/l)</b>												

**Table-59. Level of TDS (mg/l) of Meghna River Water in 2023**

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	65		153				33.1		38	36.6	62.5	
Annondo Bazar	61		<b>258</b>				<b>28.7</b>		29.6	59.6	53.2	
Bishondi Ferry Ghat	64		128				30.8	35	37.4	31.2	55.9	
Narshingdi Launch Ghat	220		220				47.5		43.4	77.9	92.6	
Bairob Bazar	61		65				58				58.9	
<b>EQS Industries (≤2100 mg/l)</b>												

**Table-60. Level of COD (mg/l) of Meghna River Water in 2023**

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	14		17				29		40	30	19	
Annondo Bazar	20		46				19		41	42	8	
Bishondi Ferry Ghat	18		9				17	10	37	7	14	
Narshingdi Launch Ghat	15						<b>100</b>		6	<b>0.9</b>	31	
Bairob Bazar	30		17				51				48	
<b>EQS Industrial (200 mg/l)</b>												

**Table-61. Level of Chloride (mg/l) of Meghna River Water in 2023**

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Meghna Ghat	13		46				4.5		10.5	8	10	
Annondo Bazar	<b>54</b>		20				<b>4</b>		10	7	10	
Bishondi Ferry Ghat	8.1		42				<b>4</b>	9	4.5	6	9	
Narshingdi Launch Ghat	17		17				5		6.5	6	22	
Bairob Bazar	7		9				4.5				14	
<b>EQS Industrial (150-600 mg/l)</b>												

**9.0 Padma River (Table: 62-67)****Table-62. Level of pH of Padma River Water in 2023**

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Barha Ghat	7.38		<b>8.06</b>						7.43			6.66
Mawa Ghat	7.98		8.04						7.6	<b>6.35</b>		7.19
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-63. Level of DO (mg/l) of Padma River Water in 2023**

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Barha Ghat	6.9		8.8						<b>6.78</b>			7.8
Mawa Ghat	<b>8.9</b>		8.7						7.05	7.4		7.6
<b>EQS for Fisheries (5 mg/l)≥</b>												

**Table-64. Level of BOD (mg/l) of Padma River Water in 2023**

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Barha Ghat	<b>10</b>		1						1.1			2
Mawa Ghat	4		1						<b>0.9</b>	3.1		2
<b>EQS for Fisheries (≤6 mg/l)</b>												
<b>EQS Industrial Discharge (≤30 mg/l)</b>												

**Table-65. Level of TDS (mg/l) of Padma River Water in 2023**

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Barha Ghat	<b>132</b>		101						93.3			100.2
Mawa Ghat	106		100.3						92	<b>77.9</b>		98.5
<b>EQS for Industrial Discharge (≤2100mg/l)</b>												

**Table-66. Level of SS (mg/l) of Padma River Water in 2023**

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Barha Ghat	<b>7.38</b>		17						<b>377</b>			35
Mawa Ghat	7.98		13						184	103		48
<b>EQS for Industrial Discharge (≤100 mg/l)</b>												

**Table-67. Level of EC (µmhos/cm) of Padma River Water in 2023**

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Barha Ghat	<b>244</b>		172.7						174.2			183.9
Mawa Ghat	189		173.2						172.4	<b>147</b>		183.3
<b>EQS for Industrial Discharge (1200µmhos/cm)</b>												

## 10.0 Korotoa River (Table: 68-73)

**Table-68. Level of pH of Korotoa River Water in 2023**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dottobari Bridge (UP)	<b>7.36</b>	7.38		7.4	7.42	7.54	7.76	7.72	7.75	7.74	<b>7.85</b>	7.83
Dottobari Bridge (Down)	7.36	7.38		7.4	7.42	7.54	7.76	7.72	7.75	7.74	7.85	7.83
Aziz Ahmed Taki Road (UP)	7.36	7.38		7.4	7.42	7.54	7.76	7.72	7.75	7.74	7.85	7.83
Aziz Ahmed Taki Road (Down)	7.36	7.38		7.4	7.42	7.54	7.76	7.72	7.75	7.74	7.85	7.83
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industries (6.5-8.5)</b>												

**Table-69. Level of DO (mg/l) of Korotoa River Water in 2023**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dottobari Bridge (UP)	<b>6</b>	4		3	3	3.2	3	4.3	4	3.5	2.5	<b>2.4</b>
Dottobari Bridge (Down)	6	4		3	3	3.2	3	4.3	4	3.5	2.5	2.4
Aziz Ahmed Taki Road (UP)	6	4		3	3	3.2	3	4.3	4	3.5	2.5	2.4
Aziz Ahmed Taki Road (Down)	6	4		3	3	3.2	3	4.3	4	3.5	2.5	2.4
<b>EQS Fisheries (5 mg/l)≥</b>												

**Table-70. Level of BOD (mg/l) of Korotoa River Water in 2023**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dottobari Bridge (UP)	2.2	4.2		4.2	4.1	4	4.2	4.3	4.2	4	4.2	4.3
Dottobari Bridge (Down)	2.2	4.2		4.2	4.1	4	4.2	4.3	4.2	4	4.2	4.3
Aziz Ahmed Taki Road (UP)	2.2	4.2		4.2	4.1	4	4.2	4.3	4.2	4	4.2	4.3
Aziz Ahmed Taki Road (Down)	2.2	4.2		4.2	4.1	4	4.2	4.3	4.2	4	4.2	4.3
<b>EQS Fisheries (<math>\leq 6</math> mg/l)</b>												
<b>EQS Industrial (<math>\leq 30</math> mg/l)</b>												

**Table-71. Level of TDS (mg/l) of Korotoa River Water in 2023**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dottobari Bridge (UP)	194	195		196	190	198	195	198	197	195	205	210
Dottobari Bridge (Down)	194	195		196	190	198	195	198	197	195	205	210
Aziz Ahmed Taki Road (UP)	195	195		196	190	198	195	198	197	195	205	210
Aziz Ahmed Taki Road (Down)	195	195		196	190	198	195	198	197	195	205	210
<b>EQS Fisheries (<math>\leq 1000</math>mg/l)</b>												

**Table-72. Level of SS (mg/l) of Korotoa River Water in 2023**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dottobari Bridge (UP)	58	58		58	58	58	56	56	56	56	56	56
Dottobari Bridge (Down)	58	58		58	58	58	56	56	56	56	56	56
Aziz Ahmed Taki Road (UP)	54	54		54	54	54	56	56	56	56	55	55
Aziz Ahmed Taki Road (Down)	54	54		54	54	54	56	56	56	56	55	55
<b>EQS Industrial (<math>\leq 150</math>mg/l)</b>												

**Table-73. Level of EC ( $\mu$ mhos/cm) of Korotoa River Water in 2023**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dottobari Bridge (UP)	390	392		392	380	396	390	396	394	390	410	420
Dottobari Bridge (Down)	390	392		392	380	396	390	396	394	390	410	420
Aziz Ahmed Taki Road (UP)	390	392		392	380	396	390	396	394	390	410	420
Aziz Ahmed Taki Road (Down)	390	392		392	380	396	390	396	394	390	410	410
<b>EQS Industrial (<math>1200\mu</math>mhos/cm)</b>												

**11.0 Teesta River (Table: 74-79)****Table-74. Level of pH of Teesta River Water in 2023**

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up)	7.56	7.54		7.45	7.4	7.42	7.4	7.38	7.39	7.42	7.52	7.5
Sardah (Down)	7.56	7.54		7.45	7.4	7.42	7.4	7.38	7.39	7.42	7.52	7.5
Nurullapur (Up)	7.56	7.56		7.52	7.5	7.4	7.42	7.4	7.42	7.38	7.44	7.45
Nurullapur (Down)	7.56	7.56		7.52	7.5	7.4	7.42	7.4	7.42	7.38	7.44	7.45
Kanchan Park (Up)	7.62	7.6		7.55	7.56	7.5	7.42	7.44	7.46	7.45	7.46	7.48
Kanchan Park (Down)	7.62	7.6		7.55	7.56	7.5	7.42	7.44	7.46	7.45	7.46	7.48
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industries (6.5-8.5)</b>												

**Table-75. Level of DO (mg/l) of Teesta River Water in 2023**

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up)	7.6	7.6		7.58	7.56	7.52	7.5	7.52	7.52	7.4	7.4	7.4
Sardah (Down)	7.6	7.6		7.58	7.56	7.52	7.5	7.52	7.52	7.4	7.4	7.4
Nurullapur (Up)	7.62	7.62		7.62	7.6	7.62	7.6	7.62	7.62	7.6	7.5	7.45
Nurullapur (Down)	7.62	7.62		7.62	7.6	7.62	7.6	7.62	7.62	7.6	7.5	7.45
Kanchan Park (Up)	7.6	7.6		7.4	7.42	7.4	7.46	7.44	7.44	7.4	7.42	7.4
Kanchan Park (Down)	7.6	7.6		7.4	7.42	7.4	7.46	7.44	7.44	7.4	7.42	7.4
<b>EQS Fisheries (5 mg/l<math>\geq</math>)</b>												

**Table-76. Level of BOD (mg/l) of Teesta River Water in 2023**

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up)	2.4	<b>2.5</b>		2.4	2.5	2.2	2.4	2.3	2.4	2.3	2.3	2.4
Sardah (Down)	2.4	2.5		2.4	2.5	2.2	2.4	2.3	2.4	2.3	2.3	2.4
Nurullapur (Up)	2.4	2.4		2.2	<b>2.1</b>	2.2	2.1	2.2	2.2	2.4	2.5	2.5
Nurullapur (Down)	2.4	2.4		2.2	2.1	2.2	2.1	2.2	2.2	2.4	2.5	2.5
Kanchan Park (Up)	2.3	2.3		2.3	2.4	2.3	2.3	2.3	2.4	2.3	2.4	2.3
Kanchan Park (Down)	2.3	2.3		2.3	2.4	2.3	2.3	2.3	2.4	2.3	2.4	2.3
<b>EQS Fisheries (≤6 mg/l)</b>												
<b>EQS Industrial (≤30 mg/l)</b>												

**Table-77. Level of TDS (mg/l) of Teesta River Water in 2023**

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up)	130	130		135	140	145	141	141	<b>175</b>	143	150	150
Sardah (Down)	130	130		135	140	145	141	141	175	143	150	150
Nurullapur (Up)	<b>127</b>	131		130	135	138	138	138	160	145	145	140
Nurullapur (Down)	127	131		130	135	138	138	138	160	145	145	140
Kanchan Park (Up)	130	130		133	135	135	135	136	170	140	155	155
Kanchan Park (Down)	130	130		133	135	135	135	136	170	140	155	155
<b>EQS Fisheries (≤1000mg/l)</b>												

**Table-78. Level of SS (mg/l) of Teesta River Water in 2023**

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up)	44	44		44	44	44	<b>45</b>	45	45	45	45	45
Sardah (Down)	44	44		44	44	44	45	45	45	45	45	45
Nurullapur (Up)	37	37		<b>37</b>	37	37	38	38	38	38	38	38
Nurullapur (Down)	37	37		37	37	37	38	38	38	38	38	38
Kanchan Park (Up)	42	42		42	42	42	45	45	45	45	45	45
Kanchan Park (Down)	42	42		42	42	42	45	45	45	45	45	45
<b>EQS Industrial (≤2100mg/l)</b>												

**Table-79. Level of Chloride (mg/l) of Teesta River Water in 2023**

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Sardah (Up)	10	10		10	10	12	12	11	11	11	11	11
Sardah (Down)	10	10		10	10	12	12	11	11	11	11	11
Nurullapur (Up)	10	10		10	<b>10</b>	13	13	14	14	<b>14</b>	14	14
Nurullapur (Down)	10	10		10	10	13	13	14	14	14	14	14
Kanchan Park (Up)	10	10		10	10	12	12	12	12	12	12	12
Kanchan Park (Down)	10	10		10	10	12	12	12	12	12	12	12
<b>EQS (150-600 mg/l)</b>												

**12.0 Karnaphuli River (Table: 80-85)****Table-80. Level of pH of Karnaphuli River Water in 2023**

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	7.04	6.85	8.09	8.09	8.18	8.07	7.89	7.56	7.85	7.19	6.79	7.63
TSP	7.81	7.09	8.09	8.16	8.34	<b>8.39</b>	7.97	7.1	6.96	7.67	<b>6.81</b>	7.8
Shikalbaha	7.24	7.24	7.69	7.34	7.41	7.21	7.41	6.85	7.22	7.45	6.78	7.65
Kalurghat Bridge	7.35	7.11	7.48	7.21	7.37	7.47	7.57	6.7	7.29	7.22	6.87	7.33
Mariam Nagar	7.38	7.36	7.99	7.42	7.27	7.47	7.67	7.12	7.14	6.99	6.69	6.99
Karnafully Paper	7.19	7.36	8.1	7.53	7.42	7.22	7.42	6.25	7.42	6.85	6.71	6.86
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industries (6.5-8.5)</b>												

**Table-81. Level of DO (mg/l) of Karnaphuli River Water in 2023**

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	7.7	7.72	7.72	8.43	8.1	7.98	8.48	7.25	7.48	6.99	7.39	6.55
TSP	<b>6.42</b>	7.69	6.64	<b>8.85</b>	8.09	7.79	8.39	7.41	7.51	7.01	7.4	7.05
Shikalbaha	7.38	7.39	7.26	7.42	7.18	7.24	7.39	8.09	7.09	7.11	7.4	7.26
Kalurghat Bridge	7.63	7.48	7.52	7.36	7.48	7.63	7.75	8.25	7	7.41	7.88	7.49
Mariam Nagar	7.39	7.33	6.92	7.45	7.6	7.5	7.63	7.63	8.11	7.28	7.72	6.9
Karnafully Paper	7.41	7.49	7.49	7.62	7.42	7.62	7.82	7.82	7.29	8.05	7.99	6.69
<b>EQS Fisheries (5 mg/l<math>\geq</math>)</b>												

**Table-82. Level of BOD (mg/l) of Karnaphuli River Water in 2023**

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	7	9	11	8	8	7	5	3	4	4	4	11
TSP	6	7	9	7	6	6	4	4	<b>3</b>	<b>3</b>	4	<b>14</b>
Shikalbaha	4	5	5	4	4	6	6	4.9	4	6	<b>3</b>	6
Kalurghat Bridge	<b>3</b>	4	5	<b>3</b>	4	<b>3</b>	4	5	6	5	5	6
Mariam Nagar	5	4	4	3	4	3	4	6	5	4	6	5
Karnafully Paper	4	5	4	4	<b>3</b>	4	3	5	5	<b>3</b>	5	5
<b>EQS Fisheries (<math>\leq</math>6 mg/l)</b>												
<b>EQS Industrial (<math>\leq</math>30 mg/l)</b>												

**Table-83. Level of COD (mg/l) of Karnaphuli River Water in 2023**

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	42	56	<b>64</b>	47	36	45	36	36	30	26	15	36
TSP	34	39	52	36	29	35	26	24	29	21	<b>17</b>	49
Shikalbaha	10	11	16	9	10	11	13	19	30	15	19	14
Kalurghat Bridge	8	9	12	8	9	8	9	11	17	17	28	16
Mariam Nagar	9	8	18	7	8	6	7	21	19	32	32	12
Karnafully Paper	11	12	12	10	7	9	8	25	25	30	11	13
CUFL	42	56	<b>64</b>	47	36	45	36	36	30	26	15	36
<b>EQS Fisheries (<math>\leq</math>50 mg/l)</b>												
<b>EQS Industrial (<math>\leq</math>200 mg/l)</b>												

**Table-84. Level of TDS (mg/l) of Karnaphuli River Water in 2023**

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	14480	18640	21500	18240	15280	17310	14390	15401	9510	8601	11890	8860
TSP	12750	9000	<b>19140</b>	16850	14567	16240	12940	14380	10510	10110	9510	6740
Shikalbaha	217	369	445	416	578	378	269	301	351	209	<b>118</b>	184
Kalurghat Bridge	189	289	217	328	289	189	157	285	201	185	195	261
Mariam Nagar	289	159	187	169	174	184	236	264	215	189	201	207
Karnafully Paper	361	169	405	210	247	347	264	205	198	260	239	203
<b>EQS Industries (<math>\leq</math>1000 mg/l)</b>												

**Table-85. Level of SS (mg/l) of Karnaphuli River Water in 2023**

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	170	314	181	241	278	328	238	204	189	201	218	206
TSP	57	224	65	159	247	419	<b>439</b>	328	156	358	305	237
Shikalbaha	68	39	72	30	<b>18</b>	28	19	21	40	25	40	49
Kalurghat Bridge	59	62	59	39	28	39	27	24	31	23	27	30
Mariam Nagar	69	58	74	49	60	89	32	36	28	22	32	39
Karnafully Paper	74	64	68	42	39	34	36	31	45	31	36	35
<b>EQS Industries (<math>\leq</math>100 mg/l)</b>												

### 13.0 Halda River (Table: 86-91)

**Table-86. Level of pH of Halda River Water in 2023**

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	7	6.46	7.2	<b>7.31</b>	6.53	6.78	6.33	6.51	6.55	6.7	6.81	7.25
Garduara Sluice gate	6.88	6.27	6.98	7.29	<b>5.98</b>	6.21	6.38	6.52	6.49	6.65	6.9	7.12
Halda Bridge	6.79	6.08	6.89	7.25	6.26	6.49	6.46	6.55	6.71	6.79	6.96	7.26
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industries (6.5-8.5)</b>												

**Table-87. Level of DO (mg/l) of Halda River Water in 2023**

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	7.12	6.53	7.22	6.63	7.13	6.49	7.38	6.49	7.56	6.19	7.83	7.83
Garduara Sluice gate	<b>8.46</b>	<b>5.02</b>	8.26	7.31	7.51	6.39	7.48	6.78	7.12	6.46	7.41	7.41
Halda Bridge	6.93	6.26	6.48	6.32	6.1	7.24	7.63	7.01	6.98	6.88	7.06	7.06
<b>EQS Fisheries (5 mg/l≥)</b>												

**Table-88. Level of BOD (mg/l) of Halda River Water in 2023**

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	4	5	4	3	5	4	4	3	3	3	4	<b>5</b>
Garduara Sluice gate	4	4	5	4	4	3	4	3	4	3	4	4
Halda Bridge	5	3	4	5	4	3	3	<b>2</b>	3	3	3	4
<b>EQS Fisheries (≤6 mg/l)</b>												
<b>EQS Industrial (≤30 mg/l)</b>												

**Table-89. Level of COD (mg/l) of Halda River Water in 2023**

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	9	11	10	9	11	11	10	9	8	8	9	<b>13</b>
Garduara Sluice gate	11	9	12	10	9	8	8	6	10	8	9	10
Halda Bridge	10	9	9	11	10	7	8	<b>5</b>	9	9	8	12
<b>EQS Fisheries (≤50 mg/l)</b>												
<b>EQS Industrial (≤200 mg/l)</b>												

**Table-90. Level of EC (µmhos/cm) of Halda River Water in 2023**

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	235	790	275	336	<b>790</b>	479	348	336	340	356	114.4	114.4
Garduara Sluice gate	242	400	318	391	400	418	412	326	330	336	212.6	198
Halda Bridge	221	309	242	344	309	378	318	262	285	310	189.7	<b>181</b>
<b>EQS Industries (≤1200 µmhos/cm)</b>												

**Table-91. Level of SS (mg/l) of Halda River Water in 2023**

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maduna Ghat	58	42	40	30	37	58	45	40	32	37	41	<b>114.4</b>
Garduara Sluice gate	39	<b>28</b>	29	44	43	67	68	61	49	45	35	40
Halda Bridge	46	32	36	28	34	89	59	55	40	42	47	41.2
<b>EQS Industries (≤100 mg/l)</b>												

## 14.0 Moyuri River (Table: 92-99)

**Table-92. Level of pH of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	7.74	<b>7.95</b>	6.45		5.35	7	5.46	4.46	7	6.96	5.88	<b>4.14</b>
Buro Moulavir Darga	7.64	7.82	5.72		5.42	5.14			5.14	5.36	5.38	4.19
Doshgate Jalma	6.52	7.64	5.42		7.64	7.05			7.05	7.05	7.44	7.65
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industries (6.5-8.5)</b>												

**Table-93. Level of DO (mg/l) of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	<b>0</b>	0	0		0	0	0	0	0	1.11	0	0
Buro Moulavir Darga	0	0	0		0	0			0	0	0	0
Doshgate Jalma	2.27	4.32	2.04		<b>5.8</b>	2.3			2.3	2.3	3.17	5.34
<b>EQS Fisheries (5 mg/l<math>\geq</math>)</b>												

**Table-94. Level of TDS (mg/l) of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	96	108	313		42	214	124	371	314	611	4.68	158
Buro Moulavir Darga	93	122	163		<b>38</b>	370			470	388	213	174
Doshgate Jalma	377	<b>923</b>	426		68	448			548	598	423	398
<b>EQS Fisheries (<math>\leq</math>1000mg/l)</b>												

**Table-95. Level of Chloride (mg/l) of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	48	54	156		107	107	62	186	109	306	234	79
Buro Moulavir Darga	<b>46</b>	61	81		96	189			156	194	107	87
Doshgate Jalma	189	<b>461</b>	213		372	224			225	299	212	198
<b>EQS Industries (150-600 mg/l)</b>												

**Table-96. Level of Turbidity (NTU) of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	13	24	16		25	39	36	<b>76</b>	40	35	27	64
Buro Moulavir Darga	<b>11</b>	21	12		22	35			35	35	25	62
Doshgate Jalma	17	37	24		32	37			35	35	36	27
<b>EQS Industries (<math>\leq</math>10 NTU)</b>												

**Table-97. Level of BOD (mg/l) of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	1.1	1.2	1.1		28.6	28.6	35.6	<b>45.6</b>	28.6	8.9	24.4	29.2
Buro Moulavir Darga	1.2	1.3	<b>0.05</b>		26.4	26.4			26.4	25.4	23.9	25.5
Doshgate Jalma	1.7	1.9	1.3		21.5	37.8			37.8	37.7	42.8	32.2
<b>EQS Fisheries (<math>\leq</math>6 mg/l)</b>												
<b>EQS Industrial (<math>\leq</math>30 mg/l)</b>												

**Table-98. Level of EC ( $\mu\text{mhos/cm}$ ) of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	192	216	625		428	957	248	742	957	1222	936	316
Buro Moulavir Darga	<b>186</b>	244	326		384	756			756	776	426	348
Doshgate Jalma	754	<b>1845</b>	852		1486	896			896	1196	846	796
<b>EQS Industries (1200 <math>\mu\text{mhos/cm}</math>)</b>												

**Table-99. Level of Salinity (mg/l) of Moyuri River Water in 2023**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Shoshan Ghat	0.04	0.08	0.05		0.09	<b>36.4</b>	2.4	1.04	36.4	0.62	0.08	<b>0.02</b>
Buro Moulavir Darga	0.02	0.06	0.03		0.08	0.08			0.08	0.08	0.06	<b>0.02</b>
Doshgate Jalma	0.08	0.09	2.12		4.1	4.1			4.1	0.15	0.17	0.24
<b>EQS (400 ppt)</b>												

**15.0 Bhairab River (Table: 100-107)****Table-100. Level of pH of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	6.22	7.46	6.39		7.57	7.14	7.42	<b>6.08</b>	7.14	7.12	7.45	7.88
Noapara Ferry Ghat Abhaynagar	7.82	8.05	6.64		7.85	6.65	6.65	7.62	6.65	7.08	7.15	7.33
Noapara Jafarpur	7.84	8.22	6.62		7.66	6.93	7.32	7.63	6.93	7.16	6.88	7.37
Fultala Ghat, Dhulgram	6.58	7.87	6.48		<b>8.29</b>	6.96	7.95	6.44	6.96	7.1	7.14	7.09
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industries (6.5-8.5)</b>												

**Table-101. Level of DO (mg/l) of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	4.21	5.34	6.86		5.67	7.52	6.15	2.08	<b>7.52</b>	7.5	2.37	3.46
Noapara Ferry Ghat Abhaynagar	6.34	6.25	6.3		7.45	6.37	5.64	5.07	6.37	5.18	2.97	6.61
Noapara Jafarpur	6.29	7.2	7.02		7.28	6.3	6.36	5.09	6.3	<b>1.69</b>	5.7	6.64
Fultala Ghat, Dhulgram	4.7	6.23	6.27		7.15	6.3	6.36	5.14	6.3	4.16	6.09	6.54
<b>EQS Fisheries (5 mg/l<math>\geq</math>)</b>												

**Table-102. Level of BOD (mg/l) of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	<b>2.7</b>	2.9	3.07		8.8	9.14	9.45	18.4	9.14	9.12	7.07	8.12
Noapara Ferry Ghat Abhaynagar	4.8	4.6	4.8		16.8	16.8		14.4	16.8	16.9	18.7	20.4
Noapara Jafarpur	4.6	3.4	3.02		17.6	17.8	13.6	11.7	17.8	16.8	22.4	<b>24.2</b>
Fultala Ghat, Dhulgram	2.9	2.9	3.08		11.7	18.9	14.3	9.14	18.9	18.8	14.3	17.8
<b>EQS Fisheries (<math>\leq 6</math> mg/l)</b>												
<b>EQS Industrial (<math>\leq 30</math> mg/l)</b>												

**Table-103. Level of TDS (mg/l) of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	360	173	251		432	439	<b>1175</b>	713	439	438	289	281
Noapara Ferry Ghat Abhaynagar	573	170	347		712	574	2135	1155	574	<b>98</b>	469	350
Noapara Jafarpur	578	154	328		723	577	981	1159	577	130	343	331
Fultala Ghat, Dhulgram	323	323	614		624	576	160	759	576	130	259	294
<b>EQS Fisheries (<math>\leq 1000</math>mg/l)</b>												

**Table-104. Level of Chloride (mg/l) of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	79	87	126		216	220	588	357	225	224	144	142
Noapara Ferry Ghat Abhaynagar	187	85	174		356	297	<b>1068</b>	578	298	49	245	165
Noapara Jafarpur	289	77	164		361	280	491	577	275	<b>65</b>	171	166
Fultala Ghat, Dhulgram	161	162	307		312	288	80	380	285	<b>65</b>	137	146
<b>EQS Industries (150-600 mg/l)</b>												

**Table-105. Level of Turbidity (NTU) of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	0.14	0.19	0.23		0.35	0.32	<b>74</b>	45	0.32	0.32	<b>0.08</b>	0.13
Noapara Ferry Ghat Abhaynagar	59	62	24		24	63	54	66	63	23	21	16
Noapara Jafarpur	61	67	37		26	26	47	69	26	21	19	17
Fultala Ghat, Dhulgram	31	41	22		32	52	68	55	25	22	17	22
<b>EQS Industries (≤10 NTU)</b>												

**Table-106. Level of EC (μmhos/cm) of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	318	346	501		864	878	2350	1426	878	879	578	566
Noapara Ferry Ghat Abhaynagar	1146	340	694		1424	1147	<b>4270</b>	2310	1147	<b>195</b>	979	659
Noapara Jafarpur	1156	307	656		1445	1153	1962	2318	1153	259	684	662
Fultala Ghat, Dhulgram	646	646	1228		1248	1152	320	1518	1152	260	547	584
<b>EQS Industries (μmhos/cm)</b>												

**Table-107. Level of Salinity (ppt) of Bhairab River Water in 2023**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Basundia Bazar, Aladipur	<b>0.04</b>	0.09	2.05		7.8	43.2	1.09	2.7	4.2	0.2	0.18	0.22
Noapara Ferry Ghat Abhaynagar	0.13	0.17	3.17		11.18	<b>90.9</b>	2.03	6.23	9.9	0.8	0.47	0.35
Noapara Jafarpur	0.11	0.15	3.2		10.2	88.7	89	6.27	8.7	0.11	0.48	0.35
Fultala Ghat, Dhulgram	0.07	0.13	3.64		8.22	88.7	14	7.24	8.7	0.11	0.26	0.37
<b>EQS (400 ppt)</b>												

**16.0 Rupsa River (Table: 108-115)****Table-108. Level of pH of Rupsa River Water in 2023**

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola, Nadan Pratap (M)	6.42	7.82	6.34		7.75	7.04			<b>6.04</b>	7.35	7.64	7.74
Kalibari Ghat (M)	7.61	8.04	6.62		7.55	6.47	7.55	6.87	6.45	6.74	7.18	7.26
Charer Hat, Sulpur Aijgati (M)	7.68	<b>8.72</b>	6.24		7.21	6.93	7.89	7.54	6.55	6.59	7.39	7.44
Rupsa Ghat (M)	7.56	8.65	6.53		7.65	6.55	8.09	7.66	7.55	7.39	7.66	7.37
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-109. Level of DO (mg/l) of Rupsa River Water in 2023**

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola, Nadan Pratap (M)	5.9	6.8	6.05		6.8	5.68			5.68	<b>3.55</b>	5.19	4.28
Kalibari Ghat (M)	4.15	6.19	6.85		5.1	6.8	6.4	7.22	6.8	6.9	5.13	4.19
Charer Hat, Sulpur Aijgati (M)	5.43	6.75	6.54		6.58	6.3	6.78	6.67	6.3	6.35	6.74	5.11
Rupsa Ghat (M)	5.35	6.48	6.9		<b>7.66</b>	6.6	6.65	7.32	6.6	6.61	6.52	5.23
<b>EQS Fisheries (5 mg/l≥)</b>												

**Table-110. Level of BOD (mg/l) of Rupsa River Water in 2023**

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola , Nadan Pratap (M)	3.7	2.4	4.02		9.2	9.2			9.2	8.2	5.24	6.65
Kalibari Ghat (M)	2.2	2.26	2.28		11.12	35.2	33.7	26.9	35.2	32.2	25.6	18.2
Charer Hat, Sulpur Aijgati (M)	3.4	<b>1.9</b>	3.4		13.2	13.2	17.6	19.8	13.2	9.2	8.9	9.17
Rupsa Ghat (M)	2.4	4.8	4.07		32.5	37.8	37.8	<b>42.8</b>	37.8	37.8	27.3	29.7
<b>EQS Fisheries (≤6 mg/l)</b>												
<b>EQS Industrial (≤30 mg/l)</b>												

**Table-111. Level of Chloride (mg/l) of Rupsa River Water in 2023**

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola , Nadan Pratap (M)	136	182	1000		286	298			295	<b>74</b>	81	79
Kalibari Ghat (M)	246	246	1714		462	294	230	370	293	145	212	162
Charer Hat, Sulpur Aijgati (M)	216	221	1259		332	288	130	344	286	163	232	107
Rupsa Ghat (M)	208	305	<b>1755</b>		406	287	80	437	282	282	87	130
<b>EQS Industrial (150-600 mg/l)</b>												

**Table-112. Level of SS (mg/l) of Rupsa River Water in 2023**

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola , Nadan Pratap (M)	37	42	43		47	47			<b>17</b>	37	28	32
Kalibari Ghat (M)	125	128	68		74	64	67	55	64	44	36	24
Charer Hat, Sulpur Aijgati (M)	132	138	78		67	68	83	46	68	38	36	27
Rupsa Ghat (M)	136	<b>144</b>	82		105	125	138	54	125	125	125	57
<b>EQS Industrial (100 mg/l)</b>												

**Table-113. Level of Turbidity (NTU) of Rupsa River Water in 2023**

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola , Nadan Pratap (M)	27	36	28		42	42			40	10	13	<b>10</b>
Kalibari Ghat (M)	52	64	48		58	78	85	74	75	55	27	14
Charer Hat, Sulpur Aijgati (M)	47	49	51		78	87	92	66	85	65	47	47
Rupsa Ghat (M)	53	87	54		74	82	<b>97</b>	74	80	72	64	75
<b>EQS Industrial (≤10 NTU)</b>												

**Table-114. Level of EC (µmhos/cm) of Rupsa River Water in 2023**

Location of RupsaRupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola , Nadan Pratap (M)	542	728	4038		1142	1151			1151	295	324	316
Kalibari Ghat (M)	984	984	6854		1846	1174	918	1478	1174	574	846	648
Charer Hat, Sulpur Aijgati (M)	864	884	5036		1328	1153	518	1376	1153	653	518	428
Rupsa Ghat (M)	832	1218	<b>7020</b>		1624	1148	319	1747	1148	<b>127</b>	348	518
<b>EQS (1200 µmhos/cm)</b>												

**Table-115. Level of Salinity (ppt) of Rupsa River Water in 2023**

Location of RupsaRupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gilatola , Nadan Pratap (M)	0.08	0.15	2.89		8.13	79.7			7.7	0.13	0.18	0.24
Kalibari Ghat (M)	0.12	0.14	3.75		11.45	36.5	0.3	8.72	9.5	0.05	0.08	0.32
Charer Hat, Sulpur Aijgati (M)	0.08	0.18	3.66		12.7	90.9	0.23	0.06	9.9	0.09	0.27	0.29
Rupsa Ghat (M)	0.13	0.22	3.69		15.7	38.5	0.4	0.08	8.5	0.05	0.29	0.45
<b>EQS (400 ppt)</b>												

## 17.0 Mathavanga River (Table: 116-123)

**Table-116. Level of pH of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	7.62	<b>7.87</b>	<b>6.84</b>			7.75		7.28	7.18	7.22	7.25	7.74
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-117. Level of DO (mg/l) of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	3.5	2.6	<b>7.89</b>			<b>2.45</b>		2.82	2.8	5.76	7.78	5.12
EQS Fisheries (5 mg/l $\geq$ )												

**Table-118. Level of BOD (mg/l) of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	2.1	<b>1.1</b>	2.08			<b>50</b>		47	28	32	36	42.7
EQS Fisheries ( $\leq$ 6 mg/l)												
EQS Industries ( $\leq$ 30 mg/l)												

**Table-119. Level of TDS (mg/l) of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	192	233	<b>50</b>			171		77	197	216	<b>269</b>	233
EQS Fisheries ( $\leq$ 1000 mg/l)												

**Table-120. Level of Chloride (mg/l) of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	96	117	<b>25</b>			86		39	98	107	<b>123</b>	117
EQS Industries (150-600 mg/l)												

**Table-121. Level of Turbidity (NTU) of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	<b>24</b>	26	34			54		<b>69</b>	44	48	42	35
EQS Industries ( $\leq$ 10 NTU)												

**Table-122. Level of EC ( $\mu$ mhos/cm) of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	384	466	<b>99</b>			342		154	391	426	<b>493</b>	466
EQS Industries (1200 $\mu$ mhos/cm)												

**Table-123. Level of Salinity (ppt) of Mathavanga River Water in 2023**

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat, (M.P)	0.06	<b>0.04</b>	0.06			0.15		0.08	0.22	0.25	0.27	<b>0.29</b>
EQS (400 ppt)												

## 18.0 Pashur River (Table: 124-131)

**Table-124. Level of pH of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	6.75	<b>7.87</b>	6.47			7.27	7.47	7.65	7.58	7.8	7.43	7.21
Banishanta	6.44	7.54	6.41			7.35	7.68	7.61	7.35	7.04	7.55	7.11
Batiaghata By Pass	7.53	7.72	<b>6.04</b>		7.64	7.64			7.64	7.62	7.22	7.34
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-125 Level of DO (mg/l) of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	7.62	5.54	7.37			6.5	6.8	5.57	6.5	6.7	7.26	7.6
Banishanta	7.53	5.51	7.4			6.7	6.9	5.92	6.7	6.99	5.74	<b>7.72</b>
Batiaghata By Pass	6.45	7.5	<b>5.5</b>		6.64	6.64			6.64	6.64	7.25	7.13
EQS Fisheries (5 mg/l $\geq$ )												

**Table-126. Level of BOD (mg/l) of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	4.8	4.3	2.7			20.7	25.2	21.1	6.7	12.2	8.14	9.19
Banishanta	5.6	3.6	<b>2.3</b>			22.4	<b>27.9</b>	22.4	22.4	18.2	15.5	11.19
Batiaghata By Pass	3.9	4.8	2.4		9.8	9.8			9.8	9.9	9.18	12.6
EQS Fisheries ( $\leq$ 6 mg/l)												
EQS Industries ( $\leq$ 30 mg/l)												

**Table-127. Level of TDS (mg/l) of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	773	857	4813			6105	683	1275	171	108	713	239
Banishanta	921	962	4870			6123	726	1350	<b>6123</b>	<b>61</b>	793	321
Batiaghata By Pass	96	623	364		516	516			616	568	897	411
EQS Industries ( $\leq$ 1000mg/l)												

**Table-128. Level of Chloride (mg/l) of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	387	429	2407			3050	342	638	86	54	357	120
Banishanta	460	481	2435			<b>3062</b>	363	675	2306	<b>31</b>	397	160
Batiaghata By Pass	182	311	182		258	258			354	284	388	206
EQS Industries (150-600 mg/l)												

**Table-129. Level of Turbidity (NTU) of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	57	59	32			64	68	<b>97</b>	70	32	45	36
Banishanta	67	72	27			66	87	92	63	35	54	42
Batiaghata By Pass	46	42	52		77	77			71	65	24	<b>16</b>
EQS Industries ( $\leq$ 10 NTU)												

**Table-130. Level of EC ( $\mu$ mhos/cm) of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	1546	1714	9626			12210	1366	2550	342	<b>216</b>	1426	480
Banishanta	1842	1924	9740			<b>12246</b>	1452	2700	12246	161.6	1586	641
Batiaghata By Pass	728	1245	728		1032	1032			1032	1035	1550	822
EQS Industries (1200 $\mu$ mhos/cm)												

**Table-131. Level of SS (mg/l) of Pashur River Water in 2023**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rampal Power Plant	74	67	52			72	83	63	65	52	66	62
Banishanta, Mongla	82	63	54			57	75	68	57	57	46	65
Batiaghata By Pass	<b>87</b>	76	65		55	55			55	48	27	<b>23</b>
EQS (100 mg/l)												

**19.0 Khakshiali River (Table: 132-139)**

**Table-132. Level of pH of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	7.21	8.17	<b>8.47</b>			6.69				6.78	6.89	7.34
Kaliganj Bazar	<b>6.67</b>	6.78	7.19			6.95				7.11	7.26	7.66
Boshontopur	6.72	6.77	6.77			7.05				7.05	7.69	7.74
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

**Table-133 Level of DO (mg/l) of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	6.23	5.8	5.8			5.37				6.07	5.17	<b>3.34</b>
Kaliganj Bazar	7.35	6.67	5.24			5.79				6.52	5.17	4.24
Boshontopur	7.63	6.73	<b>6.73</b>			6.17				6.18	6.18	4.21
EQS Fisheries (5 mg/l $\geq$ )												

**Table-134. Level of BOD (mg/l) of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	2.8	<b>2.6</b>	<b>2.6</b>			8.6				8.5	6.3	8.4
Kaliganj Bazar	3.5	2.8	3.04			9.4				<b>9.7</b>	7.9	5.7
Boshontopur	3.7	4.8	4.8			8.2				8.3	7.17	5.46
EQS Fisheries ( $\leq$ 6 mg/l)												
EQS Industries ( $\leq$ 30 mg/l)												

**Table-135. Level of TDS (mg/l) of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	627	<b>614</b>	<b>614</b>			7890				1475	1258	623
Kaliganj Bazar	2000	1925	473			7870				1595	1304	912
Boshontopur	2055	1982	1982			<b>8220</b>				1085	960	964
EQS Fisheries ( $\leq$ 1000mg/l)												

**Table-136. Level of Chloride (mg/l) of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	314	307	307			3945				738	629	312
Kaliganj Bazar	1000	963	<b>237</b>			3935				798	778	456
Boshontopur	1027	991	991			<b>4110</b>				792	480	482
EQS Industries (150-600 mg/l)												

**Table-137. Level of Turbidity (NTU) of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	53	68	68			<b>96</b>				32	32	<b>24</b>
Kaliganj Bazar	79	62	78			94				34	34	32
Boshontopur	73	38	38			88				31	37	35
EQS Industries ( $\leq$ 10 NTU)												

**Table-138. Level of EC ( $\mu\text{mhos/cm}$ ) of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	1254	1228	1228			15780				2950	2516	1246
Kaliganj Bazar	4000	3850	<b>946</b>			15740				3190	2612	1824
Boshontopur	4110	3964	3964			<b>16440</b>				2169	1920	1928
EQS Industries (1200 $\mu\text{mhos/cm}$ )												

**Table-139. Level of SS (mg/l) of Khakshiali River Water in 2023**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Uzirpur	55	62	62			75				73	73	65
Kaliganj Bazar	72	65	43			64				66	46	<b>34</b>
Boshontopur	83	<b>87</b>	<b>87</b>			74				64	54	52
EQS Industries (150 mg/l)												

**20.0 Gorai River (Table: 140-147)**

**Table-140. Level of pH of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	<b>7.48</b>	6.18	6.72			6.32			6.39	<b>6.18</b>	7.19	7.22
EQS Fisheries (6.0-9.0) EQS Industries (6.5-8.5)												

**Table-141. Level of DO (mg/l) of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	6.5	5.27	<b>5.17</b>			7.24			7.24	7.8	<b>8.16</b>	7.07
EQS Fisheries (5 mg/l $\geq$ )												

**Table-142. Level of BOD (mg/l) of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	3.2	2.7	<b>2.47</b>			7.2			7.2	<b>8.3</b>	6.9	5.17
EQS Fisheries ( $\leq 6$ mg/l) EQS Industries ( $\leq 50$ mg/l)												

**Table-143. Level of TDS (mg/l) of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	<b>79</b>	324	108			364			364	<b>368</b>	313	236
EQS Fisheries ( $\leq 1000$ mg/l)												

**Table-144. Level of Chloride (mg/l) of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	<b>39</b>	162	54			182			<b>198</b>	184	157	118
EQS Industries (150-600 mg/l)												

**Table-145. Level of Turbidity (NTU) of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	<b>17</b>	19	23			<b>35</b>			34	31	23	27
EQS Industries ( $\leq 10$ NTU)												

**Table-146. Level of EC ( $\mu\text{mhos/cm}$ ) of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	158	648	216			728			728	736	626	472
EQS Industries (1200 $\mu\text{mhos/cm}$ )												

**Table-147. Level of SS (mg/l) of Gorai River Water in 2023**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kamarkhali Bridge	22	29	36			34			34	32	35	29
EQS Industries (100 mg/l)												

## 21.0 Modhumoti River (Table: 148-155)

**Table-148. Level of pH of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	6.23	8.07	7.11			6.45		7.47	6.77	6.52	6.52	
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-149. Level of DO (mg/l) of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	5.2	6.34	7.18			7.8		6.4	6.9	6.7	6.7	
EQS Fisheries (5 mg/l $\geq$ )												

**Table-150. Level of BOD (mg/l) of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	2.4	3.6	2.04			4.6		4.8	5.7	6.7	6.7	
EQS Fisheries ( $\leq 6$ mg/l)												
EQS Industries ( $\leq 30$ mg/l)												

**Table-151. Level of TDS (mg/l) of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	359	408	86			471		158	437	330	330	
EQS Fisheries ( $\leq 1000$ mg/l)												

**Table-152. Level of Chloride (mg/l) of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	179	204	43			236		79	219	164	164	
EQS Industries (150-600 mg/l)												

**Table-153. Level of Turbidity (NTU) of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	42	47	32			56		26	58	28	28	
EQS Industries ( $\leq 10$ NTU)												

**Table-154. Level of EC ( $\mu$ mhos/cm) of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	718	816	171			942		316	874	660	660	
EQS Industries (1200 $\mu$ mhos/cm)												

**Table-155. Level of SS (mg/l) of Modhumoti River Water in 2023**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Dhalaitala	48	52	41			65		57	58	38	38	
EQS Industries (100 mg/l)												

**22.0 Ganges River (Table: 156-163)****Table-156. Level of pH of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	6.42	7.23	7.23		6.22	7.22			7.22	7.58	7.78	6.29
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-157. Level of DO (mg/l) of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	4.7	6.71	6.71		6.7	7.23			7.23	6.96	2.65	4.24
EQS Fisheries (5 mg/l $\geq$ )												
EQS Industries (4.5-8 mg/l)												

**Table-158. Level of BOD (mg/l) of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	3.4	2.6	2.6		5.2	8.7			8.7	8.9	3.17	5.19
EQS Fisheries ( $\leq$ 6 mg/l)												
EQS Industries ( $\leq$ 50 mg/l)												

**Table-159. Level of TDS (mg/l) of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	142	127	427		410	877			877	324	214	232
EQS Fisheries ( $\leq$ 1000 mg/l)												

**Table-160. Level of Chloride (mg/l) of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	70.5	214	214		205	439			397	145	107	117
EQS Industries (150-600 mg/l)												

**Table-161. Level of Turbidity (NTU) of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	26	37	22		65	95			95	32	22	16
EQS Industries ( $\leq$ 10 NTU)												

**Table-162. Level of EC ( $\mu$ mhos/cm) of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	282	854	854		820	1754			1754	580	428	468
EQS Industries (1200 $\mu$ mhos/cm)												

**Table-163. Level of SS (mg/l) of Ganges River Water in 2023**

Location of Ganges river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gorai off Take	25	54	54		66	72			72	22	13	11
EQS Industries (100 mg/l)												

**23.0 Kirtankhola River (Table: 164-167)****Table-164. Level of pH of Kirtankhola River Water in 2023**

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	8.82								8.32	8.11		8.01
Launch Ghat (M)	8.66								8.13	8.08		8.09
Kaower Char (S)	8.1								8.24	8.59		8.02
Kaower Char (M)	8.28								8.31	8.24		8.11
Dopdopia Kheyaghat (S)	8.52								8.22	8.31		7.91
Dopdopia Kheyaghat (M)	8.16								8.42	8.22		7.74
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-165. Level of DO (mg/l) of Kirtankhola River Water in 2023**

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	7.1								6.51	7.41		6.71
Launch Ghat (M)	7.25								6.7	7.11		6.82
Kaower Char (S)	6.66								6.38	7.48		7.13
Kaower Char (M)	6.37								6.66	6.97		6.59
Dopdopia Kheyaghat (S)	7.13								7.73	7.17		7.41
Dopdopia Kheyaghat (M)	6.79								6.19	7.34		7.04
EQS Fisheries (5 mg/l $\geq$ )												

**Table-166. Level of TDS (mg/l) of Kirtankhola River Water in 2023**

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	811								89.6	104.9		212
Launch Ghat (M)	801								94.5	113.1		192
Kaower Char (S)	878								81.6	119.3		359
Kaower Char (M)	861								93.5	114.4		294
Dopdopia Kheyaghat (S)	897								84.3	94.8		257
Dopdopia Kheyaghat (M)	861								88.4	101.4		249
EQS Fisheries ( $\leq$ 1000mg/l)												

**Table-167. Level of EC ( $\mu$ mhos/cm) of Kirtankhola River Water in 2023**

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	1534								161.3	213.4		438
Launch Ghat (M)	1518								187.1	229.8		408
Kaower Char (S)	1631								170	251.7		688
Kaower Char (M)	1691								199.9	237.1		584
Dopdopia Kheyaghat (S)	1701								179.4	197.5		528
Dopdopia Kheyaghat (M)	1632								187.2	211.2		490
EQS Industries ( $\leq$ 1200 $\mu$ mhos/cm)												

## 24.0 Tatulia River (Table: 168-171)

**Table-168. Level of pH of Tatulia River Water in 2023**

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	8.52											8.38
Vadura Launch Ghat (M)	8.16											8.49
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-169. Level of DO (mg/l) of Tatulia River Water in 2023**

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	6.1											7.87
Vadura Launch Ghat (M)	6.05											6.02
EQS Fisheries (5 mg/l $\geq$ )												

**Table-170. Level of TDS (mg/l) of Tatulia River Water in 2023**

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	70.3											123
Vadura Launch Ghat (M)	67.3											229
EQS Fisheries ( $\leq$ 1000mg/l)												

**Table-171. Level of EC ( $\mu$ mhos/cm) of Tatulia River Water in 2023**

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	165.5											257
Vadura Launch Ghat (M)	155.4											241
EQS Industries (1200 $\mu$ mhos/cm)												

## 25.0 Kalabodar River (Table: 172-175)

**Table-172. Level of pH of Kalabodar River Water in 2023**

Location of Kalabodar river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kalabodar Ferry Ghat (S)	7.8											
Kalabodar Ferry Ghat (M)	7.3											
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-173. Level of DO (mg/l) of Kalabodar River Water in 2023**

Location of Kalabodar river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kalabodar Ferry Ghat (S)	5.3											
Kalabodar Ferry Ghat (M)	5.1											
EQS Fisheries (5 mg/l $\geq$ )												

**Table-174. Level of TDS (mg/l) of Kalabodar River River Water in 2023**

Location of Kalabodar river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kalabodar Ferry Ghat (S)	148											
Kalabodar Ferry Ghat (M)	124											
EQS Fisheries ( $\leq$ 1000 mg/l)												

**Table-175. Level of EC ( $\mu$ mhos/cm) of Kalabodar River Water in 2023**

Location of Kalabodar river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kalabodar Ferry Ghat (S)	332											
Kalabodar Ferry Ghat (M)	306											
EQS Industries (1200 $\mu$ mhos/cm)												

## 26.0 Lohalia River (Table: 176-179)

**Table-176. Level of pH of Lohalia River Water in 2023**

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)	9.03								8.48			
Patuakhali Launch Ghat (M)	8.91								8.35			
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-177. Level of DO (mg/l) of Lohalia River Water in 2023**

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali L.G (S)	7								7.27			
Patuakhali L.G (M)	6.84								6.34			
EQS Fisheries (5 mg/l $\geq$ )												
EQS Industries (4.5-8 mg/l)												

**Table-178. Level of TDS (mg/l) of Lohalia River River Water in 2023**

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali L.G (S)	114								93.7			
Patuakhali L.G (M)	109								96.8			
EQS Fisheries ( $\leq$ 1000mg/l)												

**Table-179. Level of EC ( $\mu$ mohos/cm) of Lohalia River Water in 2023**

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali L.G (S)	265								204.3			
Patuakhali L.G (M)	234								209.2			
EQS Industries (1200 $\mu$ mohos/cm)												

## 27.0 Surma River (Table: 180-185)

**Table-180. Level of pH of Surma River Water in 2023**

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point			7.33				7.12					
Kin Bridge Point			7.36				7.17					
Sheaik Ghat			7.41				7.19					
Chhatak			7.69				7.14					
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-181. Level of DO (mg/l) of Surma River Water in 2023**

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point			7.24				7.13					
Kin Bridge Point			7.27				7.19					
Sheaik Ghat			7.3				7.18					
Chhatak			8.27				7.21					
EQS Fisheries (5 mg/l $\geq$ )												

**Table-182. Level of BOD (mg/l) of Surma River Water in 2023**

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point			2.6				2.3					
Kin Bridge Point			3.1				3.4					
Sheaik Ghat			3.6				3.2					
Chhatak			2.9				3.1					
EQS Fisheries ( $\leq 6$ mg/l)												
EQS Industries ( $\leq 30$ mg/l)												

**Table-183. Level of SS (mg/l) of Surma River Water in 2023**

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point			64				64					
Kin Bridge Point			66				67					
Sheaik Ghat			69				72					
Chhatak			58				52					
EQS Industrial ( $\leq 100$ mg/l)												

**Table-184. Level of TDS (mg/l) of Surma River Water in 2023**

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point			144				108					
Kin Bridge Point			151				113					
Sheaik Ghat			149				118					
Chhatak			85				112					
EQS Fisheries ( $\leq 1000$ mg/l)												

**Table-185. Level of EC ( $\mu$ mhos/cm) of Surma River Water in 2023**

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point			296				218					
Kin Bridge Point			302				222					
Sheaik Ghat			306				234					
Chhatak			172				226					
EQS Industries ( $\leq 1200 \mu$ mhos/cm)												

**28.0 Kushiara River (Table: 186-191)****Table-186. Level of pH of Kushiara River Water in 2023**

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point			7.53				7.48					
Fenchuganj Fertilizer Industry Point			8.79				8.72					
EQS Fisheries (6.0-9.0)												
EQS Industries (6.5-8.5)												

**Table-187. Level of DO (mg/l) of Kushiara River Water in 2023**

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point			7.65				7.66					
Fenchuganj Fertilizer Industry Point			8.81				8.76					
EQS Fisheries (5 mg/l $\geq$ )												

**Table-188. Level of BOD (mg/l) of Kushiara River Water in 2023**

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point			2.9				2.7					
Fenchuganj Fertilizer Industry Point			23				18					
EQS Fisheries ( $\leq 6$ mg/l)												
EQS Industries ( $\leq 30$ mg/l)												

**Table-189. Level of COD (mg/l) of Kushiara River Water in 2023**

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point			16				14					
Fenchuganj Fertilizer Industry Point			82				75					
EQS Fisheries ( $\leq 50$ mg/l)												
EQS Industrial ( $\leq 200$ mg/l)												

**Table-190. Level of TDS (mg/l) of Kushiara River Water in 2023**

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point			74				70					
Fenchuganj Fertilizer Industry Point			111				106					
EQS Fisheries ( $\leq 1000$ mg/l)												

**Table-191. Level of EC ( $\mu$ mhos/cm) of Kushiara River Water in 2023**

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Fenchuganj Bridge Point			148				143					
Fenchuganj Fertilizer Industry Point			218				213					
EQS Industries (1200 $\mu$ mhos/cm)												

**29.0 Balu River (Table: 192-201)****Table-192. Level of pH of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	6.82	7.02	7.09				7.33	6.71		6.98	6.39	6.89
Jolshiri Abason	7.13	7.41	7.1				7.38	6.49		6.73	7.27	7.35
EQS Fisheries (6.0-9.0)												
EQS Industrial (6.5-8.5)												

**Table-193. Level of DO (mg/l) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	0	0	0.1				0.3	0		1.8	1.04	0.5
Jolshiri Abason	1.41	0.1	2.1				8.3	3.2		2.1	6.01	2
EQS Fisheries (5 mg/l $\geq$ )												

**Table-194. Level of BOD (mg/l) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	68	38	40				34	22.8		6	7	22
Jolshiri Abason	18	20	22				3	2.1		4	5	5
EQS Fisheries ( $\leq 6$ mg/l)												
EQS Industrial ( $\leq 30$ mg/l)												

**Table-195. Level of COD (mg/l) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	217	63	76				119	48		19	27	41
Jolshiri Abason	60	56	54				36	5		14	27	15
EQS Fisheries ( $\leq 50$ mg/l)												
EQS Industrial ( $\leq 200$ mg/l)												

**Table-196. Level of TDS (mg/l) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	480	487	455				349	249		136	388	353
Jolshiri Abason	132	235	224				268	176		112	253	224
EQS Industrial ( $\leq 200$ mg/l)												

**Table-197. Level of Chloride (mg/l) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	99	81	73				49	25.5		19	52	50
Jolshiri Abason	18	23	43				26	15		13	32	28
EQS Industrial (150-600 mg/l)												

**Table-198. Level of SS (mg/l) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	59	122	110				8.45	36		13	83	64
Jolshiri Abason	28	40	40				16.9	7		7	19	21
EQS Industrial ( $\leq 100$ mg/l)												

**Table-199. Level of EC ( $\mu$ mhos/cm) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	847	858	826				664	553		263	815	637
Jolshiri Abason	248	334	418				510	405		219.2	538	411
EQS (1200 $\mu$ mhos/cm)												

**Table-200. Level of T.alkalinity (mg/l) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	330	382	262				164	70		16	22	58
Jolshiri Abason	108	124	186				97	61		14	28	56
EQS (150 mg/l)												

**Table-201. Level of Turbidity (NTU) of Balu River Water in 2023**

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Trimohoni Bridge	50	83.9	32.8				7.52	30.8		8	22.5	47
Jolshiri Abason	43.4	51.1	8.98				19.7	9.02		4	7.77	5.79
EQS (10 NTU)												

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

## I. Gulshan Lake (Table: 202-211)

**Table-202. Level of pH of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		7.1						7.62			7.54	
South Bridge		7.33						<b>7.69</b>			7.19	
Lake View Clinic		7.19						7.43			7.15	
Taltola Shooting Complex		7.32						7.56			7.2	
South Side of Gulsan Baridhara Lake		7.41						7.58			<b>7.05</b>	
North Side of Gulsan Baridhara Lake								7.47				
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-203. Level of DO (mg/l) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		6.96						2.72			6.63	
South Bridge		7.08						1.3			2.66	
Lake View Clinic		6.78						1.59			<b>9.48</b>	
Taltola Shooting Complex		5.32						4.67			1.39	
South Side of Gulsan Baridhara Lake		7.07						4.01			3.3	
North Side of Gulsan Baridhara Lake								<b>1.12</b>				
<b>EQS for fisheries <math>\geq 5</math> mg/l</b>												

**Table-204. Level of BOD (mg/l) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		25						16.2			22.5	
South Bridge		25						<b>11.1</b>			33	
Lake View Clinic		<b>37</b>						14.1			25.5	
Taltola Shooting Complex		24						11.4			22.5	
South Side of Gulsan Baridhara Lake		19						14.1			18	
North Side of Gulsan Baridhara Lake								14.1				
<b>EQS Fisheries (<math>\leq 6</math> mg/l)</b>												
<b>EQS Industrial (<math>\leq 30</math> mg/l)</b>												

**Table-205. Level of COD (mg/l) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		54						73			<b>153</b>	
South Bridge		58						65			133	
Lake View Clinic		68						<b>62</b>			138	
Taltola Shooting Complex		51						71			122	
South Side of Gulsan Baridhara Lake		41						66			138	
North Side of Gulsan Baridhara Lake								60				
<b>EQS Fisheries (<math>\leq 50</math> mg/l)</b>												
<b>EQS Industrial (<math>\leq 200</math> mg/l)</b>												

**Table-206. Level of TDS (mg/l) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		286						215			255	
South Bridge		304						227			266	
Lake View Clinic		302						215			261	
Taltola Shooting Complex		<b>358</b>						240			265	
South Side of Gulsan Baridhara Lake		302						238			259	
North Side of Gulsan Baridhara Lake								<b>212</b>				
<b>EQS Fisheries (<math>\leq 1000</math> mg/l)</b>												

**Table-207. Level of Turbidity (NTU) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		92						15.8			64.4	
South Bridge		78						16.9			62.3	
Lake View Clinic		<b>107</b>						34.5			61.7	
Taltola Shooting Complex		52						18.4			61	
South Side of Gulsan Baridhara Lake		82						<b>9.89</b>			65.6	
North Side of Gulsan Baridhara Lake								26.3				
<b>EQS for wastewater after treatment from industrial units 10 NTU</b>												

**Table-208. Level of Chloride (mg/l) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		54						<b>40</b>			44.5	
South Bridge		58						43			47	
Lake View Clinic		52						42			45.5	
Taltola Shooting Complex		<b>66</b>						48			45	
South Side of Gulsan Baridhara Lake		53						43			46	
North Side of Gulsan Baridhara Lake								42				
<b>EQS for wastewater after treatment from industrial units 150-600 mg/l</b>												

**Table-209. Level of SS (mg/l) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		194						<b>14</b>			165	
South Bridge		202						17			151	
Lake View Clinic		241						65			163	
Taltola Shooting Complex		122						20			154	
South Side of Gulsan Baridhara Lake		<b>208</b>						14			169	
North Side of Gulsan Baridhara Lake								35				
<b>EQS for wastewater after treatment from industrial units 100 mg/l</b>												

**Table-210. Level of Total Alkalinity (mg/l) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		212						110			48	
South Bridge		240						131			48	
Lake View Clinic		276						142			<b>36</b>	
Taltola Shooting Complex		<b>280</b>						138			52	
South Side of Gulsan Baridhara Lake		250						122			40	
North Side of Gulsan Baridhara Lake								118				
<b>EQS for wastewater after treatment from industrial units 150 mg/l</b>												

**Table-211. Level of EC ( $\mu$ mhos/cm) of Gulshan Lake Water in 2023**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
United Hospital		540						483			590	
South Bridge		559						508			510	
Lake View Clinic		562						477			555	
Taltola Shooting Complex		<b>665</b>						534			568	
South Side of Gulsan Baridhara Lake		559						524			553	
North Side of Gulsan Baridhara Lake								<b>470</b>				
<b>EQS for wastewater after treatment from industrial units 1200 <math>\mu</math>mhos/cm</b>												

## II. Dhanmondi Lake (Table: 212-221)

**Table-212. Level of pH of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		7.7						7.82			7.56	
Near Gigatola Pilkhana More		7.55						7.6			7.59	
Near Dhanmondi-32 Bridge		<b>7.96</b>						7.3			7.43	
Near Dhanmondi- Road No 28		7.76						7.28			<b>7.23</b>	
<b>EQS Fisheries (6.0-9.0)</b>												
<b>EQS Industrial (6.5-8.5)</b>												

**Table-213. Level of DO (mg/l) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		5.37						1.66			3.39	
Near Gigatola Pilkhana More		5.65						<b>2.64</b>			3.84	
Near Dhanmondi-32 Bridge		6.18						2.97			6.54	
Near Dhanmondi- Road No 28		<b>5.27</b>						2.19			3.48	
<b>EQS for fisheries <math>\geq</math>5 mg/l</b>												

**Table-214. Level of BOD (mg/l) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		<b>14</b>						<b>2.1</b>			7	
Near Gigatola Pilkhana More		13						1.8			5	
Near Dhanmondi-32 Bridge		13						2.4			5	
Near Dhanmondi- Road No 28		14						2.4			5	
<b>EQS Fisheries (<math>\leq</math>6 mg/l)</b>												
<b>EQS Industrial (<math>\leq</math>30 mg/l)</b>												

**Table-215. Level of COD (mg/l) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		12						26			23	
Near Gigatola Pilkhana More		39						<b>66</b>			19	
Near Dhanmondi-32 Bridge		<b>7</b>						64			54	
Near Dhanmondi- Road No 28		22						14			9	
<b>EQS Fisheries (≤50 mg/l)</b>												
<b>EQS Industrial (≤200 mg/l)</b>												

**Table-216. Level of TDS (mg/l) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		159						131			<b>113.4</b>	
Near Gigatola Pilkhana More		156						128			120.8	
Near Dhanmondi-32 Bridge		196						212			148.5	
Near Dhanmondi- Road No 28		263						<b>299</b>			221	
<b>EQS Fisheries (≤1000 mg/l)</b>												

**Table-217. Level of Turbidity (NTU) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		8.41						2.01			5.23	
Near Gigatola Pilkhana More		8.09						5.32			3.2	
Near Dhanmondi-32 Bridge		<b>9</b>						3.28			6.85	
Near Dhanmondi- Road No 28		8.11						<b>1.59</b>			3.2	
<b>EQS for wastewater after treatment from industrial units 10 NTU</b>												

**Table-218. Level of Chloride (mg/l) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		<b>33</b>						47			36	
Near Gigatola Pilkhana More		35						50			39	
Near Dhanmondi-32 Bridge		42						49			34	
Near Dhanmondi- Road No 28		<b>63</b>						54			35	
<b>EQS for wastewater after treatment from industrial units 150-600 mg/l</b>												

**Table-219. Level of SS (mg/l) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		18						<b>1</b>			13	
Near Gigatola Pilkhana More		16						4			14	
Near Dhanmondi-32 Bridge		18						4			17	
Near Dhanmondi- Road No 28		17						1			<b>32</b>	
<b>EQS for wastewater after treatment from industrial units 100 mg/l</b>												

**Table-220. Level of Total Alkalinity (mg/l) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		112						90			<b>24</b>	
Near Gigatola Pilkhana More		120						91			24	
Near Dhanmondi-32 Bridge		140						101			32	
Near Dhanmondi- Road No 28		<b>168</b>						149			36	
<b>EQS for wastewater after treatment from industrial units 150 mg/l</b>												

**Table-221. Level of EC ( $\mu\text{mhos/cm}$ ) of Dhanmondi Lake Water in 2023**

Location of Dhanmondi Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge		305						297			242	
Near Gigatola Pilkhana More		299						288			257	
Near Dhanmondi-32 Bridge		375						467			314	
Near Dhanmondi- Road No 28		500						664			463	
EQS for wastewater after treatment from industrial units 1200 $\mu\text{mhos/cm}$												

**III. Hatir Jheel Lake (Table: 222-231)****Table-222. Level of pH of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		7.34						7.57			7.64	
FDC More Bridge		7.5						7.59			7.7	
Raampura Bridge		7.45						7.68			7.59	
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

**Table-223. Level of DO ( $\text{mg/l}$ ) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		2.41						1.57			2.47	
FDC More Bridge		6.42						1.3			10.98	
Raampura Bridge		2.37						2.24			3.58	
EQS for fisheries $\geq 5 \text{ mg/l}$												

**Table-224. Level of BOD ( $\text{mg/l}$ ) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		24						18.3			19	
FDC More Bridge		13						18.6			9	
Raampura Bridge		34						16.8			13	
EQS Fisheries ( $\leq 6 \text{ mg/l}$ )												
EQS Industrial ( $\leq 30 \text{ mg/l}$ )												

**Table-225. Level of COD ( $\text{mg/l}$ ) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		58						52			108	
FDC More Bridge		24						73			62	
Raampura Bridge		63						70			74	
EQS Fisheries ( $\leq 50 \text{ mg/l}$ )												
EQS Industrial ( $\leq 200 \text{ mg/l}$ )												

**Table-226. Level of TDS ( $\text{mg/l}$ ) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		369						234			276	
FDC More Bridge		313						276			230	
Raampura Bridge		366						230			264	
EQS Fisheries ( $\leq 1000 \text{ mg/l}$ )												

**Table-227. Level of Turbidity (NTU) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		39.2						4.35			40.8	
FDC More Bridge		17.3						2.52			23.9	
Raampura Bridge		33						3.91			28.7	
<b>EQS for wastewater after treatment from industrial units 10 NTU</b>												

**Table-228. Level of Chloride (mg/l) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		68						49			48	
FDC More Bridge		63						61			50	
Raampura Bridge		75						48			47	
<b>EQS for wastewater after treatment from industrial units 150-600 mg/l</b>												

**Table-229. Level of SS (mg/l) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		97						13			70	
FDC More Bridge		33						7			24	
Raampura Bridge		83						14			63	
<b>EQS for wastewater after treatment from industrial units 15 mg/l</b>												

**Table-230. Level of Total Alkalinity (mg/l) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		244						128			52	
FDC More Bridge		208						183			44	
Raampura Bridge		252						131			36	
<b>EQS for wastewater after treatment from industrial units 150 mg/l</b>												

**Table-231. Level of EC ( $\mu$ mhos/cm) of Hatir Jheel Lake Water in 2023**

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge		673						525			596	
FDC More Bridge		580						611			511	
Raampura Bridge		667						519			590	
<b>EQS for wastewater after treatment from industrial units 1200 <math>\mu</math>mhos/cm</b>												

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

#### IV. Ground Water (Deep Tubewell) in Chittagong District (Table: 232-245)

**Table-232. Level of pH of Ground Water at Chittagong District in 2023**

Location of Chittagong District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MES College Area	6.1	6.22	6.13	8.89	7.46	7.26	7.74	7.39	7.49	7.28	7.36	7.36
CEPS Area	6.28	6.39	6.23	7.23	7.03	7.25	7.29	7.48	7.38	7.47	7.56	7.28
Karnafully EPZ Area	6.12	6.12	6.2	8.2	7.8	8.1	7.66	7.59	7.39	7.45	7.31	7.39
Patenga Area	6.29	6.59	6	8	7	7.8	7.58	7.19	7.29	7.36	7.42	7.24
Agrabad Area	6.46	6.69	6.53	9.17	7.45	7.48	7.65	7.36	7.46	7.21	7.32	7.03
Halishahar Area	6.36	6.59	6.25	8.25	7.25	7.56	7.79	7.55	7.35	7.34	7.42	7.09
Akbarshah Residential Area	6.34	6.47	6.33	8.33	7.25	7.33	7.47	7.71	7.61	7.54	7.65	7.74
Chawkbazar Area	6.23	6.39	6.09	<b>9.56</b>	7.59	7.69	7.66	7.77	7.87	7.48	7.59	7.05
GEC point								7.67	7.57	7.48	7.52	7.42
<b>EQS Drinking (6.5-8.5)</b>												

**Table-233. Level of TDS (mg/l) of Ground Water at Chittagong District in 2023**

Location of Chittagong District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MES College Area	263	279	324	<b>885</b>	652	313	85.5	72.6	84.5	98	120	78.5
CEPS Area	224	247	242	742	698	512	313	69.5	78.9	120	142	64.5
Karnafully EPZ Area	312	339	298	698	665	598	205	74.3	79.4	86.5	87.5	72
Patenga Area	269	279	302	802	702	392	324	112	138	148	152	83
Agrabad Area	214	228	234	591	653	215	85.6	136	110	94	110	65.4
Halishahar Area	229	237	316	516	655	506	365	148	128	136	142	78.4
Akbarshah Residential Area	231.5	248.5	231	731	502	431	169.1	249	179	164	168	335
Chawkbazar Area	210.5	242.5	324	566	409	90.6	86.1	75.3	72.6	78.5	84.5	84.5
GEC point								<b>62.5</b>	67	112	134	82.6
<b>EQS for Drinking (1000 mg/l)</b>												

**Table-234. Level of EC ( $\mu$ mhos/cm) of Ground Water at Chittagong District in 2023**

Location of Chittagong District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MES College Area	452	447	653	1586	1360	591	179.1	139	167	162	198	178.9
CEPS Area	398	389	410	1410	1450	819	589	143	164	240	248	149.5
Karnafully EPZ Area	532	611	386	1386	1389	1045	354	146.5	154.6	126	169	164
Patenga Area	468	487	568	<b>1668</b>	1404	668	658	129	172	269	287	178.6
Agrabad Area	396	404	338	1050	1358	357	184	168	178	159	242	127.6
Halishahar Area	364	398	612	1050	1368	812	602	198	169	239	256	148.5
Akbarshah Residential Area	426.5	459.5	426	1012	958	626	356	482	379	248	298	636
Chawkbazar Area	369.5	449.5	650	1426	878	167.2	185	149.8	139.5	136.5	165.5	165.5
GEC point								<b>124.2</b>	158.8	223	236	164.7
<b>EQS for wastewater after treatment from industrial units 1200 <math>\mu</math>mhos/cm</b>												

**Table-235. Level of Salinity (ppt) of Ground Water at Chittagong District in 2023**

Location of Chittagong District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MES College Area	0.26	0.26	0.32	<b>0.9</b>	0.5	0.35	0.09	0.07	0.08	0.09	0.12	0.07
CEPS Area	0.22	0.24	0.24	0.74	0.7	0.54	0.34	0.06	0.07	0.11	0.14	0.06
Karnafully EPZ Area	0.32	0.33	0.3	0.7	0.66	0.61	0.21	0.08	0.07	0.08	0.08	0.07
Patenga Area	0.26	0.27	0.3	0.8	0.7	0.45	0.32	0.11	0.13	0.15	0.15	0.08
Agrabad Area	0.22	0.22	0.22	0.59	0.65	0.23	0.09	0.14	0.11	0.09	0.11	0.06
Halishahar Area	0.21	0.23	0.32	0.52	0.66	0.52	0.38	0.15	0.12	0.13	0.14	0.07
Akbarshah Residential Area	0.23	0.24	0.23	0.73	0.5	0.49	0.18	0.24	0.17	0.16	0.16	0.34
Chawkbazar Area	0.21	0.24	0.32	0.57	0.5	0.11	0.09	0.075	0.07	0.078	0.08	0.08
GEC point								0.063	<b>0.06</b>	0.11	0.13	0.08
<b>EQS (400 ppt)</b>												

## VI. Ground Water (Deep Tubewell) in Barisal district (Table: 236-239)

**Table-236: Level of pH of Ground Water at Barisal District in 2023**

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kali Matar Mondir									7.52			7.1
Zia Sarak									7.39			<b>6.98</b>
I.T Bhovon									8.11			7.21
Bikrompur Mistanno Vandar									8.17			8.08
Bivgio Passport Office									7.77			7.93
Ucco Madhomic Sikkha Board									7.91			7.31
Barishal Potuakhali Bus Stand									8.41			8.55
Kacha Bazar									8.71			8.14
Notullabad Bus Stand	7.49								8.25			8.38
Ritika Satkhira Mistanno Vandar									<b>9.42</b>			8.49
Jom Jom Nursing Institute									8.01			8.25
Sriguru Mistanno Vandar									8.13			8.61
Jom Jom Diagnostic Center									8.28			8.27
Khabar Bari resturent									8.51			8.83
B.M College	7.2								7.89			7.74
Nagar Bhaban										8.69		
Bivagio Zadughar										8.12		
Zila Parishad										8.81		
Dak Banglo										8.6		
Sri sri Kali mata Thakurani Mondiri										8.31		
Akash Hotel										9.11		
Upozila Vumi office										8.3		
Upozila Stelment office										8.33		
Agrani Bank Limited										8.65		
Rosh malai Hotel & Restaurent										8.01		
Fire Service & Civil Defence										8.51		
Dakghor										8.69		
Ghos Mistanno Vandar										8.97		
Bivagio George Cort										8.19		
D.C Office	7.36									8.41		
Upozilla office	7.57											
Sadar Hospital	7.1											
Sher-e Bangla Medical College	7.74											
Sayad Hatem Ali College	7.66											
Amrita Lal Dey College	7.23											
B.M School	7.45											
Barishal Zila School	7.67											
Barishal Central Jail	7.87											
Barishal City College	7.28											
Rupatoli Bus Stand	7.11											
Choumatha Bazar	7.68											
Bat Tala Bazar	7.4											
<b>EQS (6.5-8.5) for drinking</b>												

**Table-237: Level of EC of Ground Water at Barisal District in 2023**

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kali Matar Mondir									692			651
Zia Sarak									684			713
I.T Bhovon									666			698
Bikrompur Mistanno Vandar									867			937
Bivgio Passport office									774			804
Ucco Madhomic Sikkha Board									696			623
Barishal Potuakhali Bus Stand									889			887
Kacha Bazar									803			741
Notullabad Bus Stand	811								741			725
Ritika Satkhira Mistanno Vandar									801			781
Jom Jom Nursing Institute									<b>1437</b>			1261
Sriguru Mistanno Vandar									1291			1312
Jom Jom Diagnostic Center									1127			1057
Khabar Bari resturent									607			628
B.M College	836								632			689
Nagar Bhaban										812		
Bivagio Zadughar										731		
Zila Parishad										763		
Dak Banglo										752		
Sri sri Kali mata Thakurani Mondiri										881		
Akash Hotel										<b>510</b>		
Upozila Vumi office										769		
Upozila Stelment office										733		
Agrani Bank Limited										839		
Rosh malai Hotel & Restaurent										856		
Fire Service & Civil Defence										819		
Dakghor										633		
Ghos Mistanno Vandar										794		
Bivagio George Cort										750		
D.C Office	1088									798		
Upozilla office	951											
Sadar Hospital	1021											
Sher-e Bangla Medical College	902											
Sayad Hatem Ali College	1200											
Amrita Lal Dey College	981											
B.M School	1055											
Barishal Zila School	732											
Barishal Central Jail	1241											
Barishal City College	874											
Rupatoli Bus Stand	1132											
Choumatha Bazar	702											
Bat Tala Bazar	1135											
<b>EQS for wastewater after treatment from industrial units 1200 <math>\mu</math>mhos/cm</b>												

**Table-238: Level of TDS of Ground Water at Barisal District in 2023**

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kali Matar Mondir									328			286
Zia Sarak									310			348
I.T Bhovon									294			327
Bikrompur Mistanno Vandar									401			475
Bivgio Passport office									358			371
Ucco Madhomic Sikkha Board									314			278
Barishal Potuakhali Bus Stand									419			409
Kacha Bazar									389			335
Notullabad Bus Stand	401								319			311
Ritika Satkhira Mistanno Vandar									379			332
Jom Jom Nursing Institute									<b>691</b>			598
Sriguru Mistanno Vandar									613			654
Jom Jom Diagnostic Center									537			516
Khabar Bari resturent									291			298
B.M College	427								278			314
Nagar Bhaban										387		
Bivagio Zadughar										347		
Zila Parishad										344		
Dak Banglo										329		
Sri sri Kali mata Thakurani Mondiri										391		
Akash Hotel										<b>221</b>		
Upozila Vumi office										357		
Upozila Stelment office										321		
Agrani Bank Limited										385		
Rosh malai Hotel & Restaurent										346		
Fire Service & Civil Defence										378		
Dakghor										274		
Ghos Mistanno Vandar										347		
Bivagio George Cort										334		
D.C Office	552									375		
Upozilla office	499											
Sadar Hospital	573											
Sher-e Bangla Medical College	428											
Sayad Hatem Ali College	595											
Amrita Lal Dey College	472											
B.M School	544											
Barishal Zila School	354											
Barishal Central Jail	628											
Barishal City College	419											
Rupatoli Bus Stand	529											
Choumatha Bazar	309											
Bat Tala Bazar	552											
<b>EQS for drinking 1000 mg/l</b>												

**Table-239: Level of Iron of Ground Water at Barisal District in 2023**

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kali Matar Mondir									0.25			0.5
Zia Sarak									0.25			0.25
I.T Bhovon									0.5			0.25
Bikrompur Mistanno Vandar									0.25			0.5
Bivgio Passport office									0.2			0.25
Ucco Madhomic Sikkha Board									0.05			0.05
Barishal Potuakhali Bus Stand									0.5			0.5
Kacha Bazar									0.5			0.25
Notullabad Bus Stand	0.5								0.5			0.5
Ritika Satkhira Mistanno Vandar									0.05			0.5
Jom Jom Nursing Institute									0.25			0.25
Sriguru Mistanno Vandar									0.5			0.5
Jom Jom Diagnostic Center									0.25			0.5
Khabar Bari resturent									0.5			0.25
B.M College	0.25								0.25			0.25
Nagar Bhaban										0.25		
Bivagio Zadughar										0.5		
Zila Parishad										0.05		
Dak Banglo										0.25		
Sri sri Kali mata Thakurani Mondiri										0.25		
Akash Hotel										0.5		
Upozila Vumi office										0.25		
Upozila Stelment office										0.5		
Agrani Bank Limited										0.5		
Rosh malai Hotel & Restaurent										0.25		
Fire Service & Civil Defence										0.25		
Dakghor										0.5		
Ghos Mistanno Vandar										0.5		
Bivagio George Cort										0.25		
D.C Office	0.5									0.25		
Upozilla office	<b>0</b>											
Sadar Hospital	0.2											
Sher-e Bangla Medical College	0.5											
Sayad Hatem Ali College	0.5											
Amrita Lal Dey College	0.5											
B.M School	0.25											
Barishal Zila School	0.25											
Barishal Central Jail	0.5											
Barishal City College	0.15											
Rupatoli Bus Stand	<b>0.5</b>											
Choumatha Bazar	<b>0.5</b>											
Bat Tala Bazar	<b>0.5</b>											
<b>EQS For Drinking (0.3-1 mg/l)</b>												

## VI. Ground water (Deep Tubewell) in Bogura District (Table: 240-243)

**Table-240. Level of pH of Ground Water at Bogura District in 2023**

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								7.3				
Head Post Office								7.32				
Commercial College								7.34				
Zilla Parishad								7.3				
Office of the Duputy Commissioner								7.46				
Porosovha								7.42				
VM School, Sadar								7.44				
T & T Office								7.34				
Biddut Office								7.36				
Bogra sadar thana								7.42				
<b>EQS (6.5-8.5) for drinking</b>												

**Table-241. Level of EC of Ground Water at Bogura District in 2023**

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								390				
Head Post Office								380				
Commercial College								410				
Zilla Parishad								400				
Office of the Duputy Commissioner								380				
Porosovha								420				
VM School, Sadar								380				
T & T Office								370				
Biddut Office								310				
Bogra sadar thana								320				
<b>EQS For Industries (1200 µmohos/cm)</b>												

**Table-242. Level of Iron of Ground Water at Bogura District in 2023**

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								0.32				
Head Post Office								0.3				
Commercial College								0.41				
Zilla Parishad								0.4				
Office of the Duputy Commissioner								0.39				
Porosovha								0.4				
VM School, Sadar								0.39				
T & T Office								0.38				
Biddut Office								0.34				
Bogra sadar thana								0.32				
<b>EQS For Drinking (0.3-1 mg/l)</b>												

**Table-243. Level of T. Hardness of Ground Water at Bogura District in 2023**

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School								240				
Head Post Office								230				
Commercial College								210				
Zilla Parishad								220				
Office of the Duputy Commissioner								200				
Porosovha								230				
VM School, Sadar								220				
T & T Office								230				
Biddut Office								210				
Bogra sadar thana								220				
<b>EQS For Drinking (200-500 mg/l)</b>												

**VII. Ground water (Deep Tubewell) in Sunamgonj district (Table: 244-245)****Table-244. Level of pH of Ground Water at Sunamgonj District in 2023**

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Sunamganj Launch Ghat			6.87				6.69					
jamalganj Point			7.89				6.87					
<b>EQS (6.5-8.5) for drinking</b>												

**Table-245. Level of EC of Ground Water at Sunamgonj District in 2023**

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Sunamganj Launch Ghat			147				58					
jamalganj Point			155				92					
<b>EQS for wastewater after treatment from industrial units 1200 <math>\mu</math>mohos/cm</b>												

\*\*\*\*\* End \*\*\*\*\*