

SURFACE AND GROUND WATER QUALITY REPORT 2019



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Surface and Ground Water Quality Report 2019

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MESSAGE

Rivers and wetlands are lifeline of Bangladesh. Three major river systems namely the Ganges, the Brahmaputra and the Maghna which drain through the country of the Bay of Bengal created huge floodplains, active and moribund and a good number of unique water ecosystems. Industrialisation, urbanisation 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 2019 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, 1997 (amended 2010), and 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 especially in the dry season. In addition, this report includes the water quality of three lakes (namely Dhanmondi, Gulshan and Hatir Jheel), 4 stations of marine water and 81 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 2019 contains data and some basic statistical analysis of a number of water quality parameters 122 points of 29 rivers, 12 points of 03 lakes, 4 stations of sea water and 80 stations of 04 districts of ground water for the period from January to December 2019. Physiochemical water quality parameters such as pH, EC, TDS, DO, BOD, COD, SS, Chloride, Turbidity, Total Alkalinity and Salinity were measured in laboratory base analysis. The mean value of such respective parameters in both seasons was compared with the water quality standards as set by the EQS guideline of Department of Environment (DoE). This report also gives an annual trend of quality and its seasonal variation of those parameters from 2010 to 2019. The report does not include biological indicators for monitoring.

In 2019, the monitoring program covered sampling of 101 points/stations of 07 district (Barisal Dist.-30 points, Bhola Dist.-15 points, Bogura Dist.-10 points, Naogaon Dist.-10 points, Pirojpur Dist.-16 points, Rajshahi Dist.-10 points, Rangour Dist.-10 points) in the month of January and February for analysis of drinking water quality.

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 1997. The pollution level of different points along a single stress of a river also varied. River erosion and dumping of solid waste increased the turbidity of river water in some sampling points. The water quality of three lakes in Dhaka was mostly below the EQS although Gulshan Lake's data showed some improvements.

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

Syeda Masuma Khanam
Director (Joint Secretary)
Natural Resource Management and Research Wing
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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 the health of ecosystems, safety of human contact, and drinking water. Water quality and quantity greatly affects ecosystems productivity and services they provide. To provide with necessary information for sustainable services especially of aquatic ecosystem, continuous monitoring of water quality is essential.

Water quality parameters like pH, Dissolve Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Turbidity, Total Dissolve Solids (TDS), Suspended Solid (SS), Total Alkalinity, Electrical Conductivity (EC), Chloride and Salinity presented in this report were measured more or less round the year of 2019. 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)

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Zawata Afnan
Assistant Director (Water & Bio.)

ABBREVIATIONS

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

GLOSSARY

pH:

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

Dissolved Oxygen (DO):

Dissolved Oxygen is the amount of gaseous oxygen (O₂) dissolved in the water. Oxygen enters the water by direct absorption from the atmosphere, by rapid movement, or as a waste product of plant photosynthesis. Adequate dissolved oxygen is important for good water quality and necessary to all forms of life. Dissolved oxygen levels that drop below 5.0 mg/L cause stress to aquatic life. Lower concentrations cause greater stress. Oxygen levels that go below 1-2 mg/L for a few hours may result in large fish kills.

Biochemical Oxygen Demand (BOD₅):

Biochemical Oxygen Demand (BOD₅), also called Biological Oxygen Demand) is the amount of dissolved oxygen needed (i.e. demanded) by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period. The BOD value is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20 °C and is often used as a surrogate of the degree of organic pollution of water. BOD can be used as a gauge of the effectiveness of wastewater treatment plants. There are two commonly recognized methods for the measurement of BOD. Dilution method & Manometric method.

Chemical Oxygen Demand (COD):

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

Total Dissolved Solid (TDS):

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

Electrical Conductivity (EC):

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

Suspended Solids (SS):

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

Total Suspended Solids (TSS):

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

Chloride:

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

Alkalinity:

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

Turbidity:

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

Salinity:

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

Hardness:

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY	23
CHAPTER 1: INTRODUCTION	25
1.1 Background	25
1.2 Major objectives of the report	25
1.3 Limitation of the report	26
CHAPTER 2: AN OVERVIEW OF RIVERS OF BANGLADESH.....	27
2.1 Surface Water Sources and Rivers of Bangladesh	27
2.2 Groundwater.....	29
CHAPTER 3: METHODS FOR MEASUREMENT AND ANALYSIS OF WATER QUALITY	31
3.1 Water Quality Parameters	31
3.2 Sampling Locations.....	31
3.3 Methods of Analysis.....	31
3.4 Surface Water Monitoring Stations.....	32
CHAPTER 4: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF RIVER WATER QUALITY IN 2019.....	34
4.1 Buriganga River	34
4.2 Shitalakhya River	36
4.3 Turag River	38
4.4 Balu River	40
4.5 Dhaleshwari River.....	42
4.6 Brahmaputra Riverb	44
4.7 Kaliganga River.....	46
4.8 Jamuna River.....	47
4.9 Meghna River.....	48
4.10 Padma River	49
4.11 Korotoa River.....	50
4.12 Teesta River.....	51
4.13 Karnaphuli River	52
4.14 Halda River	53
4.15 Moyuri River.....	54
4.16 Bhairab River	56
4.17 Rupsa River.....	58
4.18 Mathavanga River	59
4.19 Pashur River	61

4.20 Khakshiali River.....	62
4.21 Gorai River.....	64
4. 22 Madhumati River.....	65
4.23 Beel Dakatia River	67
4.24 Kirtankhola River.....	68
4.25 Tatulia River.....	69
4.26 Sugandha River	71
4.28 Surma River.....	73
4.29 Kushiara River.....	74
CHAPTER 5: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF LAKE AND GROUND WATER QUALITY IN 2019	75
5.1 Water Quality Parameters of Gulshan Lake Water.....	75
5.2 Water Quality Parameters of Dhanmondi Lake	77
5.3 Water Quality Parameters of Hatir-Jheel Lake	79
5.4 Water Quality Parameters of Ground Water in Khulna District.....	81
5.5 Water Quality Parameters of Ground Water in Barisal District.....	83
5.6 Water Quality Parameters of Ground Water in Bogura District	84
5.7 Different Water Quality Parameters of Ground Water in Sylhet District	85
CHAPTER 6: TREND ANALYSIS OF WATER QUALITY OF MAJOR RIVERS	86
6.1 Buriganga River	86
6.2 Shitalakhya River	87
6.3 Turag River	88
6.4 Dhaleshwari River.....	89
6.5 Brahmaputra River	90
6.6 Halda River	91
6.7 Moyuri River	92
6.8 Surma River.....	93
6.9 Korotoa River.....	94
6.10 Mathavanga River	95
6.11 Pashur River	96
7.1 Overview of Sources of Pollution	97
7.1.1 Land Based Marine Pollution.....	97
7.1.2. Sea Based Marine Pollution	97
7.1.3. Priority Categories of Parameters, Bangladesh.....	98
7.2 Present Status of Marine Pollution.....	98
7.3 Water Quality Parateters of Sea Water	98

CHAPTER 8: TREND ANALYSIS OF LAKE WATER QUALITY.....	100
8.1 Gulshan Lake.....	100
8.2 Dhanmondi Lake	101
8.3 Hatirjheel Lake	102
CHAPTER 9: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF HOTEL, MOTEL & RESTAURANT IN 2019	103
9.1 Water Quality Parameters of Hotel, Motel & Restaurant	103
9.2 Analysis of Drinking Water Quality of Hotel, Motel & Restaurant	103
CHAPTER 10: CONCLUSION AND RECOMMENDATIONS	104
10.1 Conclusion.....	104
10.2 Recommendations	105
CHAPTER 11: REFERENCE.....	106
<i>ANNEX-1</i> 107	
<i>ANNEX-2</i> 146	
I. GULSHAN LAKE (TABLE: 206-214).....	147
II. DHANMONDI LAKE (TABLE: 215-224)	149
III. HATIR JHEEL LAKE (TABLE: 225-234)	152
<i>ANNEX-3</i> 154	
IV. GROUND WATER (DEEP TUBEWELL) IN KHULNA DISTRICT (TABLE: 235-240).....	155
V. GROUND WATER (DEEP TUBEWELL) IN BARISAL DISTRICT (TABLE: 241-246).....	161
VI. GROUND WATER (DEEP TUBEWELL) IN BOGURA DISTRICT (TABLE: 247-251).....	167
VII. GROUND WATER (DEEP TUBEWELL) IN SYLHET DISTRICT (TABLE: 252-256).....	168
<i>ANNEX-4</i> 170	
<i>ANNEX-5</i> 177	
<i>ANNEX-6</i> 179	

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 2019	108
Table-2. Level of DO (mg/l) of Buriganga River Water in 2019	108
Table-3. Level of BOD (mg/l) of Buriganga River Water in 2019	108
Table-4. Level of COD (mg/l) of Buriganga River Water in 2019	108
Table-5. Level of TDS (mg/l) of Buriganga River Water in 2019	109
Table-6. Level of Turbidity (NTU) of Buriganga River Water in 2019	109
Table-7. Level of Chloride (mg/l) of Buriganga River Water in 2019	109
Table-8. Level of SS (mg/l) of Buriganga River Water in 2019	109
Table-9. Level of Total Alkalinity (mg/l) of Buriganga River Water in 2019	110
Table-10. Level of EC ($\mu\text{mhos/cm}$) of Buriganga River Water in 2019	110
Table-11. Level of pH of Shitalakhya River Water in 2019	110
Table-12. Level of DO (mg/l) of Shitalakhya River Water in 2019	110
Table-13. Level of BOD (mg/l) of Shitalakhya River Water in 2019	111
Table-14. Level of COD (mg/l) of Shitalakhya River Water in 2019	111
Table-15. Level of TDS (mg/l) of Shitalakhya River Water in 2019	111
Table-16. Level of Chloride (mg/l) of Shitalakhya River Water in 2019	111
Table-17. Level of SS (mg/l) of Shitalakhya River Water in 2019	111
Table-18. Level of EC ($\mu\text{mhos/cm}$) of Shitalakhya River Water in 2019	111
Table-19. Level of Total Alkalinity (mg/l) of Shitalakhya River Water in 2019	112
Table-20. Level of pH of Turagh River Water in 2019	112
Table-21. Level of DO (mg/l) of Turagh River Water in 2019	112
Table-22. Level of BOD (mg/l) of Turagh River Water in 2019	112
Table-23. Level of COD (mg/l) of Turagh River Water in 2019	112
Table-24. Level of TDS (mg/l) of Turagh River Water in 2019	113
Table-25. Level of Chloride (mg/l) of Turagh River Water in 2019	113
Table-26. Level of SS (mg/l) of Turagh River Water in 2019	113
Table-27. Level of EC ($\mu\text{mhos/cm}$) of Turagh River Water in 2019	113
Table-28. Level of Total Alkalinity (mg/l) of Turagh River Water in 2019	113
Table-29. Level of pH of Balu River Water in 2019	114
Table-30. Level of DO (mg/l) of Balu River Water in 2019	114
Table-31. Level of BOD (mg/l) of Balu River Water in 2019	114
Table-32. Level of COD (mg/l) of Balu River Water in 2019	115
Table-33. Level of TDS (mg/l) of Balu River Water in 2019	115
Table-34. Level of Chloride (mg/l) of Balu River Water in 2019	115
Table-35. Level of SS (mg/l) of Balu River Water in 2019	115
Table-36. Level of EC ($\mu\text{mhos/cm}$) of Balu River Water in 2019	116
Table-37. Level of T.alkalinity (mg/l) of Balu River Water in 2019	116

Table-38. Level of Turbidity (NTU) of Balu River Water in 2019	116
Table-39. Level of pH of Dhaleshwari River Water in 2019	116
Table-40. Level of DO (mg/l) of Dhaleshwari River Water in 2019	117
Table-41. Level of BOD (mg/l) of Dhaleshwari River Water in 2019.....	117
Table-42. Level of COD (mg/l) of Dhaleshwari River Water in 2019.....	117
Table-43. Level of TDS (mg/l) of Dhaleshwari River Water in 2019.....	117
Table-44. Level of EC (1200µmohs/cm) of Dhaleshwari River Water in 2019.....	117
Table-45. Level of pH of Brahmaputra River Water in 2019.....	117
Table-46. Level of DO (mg/l) of Brahmaputra River Water in 2019.....	118
Table-47. Level of BOD (mg/l) of Brahmaputra River Water in 2019	118
Table-48. Level of TDS (mg/l) of Brahmaputra River Water in 2019.....	118
Table-49. Level of SS (mg/l) of Brahmaputra River Water in 2019	118
Table-50. Level of Chloride (mg/l) of Brahmaputra River Water in 2019.....	118
Table-51. Level of pH of Kaligonga River Water in 2019.....	118
Table-52. Level of DO (mg/l) of Kaligonga River Water in 2019	118
Table-53. Level of BOD (mg/l) of Kaligonga River Water in 2019	118
Table-54. Level of TDS (mg/l) of Kaligonga River Water in 2019	119
Table-55. Level of SS (mg/l) of Kaligonga River Water in 2019	119
Table-56. Level of Chloride (mg/l) of Kaligonga River Water in 2019.....	119
Table-57. Level of pH of Jamuna River Water in 2019	119
Table-58. Level of DO (mg/l) of Jamuna River Water in 2019	119
Table-59. Level of BOD (mg/l) of Jamuna River Water in 2019.....	120
Table-60. Level of SS of Jamuna River Water in 2019.....	120
Table-61. Level of TDS (mg/l) of Jamuna River Water in 2019.....	120
Table-62. Level of Chloride (mg/l) of Jamuna River Water in 2019	120
Table-63. Level of pH of Meghna River Water in 2019	121
Table-64. Level of DO (mg/l) of Meghna River Water in 2019.....	121
Table-65. Level of BOD (mg/l) of Meghna River Water in 2019.....	121
Table-66. Level of TDS (mg/l) of Meghna River Water in 2019.....	121
Table-67. Level of SS (mg/l) of Meghna River Water in 2019.....	121
Table-68. Level of Chloride (mg/l) of Meghna River Water in 2019	121
Table-69. Level of pH of Padma River Water in 2019.....	122
Table-70. Level of DO (mg/l) of Padma River Water in 2019.....	122
Table-71. Level of BOD (mg/l) of Padma River Water in 2019	122
Table-73. Level of SS (mg/l) of Padma River Water in 2019.....	122
Table-74. Level of EC (µmohs/cm) of Padma River Water in 2019.....	123
Table-75. Level of pH of Korotoa River Water in 2019	123
Table-76. Level of DO (mg/l) of Korotoa River Water in 2019.....	123
Table-77. Level of BOD (mg/l) of Korotoa River Water in 2019.....	123
Table-78. Level of TDS (mg/l) of Korotoa River Water in 2019.....	124

Table-79. Level of SS (mg/l) of Korotoa River Water in 2019.....	124
Table-80. Level of EC (μ mhos/cm) of Korotoa River Water in 2019.....	124
Table-81. Level of pH of Teesta River Water in 2019.....	124
Table-82. Level of DO (mg/l) of Teesta River Water in 2019.....	124
Table-83. Level of BOD (mg/l) of Teesta River Water in 2019.....	125
Table-84. Level of TDS (mg/l) of Teesta River Water in 2019.....	125
Table-85. Level of SS (mg/l) of Teesta River Water in 2019.....	125
Table-86. Level of Turbidity (NTU) of Teesta River Water in 2019.....	125
Table-87. Level of pH of Karnaphuli River Water in 2019.....	125
Table-88. Level of DO (mg/l) of Karnaphuli River Water in 2019.....	125
Table-89. Level of COD (mg/l) of Karnaphuli River Water in 2019.....	126
Table-90. Level of TDS (mg/l) of Karnaphuli River Water in 2019.....	126
Table-91. Level of SS (mg/l) of Karnaphuli River Water in 2019.....	126
Table-92. Level of EC (mg/l) of Karnaphuli River Water in 2019.....	127
Table-93. Level of pH of Halda River Water in 2019.....	127
Table-94. Level of DO (mg/l) of Halda River Water in 2019.....	127
Table-95. Level of COD (mg/l) of Halda River Water in 2019.....	127
Table-96. Level of TDS (mg/l) of Halda River Water in 2019.....	128
Table-97. Level of SS (mg/l) of Halda River Water in 2019.....	128
Table-98. Level of EC (mg/l) of Halda River Water in 2019.....	128
Table-99. Level of pH of Moyuri River Water in 2019.....	128
Table-100. Level of DO (mg/l) of Moyuri River Water in 2019.....	128
Table-101. Level of TDS (mg/l) of Moyuri River Water in 2019.....	128
Table-102. Level of Chloride (mg/l) of Moyuri River Water in 2019.....	129
Table-103. Level of Turbidity (NTU) of Moyuri River Water in 2019.....	129
Table-104. Level of SS (mg/l) of Moyuri River Water in 2019.....	129
Table-105. Level of EC (μ mhos/cm) of Moyuri River Water in 2019.....	129
Table-106. Level of Total Alkalinity (mg/l) of Moyuri River Water in 2019.....	129
Table-107. Level of pH of Bhairab River Water in 2019.....	129
Table-108. Level of DO (mg/l) of Bhairab River Water in 2019.....	130
Table-109. Level of BOD (mg/l) of Bhairab River Water in 2019.....	130
Table-110. Level of TDS (mg/l) of Bhairab River Water in 2019.....	130
Table-111. Level of Chloride (mg/l) of Bhairab River Water in 2019.....	130
Table-112. Level of Turbidity (NTU) of Bhairab River Water in 2019.....	130
Table-113. Level of EC (μ mhos/cm) of Bhairab River Water in 2019.....	131
Table-114. Level of Total Alkalinity (mg/l) of Bhairab River Water in 2019.....	131
Table-115. Level of pH of Rupsa River Water in 2019.....	131
Table-116. Level of DO (mg/l) of Rupsa River Water in 2019.....	131
Table-117. Level of BOD (mg/l) of Rupsa River Water in 2019.....	131
Table-118. Level of Chloride (mg/l) of Rupsa River Water in 2019.....	132

Table-119. Level of SS (mg/l) of Rupsa River Water in 2019	132
Table-120. Level of Turbidity (NTU) of Rupsa River Water in 2019	132
Table-121. Level of EC (μ mhos/cm) of Rupsa River Water in 2019.....	132
Table-122. Level of Total Alkalinity (mg/l) of Rupsa River Water in 2019	132
Table-123. Level of pH of Mathavanga River Water in 2019.....	133
Table-124. Level of DO (mg/l) of Mathavanga River Water in 2019	133
Table-125. Level of BOD (mg/l) of Mathavanga River Water in 2019	133
Table-126. Level of TDS (mg/l) of Mathavanga River Water in 2019	133
Table-127. Level of Chloride (mg/l) of Mathavanga River Water in 2019.....	133
Table-128. Level of Turbidity (NTU) of Mathavanga River Water in 2019.....	133
Table-129. Level of EC (μ mhos/cm) of Mathavanga River Water in 2019	134
Table-130. Level of Total Alkalinity (mg/l) of Mathavanga River Water in 2019	134
Table-131. Level of pH of Pashur River Water in 2019.....	134
Table-132 Level of DO (mg/l) of Pashur River Water in 2019.....	134
Table-133. Level of BOD (mg/l) of Pashur River Water in 2019	134
Table-134. Level of TDS (mg/l) of Pashur River Water in 2019	134
Table-135. Level of Chloride (mg/l) of Pashur River Water in 2019.....	134
Table-136. Level of Turbidity (NTU) of Pashur River Water in 2019.....	135
Table-137. Level of EC (μ mhos/cm) of Pashur River Water in 2019	135
Table-138. Level of Total Alkalinity (mg/l) of Pashur River Water in 2019	135
Table-139. Level of pH of Khakshiali River Water in 2019	135
Table-140 Level of DO (mg/l) of Khakshiali River Water in 2019	135
Table-141. Level of BOD (mg/l) of Khakshiali River Water in 2019.....	135
Table-142. Level of TDS (mg/l) of Khakshiali River Water in 2019.....	135
Table-143. Level of Chloride (mg/l) of Khakshiali River Water in 2019	136
Table-144. Level of Turbidity (NTU) of Khakshiali River Water in 2019	136
Table-145. Level of EC (μ mhos/cm) of Khakshiali River Water in 2019	136
Table-146. Level of SS (mg/l) of Khakshiali River Water in 2019.....	136
Table-147. Level of pH of Gorai River Water in 2019	136
Table-148. Level of DO (mg/l) of Gorai River Water in 2019.....	136
Table-149. Level of BOD (mg/l) of Gorai River Water in 2019.....	137
Table-150. Level of TDS (mg/l) of Gorai River Water in 2019.....	137
Table-151. Level of Chloride (mg/l) of Gorai River Water in 2019	137
Table-152. Level of Turbidity (NTU) of Gorai River Water in 2019	137
Table-153. Level of EC (μ mhos/cm) of Gorai River Water in 2019.....	137
Table-154. Level of SS (mg/l) of Gorai River Water in 2019.....	138
Table-155. Level of pH of Modhumoti River Water in 2019.....	138
Table-156. Level of DO (mg/l) of Modhumoti River Water in 2019.....	138
Table-157. Level of BOD (mg/l) of Modhumoti River Water in 2019	138
Table-158. Level of TDS (mg/l) of Modhumoti River Water in 2019	138

Table-159. Level of Chloride (mg/l) of Modhumoti River Water in 2019.....	138
Table-160. Level of Turbidity (NTU) of Modhumoti River Water in 2019.....	139
Table-161. Level of EC (μ mhos/cm) of Modhumoti River Water in 2019.....	139
Table-162. Level of SS (mg/l) of Modhumoti River Water in 2019.....	139
Table-163. Level of pH of Beel Dakatia River Water in 2019.....	139
Table-164. Level of DO (mg/l) of Beel Dakatia River Water in 2019.....	139
Table-165. Level of TDS (mg/l) of Beel Dakatia River Water in 2019.....	139
Table-166. Level of Chloride (mg/l) of Beel Dakatia River Water in 2019.....	139
Table-167. Level of Turbidity (NTU) of Beel Dakatia River Water in 2019.....	140
Table-168. Level of EC (μ mhos/cm) of Beel Dakatia River Water in 2019.....	140
Table-169. Level of SS (mg/l) of Beel Dakatia River Water in 2019.....	140
Table-170. Level of pH of Kirtankhola River Water in 2019.....	140
Table-171. Level of DO (mg/l) of Kirtankhola River Water in 2019.....	140
Table-172. Level of BOD (mg/l) of Kirtankhola River Water in 2019.....	140
Table-173. Level of TDS (mg/l) of Kirtankhola River Water in 2019.....	141
Table-174. Level of TS (mg/l) of Kirtankhola River Water in 2019.....	141
Table-175. Level of EC (μ mhos/cm) of Kirtankhola River Water in 2019.....	141
Table-176. Level of pH of Tatulia River Water in 2019.....	141
Table-177. Level of DO (mg/l) of Tatulia River Water in 2019.....	141
Table-178. Level of BOD (mg/l) of Tatulia River Water in 2019.....	141
Table-179. Level of TDS (mg/l) of Tatulia River Water in 2019.....	142
Table-180. Level of EC (μ mhos/cm) of Tatulia River Water in 2019.....	142
Table-181. Level of TS (mg/l) of Tatulia River Water in 2019.....	142
Table-182. Level of pH of Sugandha River Water in 2019.....	142
Table-183. Level of DO (mg/l) of Sugandha River Water in 2019.....	142
Table-184. Level of BOD (mg/l) of Sugandha River Water in 2019.....	142
Table-185. Level of TDS (mg/l) of Sugandha River River Water in 2019.....	142
Table-186. Level of EC (μ mhos/cm) of Sugandha River Water in 2019.....	142
Table-187. Level of TS (mg/l) of Sugandha River Water in 2019.....	143
Table-188. Level of pH of Lohalia River Water in 2019.....	143
Table-189. Level of DO (mg/l) of Lohalia River Water in 2019.....	143
Table-190. Level of BOD (mg/l) of Lohalia River Water in 2019.....	143
Table-191. Level of TDS (mg/l) of Lohalia River River Water in 2019.....	143
Table-192. Level of TS (mg/l) of Lohalia River Water in 2019.....	143
Table-193. Level of EC (μ mhos/cm) of Lohalia River Water in 2019.....	143
Table-194. Level of pH of Surma River Water in 2019.....	144
Table-195. Level of DO (mg/l) of Surma River Water in 2019.....	144
Table-196. Level of BOD (mg/l) of Surma River Water in 2019.....	144
Table-197. Level of COD (mg/l) of Surma River Water in 2019.....	144
Table-198. Level of TDS (mg/l) of Surma River Water in 2019.....	144

Table-199. Level of EC ($\mu\text{mhos/cm}$) of Surma River Water in 2019	145
Table-200. Level of pH of Kushiara River Water in 2019	145
Table-201. Level of DO (mg/l) of Kushiara River Water in 2019	145
Table-202. Level of BOD (mg/l) of Kushiara River Water in 2019.....	145
Table-203. Level of COD (mg/l) of Kushiara River Water in 2019.....	145
Table-204. Level of TDS (mg/l) of Kushiara River Water in 2019	145
Table-205. Level of EC ($\mu\text{mhos/cm}$) of Kushiara River Water in 2019	145
Table-206. Level of pH of Gulshan Lake Water in 2019	147
Table-207. Level of DO (mg/l) of Gulshan Lake Water in 2019	147
Table-207. Level of BOD (mg/l) of Gulshan Lake Water in 2019.....	147
Table-208. Level of COD (mg/l) of Gulshan Lake Water in 2019.....	147
Table-209. Level of TDS (mg/l) of Gulshan Lake Water in 2019	148
Table-210. Level of Turbidity (NTU) of Gulshan Lake Water in 2019	148
Table-211. Level of Chloride (mg/l) of Gulshan Lake Water in 2019	148
Table-212. Level of SS (mg/l) of Gulshan Lake Water in 2019.....	148
Table-213. Level of Total Alkalinity (mg/l) of Gulshan Lake Water in 2019	149
Table-214. Level of EC ($\mu\text{mhos/cm}$) of Gulshan Lake Water in 2019	149
Table-215. Level of pH of Dhanmondi Lake Water in 2019.....	149
Table-216. Level of DO (mg/l) of Dhanmondi Lake Water in 2019.....	149
Table-217. Level of BOD (mg/l) of Dhanmondi Lake Water in 2019	150
Table-218. Level of COD (mg/l) of Dhanmondi Lake Water in 2019	150
Table-219. Level of TDS (mg/l) of Dhanmondi Lake Water in 2019.....	150
Table-220. Level of Turbidity (NTU) of Dhanmondi Lake Water in 2019	150
Table-221. Level of Chloride (mg/l) of Dhanmondi Lake Water in 2019	151
Table-222. Level of SS (mg/l) of Dhanmondi Lake Water in 2019.....	151
Table-223. Level of Total Alkalinity (mg/l) of Dhanmondi Lake Water in 2019.....	151
Table-224. Level of EC ($\mu\text{mhos/cm}$) of Dhanmondi Lake Water in 2019.....	151
Table-225. Level of pH of Hatir Jheel Lake Water in 2019.....	152
Table-226. Level of DO (mg/l) of Hatir Jheel Lake Water in 2019	152
Table-227. Level of BOD (mg/l) of Hatir Jheel Lake Water in 2019.....	152
Table-228. Level of COD (mg/l) of Hatir Jheel Lake Water in 2019.....	152
Table-229. Level of TDS (mg/l) of Hatir Jheel Lake Water in 2019	152
Table-230. Level of Turbidity (NTU) of Hatir Jheel Lake Water in 2019	152
Table-231. Level of Chloride (mg/l) of Hatir Jheel Lake Water in 2019	153
Table-232. Level of SS (mg/l) of Hatir Jheel Lake Water in 2019	153
Table-233. Level of Total Alkalinity (mg/l) of Hatir Jheel Lake Water in 2019	153
Table-234. Level of EC ($\mu\text{mhos/cm}$) of Hatir Jheel Lake Water in 2019	153
Table-235. Level of pH of Ground Water at Khulna District in 2019.....	155
Table-236. Level of EC ($\mu\text{mhos/cm}$) of Ground Water at Khulna District in 2019.....	156
Table-237. Level of Chloride (mg/l) of Ground Water at Khulna District in 2019.....	157

Table-238. Level of Total Hardness (mg/l) of Ground Water at Khulna District in 2019	158
Table-239. Level of Iron (mg/l) of Ground Water at Khulna District in 2019.....	159
Table-240. Level of Salinity of Ground Water at Khulna District in 2019	160
Table-241: Level of pH of Ground Water at Barisal District in 2019.....	161
Table-242: Level of EC of Ground Water at Barisal District in 2019.....	162
Table-243: Level of TDS of Ground Water at Barisal District in 2019	163
Table-244: Level of Iron of Ground Water at Barisal District in 2019	164
Table-245: Level of Total Alkalinity of Ground Water at Barisal District in 2019	165
Table-246: Level of Total Hardness of Ground Water at Barisal District in 2019.....	166
Table-247. Level of pH of Ground Water at Bogura District in 2019.....	167
Table-248. Level of EC of Ground Water at Bogura District in 2019	167
Table-249. Level of Iron of Ground Water at Bogura District in 2019.....	167
Table-250. Level of T. Alkalinity of Ground Water at Bogura District in 2019.....	168
Table-251. Level of T. Hardness of Ground Water at Bogura District in 2019	168
Table-252. Level of pH of Ground Water at Sylhet District in 2019	168
Table-253. Level of EC of Ground Water at Sylhet District in 2019.....	168
Table-254. Level of Chloride of Ground Water at Sylhet District in 2019	169
Table-255. Level of Alkalinity of Ground Water at Sylhet District in 2019.....	169
Table-256. Level Iron of Ground Water at Sylhet District in 2019.....	169
Table-257. Trend of pH, DO and BOD of Buriganga river from 2010 to 2019.....	171
Table-258. Trend of pH, DO and BOD of Shitalakhya river from 2010 to 2019.....	171
Table-259. Trend of pH, DO and BOD of Turag river from 2010 to 2019.....	172
Table-260. Trend of pH, DO and BOD of Dhaleshwari river from 2010 to 2019.	172
Table-261. Trend of pH, DO and BOD of Brahmaputra river from 2010 to 2019.....	173
Table-262. Trend of pH, DO and BOD of Halda River from 2010 to 2019.....	173
Table-263. Trend of pH, DO and BOD of Moyuri River from 2010 to 2019.	174
Table-264. Trend of pH, DO and BOD of Surma River from 2010 to 2019.....	174
Table-265. Trend of pH, DO and BOD of Korotoa River from 2010 to 2019.	175
Table-266. Trend of pH, DO and BOD of Mathavanga River Water from 2010 to 2019.....	175
Table-267. Trend of pH, DO and BOD of Pashur River Water from 2010 to 2019.....	176
Table-268. pH Level of Sea Water in January'19 to December'19.....	178
Table-269. DO Level of Sea Water in January'19 to December'19.....	178
Table-270. TDS Level of Sea Water in January'19 to December'19.....	178
Table-271. SS Level of Sea Water in January'19 to December'19.	178
Table-272. EC Level of Sea Water in January'19 to December'19.	178
Table-273. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Barisal District in 2019	180
Table-274. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Bhola District in 2019	181
Table-275. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Bogura District in 2019	181

Table-276. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Naogaon District in 2019	181
Table-277. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Pirojpur District in 2019	182
Table-278. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Rajshahi District in 2019	182
Table-279. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Rajshahi District in 2019	182

LIST OF FIGURES

Figure-A: River System of Bangladesh (Source: BWDB, 2011).....	30
Figure-B: Location of Surface Water Monitoring Stations.....	33
Fig. 1 : Status of pH, DO, BOD, COD, TDS , Chloride, SS, T.Alkalinity, EC and Turbidity of Buriganga River in 2019	35
Fig.2: Status of pH, DO, BOD, COD, TDS , Chloride, SS, EC and T.Alakinity of Shitalakhya River in 2019.....	37
Fig.3. Status of pH, DO, BOD, COD, TDS , Turbidity, Chloride, SS, EC and T.Alkalinity of Turag River in 2019.....	39
Fig 4. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T.alkalinity and EC of Balu River in 2019.....	41
Fig.5. Status of pH, DO, BOD, COD, TDS and EC of Dhaleshwari River in 2019	43
Fig.6. Status of pH, DO, BOD, SS , Chloride, TDS, COD, EC and T.Alkalinity of Brahmaputra River in 2019.....	45
Fig.7. Status of pH, DO, BOD, COD, TDS and Chloride of Kaliganga Rriver in 2019	46
Fig.8. Status of pH, DO, BOD, SS, TDS and Chloride of Jamuna Rriver in 2019.....	47
Fig.9. Status of pH, DO, BOD, COD, TDS and Chloride of Meghna River in 2019	48
Fig.10. Status of pH, DO, BOD, TDS, EC and SS of Padma River in 2019	49
Fig.11. Status of pH, DO, BOD, TDS, SS and EC of Korotoa River in 2019	50
Fig.12. Status of pH, DO, BOD, TDS, SS and Chloride of Teesta River in 2019.....	51
Fig.13. Status of pH, DO, BOD, COD, SS and EC of Karnaphuli River in 2019	52
Fig.14. Status of pH, DO, BOD, COD, SS and EC of Halda River in 2019.....	53
Fig.15. Status of pH, DO, TDS, Chloride, Turbidity, EC , Salinity, SS and T.Alkalinity of Moyuri River in 2019.....	55
Fig.16. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC , Salinity , SS and T.alkalinity of Bhairab River in 2019	57
Fig.17. Status of pH, DO, BOD, Chloride, SS, Turbidity, EC , Salinity and SS of Rupsa River in 2019	58
Fig.18. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC , Salinity, SS and T.alkalinity of Mathavanga River in 2019	60
Fig.19. Status of pH, DO, BOD, TDS, Chloride, Turbidity, SS and EC of Pashur River in 2019	61
Fig.20. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC, Salinity, T.Alkalinity and SS of Khakshiali River in 2019.....	63
Fig.21. Status of pH, DO BOD, TDS, Chloride, Turbidity, EC and Salinity of Gorai River in 2019	64
Fig.22. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Modhumoti River in 2019.....	66
Fig.23. Status of pH, DO, TDS, Chloride, Turbidity, EC, Salinity and SS of Beel Dakatia River in 2019.....	67

Fig.24. Status of pH, DO, BOD, TDS, TS and EC of Kirtankhola River in 2019.....	69
Fig.25. Status of pH, DO, BOD, TDS, TS and SS of Tatulia River in 2019	70
Fig.26. Status of pH, DO, BOD, TDS, TS and SS of Sughanda River in 2019.....	71
Fig.27. Status of pH, DO, BOD, TDS, TS and SS of Lohalia River in 2019	72
Fig.28. Status of pH, DO, BOD, TDS, SS and COD of Surma River in 2019	73
Fig 29. Status of pH, DO, BOD, TDS, COD and SS of Kushiara River in 2019	74
Fig 30. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Gulshan Lake in 2019.....	76
Fig 31. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Dhamnondi Lake in 2019.....	78
Fig 32. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Hatir Jheel Lake in 2019.....	80
Fig 33. Status of pH, EC, Chloride, Total Hardness, Iron and Salinity of Khulna District area ground water in 2019.....	82
Fig 34. Status of pH, EC, TDS, Iron, T. alkalinity and Total Hardness of Barisal District area ground water in 2019.....	83
Fig 35. Status of pH, EC, Chloride, Iron, T. alkalinity and T. Hardness of Bogura District area ground water in 2019.....	84
Fig 36. Status of pH, EC, Chloride, T. alkalinity and Iron of Sylhet District area ground water in 2019	85
Fig 37. Trend of pH, DO and BOD of Buriganga river water from 2010 to 2019	86
Fig 38. Trend of pH, DO and BOD of Sitalakhya river water from 2010 to 2019	87
Fig 39. Trend of pH, DO and BOD of Turag river water from 2010 to 2019.....	88
Fig 40. Trend of pH, DO and BOD of Dhaleshwari river water from 2010 to 2019.....	89
Fig 41. Trend of pH, DO and BOD of Brahmaputra river water from 2010 to 2019	90
Fig 42. Trend of pH, DO and BOD of Halda river water from 2010 to 2019.....	91
Fig 43. Trend of pH, DO and BOD of Moyuri river water from 2010 to 2019	92
Fig 44. Trend of pH, DO and BOD of Surma river water from 2010 to 2019.....	93
Fig 45. Trend of pH, DO and BOD of Korotoa river water from 2010 to 2019	94
Fig 46. Trend of pH, DO and BOD of Mathavanga river water from 2010 to 2019	95
Fig 47. Trend of pH, DO and BOD of Pashur river water from 2010 to 2019	96
Fig.48: Status of pH, DO, TDS, SS, and EC of Sea Water.....	99
Fig 49. Trend of pH, DO and BOD of Gulshan Lake water from 2015 to 2020	100
Fig 50. Trend of pH, DO and BOD of Dhanmondi Lake water from 2015 to 2020.....	101
Fig 51. Trend of pH, DO and BOD of Hatirjheel Lake water from 2015 to 2020.....	102

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 distributaires, perinnial floods of riverine and deltaic flood plains and the wetlands (Haors, Baors and lakes, as a part of the *geological sinks*). They are also replenishing the sources of groundwater. The volumes of water they carry vary widely depending on the season, heavy summer rainstorms, upstream diversion of water flow and dry winter months. These sources carry a vast amount of biodiversity 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 2019, Water quality-monitoring programme of DoE covered sampling from 122 points of 29 rivers, 12 points of 3 Lakes (Gulshan, Dhanmondi and Hatir Jheel lakes) of Dhaka and 80 groundwater points of 4 districts, 4 points of marine water along the Chattagram coast 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 2019. In the Meghna River DO and BOD level were found within the EQS which varied from 3.10 mg/l to 6.90 mg/l and 2.0 mg/l to 31 mg/l, respectively. In the Jamuna River, DO and BOD levels were found from 5.6 mg/l to 7.4 mg/l and 2.0 to 3.0 mg/l, respectively. On the other hand, rivers around greater Dhaka were highly polluted specially in the first five months of 2019 in terms of DO, BOD and COD values. High levels of Turbidity (27.9 NTU), TDS (707 mg/l), BOD (34 mg/l) and COD (160 mg/l) were found in the Buriganga River from January to December in 2019. High BOD (60 mg/l), COD (224 mg/l) and Turbidity (111 NTU) was found in the Balu 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 (8150 mg/l) and TDS (14460

mg/l) were also very high in the Pashur River. Highest value of Turbidity (129.3 NTU) and EC (32850 $\mu\text{mhos/cm}$) was found in the Kakshiali River. High COD (1490 mg/l) and Salinity (20.3 ppt) was found in the Karnapuli 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 Eighty (80) 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 2019.

This report also included a trend of quality of water of 11 rivers from 2010 to 2019. The trend showed that the quality of Dhaleshwari and Korotoa river had been decreased after 2011. The DO of Burigonga, Shitalakhya, Turag and Moyuri (near khulna city) river was below the EQS (≥ 5 mg/l) and did not improve in last eight years.

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.

1.1 Background

Water is essential not only for survival of human-beings, but also for animals, plants and all other living beings. Monitoring water quality is one of the vital responsibilities of the Department of Environment (DoE). According to the clause 18,A of the Constitution of Bangladesh “The state shall endeavor to protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetlands, forests and wild life for the present and future citizens”. As a part of that responsibility the 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), 1997. The monitoring of water quality includes and identifies part of diagnosis of functionality of the aquatic ecosystem of rivers and other surface water sources. Also, it would help evaluating effectiveness of the pollution control measures.

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

DoE has established a monitoring network. Following this network for surface water quality, DoE collect surface water samples for laboratory analyses. Samples are collected on monthly basis from selected sampling points of rivers under the monitoring network. In 2019, the monitoring program covered sampling of 122 points of 29 rivers, 12 points of 3 Lakes (Gulshan, Dhanmondi and Hatir Jheel lakes) of Dhaka and 80 points (Khulna Dist.-30 points, Barisal Dist.-35 points Stations, Sylhet Dist.-05 points, Bogura Dist.-10 points) of ground water of 4 districts, 4 points of marine water in Bangladesh.

In 2019, the monitoring program covered sampling of 101 points/stations of 07 district (Barisal Dist.-30 points, Bhola Dist.-15 points, Bogura Dist.-10 points, Naogaon Dist.-10 points, Pirojpur Dist.-16 points, Rajshahi Dist.-10 points, Rangour Dist.-10 points) in the month of January and February for analysis of drinking water quality.

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 2019. The limitations of the report are:

- In some cases, data on all the parameters as per ECR 1997, for the entire period of the year could not be furnished with this report because of non-availability of data for certain parameters in some months of the year.
- This report does not include information on microbiological parameters and biological indicators. Data on weather conditions of the sampling locations at the time of sampling were unavailable.
- This report does not cover all the sources of surface water and all rivers.

CHAPTER 2: AN OVERVIEW OF RIVERS OF BANGLADESH

2.1 Surface Water Sources and Rivers of Bangladesh

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

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

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

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

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

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

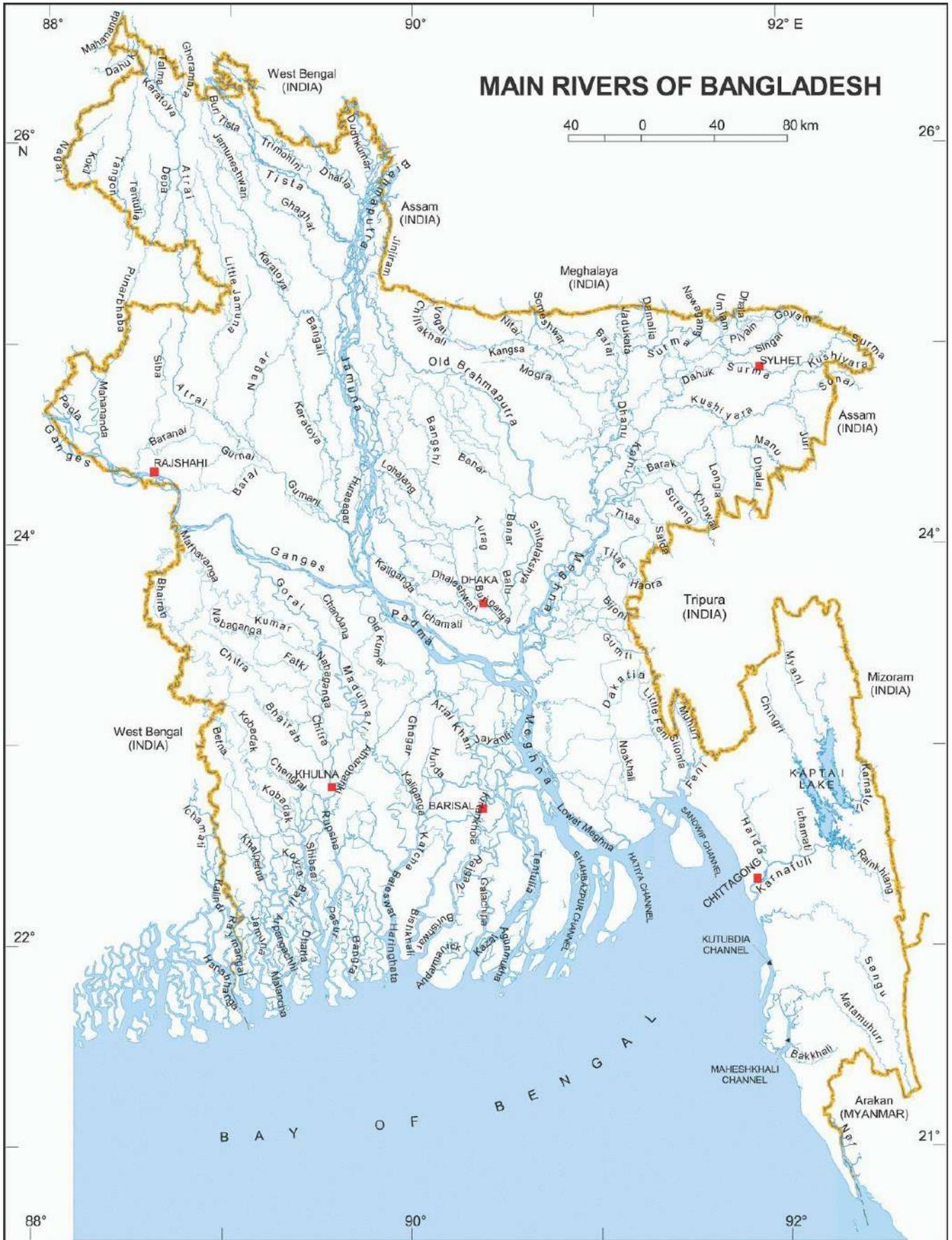


Figure-A: River System of Bangladesh (Source: BWDB, 2011)

CHAPTER 3: METHODS FOR MEASUREMENT AND ANALYSIS OF WATER QUALITY

3.1 Water Quality Parameters

Water quality monitoring can help researchers to predict and learn from natural processes at the environment and determine human impacts on an ecosystem. The measurement efforts of the quality can assist in restoration projects or ensure environmental standards are being met. Water has physical, chemical and biological properties. Physical properties of water quality include temperature and turbidity. Chemical characteristics involve parameters such as pH and dissolved oxygen. Biological indicators of water quality include algae and phytoplankton. These parameters are relevant not only to surface water studies of the ocean, lakes and rivers, also to studies of groundwater and monitoring the industrial processes as well.

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

3.2 Sampling Locations

In 2019, the monitoring program covered sampling of 122 points of 29 rivers, 12 points of 03 Lakes (Gulshan, Dhanmondi and Hatir Jheel lakes) of Dhaka and 80 stations (Khulna Dist.-30 points, Barisal Dist.-35 points Stations, Sylhet Dist.-05 points, Bogura Dist.-10 points) of 4 districts, 04 points of sea water in Bangladesh (Figure B).

In 2019, the monitoring program covered sampling of 101 points/stations of 07 district (Barisal Dist.-30 points, Bhola Dist.-15 points, Bogura Dist.-10 points, Naogaon Dist.-10 points, Pirojpur Dist.-16 points, Rajshahi Dist.-10 points, Rangour Dist.-10 points) in the month of January and February for analysis of drinking water quality.

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 ₅)	Dilution Method
Chemical Oxygen Demand (COD)	Closed Reflux Colorimetric Method
Total Dissolved Solid (TDS)	Gravimetric Method
Suspended Solid (SS)	Gravimetric Method
Chloride	Argentometric Method
Temperature	Thermometer
Turbidity	Nephelometric Method
pH	Standard method/Using Electrode
EC	Standard method
Total Alkalinity	Standard method/ Titrimetric Method
Salinity	Using Electrode

3.4 Surface Water Monitoring Stations

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

Sl	River Name	Monitoring Stations	No. of Stations
1	Buriganga	Mirpur Bridge, Hazaribagh, Kamrangir Char, Chandni Ghat, Sadar Ghat, Dholaikhal, Pagla, Bangladesh China Friendship Bridge	08
2	Shitalakhya	Near ACI Factory, Demra Ghat, Ghorashal Fertilizer Factory, Near Kachpur Bridge	04
3	Turag	Gabtoli Bridge, Mirpur BIWTA Landing Station, Ashulia BIWTA Landing Station, Tongi Istima Mat and North Side of Tongi Bridge	05
4	Balu	Near Jaber & Jubair Fabrics Ltd., Near Hossain Dyeing Ltd., Near Damra University College, Near Balu Bridge, 300 feet Road, Near Fulpukuria Dyeing Ltd. Pagar, Tongi.	05
5	Dhaleshwari	200m up of CETP, Dropping Point of CETP, 200m Down of CETP	03
6	Brahmaputra	Mymensingh	01
7	Kaliganga	Veuta Ghat, Manikgonj	01
8	Jamuna	Bahadurabad Ghat, Near Jamuna Fertilizer Factory, Fulchari Ghat, Gibanda (UP & Down Steam), Shariakandi Groin Badth, Bogra (UP & Down Steam), Near Bangabandhu Bridge (UP & Down Steam).	08
9	Meghna	Bhairob Bazar, Meghna Ghat and Shahajalal Paper Mills	03
10	Padma	Mawa Ghat, Shimulia Ghat, Pakshi Ghat (Up and Down Steam), Pabna and Baro Kuti Ghat (Up and Down Steam), Rajshahi.	06
11	Korotoa	Near Fateh Ali Bridge (Up and Down Steam), Near Dutta Bari Bridge (Up and Down Steam), Near Matidali Bridge (Up and Down Steam), Near S.P Bridge (Up and Down Steam) and Shahjadpur (Up and Down Steam).	10
12	Teesta	Tista Bridge (Up Stream and Down stream)	02
13	Karnaphuli	CUFL Side Anowara, TSP Side, Patenga , Karnafully River Chaktai Khal, ctg, Karnafully Mohona, 1km Straight from patenga sea beach, Patenga charpara, 1km Straight from CEPZ, Vattiyari shipyard	08
14	Halda	Mohona, Khandakiya Khal, Madari Khal, Katakhal Khal, Krishna Khal	05
15	Moyuri	Gallamari Bridge (Bank, Middle and Oposite)	03
16	Bhairab	Noapara Ghat (Bank, Middle and Oposite), Fultala Ghat (Bank, Middle and Oposite)	06
17	Rupsa	Rupsa Ghat (Bank, Middle and Oposite), Labanchara Ghat (Bank, Middle and Oposite)	06
18	Mathavanga	Pipeghat (200M Upstream, Downstream and Middle Stream), Darshana.	03
19	Passur	Mongla Port (Bank, Middle and Oposite)	03
20	Kankshiali	Kaliganj (Bank, Middle and Oposite), Satkhira	03
21	Gorai	Kamarkhali Ghat (Bank, Middle and Oposite), Kustia and Magura Bank, Middle and Oposite)	06
22	Modhumoti	Mollarhat (Bank, Middle and Oposite), Bagarhat.	03
23	Beel Dakatia	Khulna (Bank and Middle)	02
24	Kirtankhola	Launch ghat (Bank and Middle), Dopdopia Kheyaghat (Bank and Middle), Beltola Fery Gaht (Bank and Middle)	06
25	Tetulia	Vedhoria Feri Ghat (Bank and Middle), Bhola.	02
26	Sugandha	Jhalkathi Launch Ghat (Bank and Middle)	02
27	Lohalia	Patuakhali Launch Ghat, (Bank and Middle)	02
28	Surma	Mendibag Point, Kin Bridge, Shak Ghat, Chattak and Kazi Bazaar	05
29	Kushiara	Kushiara Point	01

Map of Existing Monitoring Station of DoE

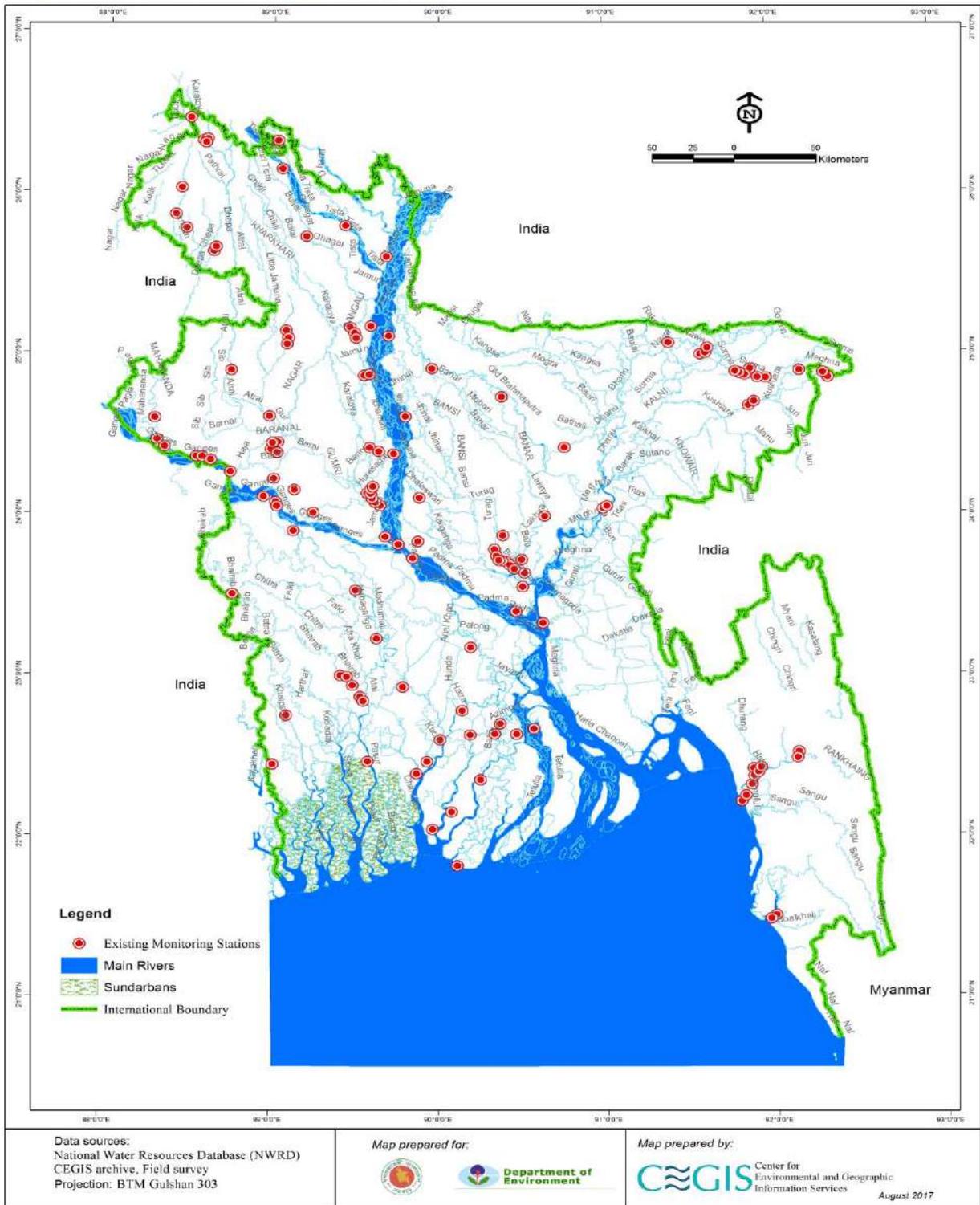


Figure-B: Location of Surface Water Monitoring Stations

CHAPTER 4: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF RIVER WATER QUALITY IN 2019

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 eight different locations viz. Mirpur Bridge (M.B), Hazaribag (Hg), Kamrangir Char (K.C), Chadni Ghat (C.G), Sadar Ghat (S.G), Dholaikhal (DL), Bangladesh China Friendship Bridge (B.C.F.B) and Pagla (Pa) along the river. Detail data is attached Annex-1 (Table: 1-10).

In 2019, standard pH range for inland surface water for fisheries is 6.5 to 8.5. The maximum pH was 8.31 in April and the minimum 6.71 in July (Fig.1a). In 2018, pH range varied from 6.49 to 8.81. In 2019, the maximum DO (5.0 mg/l) in September and the minimum (0.2 mg/l) in April & June (Fig.1b). In 2018, DO range varied from 0.0 mg/l to 5.28 mg/l. In 2019, BOD of Buriganga river water was higher than EQS (≤ 6 mg/l). In 2019, The maximum BOD (34 mg/l) in March at Dholaikhal and the minimum (0.6 mg/l) in September at Mirpur Bridge (Fig.1c). In 2018, BOD range varied from 1.0 mg/l to 24.0 mg/l. In 2019, COD level was mostly below the EQS (200 mg/l) set for industrial waste water after treatment. The maximum and the minimum COD concentration of Buriganga river was 160 mg/l in May at Pagla and 2.4 mg/l in November at Dholaikhal point (Fig.1d). In 2018, COD range varied from 9.0 mg/l to 91.0 mg/l. In 2019, The maximum and the minimum TDS was 707 and 67.3 mg/l (Fig.1e). The EQS of 2100 mg/l for industrial wastewater after treatment. In 2018, TDS range varied from 37.1 mg/l to 695 mg/l.

In 2019, Chloride concentration of the Buriganga river was below the EQS for industrial wastewater after treatment. The maximum concentration was 94 mg/l in March at Sadar Ghat and the minimum 10 mg/l in September at Sadar Ghat and Kamrangir Char point (Fig.1f). In 2018, Chloride range varied from 8.0 mg/l to 73 mg/l. In 2019, SS of Buriganga river water at different locations was below the EQS (150 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum SS was 183 mg/l in March and the minimum 4 mg/l in September at Chadni Ghat (Fig.1g). In 2018, SS range varied from 10.0 mg/l to 166 mg/l. In 2019, the maximum and the minimum Total Alkalinity of Buriganga river water was 614 mg/l in April at B.C.F.B point and 19 mg/l in October at Mirpur Bridge (Fig.1h). In 2018, Total Alkalinity range varied from 34 mg/l to 410 mg/l. In 2019, the maximum EC of Buriganga river water is 1124 $\mu\text{mhos/cm}$ in March at Dholaikhal Point and the minimum 151.6 $\mu\text{mhos/cm}$ in September at Mirpur Bridge (Fig.1i). In 2018, EC range varied from 88.7 $\mu\text{mhos/cm}$ to 1043 $\mu\text{mhos/cm}$. In 2019, the maximum and the minimum Turbidity of Buriganga river water was 27.9 NTU in May at Pagla and 4.31 NTU in July at B.C.F.B point while EQS is 10 NTU (Fig.1j). In 2018, Turbidity range varied from 3.42 NTU to 154 NTU.

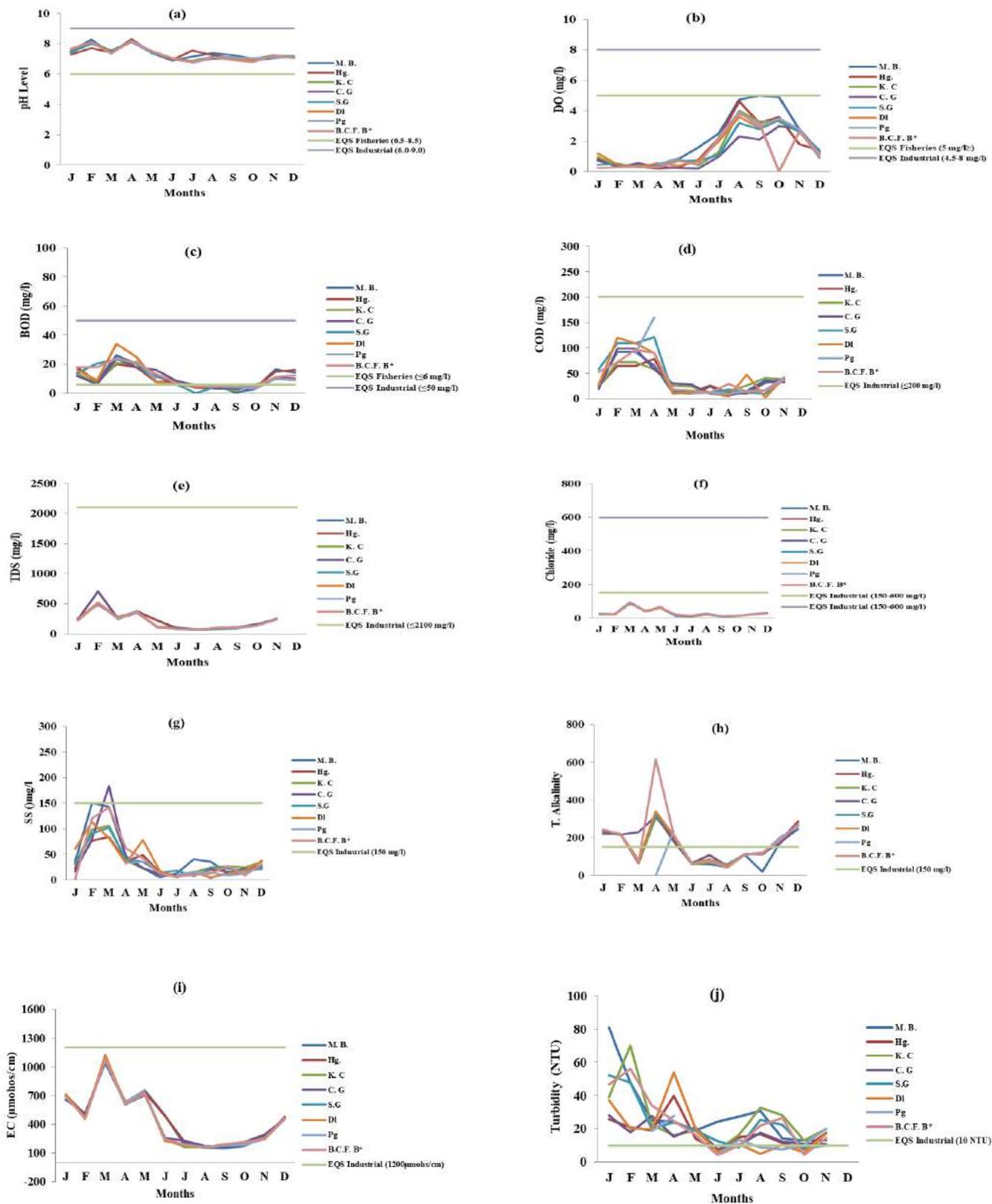


Fig. 1 : Status of pH, DO, BOD, COD, TDS , Chloride, SS, T. Alkalinity, EC and Turbidity of Buriganga River in 2019

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. Demra Ghat (D.G), Ghorasal Fertilizer Factory (G.F.F), Near Kanchpur Bridge (N.K.B) and near ACI Factory at Narayanganj. Detail data is attached Annex-1 (Table:11-19).

In 2019, pH of Shitalakhya river water was within the EQS (6.5-8.5) range for inland surface water. The maximum pH was 7.92 in August and the minimum pH was 3.32 in December (Fig.2a). In 2018, pH range varied from 6.61 to 8.66. In 2019, the maximum DO (6.5 mg/l) in March at G.F.F point and the minimum (0.6 mg/l) in February at Demra Ghat point (Fig.2b). In 2018, DO range varied from 1.0 mg/l to 6.2 mg/l. In 2019, Highest value of BOD (30 mg/l) in February at Demra Ghat point and lowest (0.4 mg/l) in October G.F.F point (Fig.2c). In 2018, BOD range varied from 1.4 mg/l to 24.6 mg/l. In 2019, COD level was within the EQS (200 mg/l) for wastewater after treatment from industrial units at all locations of Shitalakhya river. In 2019, The maximum COD (112 mg/l) in February at at Demra Ghat point and the minimum COD (8.0 mg/l) in July at G.F.F point (Fig.2d). In 2018, COD range varied from 8.4 mg/l to 118 mg/l. In 2019, TDS of Shitalakhya river water EQS (2100 mg/l) for wastewater after treatment from industrial units. In 2019, maximum TDS (436 mg/l) in February and the minimum (56.7 mg/l) in July at G.F.F point (Fig.2e). In 2018, TDS range varied from 37.4 mg/l to 411 mg/l. In 2019, Chloride concentration of the Shitalakhya river water was below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 121 mg/l May at near ACI Factory and the minimum is 5.0 mg/l in July G.F.F point (Fig.2f). In 2018, Chloride range varied from 7 mg/l to 70 mg/l. In 2019, SS of Shitalakhya river water at different sampling locations is within the EQS (150 mg/l). In 2019, Maximum SS concentration of Shitalakhya river was 187 mg/l in October at Demra Ghat and the minimum is 1.0 mg/l in June at near ACI Factory and N.K.B point (Fig.2g). In 2018, SS range varied from 19 mg/l to 86 mg/l. In 2019, EC of Shitalakhya river at different locations was mostly within the EQS (1200 μ mhos/cm) for treated wastewater from industrial units (Fig.2h).The maximum EC (827 μ mhos/cm) in February at G.F.F and K.B point and the minimum EC (108.6 μ mho/cm) in July at G.F.F point. In 2018, EC range varied from 86 μ mhos/cm to 809 μ mhos/cm. In 2019, Maximum Total Alkalinity (221 mg/l) in February at G.F.F and N.K.B point and minimum was (24 mg/l) in May at G.F.F point (Fig.2i). In 2018, Total Alkalinity range varied from 36 mg/l to 322 mg/l.

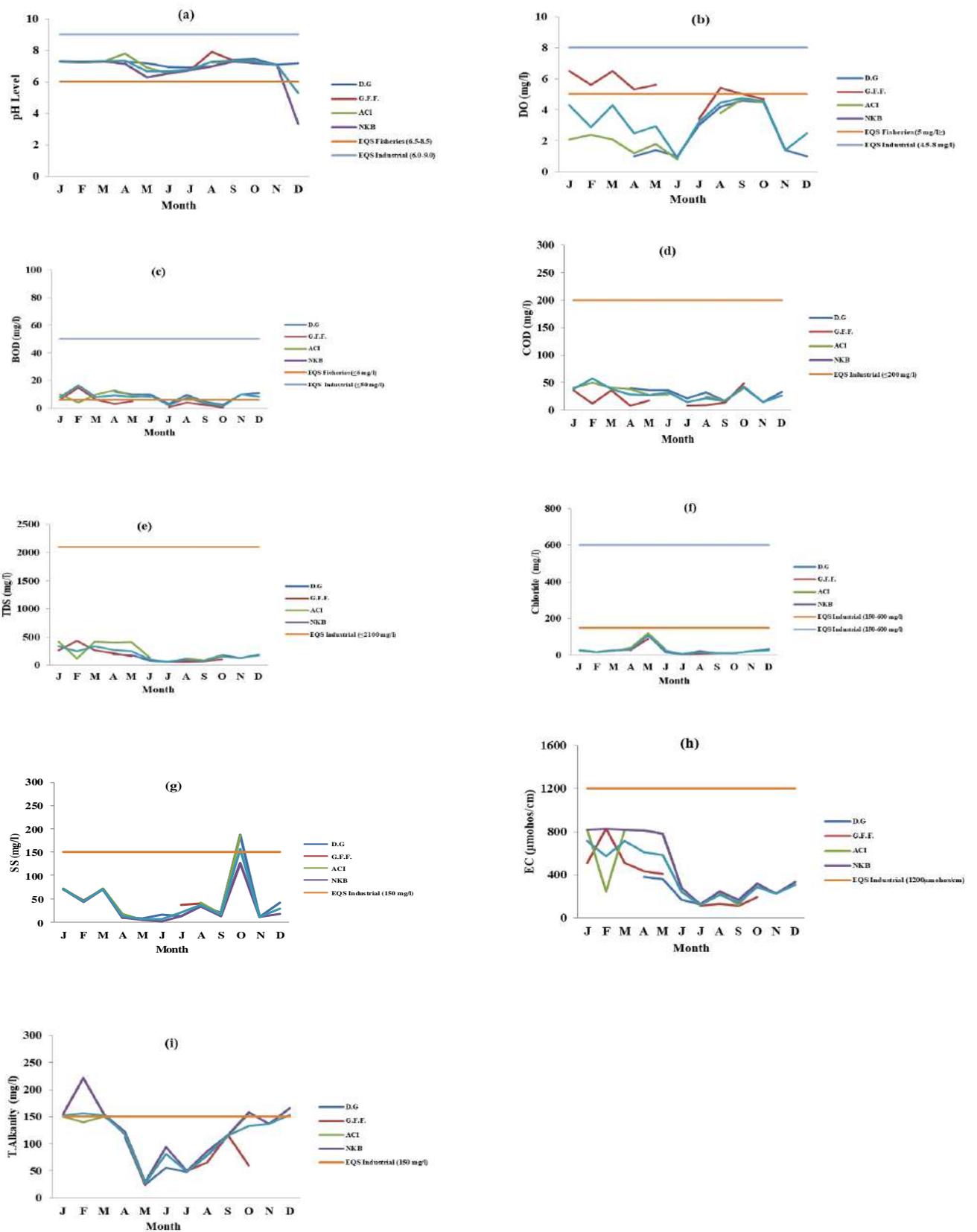


Fig.2: Status of pH, DO, BOD, COD, TDS , Chloride, SS, EC and T. Alakinity of Shitalakhya River in 2019

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 2019, water samples were collected from five locations such as New Gabtoli Bridge (N.G.B), Mirpur Diabary BIWTA Landing Station (M.D.L.S), Ashulia BIWTA Landing Station (A.L.S), Tongi Istima Mat and (T.I.M), North Side of Tongi Bridge (N.S.T.B). Data was not available for the month of March. Detail data is attached Annex-1 (Table: 20-28).

In 2019, the pH of Turag river was within EQS (6.5 -8.5). The maximum pH 8.39 in January and the minimum pH 6.75 in September (Fig.3a). In 2018, pH range varied from 6.99 to 8.48. In 2019, The maximum DO (6.2 mg/l) in August at N.S.T.B point and the minimum DO (0.0) mg/l in April and December (Fig.3b). In 2018, DO range varied from 0 mg/l to 6.32 mg/l. In 2019, The maximum BOD was 62.4 mg/l in April at T.I.M point and the minimum is 0.6 mg/l in August at N.G.B point (Fig.3c). In 2018, BOD varied from 2.2 mg/l to 86 mg/l. COD at almost all locations of Turag river was below the EQS (200 mg/l) for waste water after treatment from industrial units. In 2019, The maximum and the minimum COD content of Turag river water was 238 mg/l in May at M.D.L.S point and 8 mg/l in August at A.L.S point (Fig.3d). In 2018, COD range varied from 10 mg/l to 241 mg/l. TDS was below the EQS (2100 mg/l) for wastewater after treatment from industrial units (Fig.3e) at all the sampling points. In 2019, The maximum TDS was 457 mg/l in April at M.D.L.S and minimum was 61 in August at N.G.B point. In 2018, TDS range varied from 35.4 mg/l to 746 mg/l. In 2019, The maximum Turbidity was 111 NTU in December at N.G.B and minimum was 0.05 in May at M.D.L.S point (Fig.3f). In 2019, Chloride content of Turag river water was below the EQS (600 mg/l). In 2019, The maximum Chloride was (99 mg/l) in May at M.D.L.S and the minimum Chloride was (6.0 mg/l) in July at A.L.S (Fig.3g). In 2018, Chloride range varied from 5 mg/l to 83 mg/l. In 2019, The maximum SS (179 mg/l) in April at T.I.M and N.S.T.B point and the minimum (1.0 mg/l) in September at M.D.L.S (Fig.3h). In 2018, SS range varied from 12 mg/l to 159 mg/l. The maximum EC (954 μ hos/cm) in April at M.D.L.S and the minimum (125.3 μ hos/cm) in July at T.I.M point (Fig.3i). In 2018, EC range varied from 83.6 μ hos/cm to 1418 μ hos/cm. In 2019, The maximum Total Alkalinity (274 mg/l) in January at M.D.L.S and the minimum (42 mg/l) in August A.L.S point (Fig.3j). In 2018, Total Alkalinity range varied from 36 mg/l to 368 mg/l.

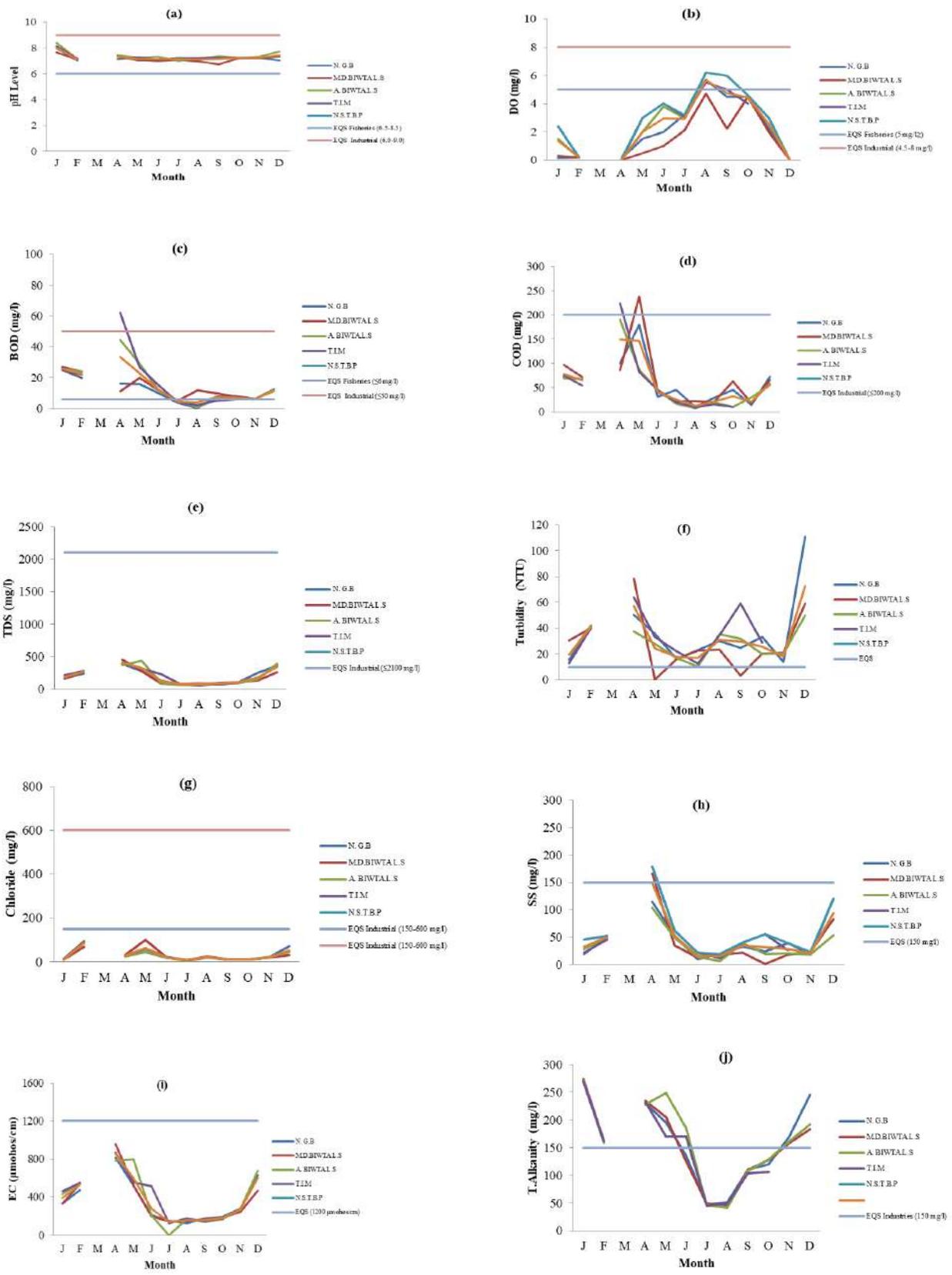


Fig.3. Status of pH, DO, BOD, COD, TDS , Turbidity, Chloride, SS, EC and T.Alkalinity of Turag River in 2019

4.4 Balu River

The Balu river runs mainly through the extensive swamps of Beel Belai and those east of Dhaka, joining the Shitalakshya near demra. It has a narrow connection through the Suti Nadi near kapasia with the Shitalakshya, and also by way of the Tongi Khal with the turag; there is also a link with the Shitalakshya near kaliganj. Although it carries floodwater from the Shitalakshya and the Turag during the flood season, the Balu is of importance mainly for local drainage and access by small boats. [Sifatul Quader Chowdhury]. To monitor water quality in 2019, water samples were collected from Five locations such as Near Jaber & Jubair Fabrics Ltd. Tongi (N.J&J F.L), Near Hossain Dyeing Ltd. Pagar, Tongi (N.H.D.L), Near Damra University College, Demra, Dhaka (N.D.U.C.D), Near Balu Bridge, 300 feet Road, Dhaka (N.B.B.D), Near Fulpukuria Dyeing Ltd. Pagar, Tongi (N.F.D.L). Detail data is attached Annex-1 (Table: 29-38).

In 2019, the pH of Balu river was within EQS (6.5 -8.5). The maximum pH 8.5 in January and the minimum pH 6.73 in July (Fig.4a). In 2018, pH range varied from 6.89 to 8.43. In 2019, The maximum DO (5.3 mg/l) in August at N.H.D.L point at and the minimum DO (0.0) mg/l (Fig.4b). In 2018, DO range varied from 0.0 mg/l to 5.6 mg/l. In 2019, the maximum BOD was 60 mg/l in April at N.B.B.D and the minimum was 4.2 mg/l in August at N.J&J F.L point (Fig.4c). In 2018, BOD range varied from 1.0 mg/l to 72 mg/l. In 2019, COD of Balu river was over the EQS (200 mg/l). In 2019, The maximum COD content of Balu river water was 224 mg/l in April at N.F.D.L & N.F.D.L and the minimum COD content 17 mg/l in October at N.H.D.L point (Fig.4d). In 2018, COD range varied from 10 mg/l to 228 mg/l. TDS was below the EQS (2100 mg/l) for wastewater after treatment from industrial units (Fig.4e) at all the sampling points. In 2019, The maximum TDS was 1089 mg/l in April at N.B.B.D point while that of minimum was 75.1 in July at N.D.U.C.D pint. In 2018, TDS range varied from 41.3 mg/l to 860 mg/l. In 2019, the maximum Turbidity of Balu river was (111 NTU) in December at N.J&J F.L and the minimum (7.54 NTU) in July at N.H.D.L point(Fig.4f). In 2018, Turbidity range varied from 7.34 NTU to 166 NTU. In 2019, The maximum Chloride was (115 mg/l) found in April and the minimum Chloride was (7.0 mg/l) in July at N.B.B.D point (Fig.4g). In 2018, Chloride range varied from 7.0 mg/l to 130 mg/l. In 2019, The maximum SS 390 mg/l April at N.B.B.D and the minimum 5.0 mg/l in July at N.H.D.L (Fig.4h). In 2018, SS range varied from 10 mg/l to 166 mg/l. In 2019, the maximum Total Alkalinity (365 mg/l) in April at N.D.U.C.D point and the minimum (51 mg/l) in July at N.B.B.D (Fig.4i). In 2018, Total Alkalinity range varied from 52 mg/l to 420 mg/l. In 2019, The maximum EC (2165 μ mhos/cm) in April at N.B.B.D and the minimum (144 μ mhos/cm) in July at N.D.U.C.D point (Fig.4j). In 2018, EC range varied from 120 μ mhos/cm to 1501 μ mhos/cm.

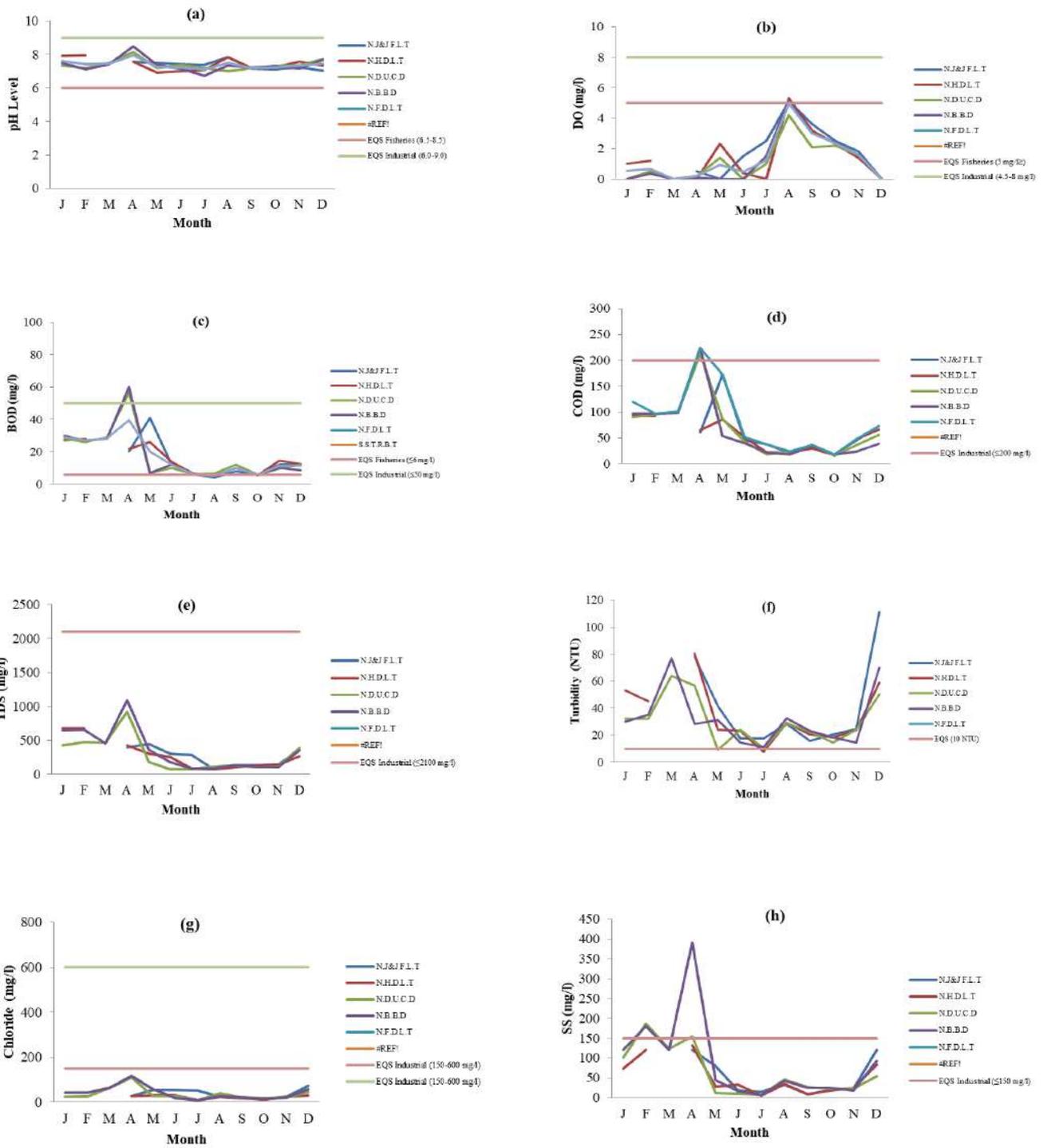


Fig 4. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T.alkalinity and EC of Balu River in 2019

4.5 Dhaleshwari River

The Dhaleshwari river is a 160 km long distributary of the Jamuna river flowing through central part of Bangladesh. Dhaleswari River is an important branch river Brahmaputra-Jamuna River. It starts off Brahmaputra-Jamuna River at Kalihati Upazila of Tangail District and finally meets with Meghna (Upper) River at Gazaria Upazila of Munshiganj District. (Source: Bangladesh Water Development Board 2011, Department of Bangladesh Haor & Wetlands Development 2016).

In 2019, water samples were collected from Three locations namely 200m up point of CETP, Dropping Point of CETP, 200m Down of CETP for analyses. Data was not available in the months of January to July. Detail data is attached Annex-1 (Table: 39-44).

In 2019, Dhaleshwari river water maximum pH 7.46 and minimum 6.94 (Fig.5a). In 2018, pH range varied from 6.55 mg/l to 8.27 mg/l. In 2019, the maximum DO concentration (5.6 mg/l) in September and the minimum (2.2 mg/l) in November at up of CETP point (Fig.5b). In 2018, DO range varied from 0.0 mg/l to 6.83 mg/l. In 2019, The maximum BOD was 12.6 mg/l in November at Dropping Point of CETP and the minimum BOD was 0.9 mg/l in August at Up Point of CETP (Fig.5c). In 2018, BOD range varied from 2.0 mg/l to 7.9 mg/l. Level of COD of Dhaleshwari river water was within the EQS. In 2019, The maximum COD of Dhaleshwari river water 46 mg/l in November at Dropping Point of CETP and the minimum was 10 mg/l in November and September at up and down point of CETP (Fig.5d) against the EQS (200 mg/l) for wastewater after treatment from industrial units. In 2018, COD range varied from 5.0 mg/l to 187 mg/l. In 2019, TDS while standard level was 2100 mg/l for wastewater after treatment from industrial units. In 2019, The maximum TDS 421 mg/l in November at Dropping Point of CETP and the minimum TDS was 73.7 mg/l in August at Down Point of CETP (Fig.5e). In 2018, TDS range varied from 78.8 mg/l to 3430 mg/l. In 2019, Electrical Conductivity (EC) of Dhaleshwari river water at different locations was mostly within the EQS (1200 μ mhos/cm). In 2019, The maximum and the minimum EC of Dhaleshwari river water was 786 μ mhos/cm in November at Dropping Point of CETP and 159.4 μ mhos/cm in August at Down Point of CETP (Fig.5f). In 2018, DO range varied from 152 μ mhos/cm to 7370 μ mhos/cm.

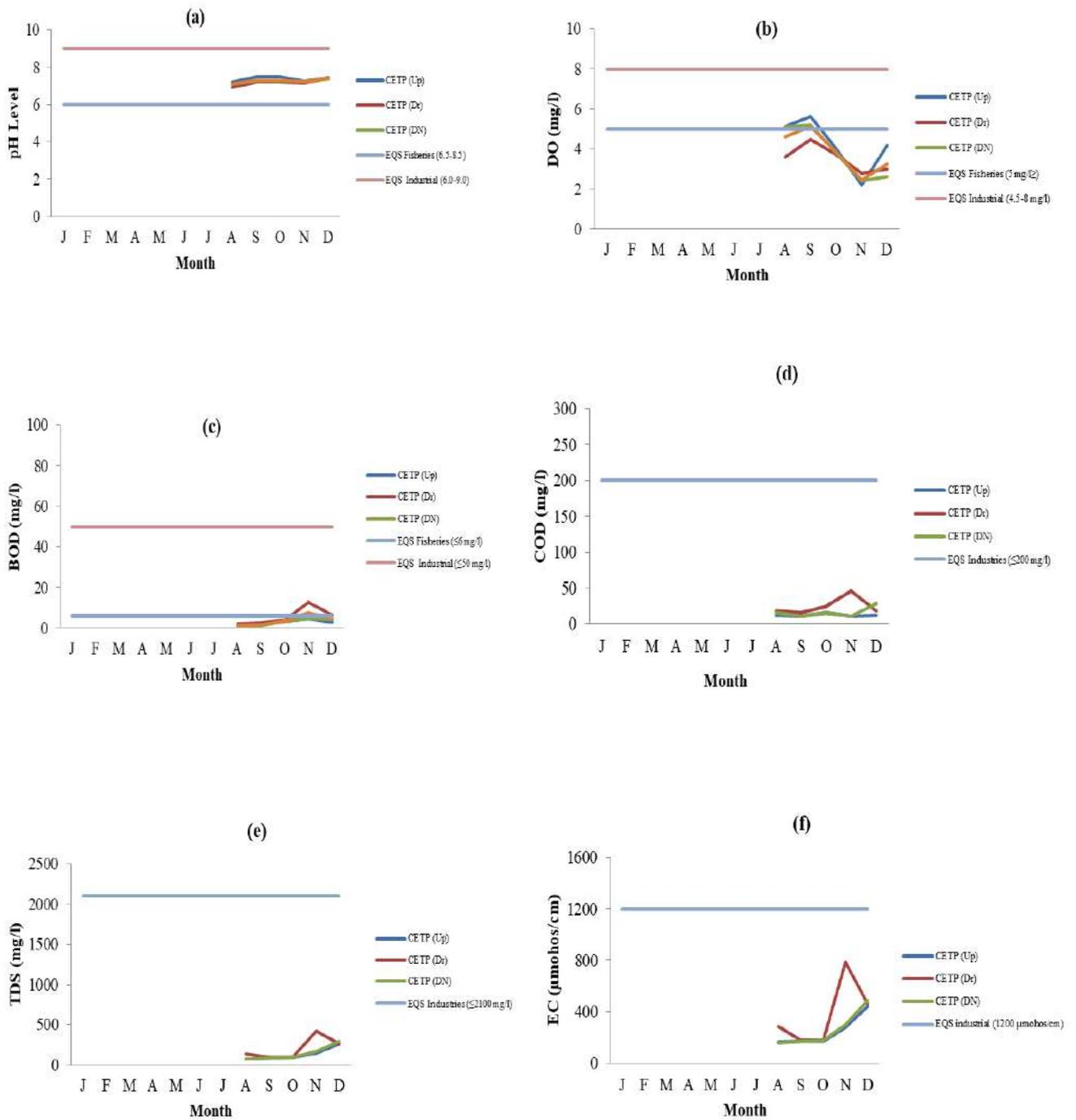


Fig.5. Status of pH, DO, BOD, COD, TDS and EC of Dhaleshwari River in 2019

4.6 Brahmaputra River

Brahmaputra river originates from mount kailash of the Himalay. After flowing past Chilmari, Bangladesh, it is joined on its right bank by the Tista River and then follows south as the Jamuna River. South of Gaibanda, the Brahmaputra leaves the left bank of the mainstream and flows past Jamalpur and Mymensingh to join the Meghna River at Bhairab Bazar (Source: Bangladesh Water Development Board 2011, Department of Bangladesh Haor & Wetlands Development 2016). For monitoring of water quality, water samples were collected from one location (e.g. Mymensingh) of the river. Data was not available for the months of January to March, July, September - October and December of the river. Detail data is attached Annex-1 (Table: 45-50).

In 2019, Brahmaputra river water pH level Maximum 8.25 in July and minimum 7.62 November (Fig.6a), while standard range for fisheries was 6.5 to 8.5. In 2018, pH range varied from 7.47 mg/l to 8.34 mg/l. In 2019, The highest and the lowest DO was 7.3 mg/l in May and 5.8 mg/l on November (Fig.6b), while EQS for DO for fisheries was ≥ 5 mg/l. In 2018, DO range varied from 5.9 mg/l to 6.61 mg/l. In 2019, Maximum BOD was 3.1 (mg/l) in August and minimum was 1.8 (mg/l) in June (Fig.6c) while EQS for fisheries is ≤ 6 mg/l. In 2018, BOD range varied from 2.0 mg/l to 2.6 mg/l. In 2019, Maximum SS level was 125(mg/l) in June and minimum is 23 (mg/l) in August & November (Fig.6d). In 2018, SS range varied from 21 mg/l to 45 mg/l. In 2019, Maximum Chloride level was 37 (mg/l) in May and minimum was 7 (mg/l) in June (Fig.6e) and which was less than EQS (600 mg/l) for treated wastewater from industrial units. In 2018, Chloride range varied from 10 mg/l to 12 mg/l. In 2019, The highest and the lowest TDS was 153 mg/l in April and 45.3 mg/l in June (Fig.6f), within the EQS (2100 mg/l). In 2018, TDS range varied from 44.4 mg/l to 210 mg/l. In 2019, The highest and the lowest COD was 46 mg/l in June and 10 mg/l on August & November (Fig.6g). Electrical Conductivity (EC) of Brahmaputra river water at different locations was mostly within the EQS (1200 μ mhos/cm). In 2019, The maximum and the minimum EC of Brahmaputra river water was 390 μ mhos/cm in May and 86.5 μ mhos/cm in June (Fig.6h). In 2019, Maximum T.Alkalinity level was 121 (mg/l) in May and minimum is 39 (mg/l) in June (Fig.6i).

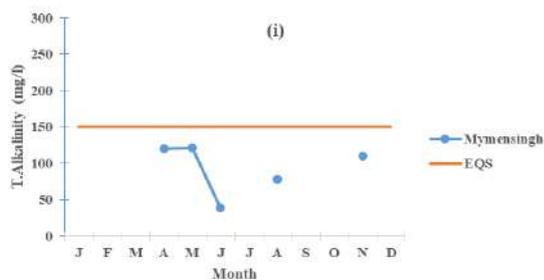
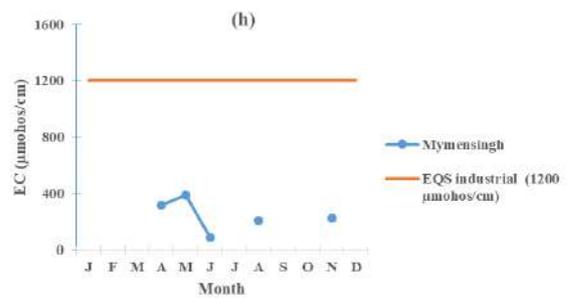
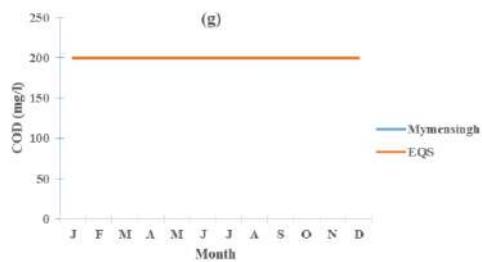
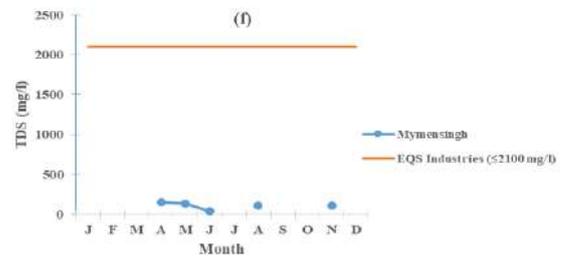
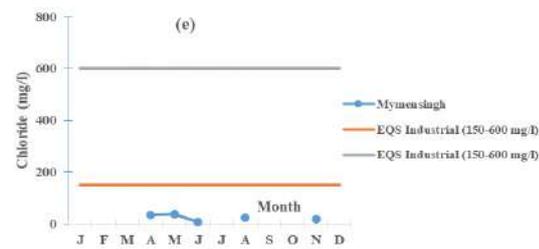
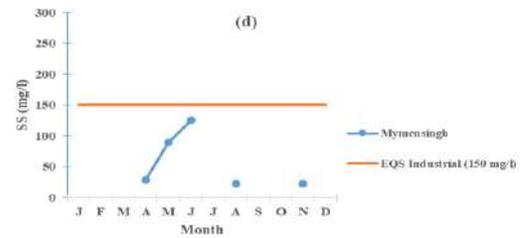
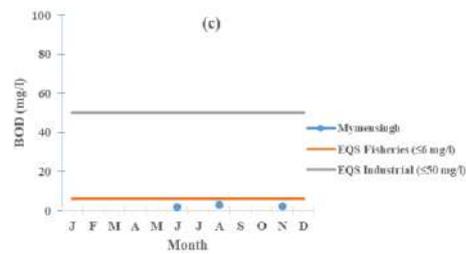
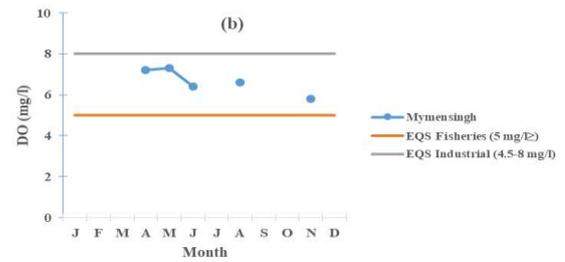
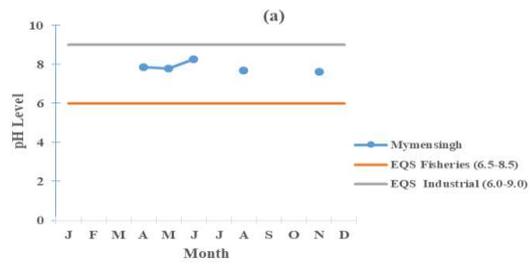


Fig.6. Status of pH, DO, BOD, SS , Chloride, TDS, COD, EC and T.Alkalinity of Brahmaputra River in 2019

4.7 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. Detail data is attached Annex-1(Table: 51-56). Data was not available for the months of February, July , September - October and December of the river.

In 2019, The maximum and the minimum pH was 7.71 in April and 7.31 in May (Fig.7a). pH standard range for fisheries was 6.5 to 8.5. In 2018, pH range varied from 6.89 mg/l to 7.76 mg/l. In 2019, The highest and the lowest DO was 6.8 mg/l in August and 5.6 mg/l in April (Fig.7b), while EQS for DO for fisheries is ≥ 5 mg/l. In 2018, DO range varied from 5.8 mg/l to 8.0 mg/l. Maximum BOD was 12 (mg/l) in November and minimum was 1.0 (mg/l) in May (Fig.7c), while EQS for fisheries was ≤ 6 mg/l. In 2018, BOD range varied from 1.4 mg/l to 6.0 mg/l. In 2019, The highest and the lowest COD was 17 mg/l in November and 8 mg/l on May & June (Fig.7d). In 2018, COD range varied from 2.5 mg/l to 18 mg/l. In 2019, The highest and the lowest TDS is 276 mg/l in March and 98 mg/l on November (Fig.7e), within the EQS (2100 mg/l). In 2018, TDS range varied from 78 mg/l to 308 mg/l. In 2019, Maximum Chloride level was 29 (mg/l) in April and minimum was 7 (mg/l) in November (Fig.7f) and which was less than EQS (600 mg/l) for treated wastewater from industrial units.

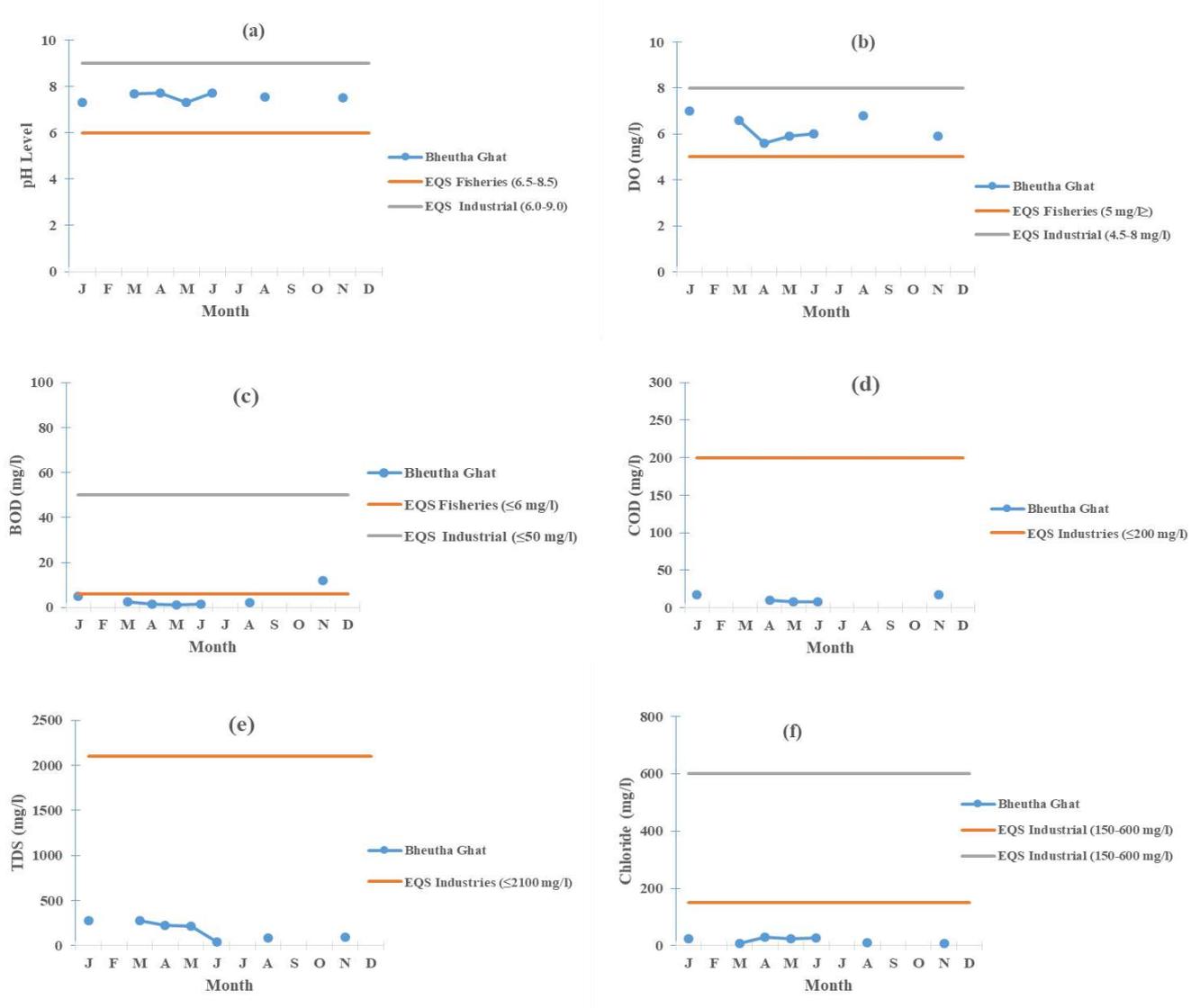


Fig.7. Status of pH, DO, BOD, COD, TDS and Chloride of Kaliganga River in 2019

4.8 Jamuna River

To monitor water quality, samples were collected only from Eight locations e.g. Bahadurabad Ghat (B.G), Near Jamuna Fertilizer Factory (N.J.F.F), Near Bangabandhu Bridge (U), Near Bangabandhu Bridge (D), Fulchari Ghat (U), Fulchari Ghat (D), Shariakandi Groin badth (U), Shariakandi Groin badth (D). Detail data is attached Annex-1 (Table: 57-62).

In 2019, The maximum and the minimum pH was 8.27 and 7.44 (Fig.8a). pH standard range for fisheries was 6.5 to 8.5. In 2018, pH range varied from 7.3 to 8.73. In 2019, The highest and the lowest DO is 7.4 mg/l at Shariakandi Groin badth (D) Point and 5.6 mg/l at Near Jamuna Fertilizer Factory (N.J.F.F) Point (Fig.8b), while EQS for DO for fisheries was ≥ 5 mg/l. In 2018, DO range varied from 6.2 mg/l to 7.63 mg/l. In 2019, The Maximum BOD was 3 mg/l at Near Jamuna Fertilizer Factory (N.J.F.F) Point and minimum was 2.0 mg/l Near Bangabandhu Bridge (D) Point (Fig.8c), while EQS for fisheries is ≤ 6 mg/l. In 2018, BOD range varied from 0.6 mg/l to 2.9 mg/l. In 2019, The highest and the lowest SS was 80 mg/l at Shariakandi Groin badth (U) Point and 18 mg/l at Bahadurabad Ghat Point (Fig.8d). In 2018, SS range varied from 44 mg/l to 90 mg/l. In 2019, The highest and the lowest TDS was 192.8 mg/l at Near Jamuna Fertilizer Factory (N.J.F.F) Point and 118.6 mg/l at Bahadurabad Ghat Point (Fig.8e), within the EQS (2100 mg/l). In 2018, TDS range varied from 40.7 mg/l to 365 mg/l. In 2019, Maximum Chloride level was 32 mg/l at Shariakandi Groin badth (U) Point and minimum was 12 mg/l at Near Jamuna Fertilizer Factory (N.J.F.F) Point (Fig.8f) and which was less than EQS (600 mg/l) for treated wastewater from industrial units. In 2018, Chloride range varied from 8.0 mg/l to 35 mg/l.

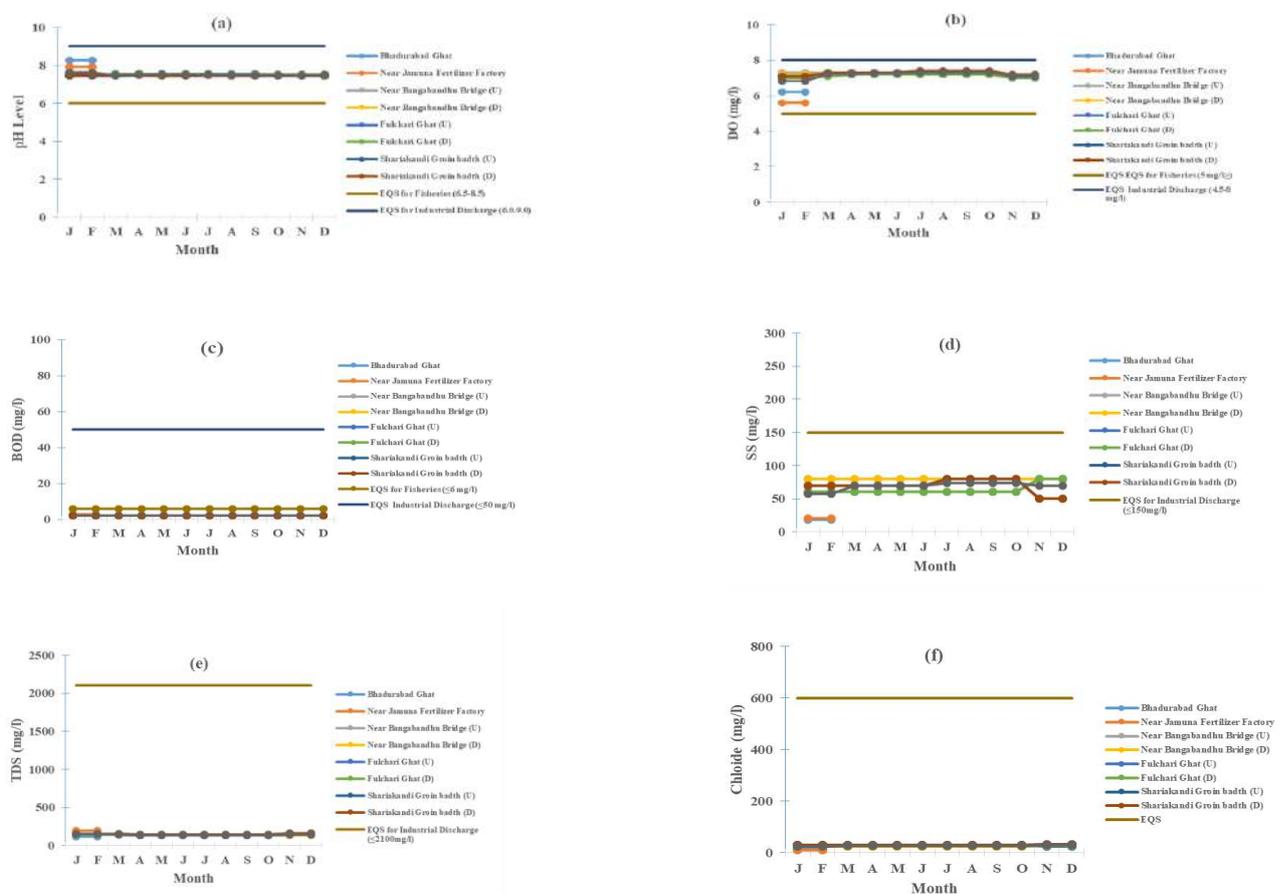


Fig.8. Status of pH, DO, BOD, SS, TDS and Chloride of Jamuna River in 2019

4.9 Meghna River

To monitor water quality, water samples were collected from three locations of Bhairab Bazar (B.B), Meghna Ghat (M.G), Near Shahjalal Paper Mills (N.S.P.M) of the Meghna river. Detail data is attached Annex-1 (Table: 63-68). Data was not available the month of January and November.

In 2019, The maximum and the minimum pH was 8.65 in July at Bhairab Bazar (B.B) Point and 6.24 in december at Bhairab Bazar (B.B) (Fig.9a). pH standard range for fisheries was 6.5 to 8.5. In 2018, pH range varied from 6.52 to 7.94. In 2019, The highest and the lowest DO was 6.9 mg/l in September at Meghna Ghat (M.G) Point and 3.1 mg/l in June at Near Shahjalal Paper Mills (N.S.P.M) Point (Fig.9b), while EQS for DO for fisheries was ≥ 5 mg/l. In 2018, DO range varied from 4.76 mg/l to 7.2 mg/l. In 2019 Maximum BOD was 31 (mg/l) in June at Near Shahjalal Paper Mills (N.S.P.M) Point and minimum was 2.0 (mg/l) in May & October at Bhairab Bazar (B.B) and Near Shahjalal Paper Mills (N.S.P.M) Point (Fig.9c), while EQS for fisheries was ≤ 6 mg/l. In 2018, BOD range varied from 1.2 mg/l to 6.4 mg/l. In 2019, The highest and the lowest COD was 40 mg/l in April at Near Shahjalal Paper Mills (N.S.P.M) Point and 5 mg/l in May at Bhairab Bazar (B.B) Point (Fig.9d). In 2019, The highest and the lowest TDS was 267 mg/l in February at Meghna Ghat (M.G) Point and 32.4 mg/l in August at Bhairab Bazar (B.B) Point (Fig.9e), within the EQS (2100 mg/l). In 2018, TDS range varied from 16.52 mg/l to 95.60 mg/l. In 2019, Maximum Chloride level was 48 (mg/l) in May at Bhairab Bazar (B.B) Point and minimum was 4 (mg/l) in August & September at Bhairab Bazar (B.B) Point & Meghna Ghat (M.G) Point (Fig.9f) and which was less than EQS (600 mg/l) for treated wastewater from industrial units. In 2018, Chloride range varied from 2.0 mg/l to 13 mg/l.

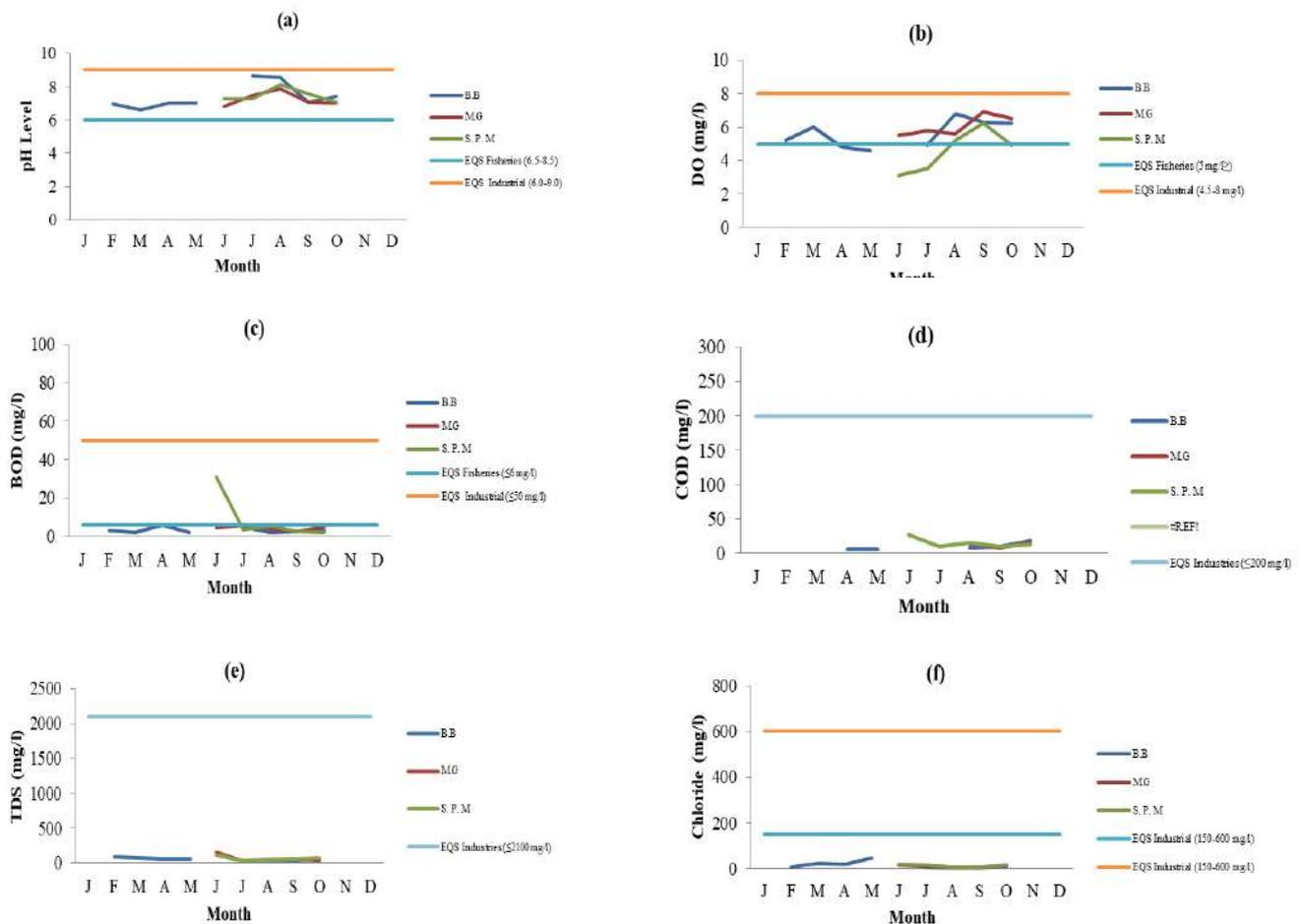


Fig.9. Status of pH, DO, BOD, COD, TDS and Chloride of Meghna River in 2019

4.10 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 Six locations of the river namely Mawa Ghat, Shimulia Ghat, Pakshi Ghat (U), Pakshi Ghat (D), Baro kuti Ghat (U), Baro kuti Ghat (D) points were used in the analysis. Detail data is attached Annex-1 (Table: 69-74).

Standard pH for fisheries is 6.5 to 8.5. In 2019 The maximum pH was 8.2 and the minimum pH level was 6.91 (Fig.10a). In 2018, pH range varied from 7.3 to 7.93. In 2019, DO level above EQS (≥ 5 mg/l) for fisheries (Fig.10b). In 2019, The maximum DO was 8.0 mg/l in April at Mawa Ghat Point and the minimum 6.5 mg/l at Mawa Ghat Point. In 2018, DO range varied from 6.4 mg/l to 8.2 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD was 4.2 mg/l in November at Mawa Ghat Point and the minimum is 1.1 mg/l in February at Mawa Ghat Point (Fig.10c). In 2018, BOD range varied from 0.4 mg/l to 2.9 mg/l. In 2019, TDS Maximum level of Padma river water was 156 mg/l in November at Pakshi Ghat (U) point & the Minimum is 54.6 mg/l in August at Mawa Ghat Point (Fig.10d). In 2018, TDS range varied from 69.7 mg/l to 156 mg/l. In 2019, the maximum and the minimum EC of Padma river water was 320 μ mhos/cm in December at Baro kuti Ghat (U) point and 95 μ mhos/cm in April at Shimulia Ghat point (Fig.10e), while EQS was 1200 μ mhos/cm wastewater after treatment from industrial units. In 2018, EC range varied from 115.1 μ mhos/cm to 320 μ mhos/cm. In 2019, The maximum SS was 134 mg/l in May at Shimulia Ghat point and the minimum is 15 mg/l in April at Shimulia Ghat point (Fig.10f).

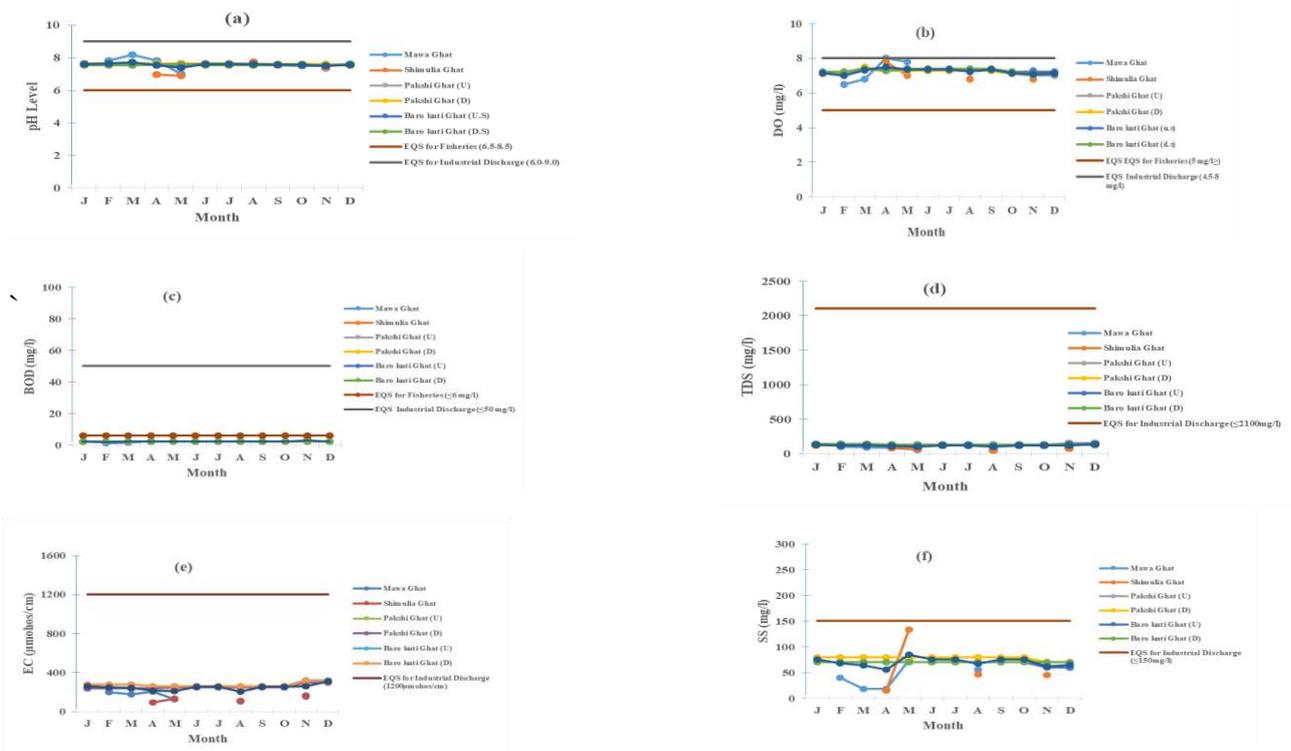


Fig.10. Status of pH, DO, BOD, TDS, EC and SS of Padma River in 2019

4.11 Korotoa River

To monitor water quality of Korotoa river in 2019, water samples were collected from ten locations of the river e.g. Near Fateh Ali Bridge (Up an Down Steam), Near Dutta Bari Bridge (Up an Down Steam), Near Matidali Bridge (Up an Down Steam), Near S.P Bridge (Up an Down Steam) and Shahjadpur (Up an Down Steam). Detail data is attached Annex-1 (Table: 75-80).

Standard pH for fisheries was 6.5 to 8.5. In 2019 The maximum pH was 7.62 and the minimum pH level was 6.87 (Fig.11a). In 2018, pH range varied from 6.58 to 7.63. In 2019, DO level above EQS (≥ 5 mg/l) for fisheries (Fig.11b). The maximum DO was 7.2 mg/l and the minimum 2.7 mg/l. In 2018, DO range varied from 2.7 mg/l to 7.5 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. The maximum BOD was 6.7 mg/l and the minimum was 2.1 mg/l (Fig.11c). In 2018, BOD range varied from 2.0 mg/l to 6.3 mg/l. In 2019, TDS Maximum level was 370 mg/l & the Minimum was 130 (Fig.11d). In 2018, TDS range varied from 110 mg/l to 350 mg/l. The maximum SS was 110 mg/l and the minimum was 70 mg/l (Fig.11e). In 2018, SS range varied from 50 mg/l to 120 mg/l. 2019, the maximum and the minimum EC of water was 740 μ mhos/cm and 220 μ mhos/cm, while EQS was 1200 μ mhos/cm wastewater after treatment from industrial units. (Fig.11f). In 2018, EC range varied from 220 μ mhos/cm to 700 μ mhos/cm.

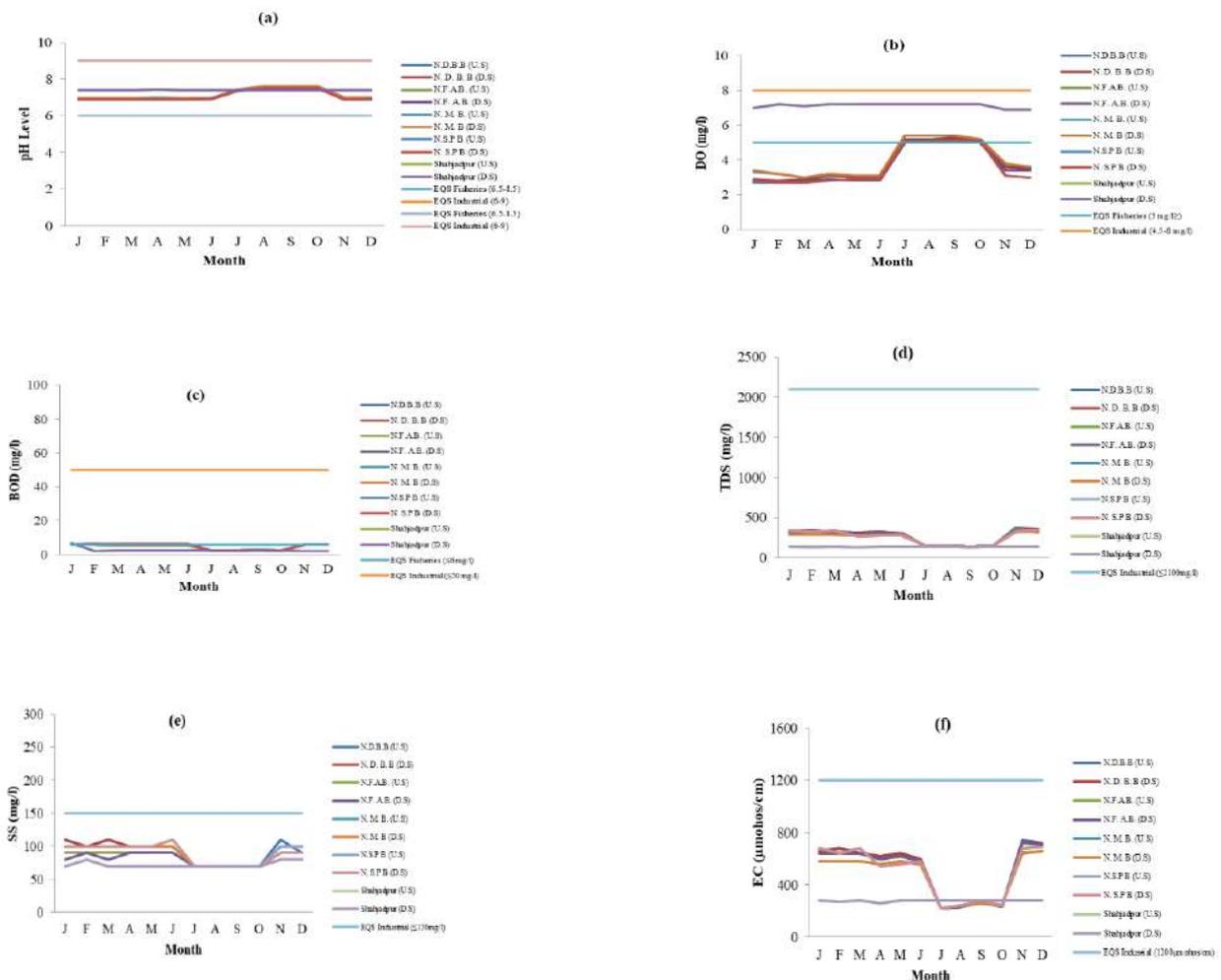


Fig.11. Status of pH, DO, BOD, TDS, SS and EC of Korotoa River in 2019

4.12 Teesta River

The Teesta River is about 315 km long and it rises in the eastern Himalayas, flows through the Indian states of West Bengal and Sikkim through Bangladesh and enters the Bay of Bengal. It joins the Jamuna River at Fulchhari in Bangladesh. It drains an area of 12,540 km². It forms the border between Sikkim and West Bengal. Water samples were collected from two locations near Teesta Bridge (up Stream and down stream) of Teesta river for monitoring of water quality in 2019. Detail data is attached Annex-1 (Table: 81-86).

In 2019, Standard pH for fisheries is 6.5 to 8.5. In 2019, The maximum pH is 7.58 and the minimum pH level is 7.56 (Fig.12a). In 2018, pH range varied from 7.35 to 7.64. In 2019, DO level above EQS (≥ 5 mg/l) for fisheries (Fig.12b). In 2019, The maximum DO is 7.2 mg/l and the minimum 6.8 mg/l. In 2018, DO range varied from 7.0 mg/l to 7.5 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 2.2 mg/l and the minimum is 2.1 mg/l (Fig.12c). In 2018, BOD range varied from 2.0 mg/l to 2.4 mg/l. In 2019, TDS Maximum level is 230 mg/l & the Minimum is 98 (Fig.12d). In 2018, TDS range varied from 90 mg/l to 142 mg/l. In 2019, The maximum SS is 90 mg/l and the minimum is 70 mg/l (Fig.12e). In 2018, SS range varied from 50 mg/l to 90 mg/l. In 2019, the maximum and the minimum Chloride of water is 35 NTU and 28 NTU (Fig.12f).

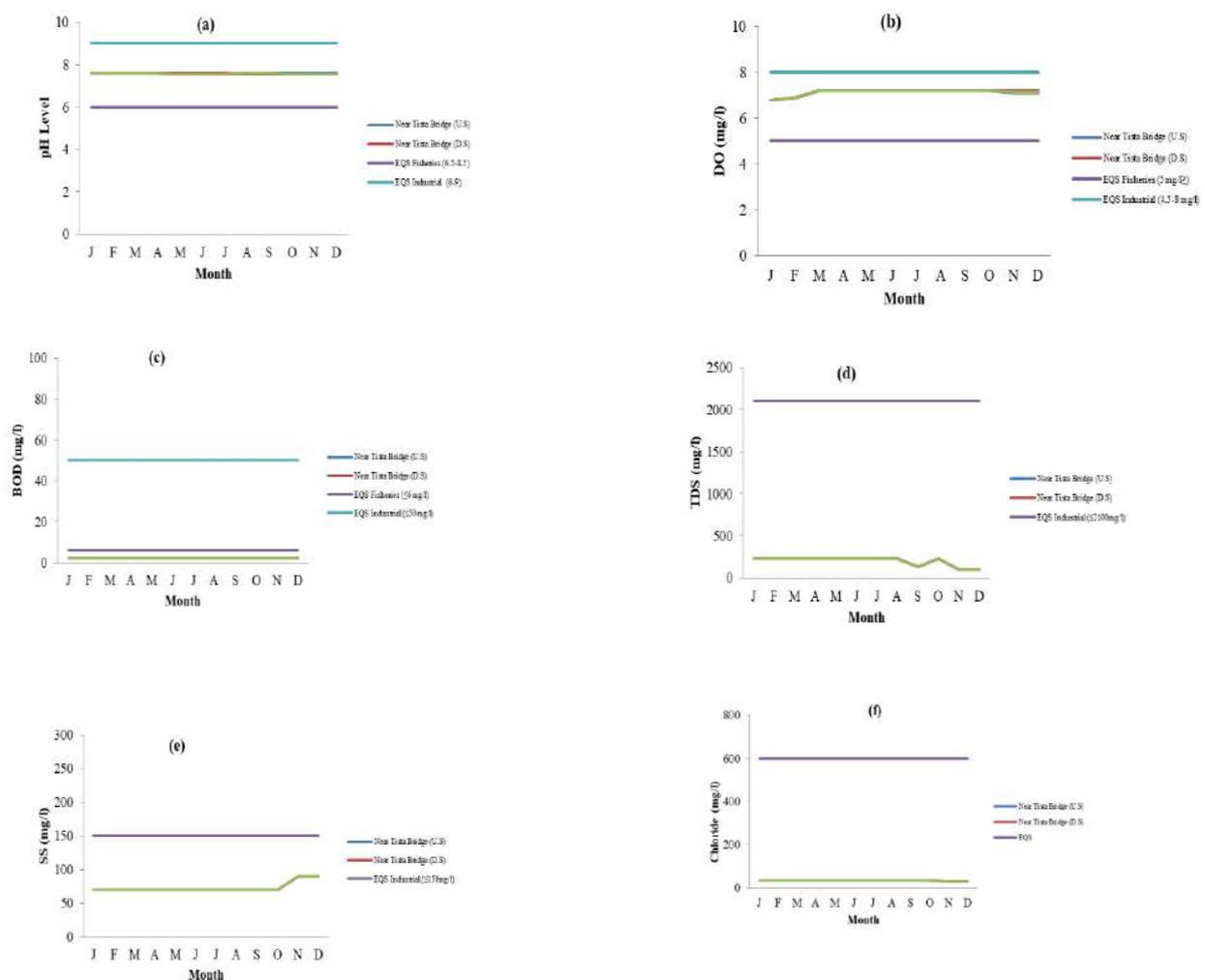


Fig.12. Status of pH, DO, BOD, TDS, SS and Chloride of Teesta River in 2019

4.13 Karnaphuli River

The Karnaphuli river is in the south-eastern part of Bangladesh that flows through Chattagram Hill Tracts and Chattagram into the Bay of Bengal. Water samples were collected from Eight locations (e.g. CUFL Side Anowara, TSP Side, Patenga , Karnafully River Chaktai Khal, ctg, Karnafully Mohona, 1km Straight from patenga sea beach, Patenga charpara, 1km Straight from CEPZ, Vattiyari shipyard area of Karnaphuli river for monitoring of water quality in 2019. Detail data is attached Annex-1 (Table: 87-92).

In 2019, Standard pH for fisheries is 6.5 to 8.5. In 2019, The maximum pH is 8.8 and the minimum pH level is 6.8 (Fig.13a). In 2018, pH range varied from 6.4 to 8.6. In 2019, DO level above EQS (≥ 5 mg/l) for fisheries (Fig.13b). In 2019, The maximum DO is 8.74 mg/l in December at Karnafully Mohona, 1km Straight from patenga sea beach point and the minimum 3.27 mg/l in October at Karnafully River Chaktai Khal point. In 2018, DO range varied from 5.0 mg/l to 8.8 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 40mg/l in October at CUFL point and the minimum is 4.8 mg/l in July at Karnafully River Chaktai Khal point (Fig.13c). In 2019, COD Maximum level is 1490 mg/l in December at 1km Straight from CEPZ point & the Minimum is 12 in August at TSP point (Fig.13d). In 2018, COD range varied from 69 mg/l to 326 mg/l. In 2019, The maximum SS is 920 mg/l in October at TSP point and the minimum is 66 mg/l in August at TSP point (Fig.13e). In 2018, SS range varied from 166 mg/l to 582 mg/l. In 2019, the maximum and the minimum EC of water is 33512 μ mhos/cm in January at CUFL point and 97.6 μ mhos/cm in August at TSP point, while EQS is 1200 μ mhos/cm wastewater after treatment from industrial units. (Fig.13f). In 2018, EC range varied from 26330 μ mhos/cm to 290 μ mhos/cm.

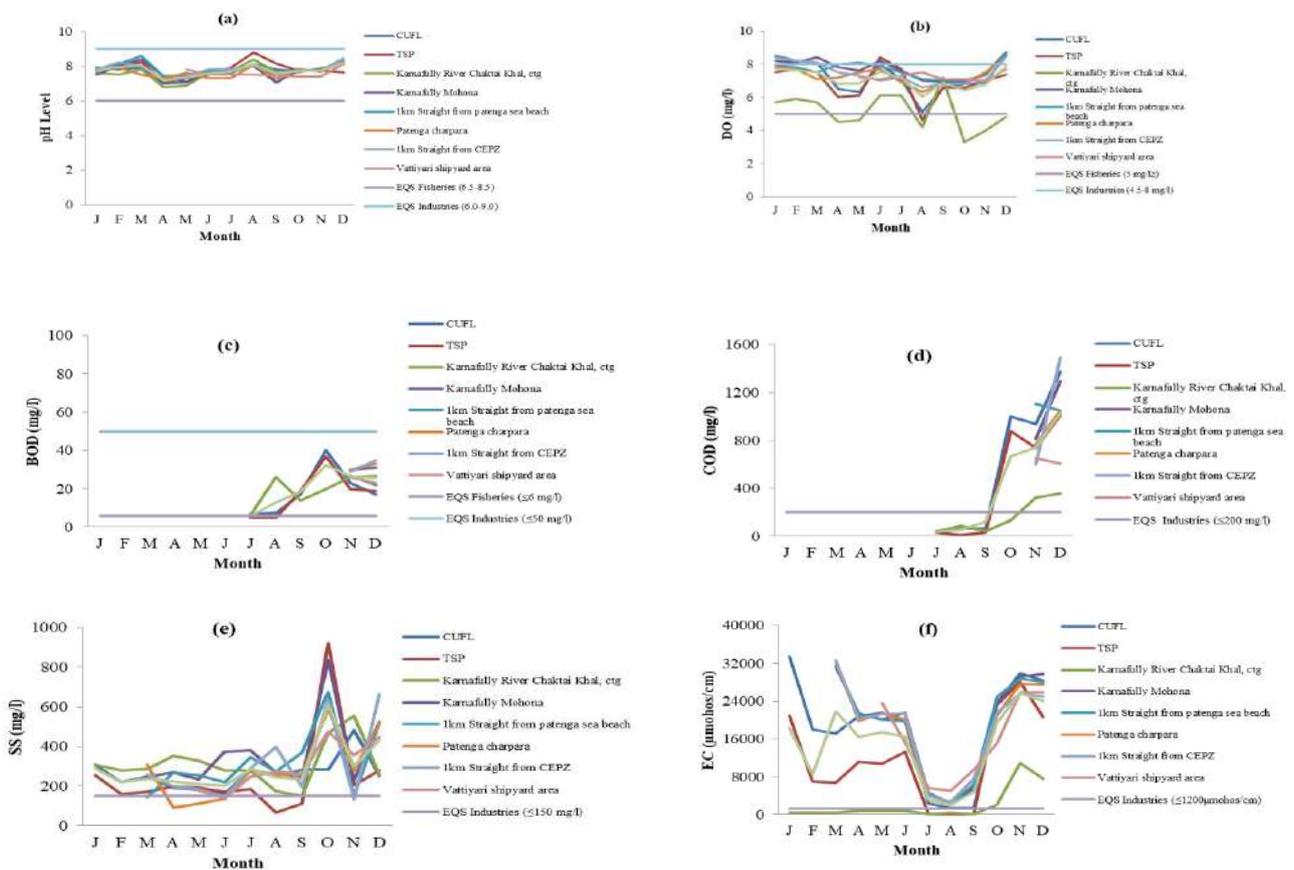


Fig.13. Status of pH, DO, BOD, COD, SS and EC of Karnaphuli River in 2019

4.14 Halda River

The Halda river passes through the South-Eastern part of Bangladesh. Water sampling Five locations were Mohona, Khandakiya Khal, Madari Khal, Katakhal Khal and Krishna Khal of Halda River. Detail data is attached Annex-1 (Table: 93-98).

In 2019, Standard pH for fisheries is 6.5 to 8.5. In 2019, The maximum pH is 9.17 in August and the minimum pH level is 6.87 May (Fig.14a). In 2018, pH range varied from 6.7 to 7.52. In 2019, DO level above EQS (≥ 5 mg/l) for fisheries (Fig.14b). In 2018, DO range varied from 3.8 mg/l to 4.98 mg/l. In 2019, The maximum DO is 8.743 mg/l in December at Khandakiya Khal point and the minimum 4.35 mg/l in April Katakhal Khal point. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 29 mg/l in December at Mohona point and the minimum is 8 mg/l in October at Krishna Khal Point (Fig.14c). In 2019, COD Maximum level is 51 mg/l in November at Khandakiya Khal point & the Minimum is 11 (Fig.14d) in October at Krishna Khal Point. In 2018, COD range varied from 23 mg/l to 113 mg/l. In 2019, The maximum SS is 233 mg/l in April at Khandakiya Khal Point and the minimum is 21 mg/l in January at at Krishna Khal Point (Fig.14e). In 2018, SS range varied from 15 mg/l to 236 mg/l. In 2019, the maximum and the minimum EC of water is 839 μ mhos/cm in June at Mohona Point and 76.2 μ mhos/cm in September at Madari Khal point, while EQS is 1200 μ mhos/cm wastewater after treatment from industrial units. (Fig.14f). In 2018, EC range varied from 65 μ mhos/cm to 488 μ mhos/cm.

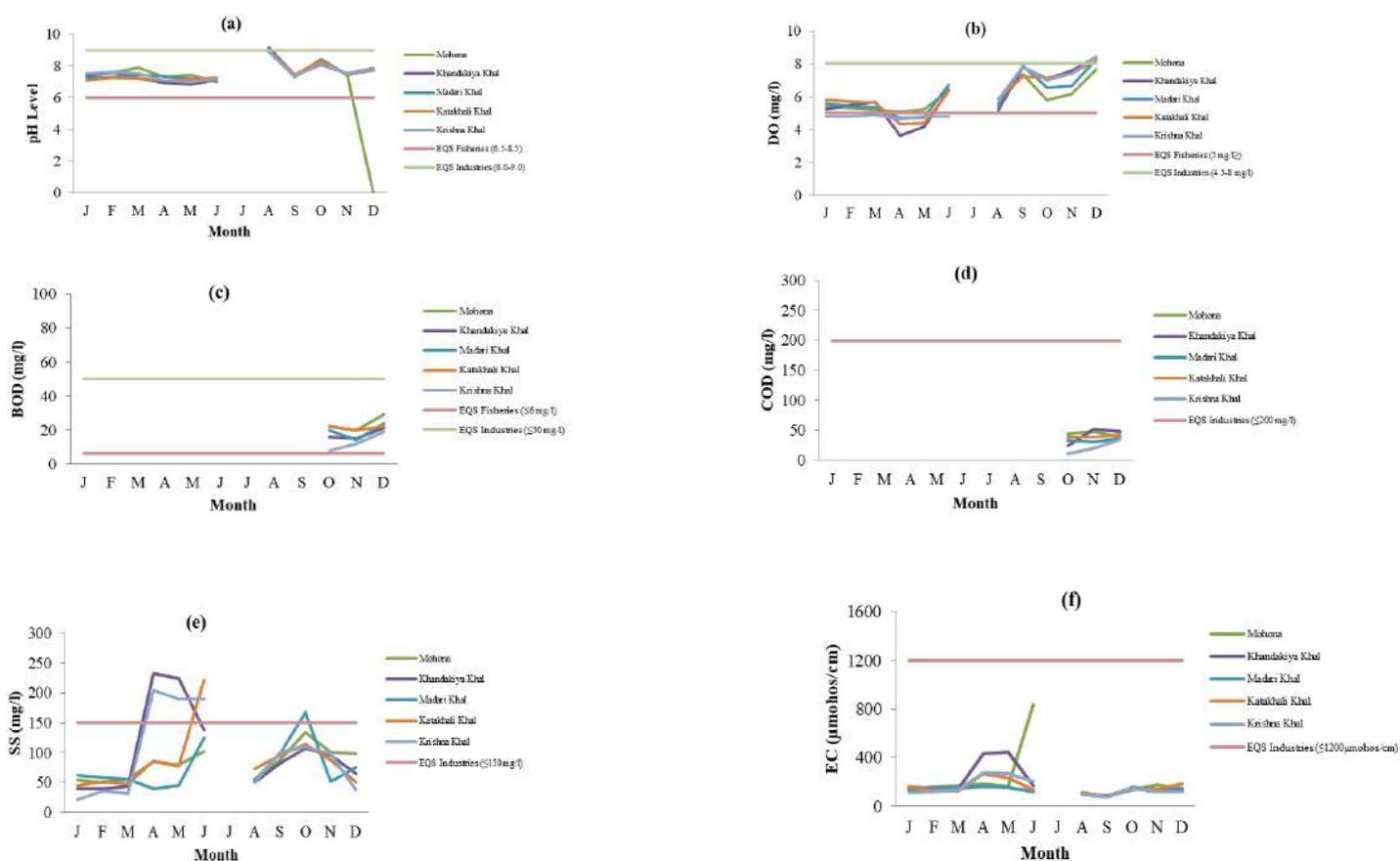


Fig.14. Status of pH, DO, BOD, COD, SS and EC of Halda River in 2019

4.15 Moyuri River

The Moyuri river is situated at the back swamp of the Bhairab-Rupsa river. For monitoring water samples were collected from three locations named Gallamari Bridge (G.B) comprising both of the banks and middle point of the river. Average value of those three points was used in the analysis. Detail data is attached Annex-1 (Table: 99-106). Data was not available the month of August.

In 2019, pH of Moyuri river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 7.74 and the minimum P^H is 7.56 (Fig.15a). In 2018, pH range varied from 7.43 to 7.76. In 2019, the maximum DO 4.47 mg/l and the minimum 0.4 mg/l (Fig.15b). In 2018, DO range varied from 0.3 mg/l to 1.6 mg/l. In 2019, TDS of Moyuri river water EQS (2100 mg/l) for wastewater after treatment from industrial units. In 2019, maximum TDS 1412 mg/l and the minimum 388 mg/l (Fig.15c). In 2018, TDS range varied from 492 mg/l to 1440 mg/l. In 2019, Chloride concentration of the Moyuri river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 802 mg/l and the minimum is 116 mg/l (Fig.15d). In 2018, Chloride range varied from 120 mg/l to 824 mg/l. In 2019, The maximum Turbidity 48.4 NTU and the minimum is 34.3 NTU (Fig.15e). In 2018, Turbidity range varied from 37.2 NTU to 54.4 NTU. The EQS for drinking water is 10 NTU. In 2019, The maximum EC 2824 µmhos/cm and the minimum EC 746 µmho/cm (Fig.15f). In 2018, EC range varied from 980 µmho/cm to 2878 µmho/cm. In 2019, Maximum Salinity 2.1 ppt and minimum is 0.2 ppt (Fig.15g). In 2019, SS of Moyuri river water at different sampling locations is within the EQS 150 mg/l. In 2019, Maximum SS concentration of Moyuri river is 75 mg/l and the minimum is 46 mg/l (Fig.15h). In 2018, SS range varied from 46 mg/l to 84 mg/l. In 2019, Maximum Total Alkalinity 34 mg/l and minimum is 32mg/l (Fig.15i). In 2018, Total Alkalinity range varied from 32 mg/l to 34 mg/l.

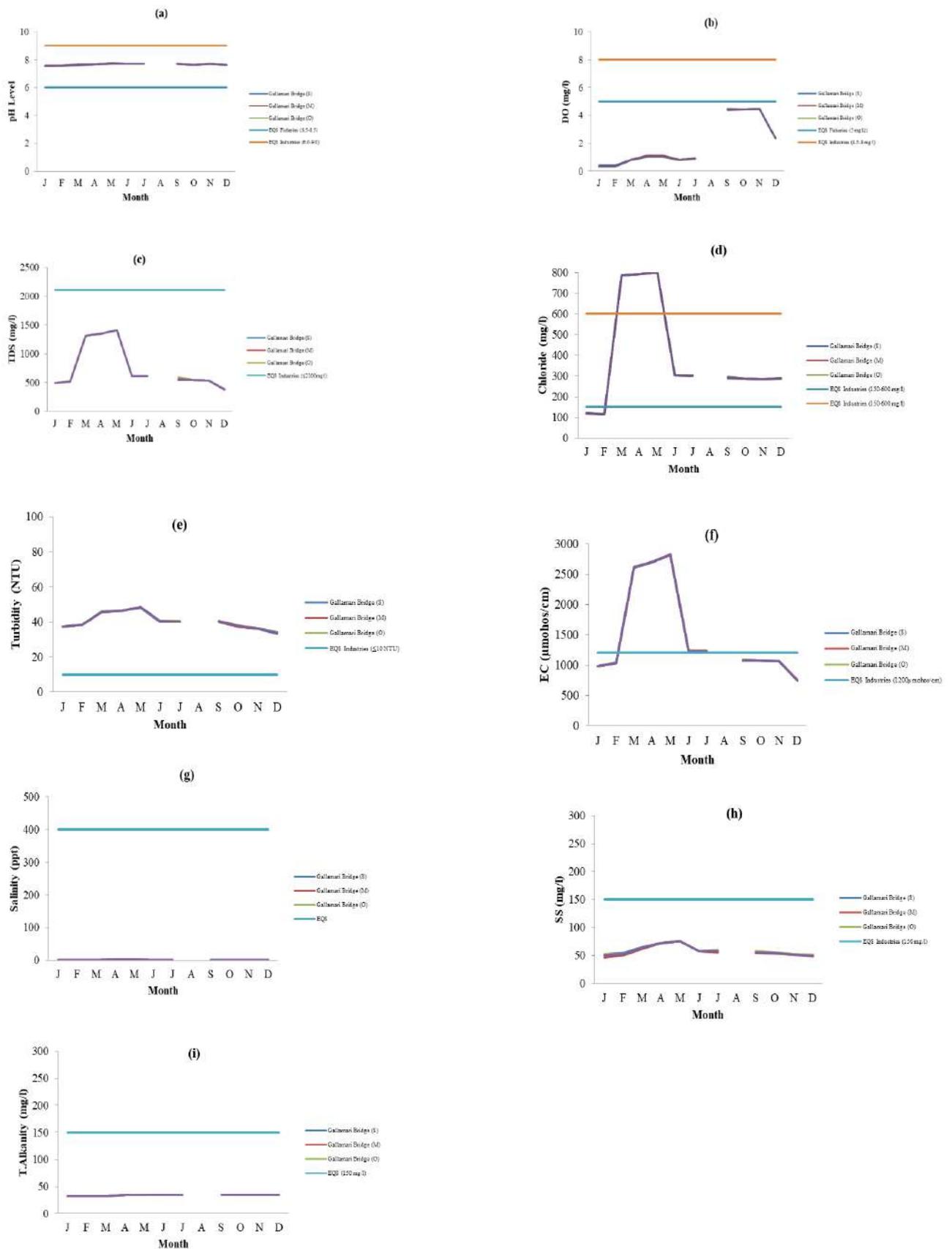


Fig.15. Status of pH, DO, TDS, Chloride, Turbidity, EC , Salinity, SS and T. Alkalinity of Moyuri River in 2019

4.16 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 six different points [e.g. Noapara Ghat Bank (NG), Middle and Opposite bank, Fultala Ghat (FG) Side, Middle and Opposite bank of Bhairab River for monitoring water quality in 2019. Detail data is attached Annex-1 (Table: 107-114). Data was not available the month of August.

In 2019, pH of Bhairab river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.82 and the minimum P^H is 7.56 (Fig.16a). In 2018, pH range varied from 7.6 to 7.87. In 2019, the maximum DO 6.9 mg/l and the minimum 5.1 mg/l (Fig.16b). In 2018, DO range varied from 5.1 mg/l to 6.5 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 1.6 mg/l and the minimum is 0.2 mg/l (Fig.16c). In 2018, BOD range varied from 0.7 mg/l to 1.6 mg/l. In 2019, TDS of Bhairab river water EQS (2100 mg/l) for wastewater after treatment from industrial units. In 2019, maximum TDS 11070 mg/l and the minimum 88 mg/l (Fig.16d). In 2018, TDS range varied from 98 mg/l to 11044 mg/l. In 2019, Chloride concentration of the Bhairab river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 7048 mg/l and the minimum is 72 mg/l (Fig.16e). In 2018, Chloride range varied from 72 mg/l to 7038 mg/l. In 2019, The maximum Turbidity 89.7 NTU and the minimum is 46.2 NTU (Fig.16f). In 2018, Turbidity range varied from 46.2 NTU to 86.2 NTU. The EQS for drinking water is 10 NTU. In 2019, The maximum EC 22138 $\mu\text{mhoms/cm}$ and the minimum EC 174 $\mu\text{mho/cm}$ EC of Bhairab river at different locations is mostly within the EQS (1200 $\mu\text{mhoms/cm}$) for treated wastewater from industrial units (Fig.16g). In 2018, EC range varied from 194 $\mu\text{mhoms/cm}$ to 22088 $\mu\text{mhoms/cm}$. In 2019, Maximum Salinity 13.9 ppt and minimum is 0.1 ppt (Fig.16h). In 2019, SS of Bhairab river water at different sampling locations is within the EQS (150 mg/l). In 2019, Maximum SS concentration of Moyuri river is 98 mg/l and the minimum is 50 mg/l (Fig.16i). In 2019, Maximum Total Alkalinity 36 mg/l and minimum is 32 mg/l (Fig.16j). In 2018, Total Alkalinity range varied from 32 mg/l to 36 mg/l.

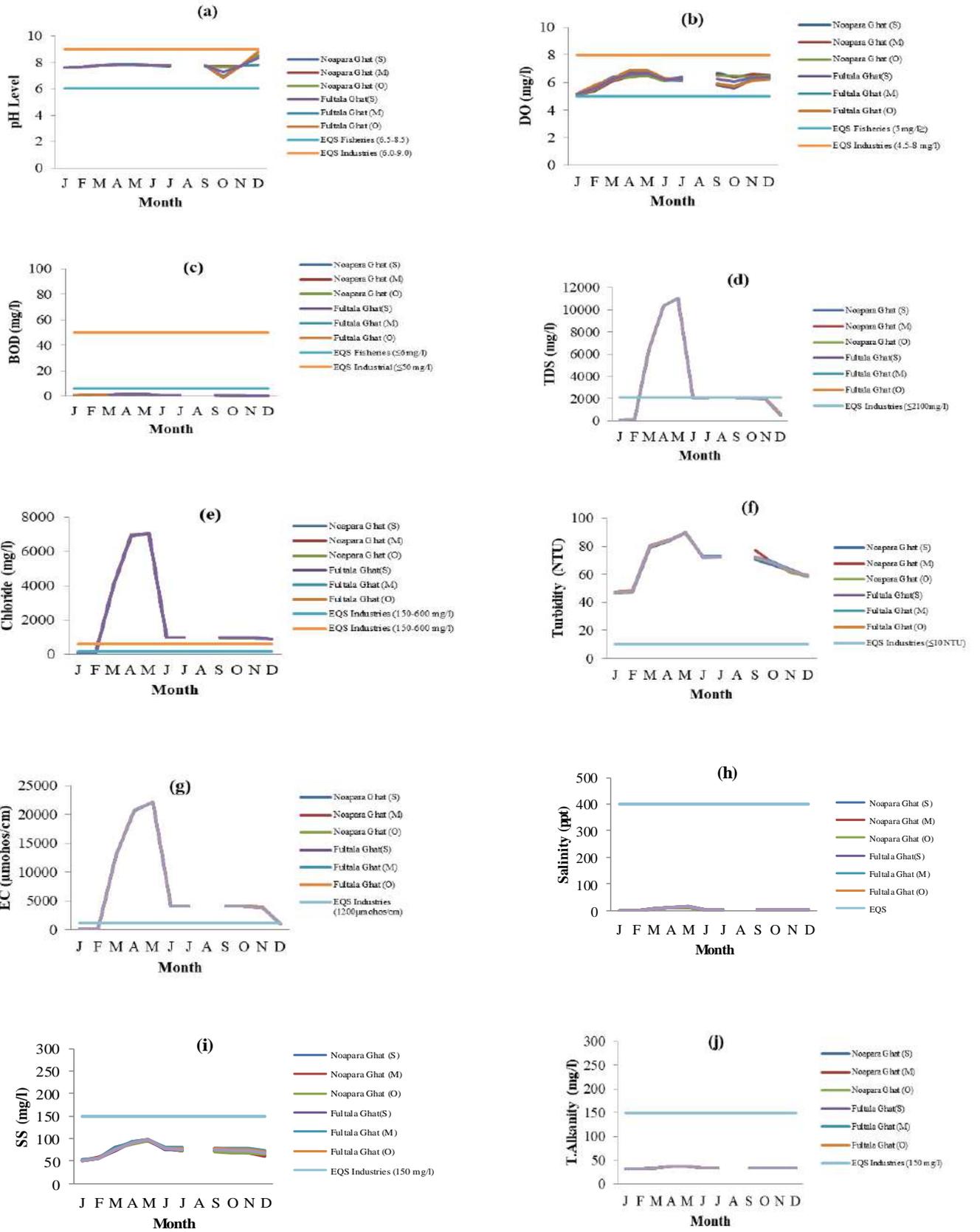


Fig.16. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC , Salinity , SS and T.alkalinity of Bhairab River in 2019

4.17 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 six different locations comprising six points [e.g. Rupsa Ghat Bank, Middle and Opposite and Labanchara Ghat Bank, Middle and Opposite] of Rupsa river for monitoring water quality in 2019. Detail data is attached Annex-1 (Table: 115-122). Data was not available the month of August.

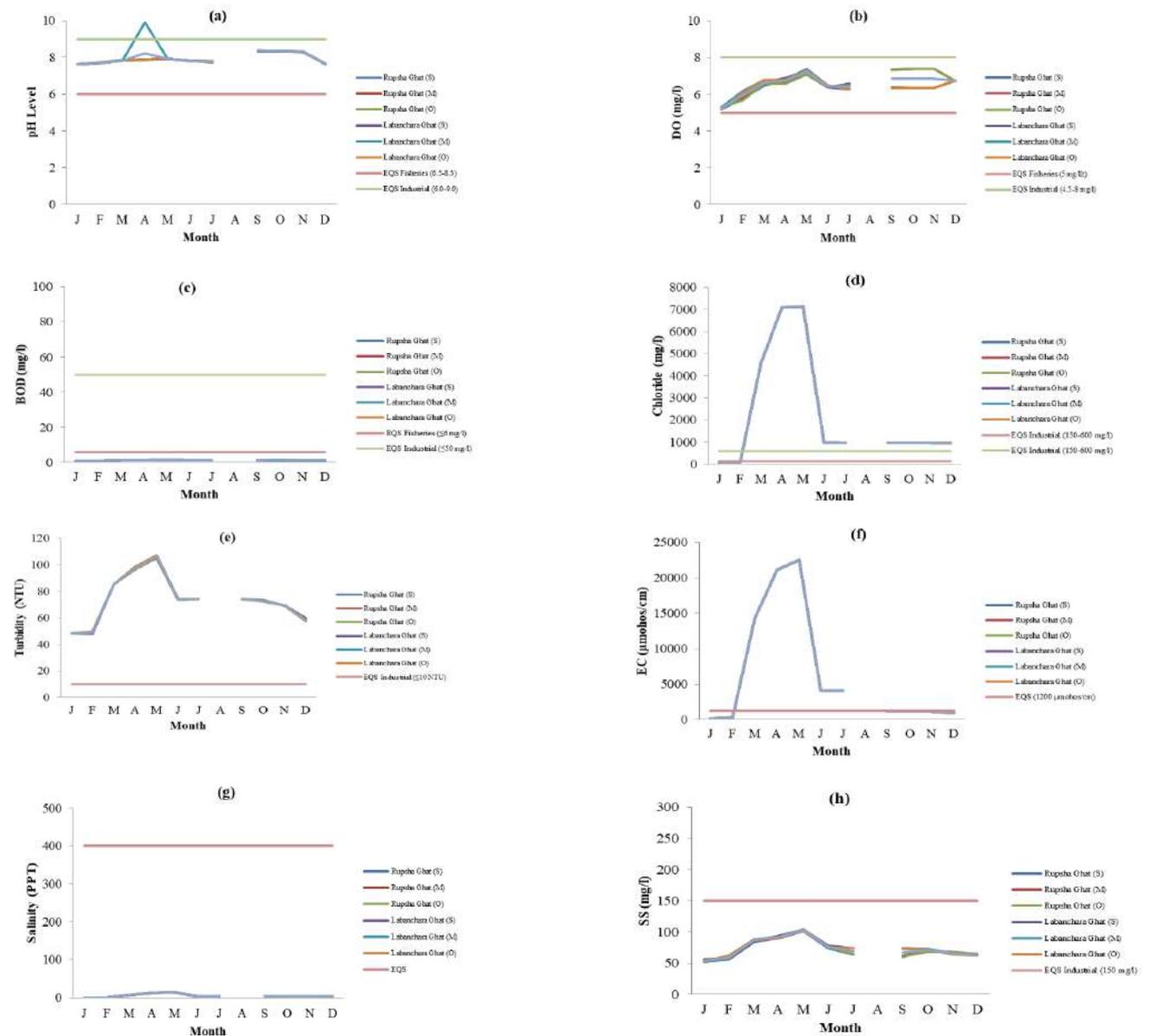


Fig.17. Status of pH, DO, BOD, Chloride, SS, Turbidity, EC , Salinity and SS of Rupsa River in 2019

In 2019, pH of Rupsa river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 9.92 and the minimum P^H is 7.62 (Fig.17a). In 2018, pH range varied from 7.6 to 7.94. In 2019, the maximum DO 7.4 mg/l and the minimum 5.2 mg/l (Fig.17b). In 2018, DO range varied from 5.2 mg/l to 6.9 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 1.7 mg/l and the minimum is 0.8 mg/l (Fig.17c). In 2018, BOD range varied from 0.7 mg/l to 1.6 mg/l. In 2019, Chloride concentration of the Rupsa river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 7142 mg/l and the minimum is 80 mg/l (Fig.17d). In 2018, Chloride range varied from 80 mg/l to 7130 mg/l. In 2019, The maximum Turbidity 107.2 NTU and the minimum is 48.1 NTU (Fig.17e). In 2018, Turbidity range varied from 48.1 NTU to 101.3 NTU. The EQS for drinking water is 10 NTU. In 2019, The maximum EC 22536 $\mu\text{mhoms/cm}$ and the minimum EC 184 $\mu\text{mho/cm}$ EC of Rupsa river at different locations is mostly within the EQS (1200 $\mu\text{mhoms/cm}$) for treated wastewater from industrial units (Fig.17f). In 2018, EC range varied from 204 $\mu\text{mhoms/cm}$ to 17142 $\mu\text{mhoms/cm}$. In 2019, Maximum Salinity 14.5 ppt and minimum is 0.1 ppt In 2019, (Fig.17g). In 2019, Maximum SS concentration of Rupsa river is 104 mg/l and the minimum is 52 mg/l (Fig.17h). In 2019, Maximum Total Alkalinity 36 mg/l and minimum is 32 mg/l (Fig.17i). In 2018, Total Alkalinity range varied from 34 mg/l to 36 mg/l.

4.18 Mathavanga River

For monitoring water quality of Mathavanga river, water samples were collected from a single location comprising three different points, Pipeghat (up stream) and Pipeghat (down stream) and Darshana, Chuadanga. Average values of three points were taken while analysis carried out. Detail data is attached Annex-1 (Table: 126-130). Data was not available the month of August, October and November.

In 2019, pH of Mathavanga river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.28 and the minimum P^H is 6.57 (Fig.18a). In 2018, pH range varied from 6.52 to 7.78. In 2019, the maximum DO 7.21 mg/l and the minimum 4.1 mg/l (Fig.18b). In 2018, DO range varied from 2.6 mg/l to 5.3 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 0.9 mg/l and the minimum is 0.2 mg/l (Fig.18c). In 2018, BOD range varied from 0.6 mg/l to 1.8 mg/l. In 2019, The maximum TDS is 380 mg/l and the minimum is 86 mg/l (Fig.18d). In 2018, TDS range varied from 90 mg/l to 440 mg/l. In 2019, Chloride concentration of the Mathavanga river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 34 mg/l and the minimum is 26 mg/l (Fig.18e). In 2018, Chloride range varied from 26 mg/l to 40 mg/l. In 2019, The maximum Turbidity 47.2 NTU and the minimum is 32.3 NTU (Fig.18f). In 2018, Turbidity range varied from 24 NTU to 36.5 NTU. The EQS for drinking water is 10 NTU. In 2019, The maximum EC 758 $\mu\text{mhoms/cm}$ and the minimum EC 170 $\mu\text{mho/cm}$ (Fig.18g). In 2018, EC range varied from 180 $\mu\text{mhoms/cm}$ to 876 $\mu\text{mhoms/cm}$. In 2019, EC of Mathavanga river at different locations is mostly within the EQS (1200 $\mu\text{mhoms/cm}$) for treated wastewater from industrial units. In 2019, Maximum Salinity 0.4 ppt and minimum is 0.1 ppt (Fig.18h). In 2019, Maximum SS concentration of Mathavanga river is 78 mg/l and the minimum is 40 mg/l (Fig.18i). In 2019, Maximum Total Alkalinity 32 mg/l and minimum is 32 mg/l (Fig.18j). In 2018, Total Alkalinity range varied from 24 mg/l to 36 mg/l.

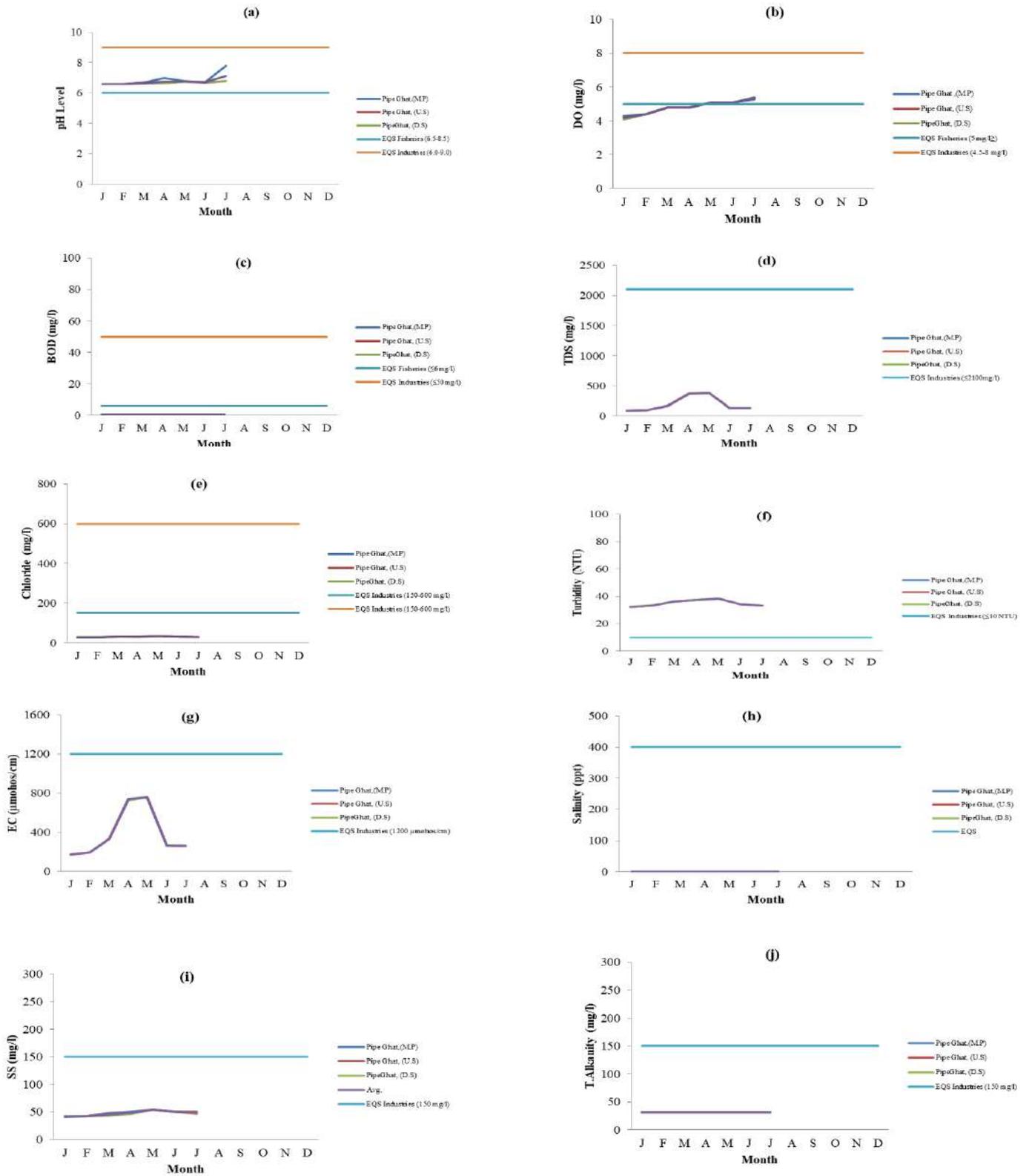


Fig.18. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC , Salinity, SS and T.alkalinity of Mathavanga River in 2019

4.19 Pashur River

The Pashur river located in southwestern Bangladesh, and a distributary of the Ganges, continues the Rupsa river. All its distributaries are tidal. It meets the 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 one location of Pashur river comprising three different points at Mongla Port (Bank, Middle and Opposite bank). For analysis, average values of three points were taken. Detail data is attached Annex-1 (Table: 131-138). Data was not available the month of August.

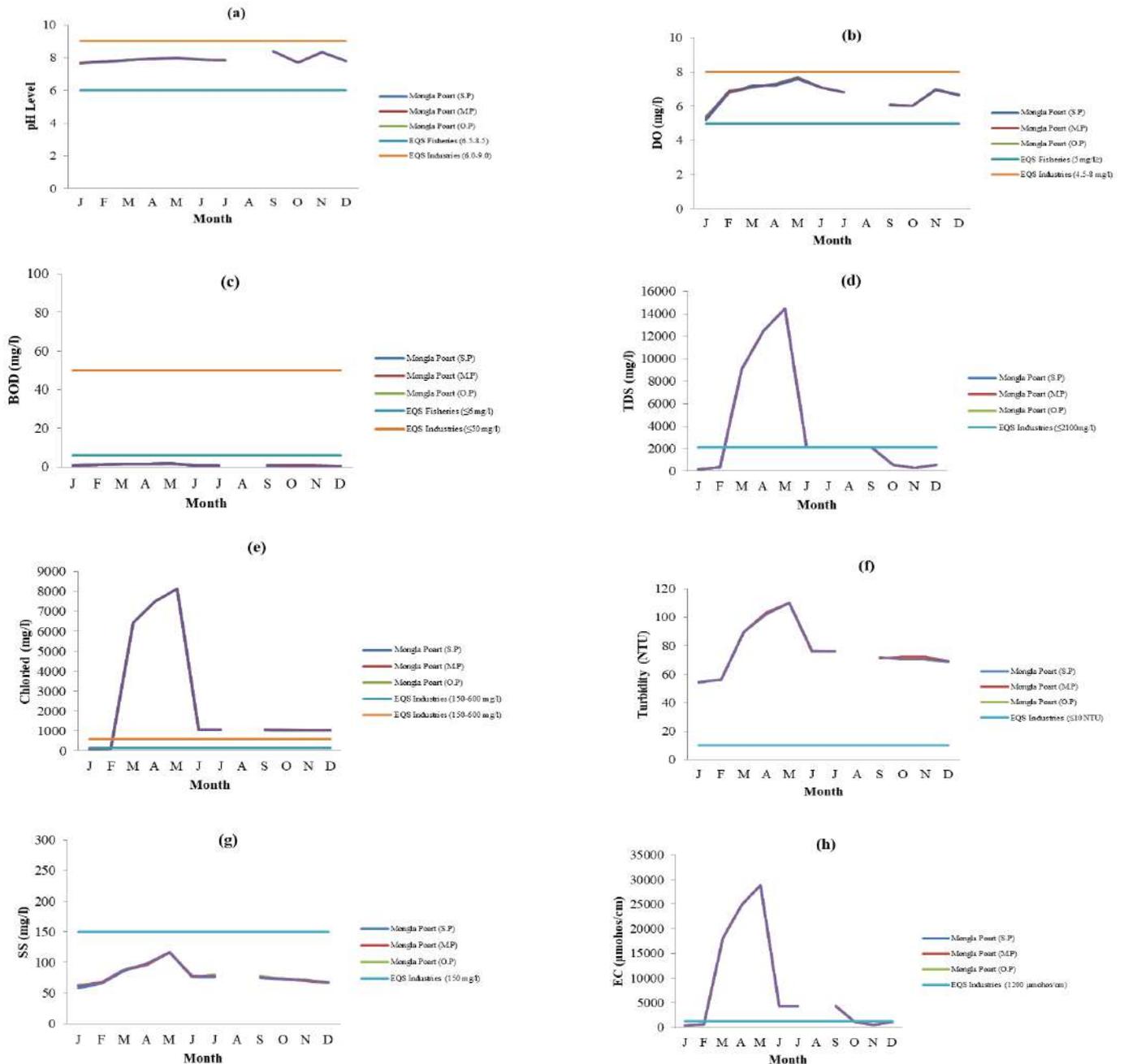


Fig.19. Status of pH, DO, BOD, TDS, Chloride, Turbidity, SS and EC of Pashur River in 2019

In 2019, pH of Pashur river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.38 and the minimum P^H is 7.62 (Fig.19a). In 2018, pH range varied from 7.62 to 7.94. In 2019, the maximum DO 7.7 mg/l and the minimum 5.2 mg/l (Fig.19b). In 2018, DO range varied from 5.2 mg/l to 7.3 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 1.7 mg/l and the minimum is 0.4 mg/l (Fig.19c). In 2018, BOD range varied from 0.8 mg/l to 1.6 mg/l. In 2019, The maximum TDS is 14460 mg/l and the minimum is 166 mg/l (Fig.19d). In 2018, TDS range varied from 182 mg/l to 12732 mg/l. In 2019, Chloride concentration of the Pashur river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 8150 mg/l and the minimum is 92 mg/l (Fig.19e). In 2018, Chloride range varied from 92 mg/l to 8116 mg/l. In 2019, The maximum Turbidity 110.4 NTU and the minimum is 54.2 NTU (Fig.19f). In 2018, Turbidity range varied from 54.2 NTU to 110 NTU . The EQS for drinking water is 10 NTU. In 2019, Maximum SS concentration of Pashur river is 116 mg/l and the minimum is 58 mg/l (Fig.19g). In 2018, SS range varied from 58 mg/l to 118 mg/l. In 2019, The maximum EC 28920 $\mu\text{mhoms/cm}$ and the minimum EC 326 $\mu\text{mho/cm}$ (Fig.19h). In 2018, EC range varied from 364 $\mu\text{mhoms/cm}$ to 28458 $\mu\text{mhoms/cm}$. In 2019, EC of Pashur river at different locations is mostly within the EQS 1200 $\mu\text{mhoms/cm}$ for treated wastewater from industrial units .

4.20 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. Kaligonj Bank, Middle and Opposite bank at Shatkhirra in 2019. For analysis, average values of three points were considered. Detail data is attached Annex-1 (Table: 139-146).

In 2019, pH of Khakshiali river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.15 and the minimum P^H is 7.49 (Fig.20a). In 2018, pH range varied from 7.4 to 7.73. In 2019, the maximum DO 8.65 mg/l and the minimum 3.25 mg/l (Fig.20b). In 2018, DO range varied from 5.1 mg/l to 5.6 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 1.5 mg/l and the minimum is 0.8 mg/l (Fig.20c). In 2018, BOD range varied from 0.8 mg/l to 1.0 mg/l. In 2019, The maximum TDS is 16426 mg/l and the minimum is 476 mg/l (Fig.20d). In 2018, TDS range varied from 492 mg/l to 16124 mg/l. In 2019, Chloride concentration of the Khakshiali river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 8728 mg/l and the minimum is 104 mg/l (Fig.20e). In 2018, Chloride range varied from 104 mg/l to 8588 mg/l. In 2019, The maximum Turbidity 129.3 NTU and the minimum is 57.6 NTU (Fig. 20f). The EQS for drinking water is 10 NTU. In 2018, Turbidity range varied from 56 NTU to 128 NTU. In 2019, The maximum EC (32850 $\mu\text{mhoms/cm}$) and the minimum EC 984 $\mu\text{mho/cm}$ (Fig.20g). In 2018, EC range varied from 982 $\mu\text{mhoms/cm}$ to 32248 $\mu\text{mhoms/cm}$. In 2019, EC of Khakshiali river at different locations is mostly within the EQS (1200 $\mu\text{mhoms/cm}$) for treated wastewater from industrial units . In 2019, Maximum Salinity 17.8 ppt and minimum is (0.6 ppt) (Fig. 20h). In 2019, Maximum Total Alkalinity (38 mg/l) and minimum is (32 mg/l) (Fig. 20i).. In 2019, Maximum SS concentration of Khakshiali river is 124 mg/l and the minimum is 55 mg/l (Fig. 20j). In 2018, SS range varied from 41 mg/l to 108 mg/l.

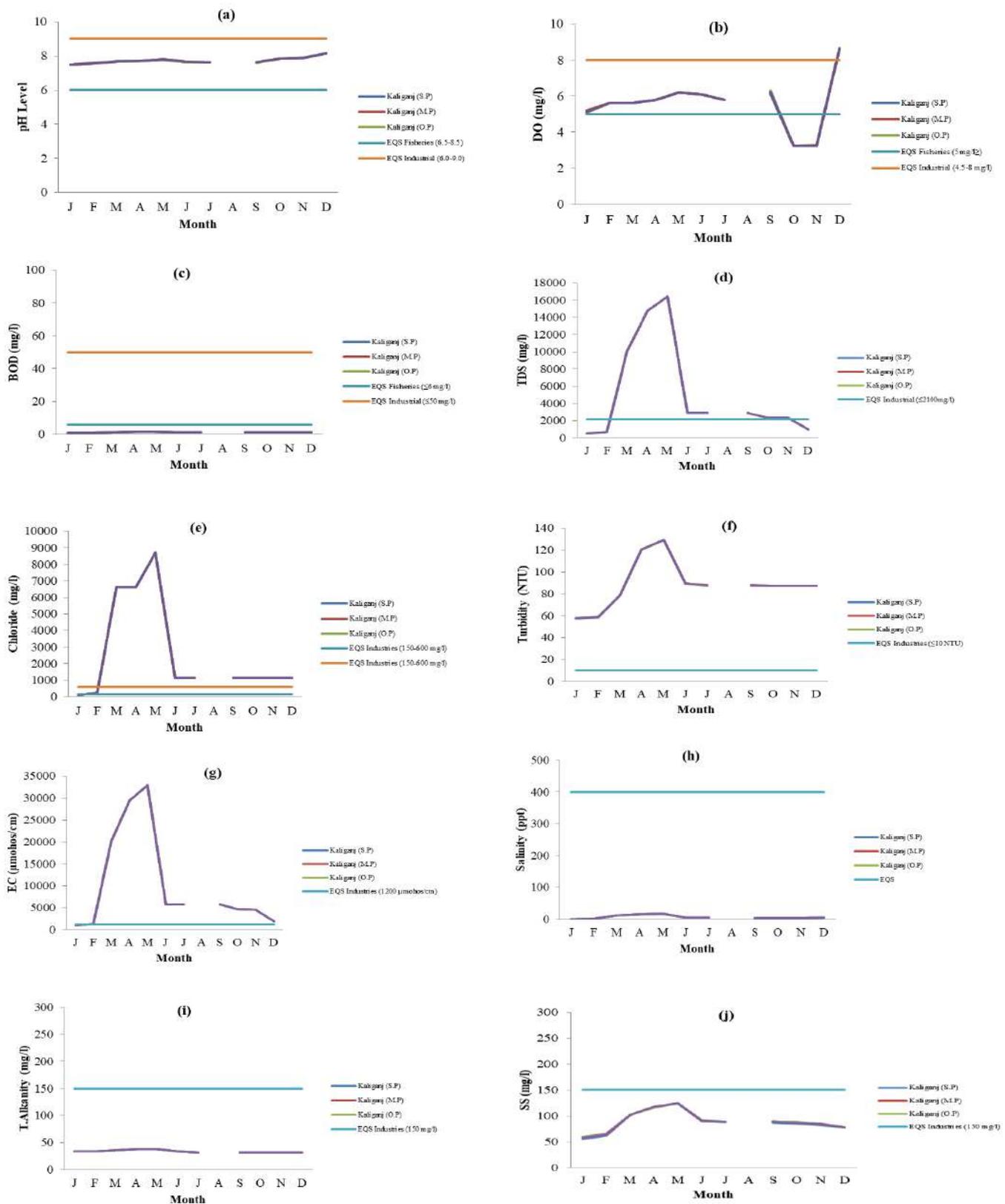


Fig.20. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC, Salinity, T. Alkalinity and SS of Khakshiali River in 2019

4.21 Gorai River

The Gorai river is located in Kushtia district in Khulna division. Water samples were collected from two locations viz. Magura and Kustia comprising three points each. Average values of six points of a location were used for graphical representation. Detail data is attached Annex-1 (Table:147-154). Data was not available the month of August.

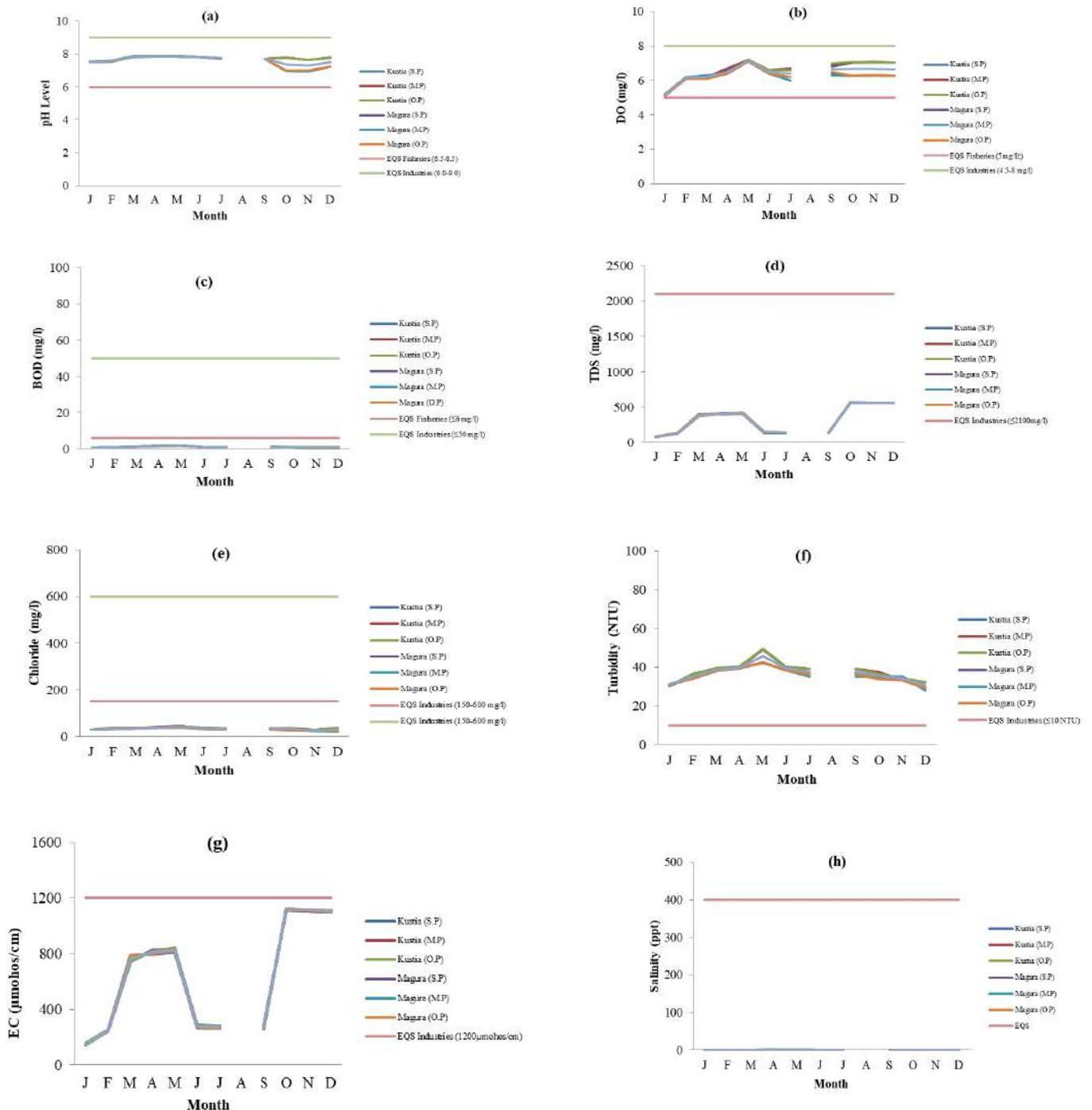


Fig.21. Status of pH, DO BOD, TDS, Chloride, Turbidity, EC and Salinity of Gorai River in 2019

In 2019, pH of Gorai river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 7.88 and the minimum P^H is 6.95 (Fig.21a). In 2018, pH range varied from 7.5 to 7.89. In 2019, the maximum DO (7.2 mg/l) and the minimum (5.1 mg/l) (Fig.21b). In 2018, DO range varied from 5.0 mg/l to 5.8 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 1.9 mg/l and the minimum is 0.4 mg/l (Fig. 21c). In 2018, BOD range varied from 0.6 mg/l to 2.3 mg/l. In 2019, The maximum TDS is 564 mg/l and the minimum is 74 mg/l (Fig. 21d). In 2018, TDS range varied from 86 mg/l to 416 mg/l. In 2019, Chloride concentration of the Gorai river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride (44 mg/l) and the minimum is 28 mg/l (Fig. 21e). In 2018, Chloride range varied from 28 mg/l to 36 mg/l. In 2019, The maximum Turbidity 49.4 NTU and the minimum is 28.1 NTU (Fig. 21f). In 2018, Turbidity range varied from 28 NTU to 40 NTU. The EQS for drinking water is 10 NTU. In 2019, The maximum EC (1123 $\mu\text{mhoms/cm}$) and the minimum EC (144 $\mu\text{mho/cm}$) (Fig. 21g). In 2018, EC range varied from 172 $\mu\text{mhoms/cm}$ to 830 $\mu\text{mhoms/cm}$. In 2019, EC of Gorai river at different locations is mostly within the EQS (1200 $\mu\text{mhoms/cm}$) for treated wastewater from industrial units . In 2019, Maximum Salinity (0.9 ppt) and minimum is (0.1 ppt) (Fig. 21h).

4. 22 Madhumati River

The Madhumati river, distributary of the upper Padma River, flowing through southwestern 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 2019, samples were collected from three location comprising three different points (Mollarhat side, middle and opposite) of Bagerhat. Detail data is attached Annex-1 (Table: 155-162). Data was not available the month of August.

In 2019, pH of Madhumati river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.37 and the minimum P^H is 6.71 (Fig. 22a). In 2018, pH range varied from 7.4 to 7.58. In 2019, the maximum DO 7.95 mg/l and the minimum 4.6 mg/l (Fig. 22b). In 2018, DO range varied from 4.6 mg/l to 5.5 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 0.9 mg/l and the minimum is 0.4 mg/l (Fig. 22c). In 2018, BOD range varied from 0.6 mg/l to 1.0 mg/l. In 2019, The maximum TDS is 380 mg/l and the minimum is 82 mg/l (Fig. 22d). In 2018, TDS range varied from 96 mg/l to 400 mg/l. In 2019, Chloride concentration of the Madhumati river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 52mg/l and the minimum is 23mg/l (Fig. 22e). In 2018, Chloride range varied from 26 mg/l to 42 mg/l. The maximum Turbidity 45.8 NTU and the minimum is 27.2 NTU (Fig. 22f). In 2018, Turbidity range varied from 27.2 NTU to 46.2 NTU. The EQS for drinking water is 10 NTU. In 2019, The maximum EC 760 $\mu\text{mhoms/cm}$ and the minimum EC 164 $\mu\text{mhoms/cm}$ (Fig. 22g). In 2018, EC range varied from 27.2 $\mu\text{mhoms/cm}$ to 46.2 $\mu\text{mhoms/cm}$. In 2019, EC of Madhumati river at different locations is mostly within the EQS (1200 $\mu\text{mhoms/cm}$) for treated wastewater from industrial units. In 2019, Maximum Salinity 0.6 ppt and minimum is 0.0 ppt (Fig.22h).

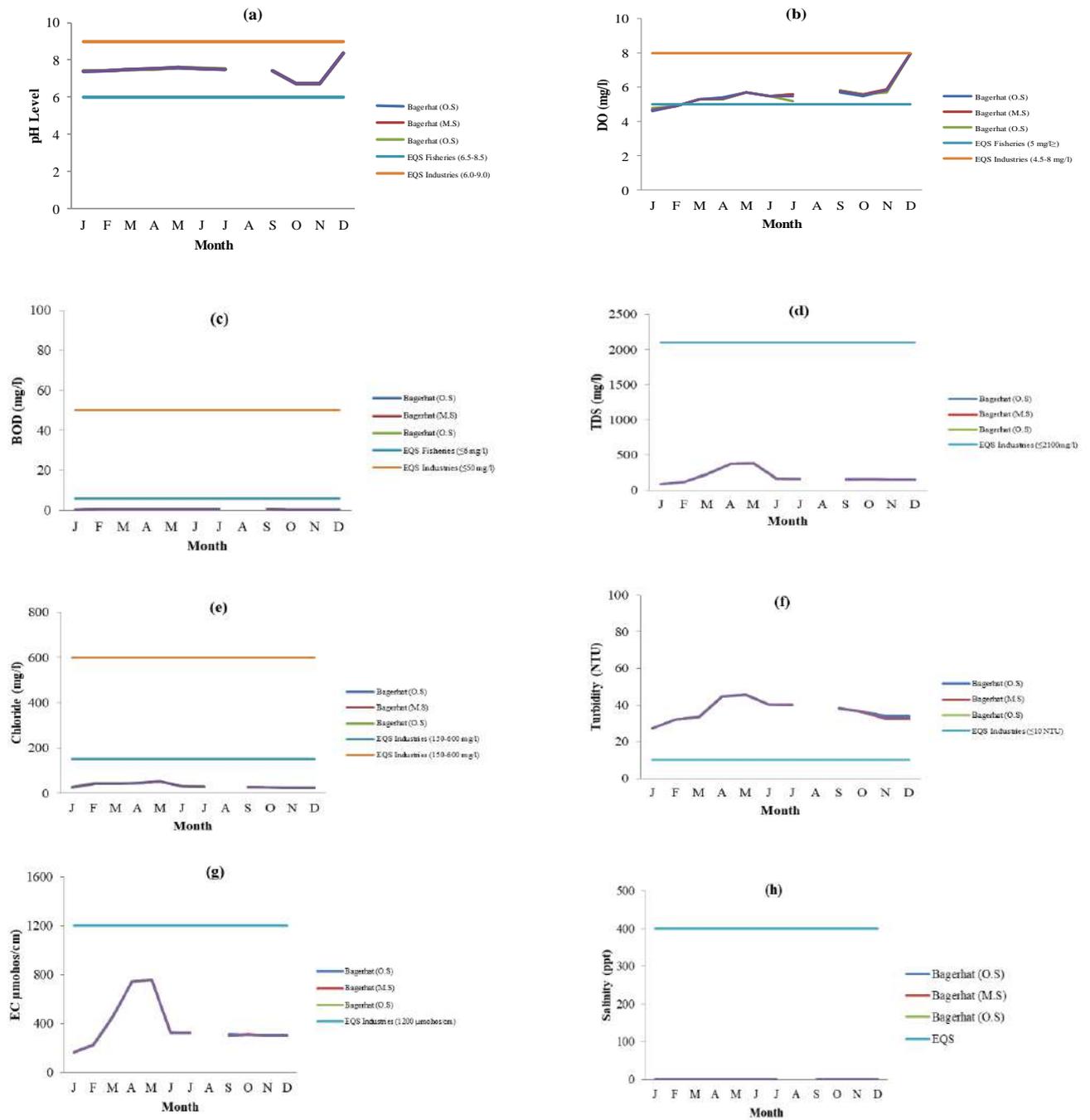


Fig.22. Status of pH, DO, BOD, TDS, Chloride, Turbidity, EC and Salinity of Modhumoti River in 2019

4.23 Beel Dakatia River

The Beel Dakatia river located in the north-eastern part of khulna district. To monitor water quality of Beel Dakatia river in 2018, samples were collected from two location at Khulna comprising two points (bank and middle). For analysis, average of two points were used. Detail data is attached Annex-1 (Table: 163-173). Data was not available the month of August.

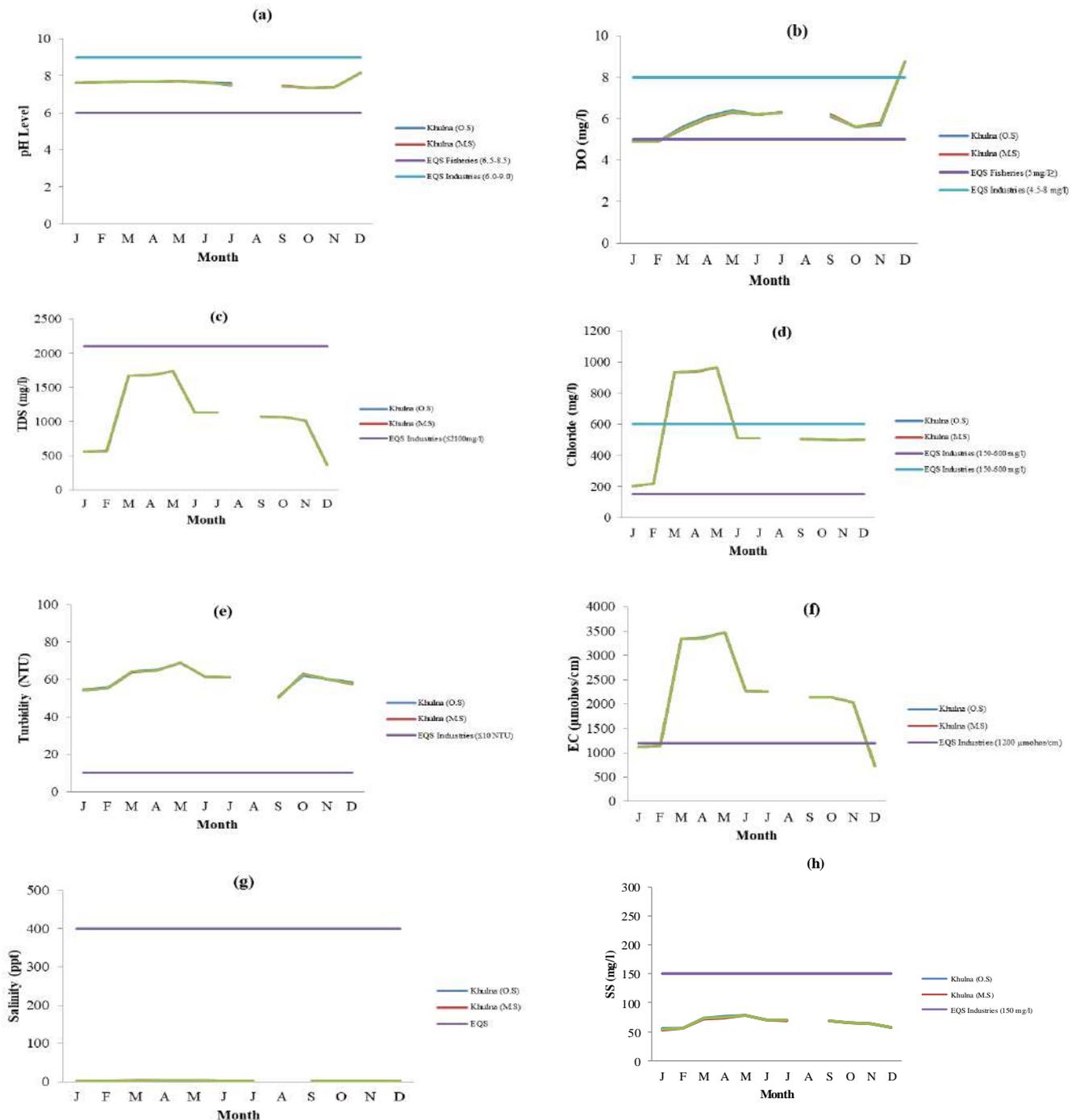


Fig.23. Status of pH, DO, TDS, Chloride, Turbidity, EC, Salinity and SS of Beel Dakatia River in 2019

In 2019, pH of Beel Dakatia river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.17 and the minimum P^H is 7.37 (Fig. 23a). In 2018, pH range varied from 7.6 to 7.68. In 2019, the maximum DO 8.77 mg/l and the minimum 4.9 mg/l (Fig. 23b). In 2018, DO range varied from 4.8 mg/l to 5.9 mg/l. In 2019, The maximum TDS is 1736 mg/l and the minimum is 366 mg/l (Fig. 23c). In 2018, TDS range varied from 564 mg/l to 1714 mg/l. In 2019, Chloride concentration of the Beel Dakatia river water is below the EQS (600 mg/l) for wastewater after treatment from industrial units. In 2019, The maximum Chloride 966 mg/l and the minimum is 204 mg/l (Fig. 23d). In 2018, Chloride range varied from 204 mg/l to 976 mg/l. In 2019, The maximum Turbidity 68.9 NTU and the minimum is 50.4 NTU (Fig. 23e). In 2018, Turbidity range varied from 54.6 NTU to 64.8 NTU. The EQS for drinking water is 10 NTU. In 2019, The maximum EC 3472 µmhoms/cm and the minimum EC 732 µmho/cm (Fig. 23f). In 2018, EC range varied from 1126 µmhoms/cm to 3409 µmhoms/cm. In 2019, EC of Beel Dakatia river at different locations is mostly within the EQS (1200 µmhoms/cm) for treated wastewater from industrial units. In 2019, Maximum Salinity 3.4 ppt and minimum is 1.0 ppt (Fig.23g). In 2019, The maximum SS is 78 mg/l and the minimum is 52 mg/l (Fig. 23h). In 2018, SS range varied from 50 mg/l to 78 mg/l.

4.24 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 one location of the river at Launch ghat (bank and in the middle), Dopdopia Kheyaghat (bank and middle), Beltola Fery Gaht (bank and middle). For analysis, average of six points were used. Detail data is attached Annex-1 (Table:170-175).

In 2019, pH of Kirtankhola river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 7.79 and the minimum P^H is 7.4 (Fig. 24a). In 2018, pH range varied from 7.4 to 7.81. In 2019, the maximum DO 7.6 mg/l and the minimum 5.2 mg/l (Fig. 24b). In 2018, DO range varied from 5.2 mg/l to 6.6 mg/l. In 2019, BOD load was within the EQS (≤6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 2.4 mg/l and the minimum is 1.5 mg/l (Fig. 24c). In 2018, BOD range varied from 1.8 mg/l to 2.4 mg/l. In 2019, The maximum TDS is 218 mg/l and the minimum is 84 mg/l (Fig. 24d). In 2018, TDS range varied from 71 mg/l to 133 mg/l. In 2019, The maximum TS 243 mg/l and the minimum is 102 mg/l (Fig. 24e). In 2018, TS range varied from 86 mg/l to 150 mg/l. In 2019, The maximum EC 436 µmhoms/cm)and the minimum EC 168 µmho/cm (Fig. 24f). In 2018, EC range varied from 142 µmhoms/cm to 264 µmhoms/cm.

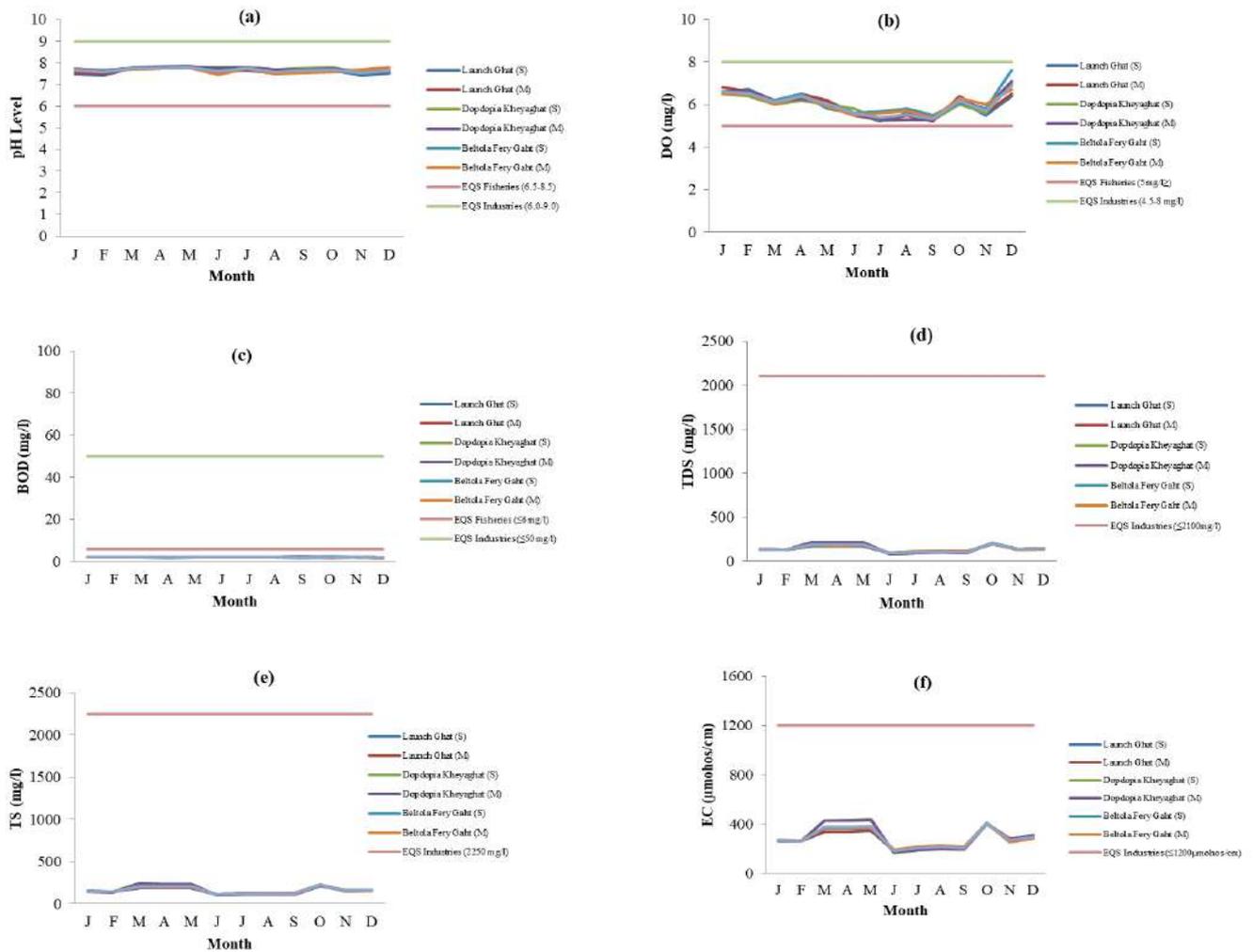


Fig.24. Status of pH, DO, BOD, TDS, TS and EC of Kirtankhola River in 2019

4.25 Tatulia River

For monitoring of water quality of Tatulia river water samples was collated from Vedhoria Fery Ghat (VFG) location (bank and middle point). For analysis, average of two points were used. Detail data is attached Annex-1 (Table: 176-181). Data was not available the month of January, march, May, July, September, November.

In 2019, pH of Tatulia river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 7.65 and the minimum P^H is 7.3 (Fig. 25a). In 2018, pH range varied from 7.28 to 7.44. In 2019, the maximum DO 6.9 mg/l and the minimum 2.1 mg/l (Fig. 25b). In 2018, DO range varied from 5.2 mg/l to 6.4 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 2.3 mg/l and the minimum is 1.4 mg/l (Fig. 25c). In 2018, BOD range varied from 1.8 mg/l to 2.3 mg/l. In 2019, The maximum TDS is 136 mg/l and the minimum is 88 mg/l (Fig. 25d). In 2018, TDS range varied from 89 mg/l to 103 mg/l. In 2019, The maximum TS 153 mg/l and the minimum is 106 mg/l (Fig. 25e). In 2018, TS range varied from 108 mg/l to 118 mg/l. In 2019, The maximum SS 21 mg/l and the minimum is 14 mg/l (Fig. 25f).

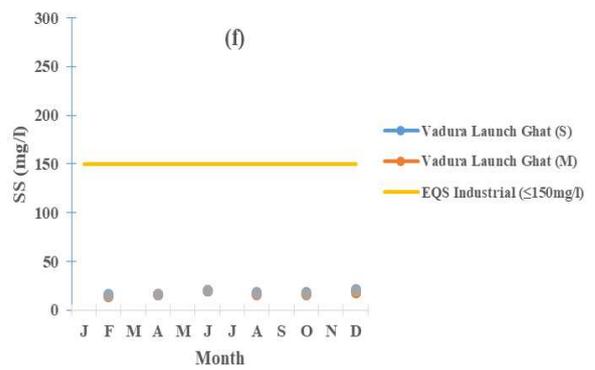
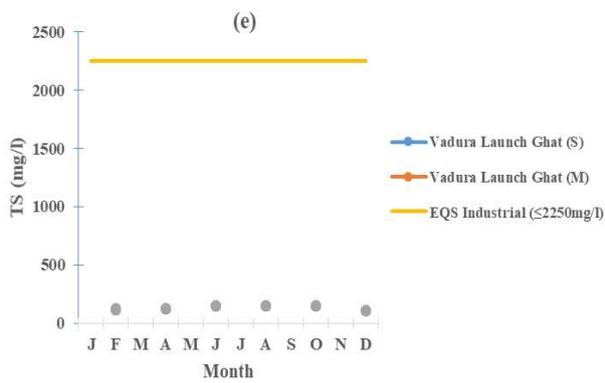
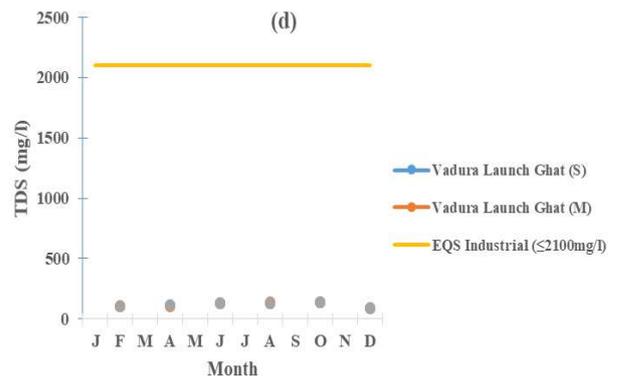
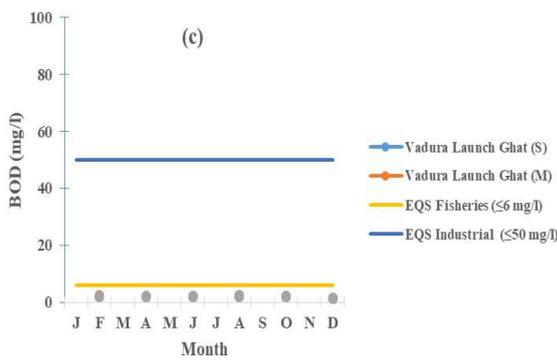
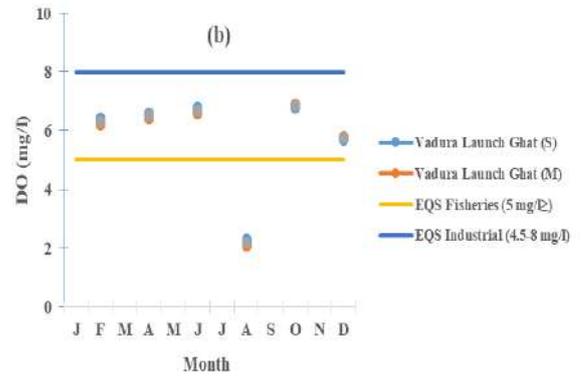
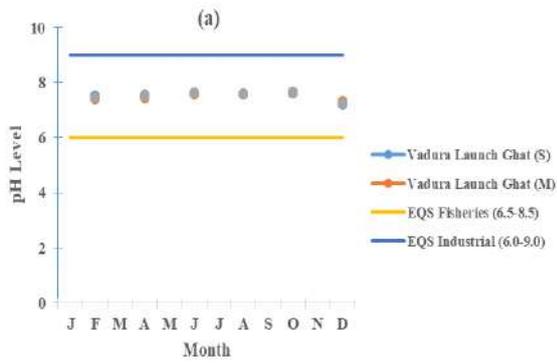


Fig.25.Status of pH, DO, BOD, TDS, TS and SS of Tatulia River in 2019

4.26 Sugandha River

The Bishkhali is a river of Bangladesh, a continuation of the Sugandha. Bishkhali River continuation of the kirtankhola and nalchity rivers. The total length of the river is 96 km. The average width of the river from its origin to first 30 km is about 1 km and the rest is about 2 km. The average depth is about 16m. The Sugandha turns into Bishkhali after entering Jhalokati town. To monitor water quality of Sugandha River water samples were collected for analysis from two points, Jhalkathi Launch Ghat (Side and Middle) of the river. Detail data is attached Annex-1 (Table: 182-187). Data was not available the month of February, April, June, August, December.

In 2019, pH of Sugandha river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.0 and the minimum P^H is 7.2 (Fig. 26a). In 2018, pH range varied from 7.35 to 7.48. In 2019, the maximum DO 6.4 mg/l and the minimum 5.5 mg/l (Fig. 26b). In 2018, DO range varied from 5.2 mg/l to 6.3 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 2.3 mg/l and the minimum is 1.8 mg/l (Fig. 26c). In 2018, BOD range varied from 2.0 mg/l to 2.35 mg/l. In 2019, The maximum TDS is 206 mg/l and the minimum is 108 mg/l (Fig. 26d). In 2018, TDS range varied from 95 mg/l to 111 mg/l. In 2019, The maximum TS 226 mg/l and the minimum is 122 mg/l (Fig. 26e). In 2018, TS range varied from 115 mg/l to 129 mg/l. In 2019, The maximum SS 20 mg/l and the minimum is 15 mg/l (Fig. 26f).

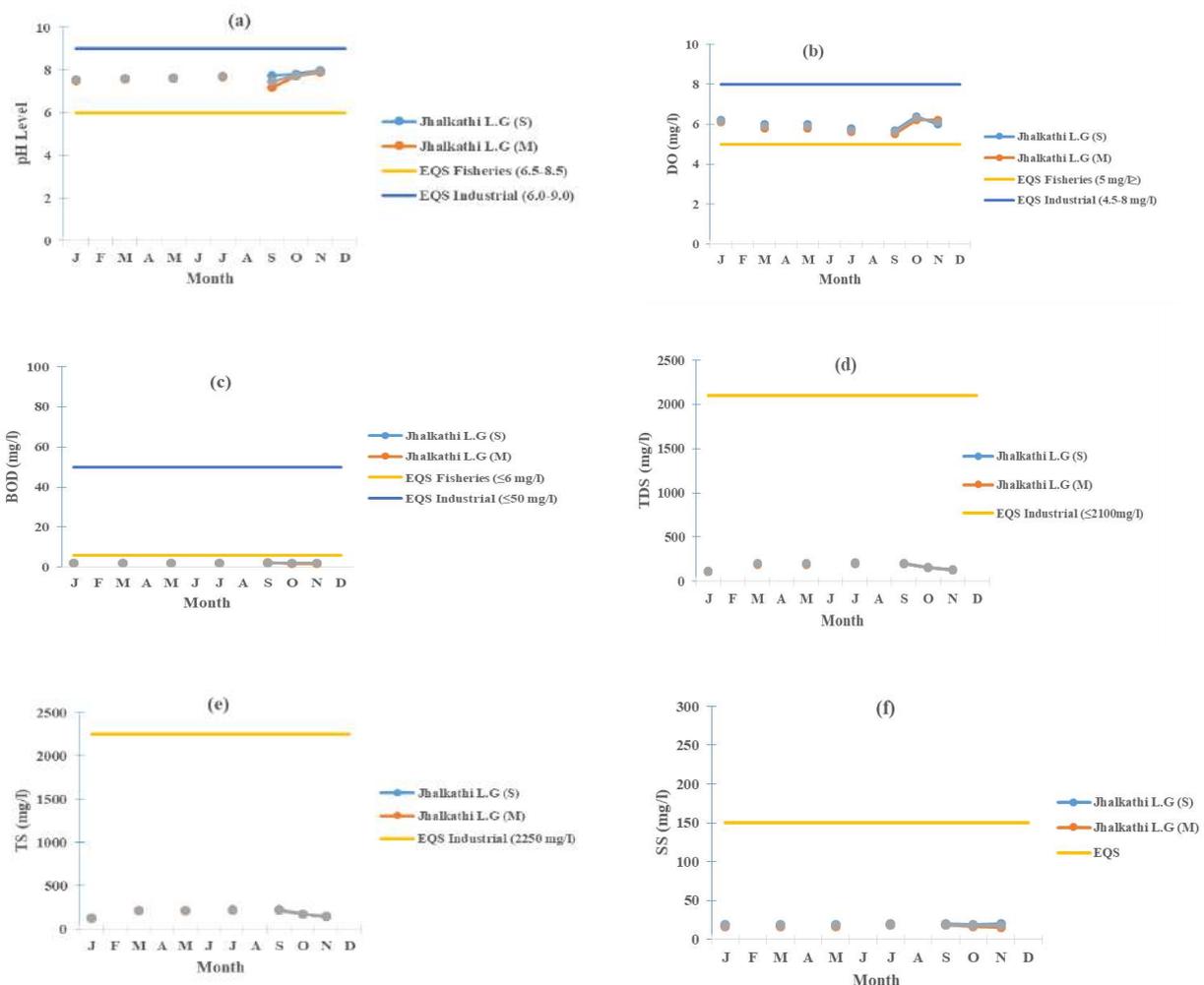


Fig.26. Status of pH, DO, BOD, TDS , TS and SS of Sugandha River in 2019

4.27 Lohalia River

Patuakhali city is surrounded on three sides by two rivers. The two major rivers are Laukathi and Lohalia, which are directly connected with the Bay of Bengal. For monitoring purpose water samples were collected from Patuakhali Launch Ghat (PLG) (side and middle). For analysis, average of two points were used. Detail data is attached Annex-1 (Table: 188-193). Data was not available the month of January, march, May, July, September, November.

In 2019, pH of Lohalia river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 7.8 and the minimum P^H is 7.47 (Fig. 27a). In 2018, pH range varied from 7.34 to 7.47. In 2019, the maximum DO 7.2 mg/l and the minimum 5.8 mg/l (Fig. 27b). In 2018, DO range varied from 5.45 mg/l to 6.1 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 2.2 mg/l and the minimum is 1.5 mg/l (Fig. 27c). In 2018, BOD range varied from 2.0 mg/l to 2.2 mg/l. In 2019, The maximum TDS is 372 mg/l and the minimum is 107 mg/l (Fig. 27d). In 2018, TDS range varied from 69 mg/l to 106 mg/l. In 2019, The maximum TS 386 mg/l and the minimum is 121 mg/l (Fig. 27e). In 2018, TS range varied from 85 mg/l to 124 mg/l. In 2019, The maximum SS 22 mg/l and the minimum is 14 mg/l (Fig. 27f).

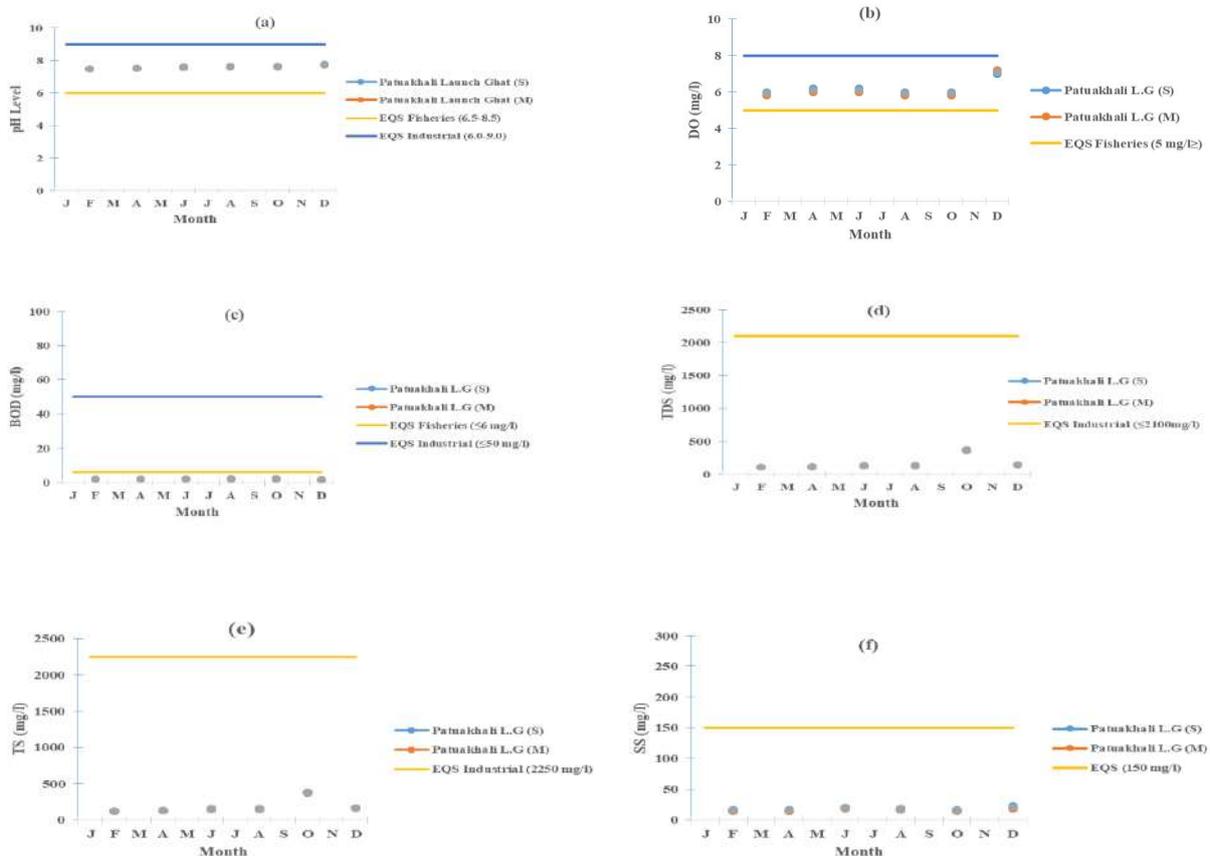


Fig.27. Status of pH, DO, BOD, TDS, TS and SS of Lohalia River in 2019

4.28 Surma River

The Surma River is a major river in Bangladesh, part of the Surma-Meghna River System. It starts when the Barak River from northeast India divides at the Bangladesh border into the Surma and the Kushiyara rivers. It ends in Kishoreganj District, above Bhairab Bazar, where the two rivers rejoin to form the Meghna River. The waters from the river ultimately flow into the Bay of Bengal. The average depth of this river is 86m and maximum depth is 170m. For monitoring purpose water samples were collected from five different locations of the river namely Mendibag Point (MP), Kin Bridge (KB), Shak Ghat (SG), Chattak and Kazi Bazar (KB). Detail data is attached Annex-1 (Table: 194-199). Data was not available the month of April, May, July, September, October, November, December.

In 2019, pH of Surma river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.9 and the minimum P^H is 6.8 (Fig. 28a). In 2018, pH range varied from 7.4 to 8.84. In 2019, the maximum DO 8.2 mg/l and the minimum 4.5 mg/l (Fig. 28b). In 2018, DO range varied from 5.8 mg/l to 7.1 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. In 2019, The maximum BOD is 6.2 mg/l and the minimum is 1.9 mg/l (Fig. 28c). In 2018, BOD range varied from 1.9 mg/l to 2.7 mg/l. In 2019, The maximum TDS is 153 mg/l and the minimum is 39 mg/l (Fig. 28d). In 2018, TDS range varied from 26.6 mg/l to 854 mg/l. In 2019, The maximum SS 84 mg/l and the minimum is 13 mg/l (Fig. 28e). In 2019, The maximum COD 21 mg/l and the minimum is 9 mg/l (Fig. 28f). In 2018, COD range varied from 9 mg/l to 26 mg/l.

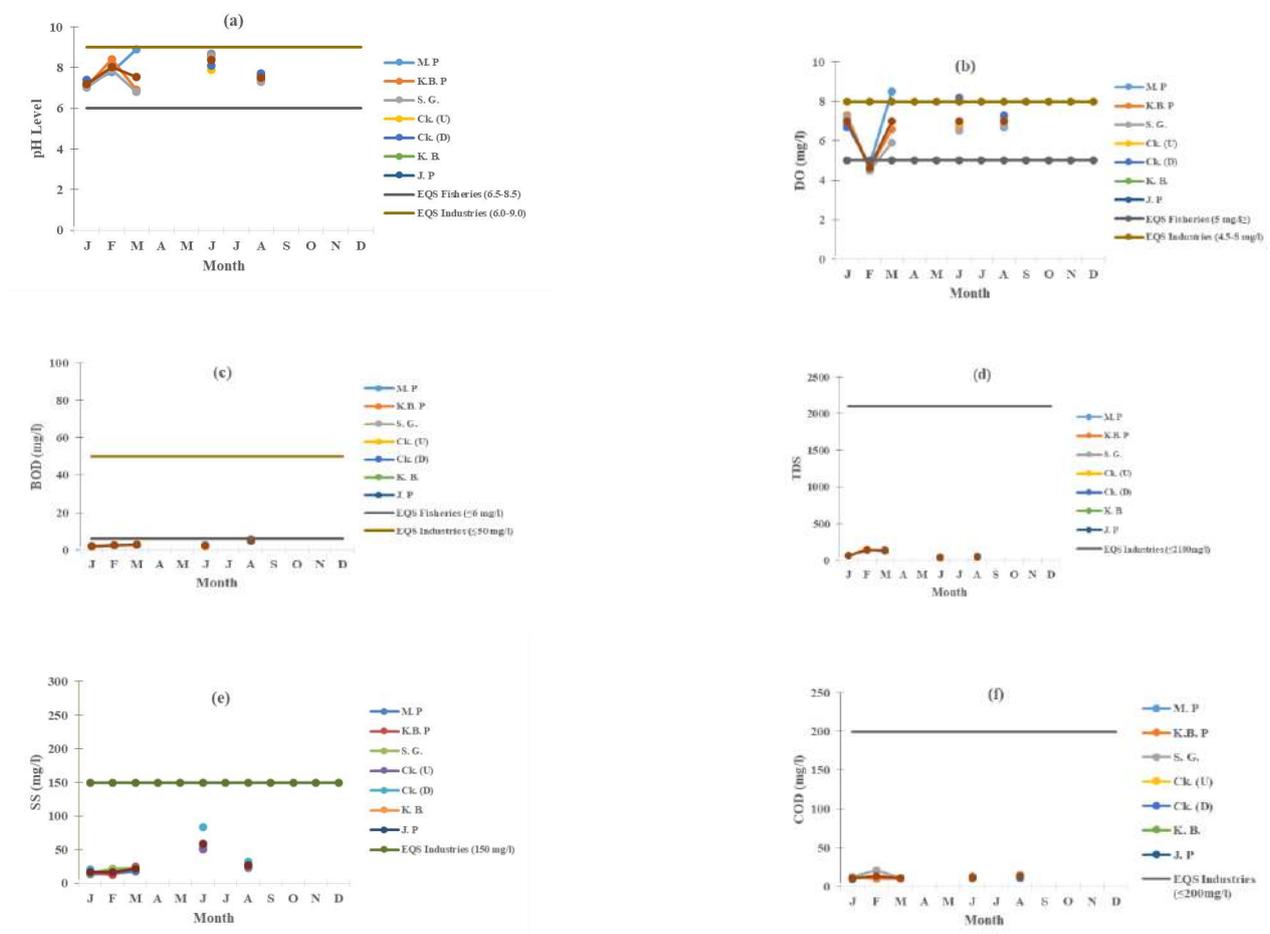


Fig.28. Status of pH, DO, BOD, TDS, SS and COD of Surma River in 2019

4.29 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 Kushiara Point. Detail data is attached Annex-1 (Table: 200-205). Data was not available the month of May to December.

In 2019, pH of Kushiara river water is within the EQS (6.5-8.5) range for inland surface water. In 2019, The maximum pH is 8.2 and the minimum pH is 7.3 (Fig. 29a). In 2018, pH range varied from 7.7 to 8.3 mg/l. In 2019, the maximum DO 7.1 mg/l and the minimum 6.3 mg/l (Fig. 29b). In 2018, DO range varied from 6.67 mg/l to 7.9 mg/l. In 2019, BOD load was within the EQS (≤ 6 mg/l) for fisheries at all locations. The maximum BOD is 3.4 mg/l and the minimum is 2.1 mg/l (Fig. 29c). In 2018, BOD range varied from 1.8 mg/l to 2.1 mg/l. The maximum TDS is 143 mg/l and the minimum is 82 mg/l (Fig. 28d). In 2018, TDS range varied from 28 mg/l to 498 mg/l. The maximum SS 21 mg/l and the minimum is 18 mg/l (Fig. 29e). The maximum COD 18 mg/l and the minimum is 12 mg/l (Fig. 29f).

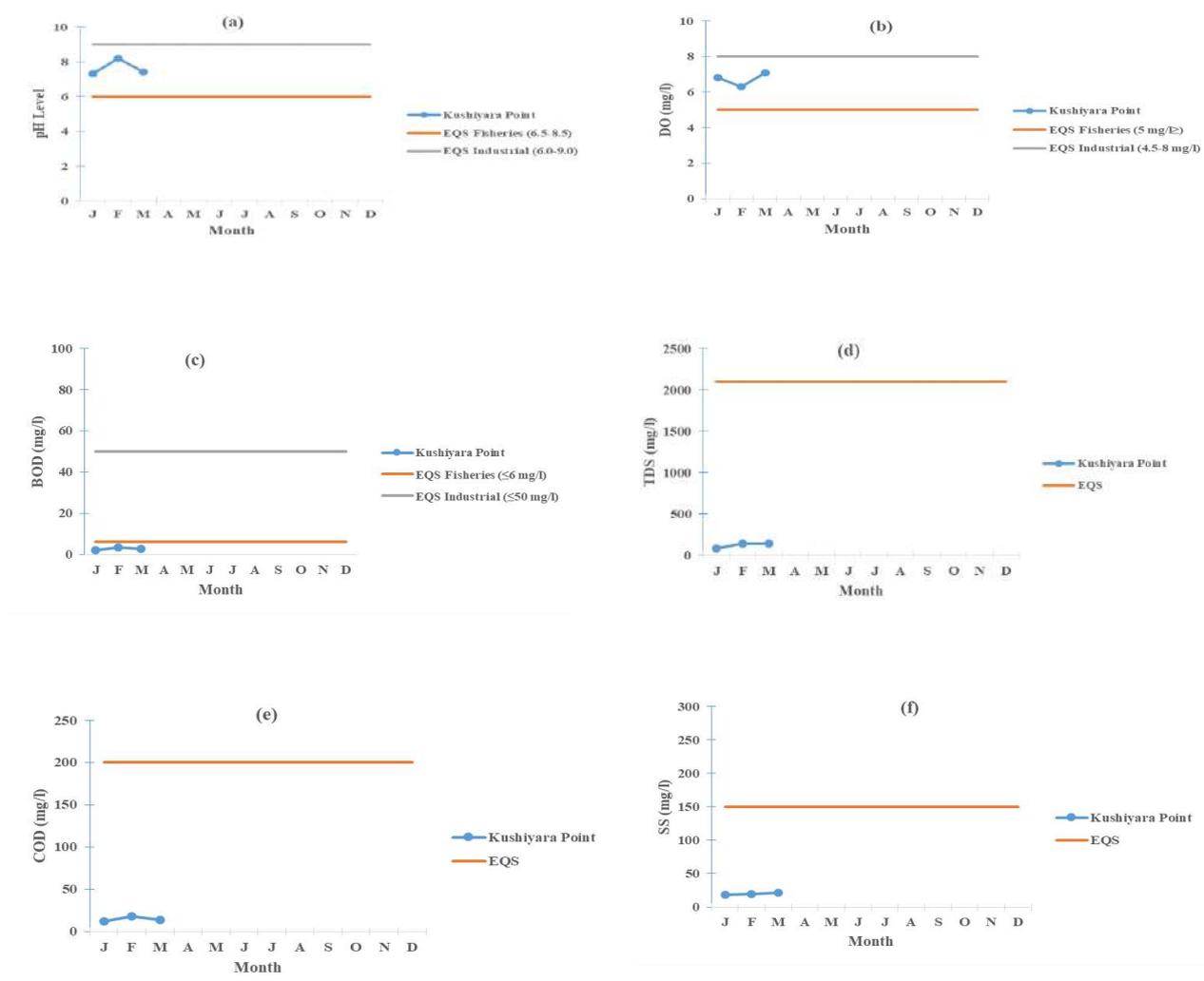


Fig 29. Status of pH, DO, BOD, TDS, COD and SS of Kushiara River in 2019

CHAPTER 5: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF LAKE AND GROUND WATER QUALITY IN 2019

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 Five locations e.g. Near United Hospital, Kalachadpur (N.U.H.K), Near Housing, South Bridge (N.H.S.B), Near Lake View Clinic (N.L.V.C), North Side Gulshan Baridhara Lake (N.S.G.B.L), Taltola Shooting Complex of the lake in 2019 for analysis of water quality. Detail data is attached Annex-2 (Table : 206-214). Data was not available the month of February.

In 2019, pH of Gulshan Lake water varied from 6.69 to 9.35 (Fig. 30a). In 2018, pH range varied from 6.9 to 8.39. In 2018, DO content of Gulshan lake widely varied among the sampling locations as well as among sampling months. In 2019, DO of Gulshan Lake water varied from 0.4 to 18.8 mg/l (Fig. 30b). In 2018, DO range varied from 0.3 mg/l to 14.1 mg/l. In 2019, BOD of Gulshan Lake water varied from 12 to 48 mg/l (Fig. 30c). In 2018, BOD range varied from 0.3 mg/l to 14.1 mg/l. In 2019, The maximum COD 194 mg/l and the minimum COD 19 mg/l (Fig. 30d). In 2019, TDS of Gulshan Lake water varied from 94.7 to 333 mg/l. (Fig. 30e). In 2018, COD range varied from 34 mg/l to 170 mg/l. In 2019, Turbidity of Gulshan Lake water varied from 13.1 to 77.1 NTU (Fig. 30f). In 2018, Turbidity range varied from 15.4 NTU to 153 NTU. In 2019, Chloride of Gulshan Lake water varied from 17 to 48 mg/l (Fig. 30g). In 2018, Chloride range varied from 16 mg/l to 59 mg/l. In 2019, The maximum SS 441.1 mg/l and the minimum SS 36 mg/l (Fig. 30h). In 2018, SS range varied from 22 mg/l to 211 mg/l. In 2019, Total Alkalinity of Gulshan Lake water varied from 112 mg/l to 352 mg/l (Fig. 30i). In 2018, Total Alkalinity range varied from 14 mg/l to 286 mg/l. In 2019, the maximum EC 638 μ mhos/cm and the minimum EC 230 μ mhos/cm (Fig. 30j). In 2018, EC range varied from 305 μ mhos/cm to 875 μ mhos/cm.

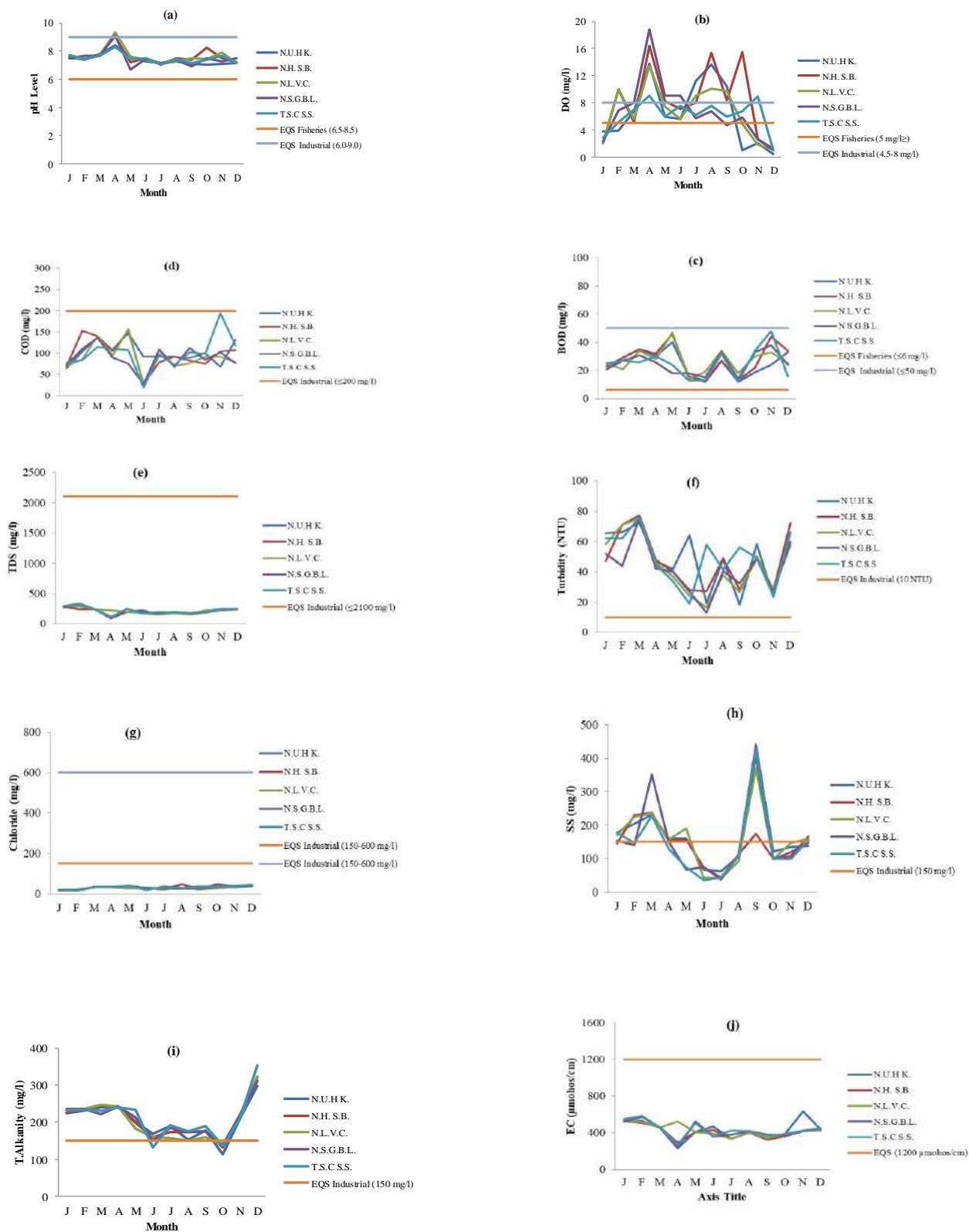


Fig 30. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Gulshan Lake in 2019

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 not available in the months of February. Detail data is attached Annex-2 (Table: 215-224).

Water samples were collected from four locations e.g. 8 No. Road Bridge (8 N.R.B), Near Gigatola Pilkhana More (N.G.P.M), Near Dhanmondi-32 Bangabandhu Jadughor (N.D.B.J), Near Dhanmondi-32 Bridge (N.D.B) of the lake in 2019 for analysis of water quality.

In 2019, pH level of Dhanmondi Lake water was within the EQS (6.5-8.5) for fisheries. It varied from 6.87 to 8.3 (Fig. 31a). In 2018, pH range varied from 6.8 to 8.45. In 2019, DO was varied from 2.2 to 12.4 mg/l (Fig. 31b). In 2018, DO range varied from 2.6 mg/l to 10.8 mg/l. In 2019, BOD was varied from 2.8 to 29 mg/l (Fig. 31c). In 2018, BOD range varied from 3.1 mg/l to 4.4 mg/l. In 2019, COD was varied from 7 to 79 mg/l COD was within the EQS (Fig. 31d). In 2018, COD range varied from 14 mg/l to 43 mg/l. In 2019, TDS was varied from 90.4 to 330 mg/l and was within the EQS (Fig. 31e). In 2018, TDS range varied from 99.3 mg/l to 136.8 mg/l. In 2019, Turbidity was varied from 3.0 to 68 NTU (Fig. 31f). In 2019, Chloride was varied from 5.5 to 49 mg/l and was within the EQS (Fig. 31g). In 2018, Chloride was varied from 3.99 to 59 mg/l. In 2019, SS was varied from 5 to 180 mg/l and was within the EQS (Fig. 31h). In 2018, SS was varied from 18 to 48 mg/l. In 2019, Total Alkalinity was within the EQS (150 mg/l) and varied from 15 to 304 mg/l (Fig. 31i). In 2018, Total Alkalinity varied from 90 to 118 mg/l. In 2019, EC was within the EQS (1200 μ mhos/cm) limit and it was varied 7.91 to 639 μ mhos/cm (Fig. 31j). Overall condition of the lake is good. In 2018, EC was varied μ mhos/cm 209 to 273 μ mhos/cm.

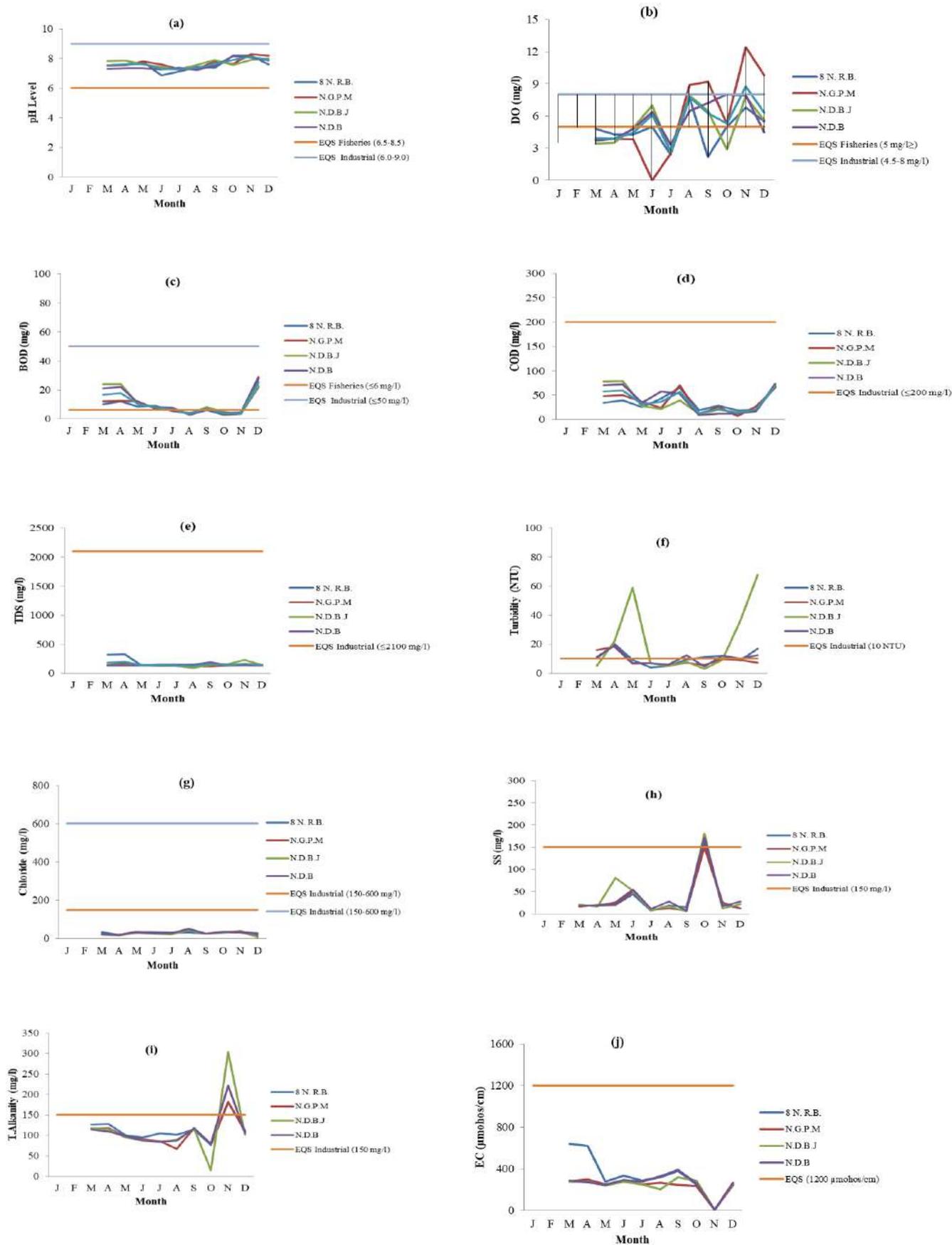


Fig 31. Status of pH, DO, BOD, COD, TDS, Turbidity , Chloride, SS, T. Alkalinity and EC of Dhamnondi Lake in 2019

5.3 Water Quality Parameters of Hatir-Jheel Lake

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

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

Direct discharge of sewage, municipal waste and industrial effluent cause water pollution in the lake. Water samples were collected from three locations e.g. Badda-Gulshan Link Road Bridge (B.G.L.R), Rampura Bridge (R.B), FDC More Bridge (FDC M.B), of the lake in 2019 for analysis of water quality. Data was not available in the months of February. Detail data is attached Annex-2 (Table: 225-234).

In 2019, pH level of Hatir Jheel Lake water was within the EQS (6.5-8.5) for fisheries. It varied from 6.87 to 7.86 (Fig.32a). In 2018, pH level varied from 6.84 to 7.8. In 2019, DO was varied from 0.4 to 16.4 mg/l (Fig.32b). In 2018, DO was varied from 0 to 9.76 mg/l. In 2019, BOD was varied from 6 to 66 mg/l (Fig.32c). In 2018, BOD was varied from 16 to 54 mg/l. In 2019, COD of Hatir Jheel water varied from 18 to 201 mg/l (Fig.32d). In 2018, COD of Hatir Jheel water varied from 36 to 211 mg/l. In 2019, TDS was varied from 47 to 444 mg/l (Fig.32e). In 2018, TDS was varied from 189.2 to 358 mg/l. In 2019, Turbidity was varied from 6.11 to 160 NTU and was above the EQS (Fig.32f). In 2018, Turbidity was varied from 16.8 to 88.5 NTU. In 2019, Chloride of Hatir Jheel Lake water varied from 7 to 65 mg/l (Fig.32g). In 2018, Chloride of Hatir Jheel Lake water varied from 33 to 132 mg/l. In 2019, SS was varied from 21 to 367 mg/l (Fig.32h). In 2018, SS was varied from 20 to 167 mg/l. In 2019, Total Alkalinity was above the EQS (150 mg/l) and varied from 129 to 352 mg/l (Fig. 32i). In 2018, Total Alkalinity varied from 158 to 246 mg/l. In 2019, EC was within the EQS (1200 μ mohos/cm) limit and it varied from 288 to 855 μ mohos/cm (Fig. 32j). In 2018, EC varied from 358 to 680 μ mohos/cm.

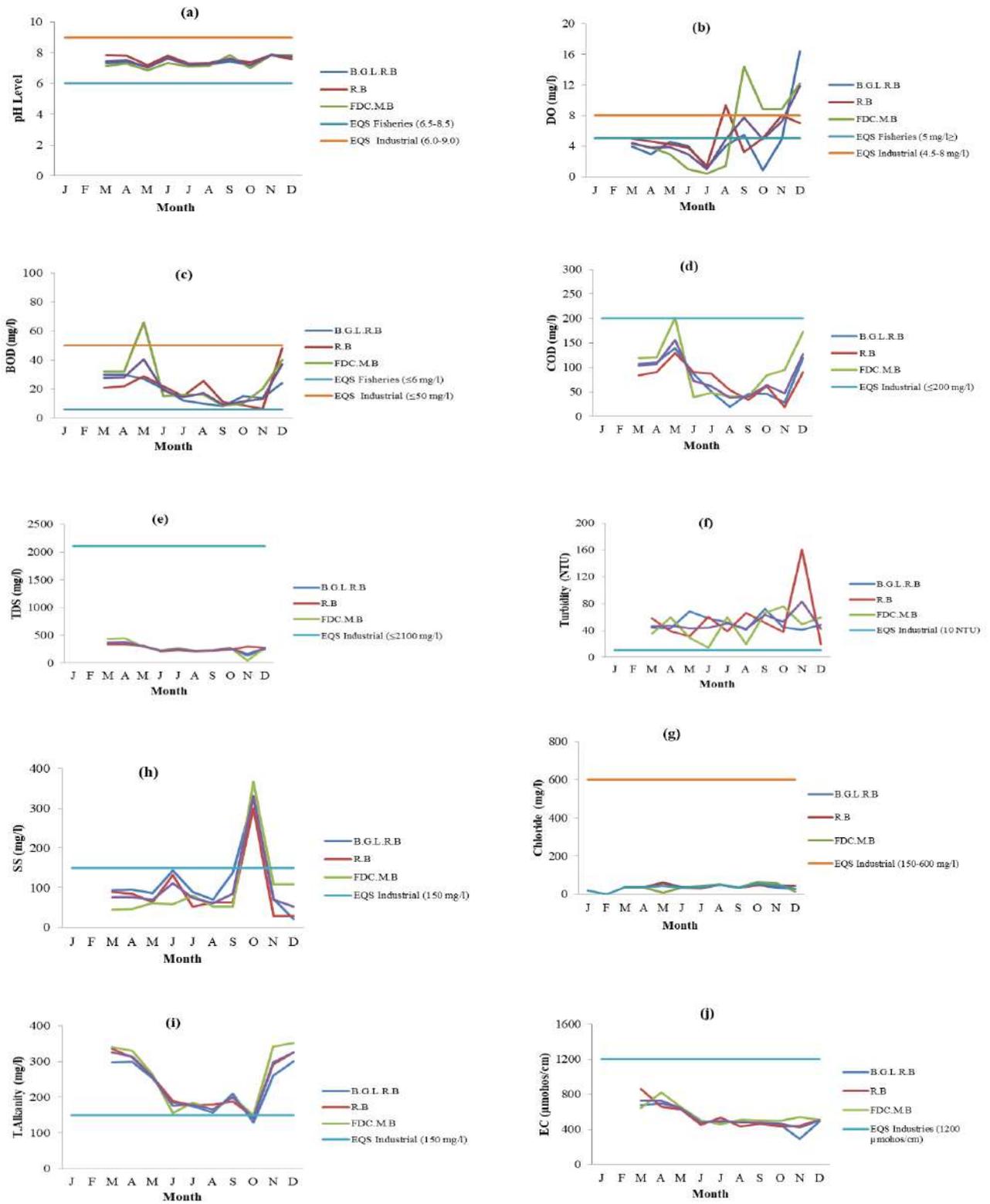


Fig 32. Status of pH, DO, BOD, COD, TDS, Turbidity, Chloride, SS, T. Alkalinity and EC of Hatir Jheel Lake in 2019

5.4 Water Quality Parameters of Ground Water in Khulna District

Khulna is the third-largest city of Bangladesh. It is situated north of the port of Mongla and has various heavy and light industries. For monitoring ground water quality, samples were collected from 30 different locations viz. Divisional Commissioner office, Boyra , KUET University Main Gate, Fulbari Gate, Govt. B.L College, Daulatpur, Govt. Mohasin College, Khalishpur, Govt. Girls College, Boyra, Khulna Public College, Boyra, Boyra Bazar More, Boyra, Aizer More, Boyra, Govt. Comercial College, Sonadanga, Sonadanga Bus Stand, Sonadanga, Sarjical Clinic, Sonadanga, Jia Hall, Sib Bary, Islami Bank Hospital, Santidham Mor, Moylapota More, Seba Clinic, Sher-E-Bangal Road, Nirala More, Gollamari Bus Stand, Gollamari, Khulna University, Vaskarja Chattar, Rupsha Bus Stand, Rupsha, Sundarban Adorso College, Hazi Mohasin College, Khulna, Khulna Medical College, Ad-din Medical College and Hospital, Khulna, Natun Bazar, Rupsha, Sarkit House, Govt. Khulna Gila School, D.C Office, Dak Banglo More, Govt.Azom Khan Commerce College, Govt. Majid Memorial City College. Data was not available in the months of July & August. Details data is attached annexure -3 (Table: 235-240).

In 2019, pH of Khulna district ground water was within the EQS (6.5-8.5). It varied from 7.28 to 7.39 (Fig. 33a). In 2018, pH varied from 7.2 to 7.48. In 2019, EC of Khulna district ground water mostly was above the EQS (1200 $\mu\text{mhos/cm}$). It varied from 2086.93 to 2132.76 $\mu\text{mhos/cm}$ (Fig. 33b). In 2018, EC level varied from 1926 to 2368 $\mu\text{mhos/cm}$. In 2019, the maximum Chloride was 270.56 mg/l and the minimum Chloride concentration was 248.5 mg/l (Fig. 33c) where the EQS is (150-600 mg/l). In 2018, Chloride level varied from 212 to 308 mg/l. In 2019, Total Hardness of Khulna district ground water within the EQS (200-500 mg/l). It varied from 256.2 to 278.2 mg/l (Fig. 33d). In 2018, Total Hardness varied from 224 to 298 mg/l. In 2019, Iron of Khulna district ground water was within EQS (0.3-1.0 mg/l). It varied from 0.35 to 0.50 mg/l (Fig. 33e). In 2018, Iron level varied from 0.3 to 0.59 mg/l. In 2019, Salinity of Khulna district ground water was within EQS (400 ppt). It varied from 0.13 to 0.21 ppt (Fig. 33f). In 2018, Salinity varied from 0.0 to 0.3 ppt.

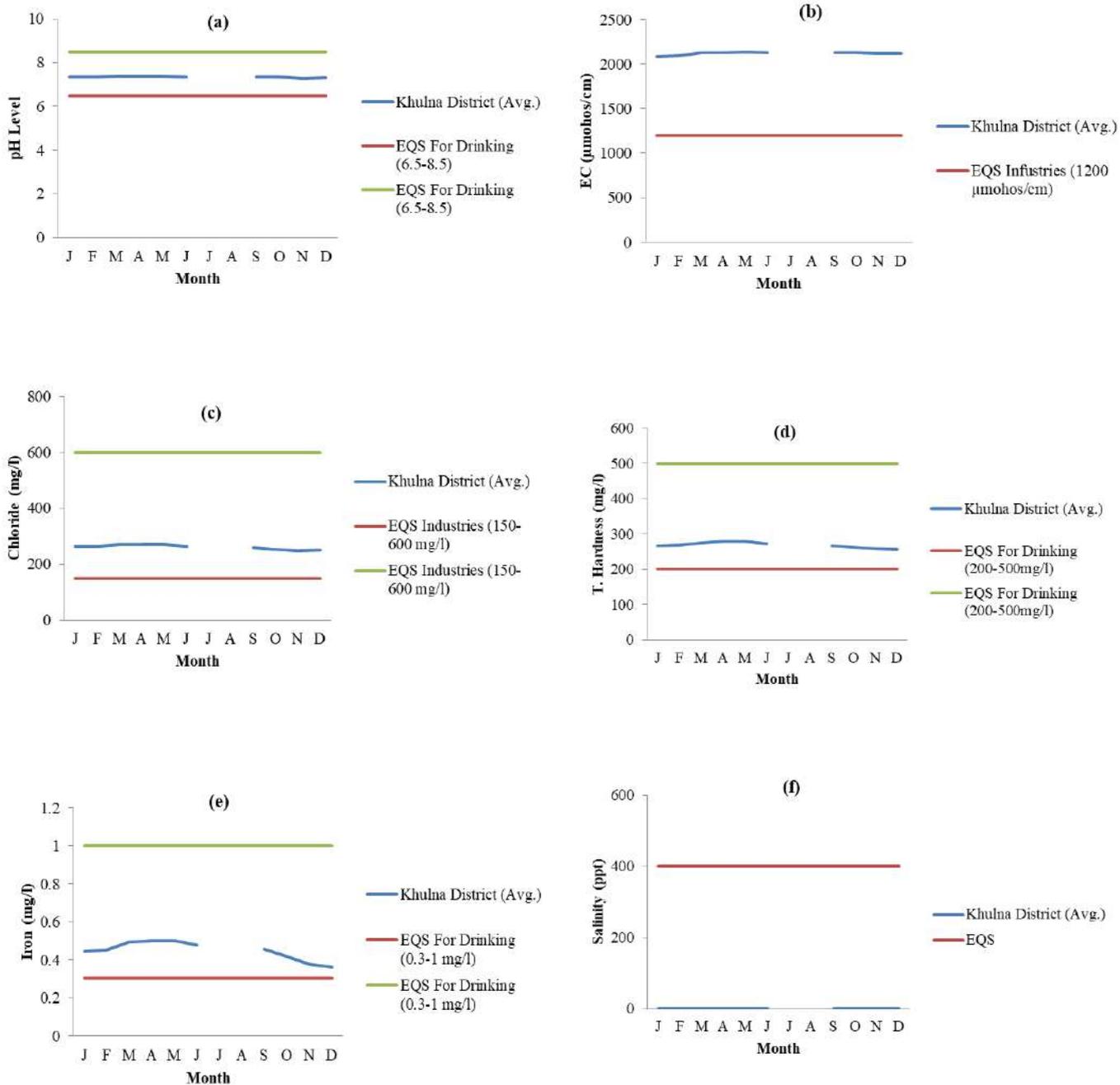


Fig 33. Status of pH, EC, Chloride, Total Hardness, Iron and Salinity of Khulna District area ground water in 2019

5.5 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 Thirty Five different locations viz. Kalizira bazar, Notun hat ali madrasha, Govt board primary school, Rupatoly Bus stand, Rupatoly Alia madrasha, Rupatoly jagua secondary school, Karitas office, Sadar upzila poishad, Amtolar mour, Khan bari mosque, Sher-E-Bangla medical college, Water development board, Barisal mission boyes school, Barisal mission girls school, T & T Office, Chowmatha bazar, Police hospital police line, Terminal, launch ghat, City Market, Vatar khal, City Market, Vatar khal, City Market, Vatar khal, City Market, Vatar khal, Govt. B M school, Govt Halima Khatun Secondary school, Kashipur High school, Kashipur bazar, Fisharighat more, Natullabad, sadar, Munshir Garaze, Steamerghat, Hazi Omarshah Madrasha, bottala, Divisional Commisionar office, Shagordi bazar, Udayon Secondary school, Udayon Secondary school, Udayon Secondary school, Sadar Hospital, Law college, Law college, T.T.C Lane. Detail data is attached Annex-3 (Table: 241-246). Data was not available the month of January, April, July to December.

In 2019, pH level of Barisal district ground water was within EQS (6.5-8.5). It varied from 7.26 to 7.35 (Fig.34a). In 2018, pH was varied from 7.12 to 7.51. In 2019, EC was within the EQS (1200 $\mu\text{mhos/cm}$) limit and it varied from 396.2 to 628.2 $\mu\text{mhos/cm}$ (Fig.34b). In 2018, EC was varied from 325 to 416 $\mu\text{mhos/cm}$. In 2019, TDS level of Barisal district ground water was within EQS (1000 mg/l). It varied from 197.7 mg/l to 314.13 mg/l (Fig.34c). In 2018, TDS was varied from 183 mg/l to 321 mg/l. In 2019, Iron level of Barisal district ground water was within EQS (0.3-1.0 mg/l). It varied from 0.17 mg/l to 0.24 mg/l (Fig.34d). In 2018, Iron was varied from 0.12 mg/l to 0.38 mg/l. In 2019, T.alkalinity was within the EQS (150 mg/l) limit and it varied from 23.6 to 26.8 mg/l ((Fig.34e). In 2018, T.alkalinity varied from 20 to 35mg/l. In 2019, Hardness was within the EQS (200-500 mg/l) limit and it varied from 118.67 to 126 mg/l (Fig.34f). In 2018, Hardness was varied from 100 to 250 mg/l.

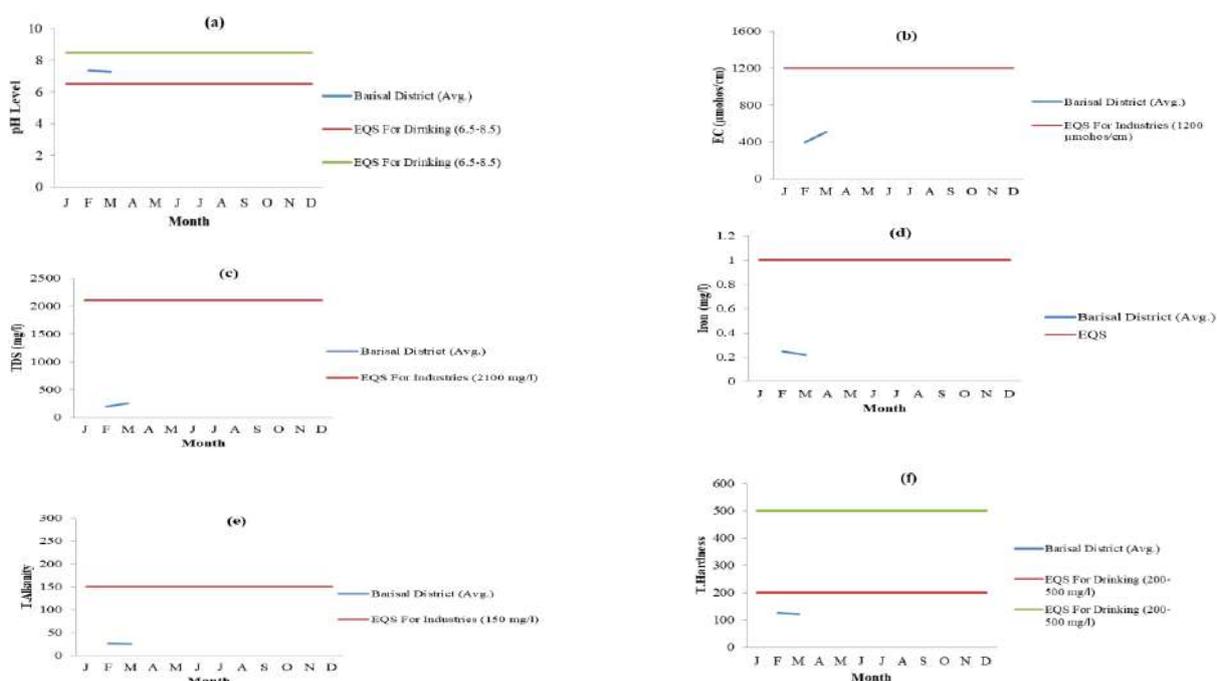


Fig 34. Status of pH, EC, TDS, Iron, T. alkalinity and Total Hardness of Barisal District area ground water in 2019

5.6 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 (B.Z.S), VM School Sadar, (VM.S.S), Zilla Parishad (Z.P), Office of the Duputy Commissioner (O.D.C), Office of the Bogra Municipality (O.B.M), Head Post Office (H.P.O), Biddut Office (B.O), T & T Office (T & T. O), Commercial College (C.C), Office of the Police Super (O.P.S). Data was not available in the months of January, March, May, June, September, October, November. Detail data is attached Annex-3 (Table: 247-251).

In 2019, pH level of Bogura district ground water is within EQS (6.5-8.5) for drinking water. In 2019, It varied from 7.21 to 7.78 (Fig. 35a). In 2018, pH was varied from 7.24 to 7.35. In 2019, EC was within the EQS (1200 $\mu\text{mhos/cm}$) limit and it varied from 320 to 422 $\mu\text{mhos/cm}$ (Fig. 35b). In 2018, EC was varied from 325 $\mu\text{mhos/cm}$ to 360 $\mu\text{mhos/cm}$. In 2019, Iron was within the EQS (0.3-1.0 mg/l) and it varied from 0.26 to 0.42 mg/l (Fig. 35c). In 2018, Iron was varied from 0.32 mg/l to 0.38 mg/l. In 2019, Total Alkalinity was also within the EQS (150 mg/l) and varied from 26 to 34 mg/l (Fig. 35d). In 2018, Total Alkalinity was varied from 28 mg/l to 34 mg/l. In 2019, Total Hardness varied from 200 to 240 mg/l while EQS for Total Hardness (200-500 mg/l) (Fig. 35e). In 2018, Total Hardness was varied from 210 mg/l to 220 mg/l.

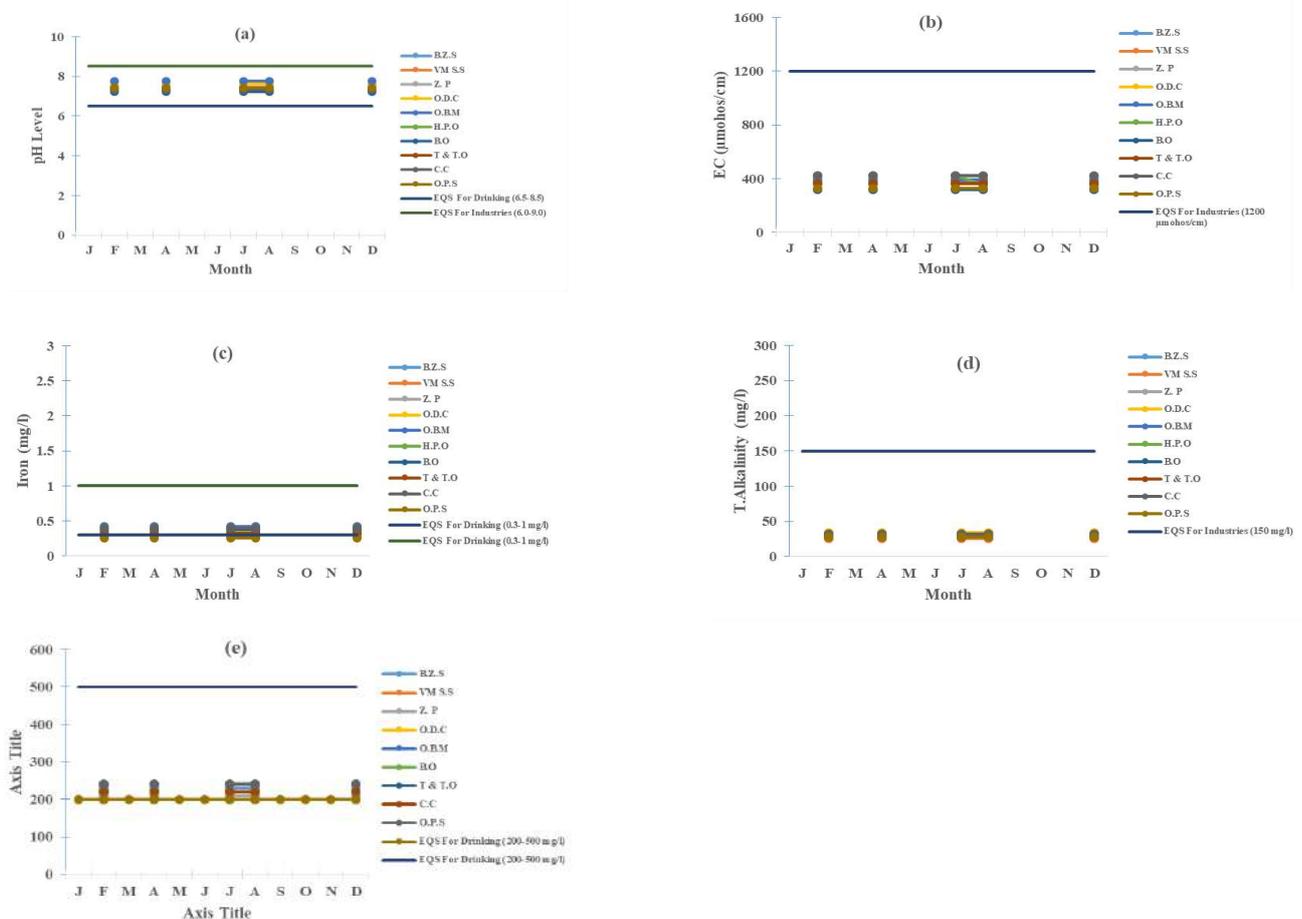


Fig 35. Status of pH, EC, Chloride, Iron, T. alkalinity and T.Hardness of Bogura District area ground water in 2019

5.7 Different Water Quality Parameters of Ground Water in Sylhet District

Sylhet is the northeastern division of Bangladesh. For monitoring ground water quality, samples were collected from Five different locations viz. MC College, Tilagor (MC. C.T), Kadamtoli Bus Terminal (K.B.T), Durgakumar Govt. Primary School (D.G.P.S), Agrogami Girls High School (A.G.H.S), Lal Bazar. Data was not available in the months of January, February, April, June, July, September, October, November, December. Detail data is attached Annex-3 (Table: 252-256).

In 2019, pH level of Sylhet district ground water is within EQS (6.5-8.5). In 2019, Maximum pH is 7.8 and Minimum 6.9 (Fig.36a). In 2018, pH was varied from 6.9 to 8.2. In 2019, EC is within the EQS (1200 μ mohos/cm) limit and it varied from 72 to 200 μ mohos/cm (Fig.36b). In 2018, EC was varied from 75 μ mohos/cm to 389 μ mohos/cm. In 2019, Chloride is within the EQS (150-600 mg/l) and it varied from 12 to 25 mg/l (Fig.36c). In 2018, Chloride was varied from 9 mg/l to 18 mg/l. In 2019, T.Alkalinity varied from 25 to 98 mg/l (Fig.36d). In 2018, T.Alkalinity was varied from 9 mg/l to 28 mg/l. In 2019, Iron is within the EQS (150 mg/l) and it varied from 0.1 to 1.07 mg/l (Fig.36e). In 2018, Iron was varied from 0.45 mg/l to 2.3 mg/l.

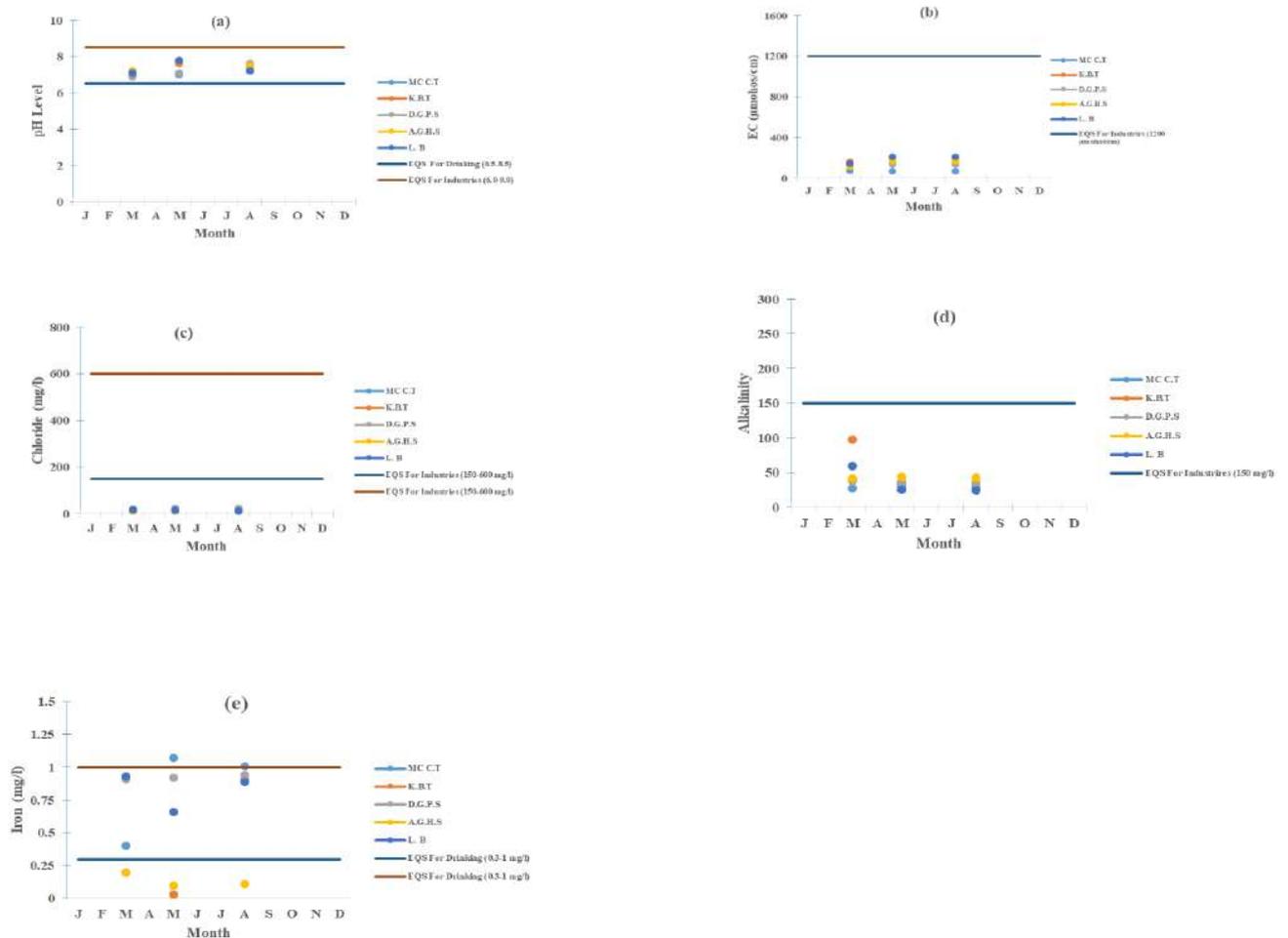


Fig 36. Status of pH, EC, Chloride, T. alkalinity and Iron of Sylhet District area ground water in 2019

CHAPTER 6: TREND ANALYSIS OF WATER QUALITY OF MAJOR RIVERS

6.1 Buriganga River

The Buriganga River flows pass the southwest outskirts of Dhaka City. The Buriganga receives high amount of food waste including rotten fruits, vegetables, and fish. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 257).

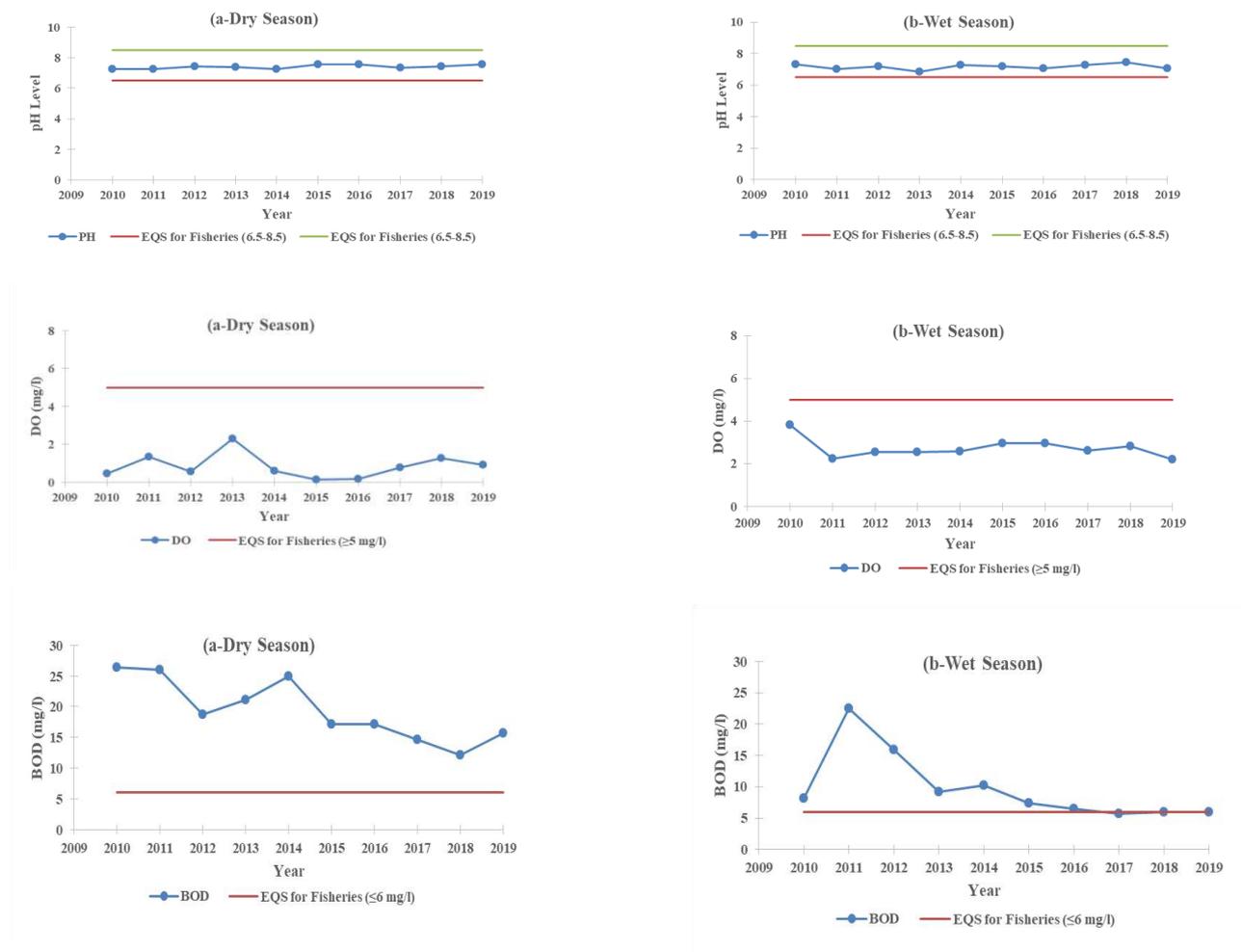


Fig 37. Trend of pH, DO and BOD of Buriganga river water from 2010 to 2019

During 2010-2019, pH of Buriganga river water was within the EQS (6.5-8.5) for inland surface water for fisheries. DO of Buriganga river was below the EQS. Direct discharge of untreated effluent from industries, domestic wastes, tannery wastes into the river and reduced flow of water are the proximate causes for depletion of DO in dry season of recent years. BOD content was higher than EQS (≤ 6 mg/l) irrespective of dry season (Fig.37).

With the passage of time tremendous human pressure on Buriganga river (interms of plying motorized vessels, infrastructural development, encroachment, industrial and sewage waste dumping etc.) and dumping of ever increasing all sorts of wastes turned Buriganga a worst polluted and ecologically dysfunctional river.

6.2 Shitalakhya River

The Shitalakhya river is a distributary of the Brahmaputra. In its initial stages it flows in a southwest direction and then east of the city of Narayanganj in central Bangladesh until it merges with the Dhaleswari near Kalagachhiya. A portion of its upper course is known as Banar River. The river is about 110 kilometres long and at its widest, near Narayanganj, it is 300 metres across. Its flow, measured at Demra, has reached 74 cubic metres per second (2,600 cu ft/s). It remains navigable year-round. The river flows through Gazipur district forming its border with Narsingdi for some distance and then through Narayanganj District. The river's maximum depth is 21 metres and average depth is 10 metres. Different parameters of Shitalakhya River water are given in the following graph. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 258).

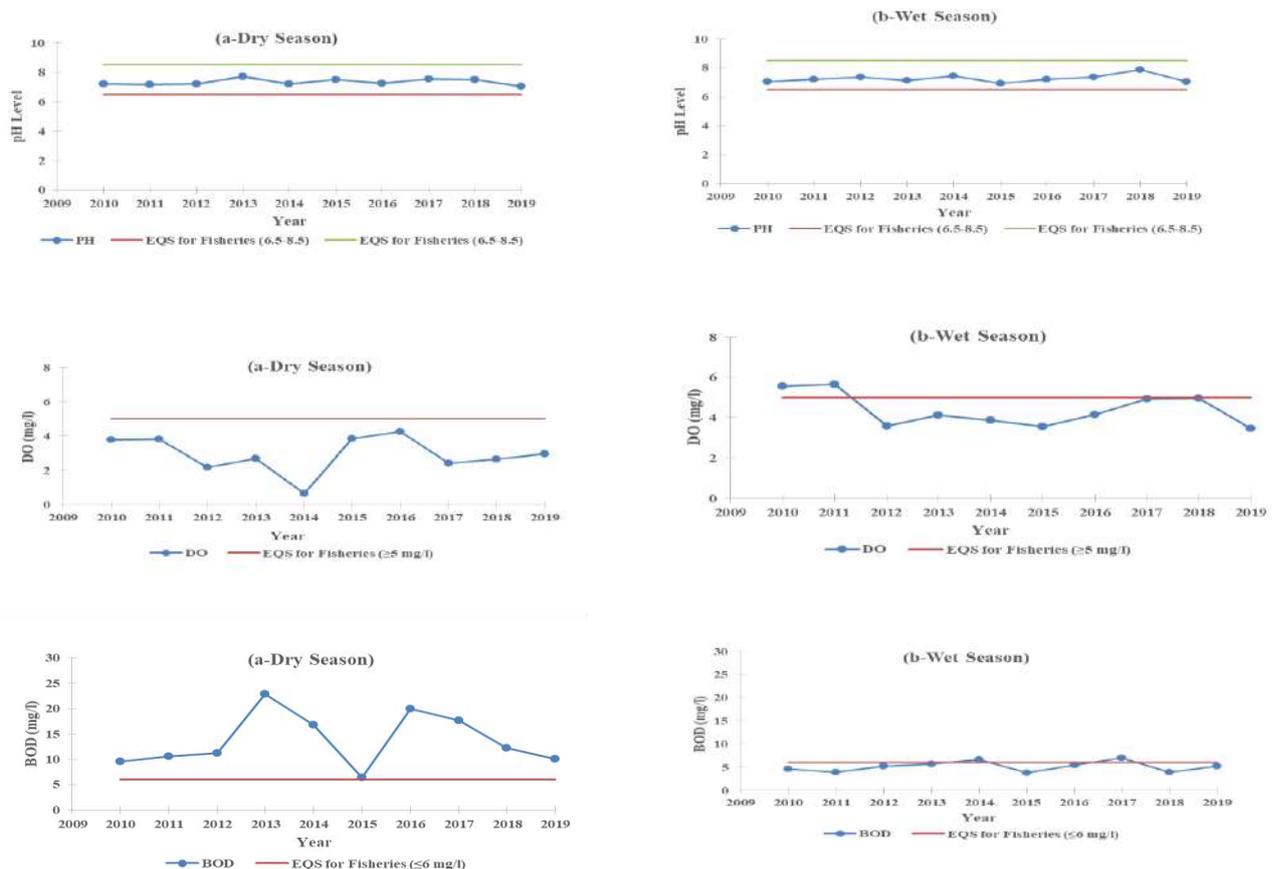


Fig 38. Trend of pH, DO and BOD of Sitalakhya river water from 2010 to 2019

During 2010-2019, pH of Shitalakhya river water was within the EQS (6.5-8.5) for inland surface water for fisheries. DO content was below the EQS (≤ 5 mg/l). BOD was exceeded EQS during 2010-2017 though water quality. This may be due to increase of flow in the river. Direct discharge of untreated effluent from industries, loading/unloading construction materials, municipal and human wastes pollute river water. Some textile dyeing industries, consumer item producing industries and jute mills are located around the sampling location and all of those industries discharge wastes into river water. In 2019 DO content has increase at dry season compare the wet season. (Fig.38).

6.3 Turag River

The Turag River is the upper tributary of the Buriganga, a major river in Bangladesh. The Turag originates from the Bangshi River, the latter an important tributary of the Dhaleshwari River, flows through Gazipur and joins the Buriganga at Mirpur in Dhaka District. Different parameters of Turag River water are shown below. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 259).

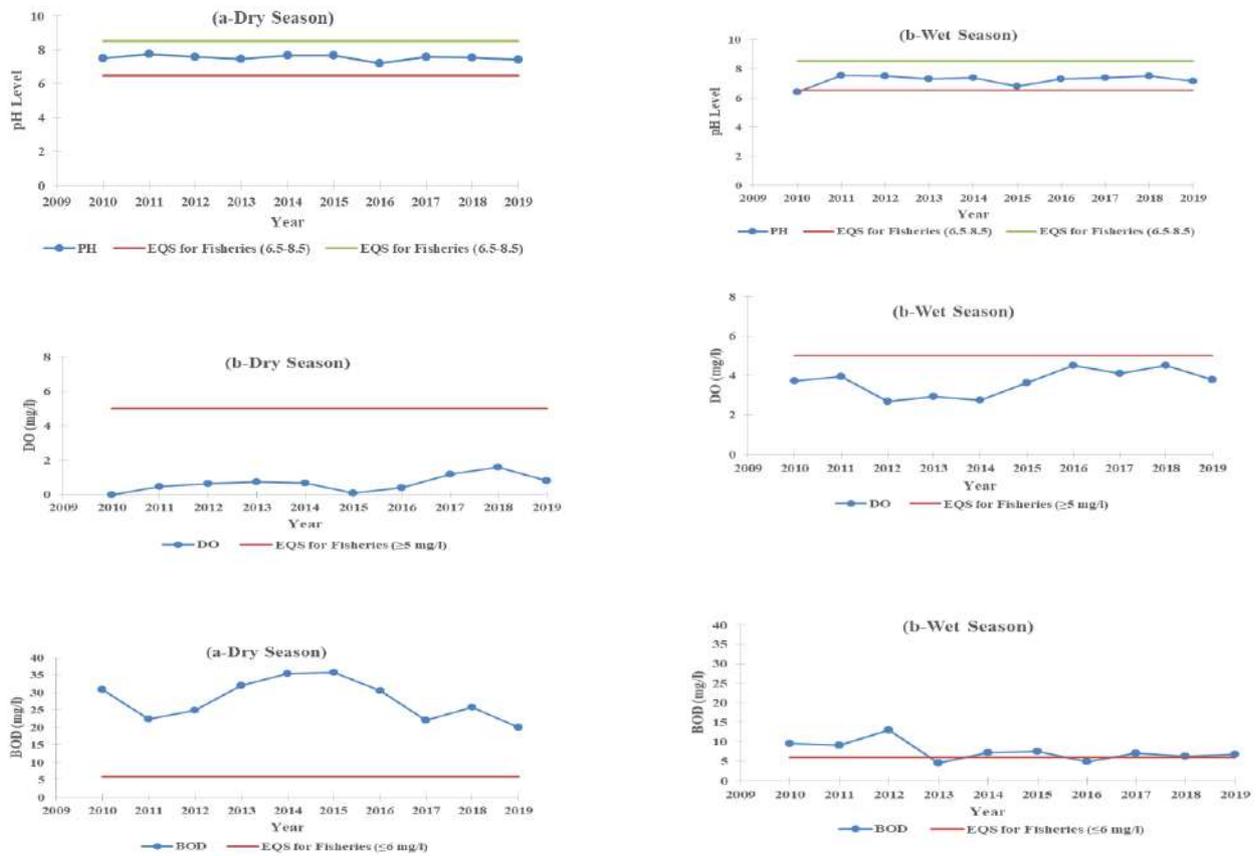


Fig 39. Trend of pH, DO and BOD of Turag river water from 2010 to 2019

During 2010-2019, pH of Turag river water was within the EQS (6.5-8.5) for inland surface water for fisheries. DO content was below the EQS irrespective of seasons. Sometimes, DO reached to zero especially in dry season. In wet seasons BOD was higher than the EQS in the recent past. Seasons or flow of the river is clearly a factor affecting water quality along with dumping of wastes (Fig.39).

There are many industries dotting the banks of this river those dispose their wastes into the river. During the Bishwa Ijtema, Muslims pilgrims coming from all over the world and stay on the river bank for few days. Unfortunately, the site lack of proper accommodation and an adequate sanitation system. As a result, human waste and garbage generated are disposed into the river and pollutes the river heavily. Encroachment, sand/earth filling, dumping of industrial, municipal and medical waste, etc. turned its water pitch black and unfit for any use.

6.4 Dhaleshwari River

The Dhaleshwari river is a 160 km long distributary of the Jamuna river flowing through central part of Bangladesh. It starts off the Jamuna near the northwestern tip of Tangail. Then it divided into two: the north branch retains the name Dhaleshwari and the other branch flows as Kaliganga. The both branches merged at the southern part of Manikganj district. Finally, the merged flow meets the Shitalakhya River near Narayanganj district. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 260).

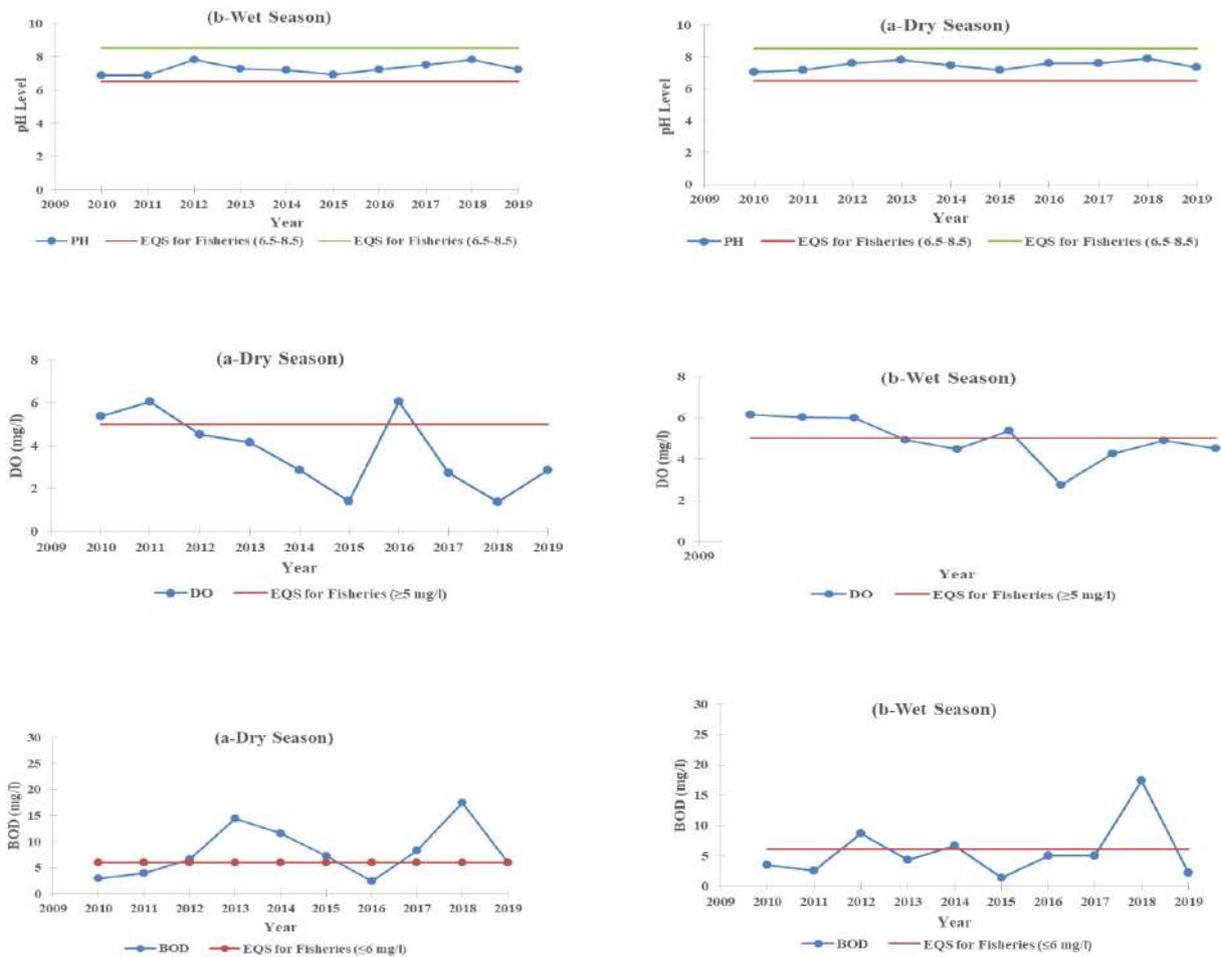


Fig 40. Trend of pH, DO and BOD of Dhaleshwari river water from 2010 to 2019

During 2010-2019, pH of Padma river water was within the EQS for inland surface water for fisheries. DO content was within the EQS in the wet season. And BOD content of Dhaleshwari river water was within the EQS in wet season. (Fig.40).

6.5 Brahmaputra River

The Brahmaputra, a trans-boundary river that originates from Manossarobar near Mount Kailash in the Himalayas and flows via Tibbet, China, India and Bangladesh to Bay of Bengal. The total length it travels from Himalayans to the Bay of Bangal is 2900 km (Chowdhury, 2006). Value in each cell is seasonal (Dry: November-April, Wet: May-October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 261).

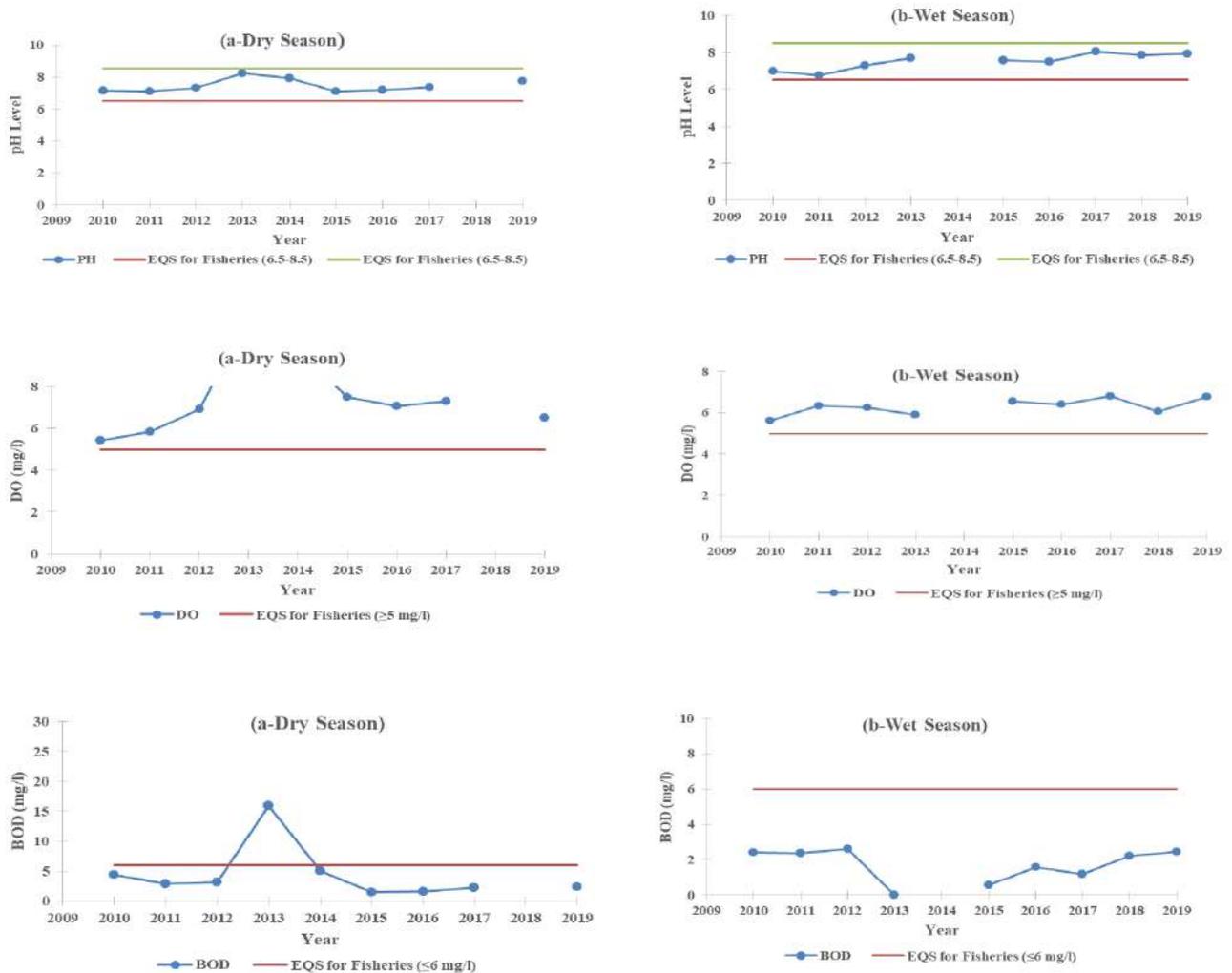


Fig 41. Trend of pH, DO and BOD of Brahmaputra river water from 2010 to 2019

During 2010-2019, pH of Brahmaputra river water was within the EQS for inland surface water for fisheries. DO content was within the EQS in the wet season. BOD content of Brahmaputra river water was higher than the EQS in the year 2013 in Dry Season. In 2019, BOD content of Brahmaputra river water was within the EQS (Fig.41).

6.6 Halda River

The Halda River is a river in south-eastern Bangladesh. It originates at the Badnatali Hill Ranges in Ramgarh Upazila in the Chittagong Hill Tracts, flows through Fatikchhari Upazila, Bhujpur Thana, Hathazari Upazila, Raozan Upazila and Chandgaon Thana of the Chittagong Metropolitan City, and falls into the Karnaphuli River. The 81-kilometre (50 mi) long river has a very turbulent tributary, the Dhurung River, which joins Purba Dhalai about 48 kilometres (30 mi) downstream. The river is navigable by big boats 29 km into it (up to Nazir Hat) and by small boats 16–24 km further (up to Narayanhat). The Halda reaches up 21 feet (6.4 m) in depth and 30 feet (9.1 m) in deepest point.^[21] Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 262).

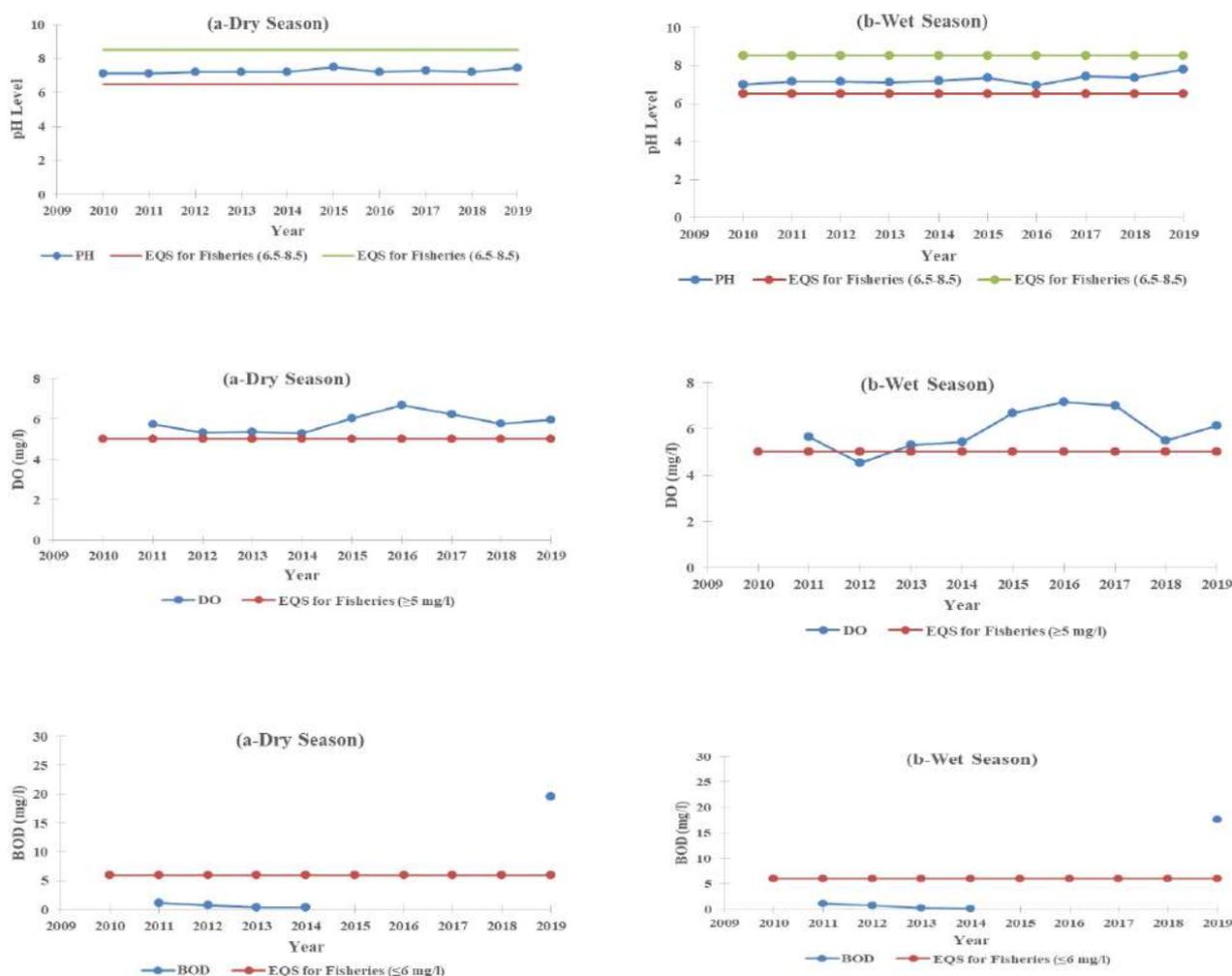


Fig 42. Trend of pH, DO and BOD of Halda river water from 2010 to 2019

During 2010-2019, pH of Halda river water was within the EQS for inland surface water for fisheries. DO and BOD content was within the EQS. In 2015-2018, BOD data was not available. Considering pH, DO and BOD, water quality of Halda is good. But BOD content of Halda river water was above the EQS (Fig.42).

6.7 Moyuri River

The Moyuri river is situated at the back swamp of the Bhairab-Rupsa River. Khulna City Corporation (KCC) is situated on the bank of this river basin and the Mayuri River borders the westbound of the city. Value in each cell is seasonal (Dry: November – April, Wet: May-October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 263).

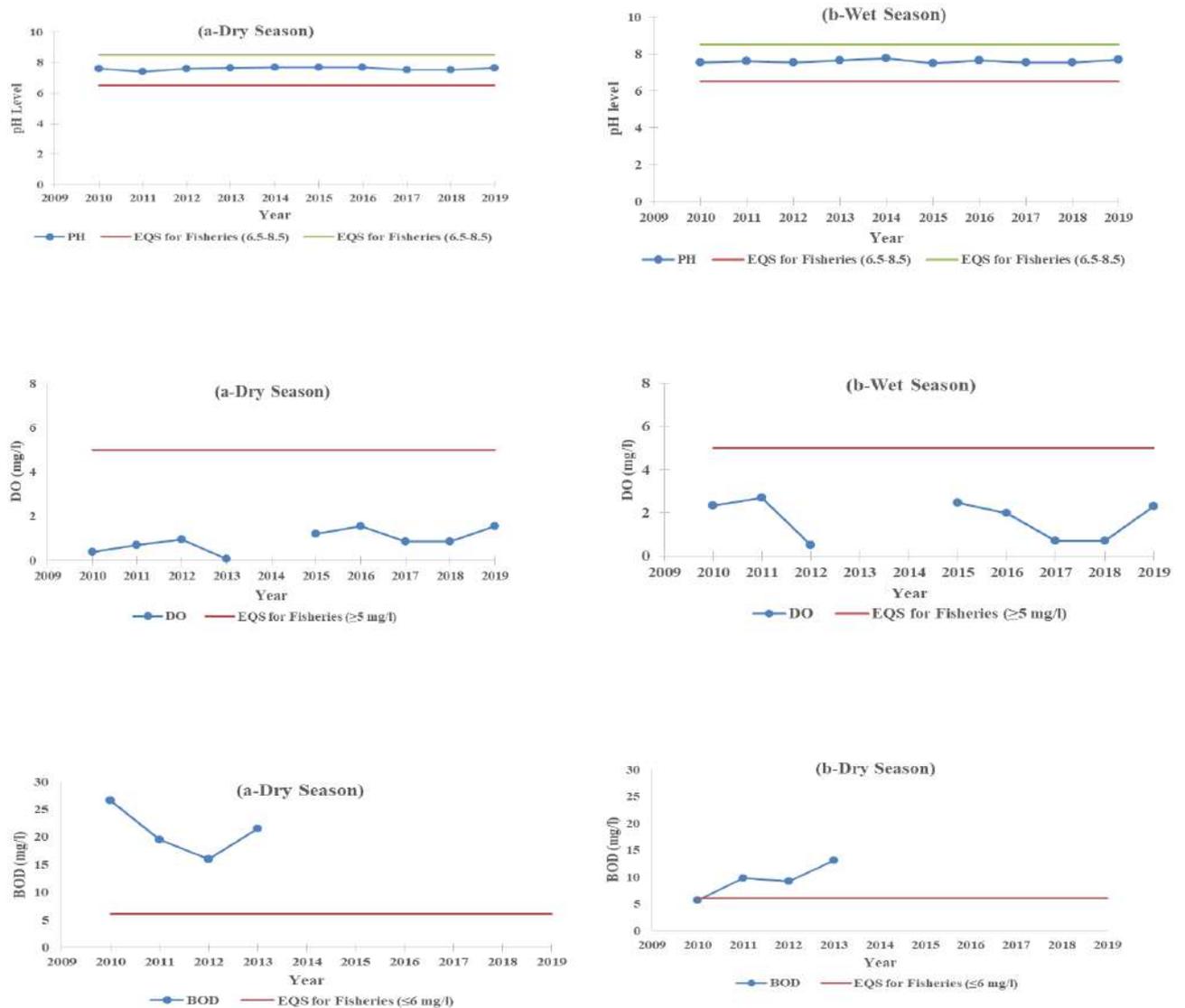


Fig 43. Trend of pH, DO and BOD of Moyuri river water from 2010 to 2019

During 2010-2019, pH of Moyuri river water was within the EQS for inland surface water for fisheries. In 2014-2018, BOD data was not available. DO content was not within the EQS. And BOD content of Moyuri river water was over the EQS (Fig.43).

6.8 Surma River

The Surma river is a major river in Bangladesh, part of the Surma-Meghna river System. It starts when the Barak river from northeast India divides at the Bangladesh border into the Surma and the Kushiya 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. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 264).

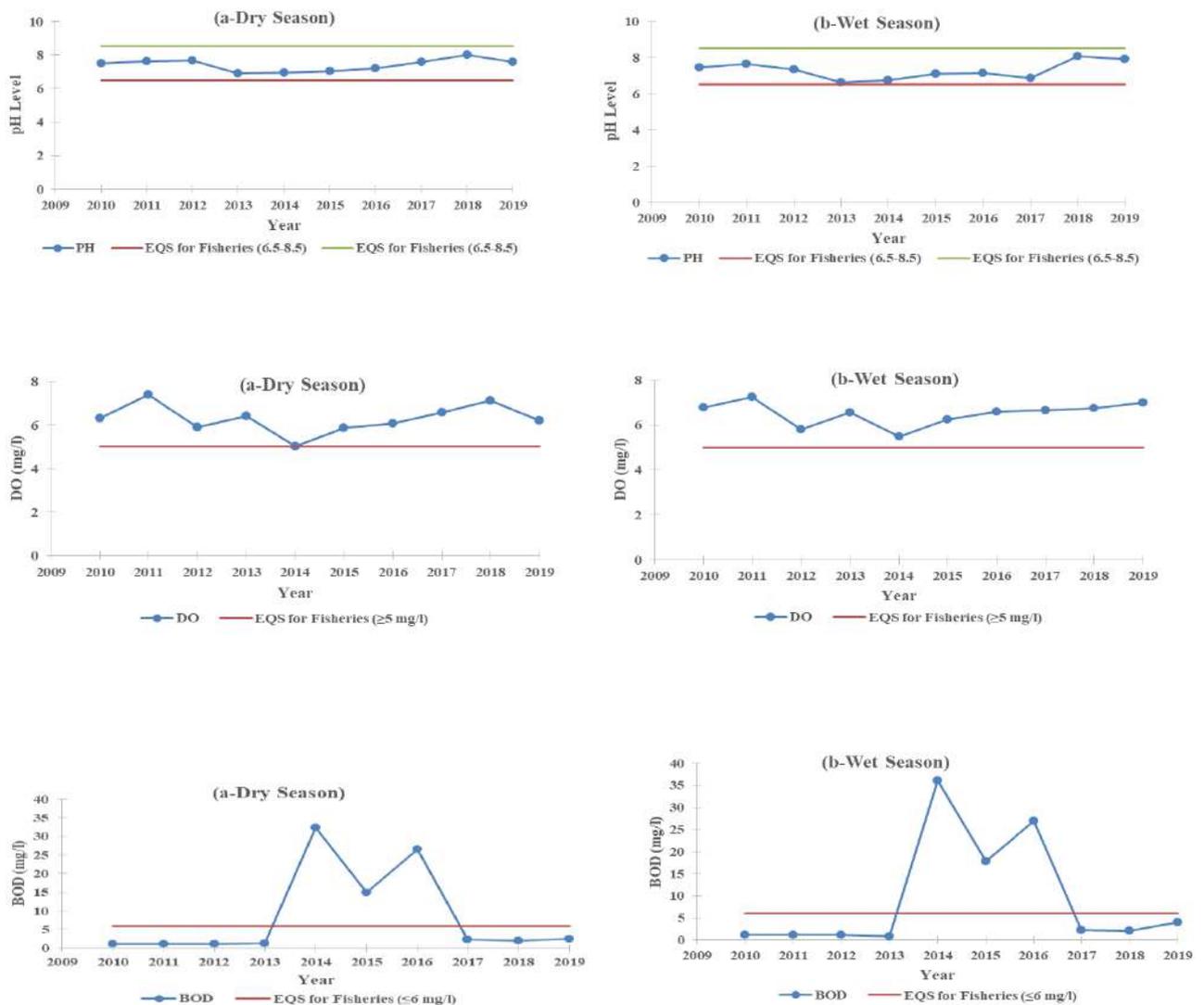


Fig 44. Trend of pH, DO and BOD of Surma river water from 2010 to 2019

During 2010-2019, pH of Surma river water was within the EQS (6.5-8.5) for inland surface water for fisheries. DO content was around the EQS. And BOD content of Surma river water was much over the EQS in the year of 2013 to 2016. BOD content of Surma river water was the EQS in the year of 2019 (Fig.44).

6.9 Korotoa River

Korotoa river is a small stream in Rajshahi division of Bangladesh, was once a large and sacred river. A channel of it presently flows by the ancient ruins of Mahasthangarh (or Pundranagara, ancient capital of Pundravardhana) in Bogra District. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 265).

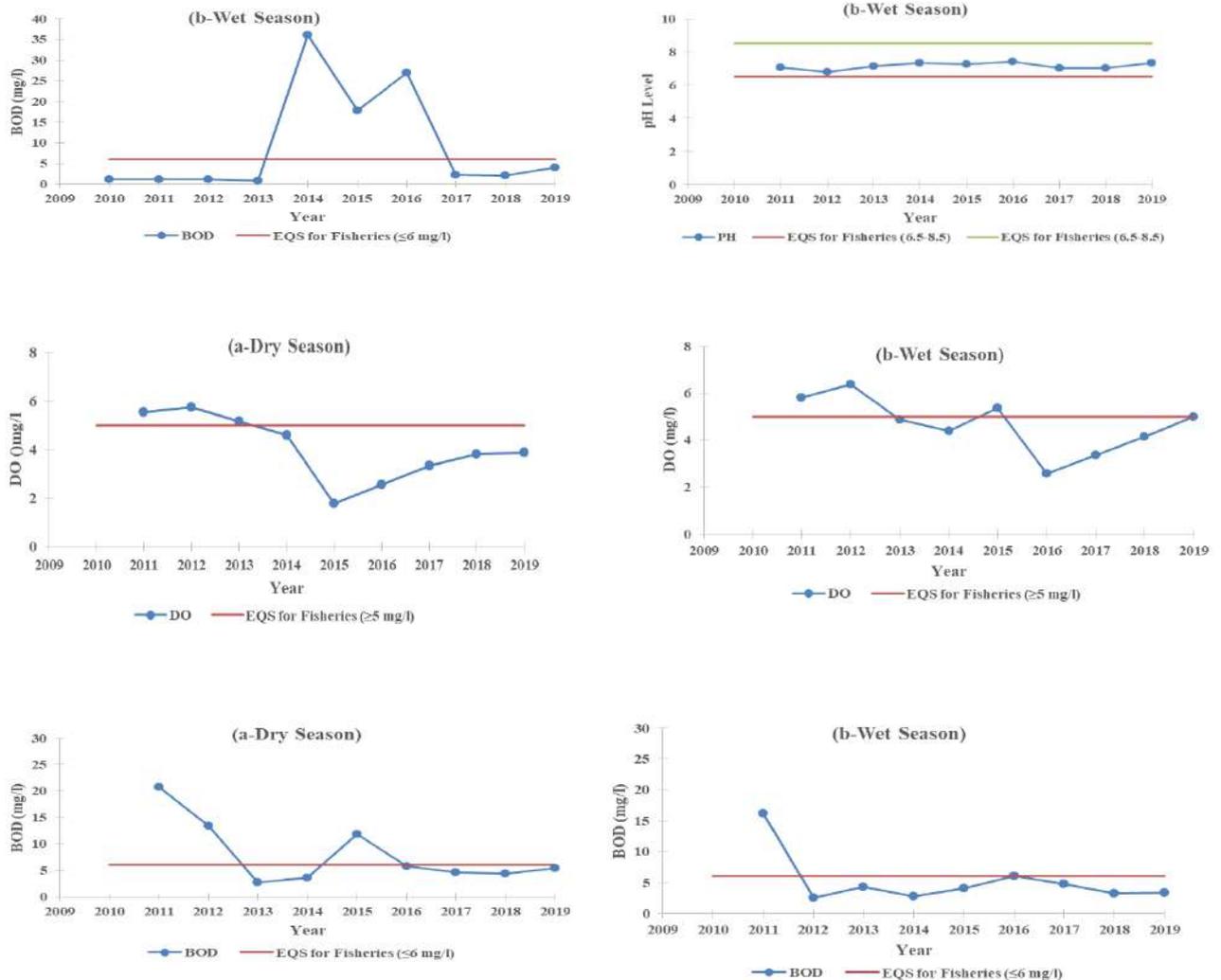


Fig 45. Trend of pH, DO and BOD of Korotoa river water from 2010 to 2019

During 2011-2019, pH of Korotoa river water was within the EQS (6.5-8.5) for inland surface water for fisheries. DO level was below EQS after 2013 till 2018. However, BOD content of Korotoa river water did not match with DO and was over the EQS in the year of 2011, 2012 (Dry season) and 2015 (Dry Season). BOD content of Korotoa river water was the EQS in the year of 2019. It is assumed that the high level of BOD at certain points influenced the average results (Fig.45).

6.10 Mathavanga River

The Mathavanga or Hauli, whose lower reach is called the Haulia, leaves the Padma about ten miles below the point where the Jalangi leaves from it. It flows first in a south-easterly direction as far as Hatboalia, where it bifurcates one branch, which is there-after as the Kumar or Pangasi, it then proceeds in the same direction, past Alamdanga, up to the boundary of the district which it forms for a few miles until it passes into Jessore, whilst the other branch pursues a very tortuous course. The general trend of which is to the south, until, after passing Chuadanga it reaches Krishnaganj (in India). There a second bifurcation takes place, the two resulting streams being as the Churni and the Ichamati, and the name of the parent river being lost. It borderline's between India and Bangladesh. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 266).

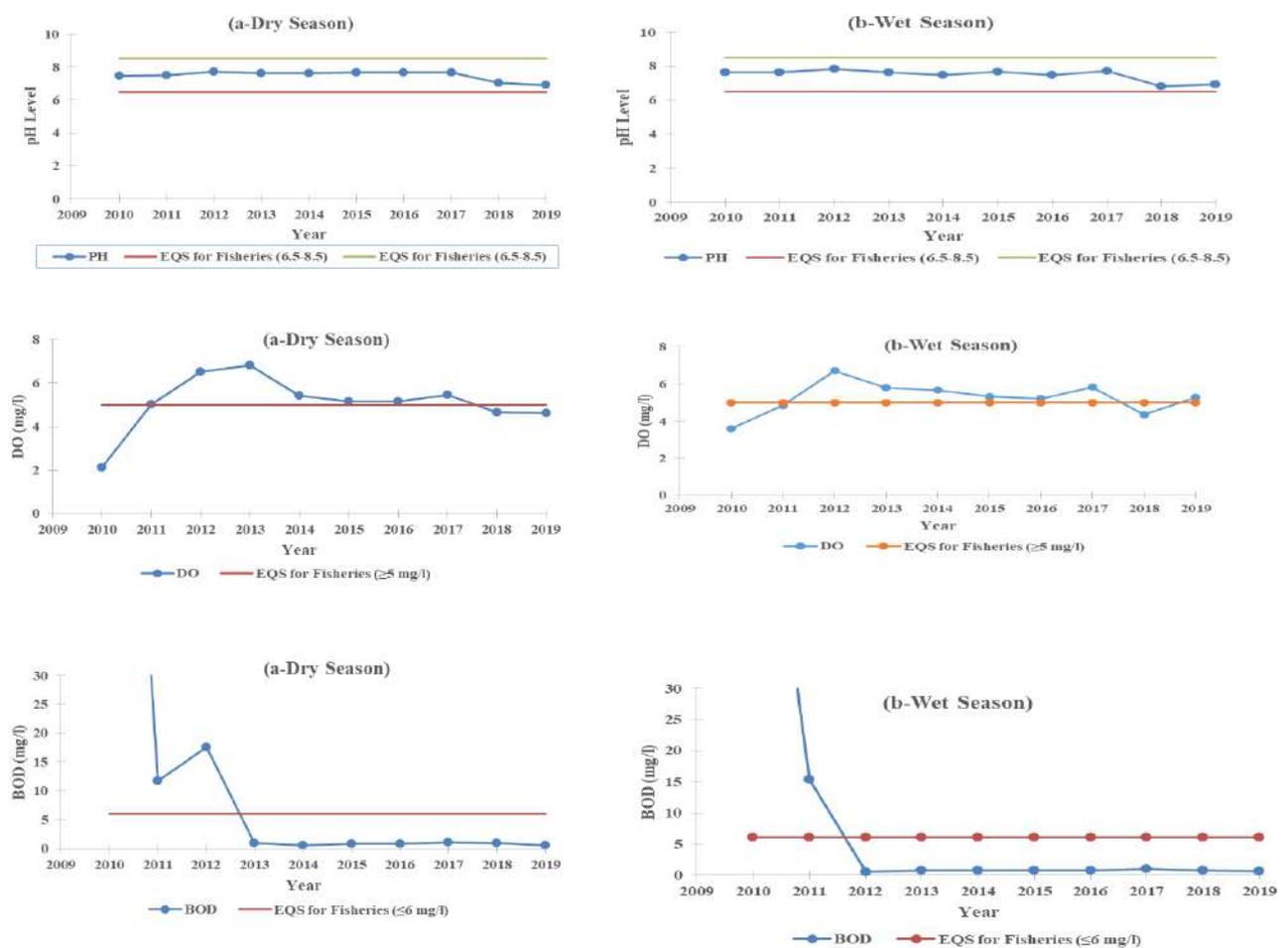


Fig 46. Trend of pH, DO and BOD of Mathavanga river water from 2010 to 2019

During 2010-2019, pH of Mathavanga river water was within the EQS (6.5-8.5) for inland surface water for fisheries. DO level was within the EQS after 2011. And BOD content of Mathavanga river water was over the EQS in the year of 2010, 2011 and 2012 (Dry Season). BOD content of Mathavanga river water was the EQS in the year of 2019 (Fig.46).

6.11 Pashur River

The Pasur River is a river in southwestern Bangladesh and a distributary of the Ganges. It continues the Rupsa River. All its distributaries are tidal. The Pasur River meets the Shibsa River within the Sundarbans, and near to the sea the river becomes the Kunga River. The Pasur River is the deepest river in Bangladesh [Masud Hasan Chowdhury (2012)] and . Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997. Detail data is attached Annex-4 (Table: 267).

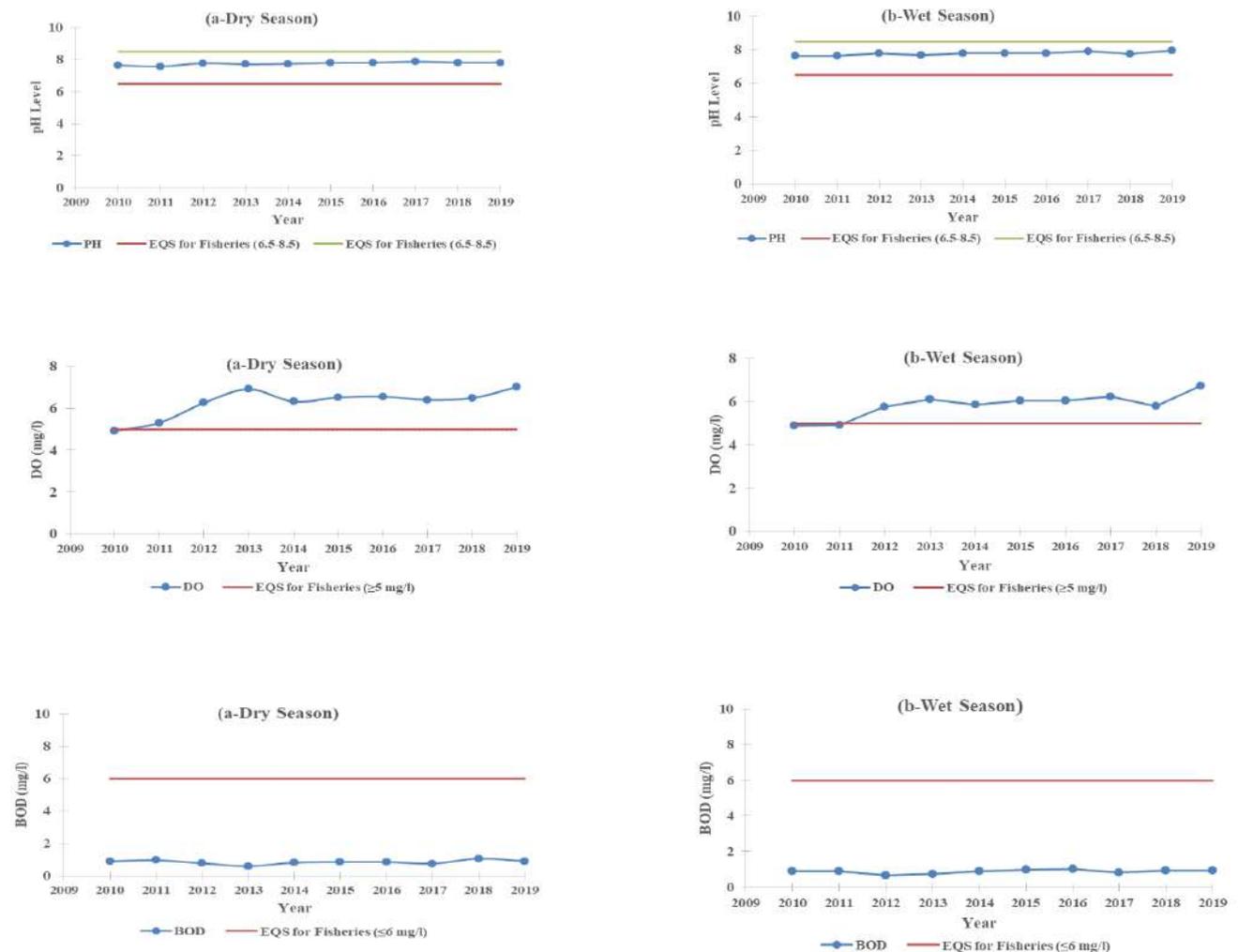


Fig 47. Trend of pH, DO and BOD of Pashur river water from 2010 to 2019

During 2010-2019, pH of Pashur river water was within the EQS (6.5-8.5) for inland surface water for fisheries. DO level was within the EQS after 2011. And BOD content of Pashur river water was within the EQS in the year of 2010, 2011 and 2012 (Dry Season). BOD content of Pashur river water was the EQS in the year of 2010-2019 (Fig.47).

7.1 Overview of Sources of Pollution

Bangladesh is one of the coastal countries of the Bay of Bengal. The country is located between 20°34' to 26°38' north latitude and 88°01' to 92°42' east longitude. The total land area is 147,570 sq. km. and consists of low and flat land (BBS, 2009). The estimated distance of the coast of Bangladesh is 654 km (Snead, 1985, BBS, 2009). There are several sources of marine pollution in Bangladesh those can be broadly placed under two categories-

7.1.1 Land Based Marine Pollution

Land based pollution is discharged directly into the sea, or enters through rivers, floods, tides, ground water or by atmospheric deposition. This means that pollution sources can be located far away from coastal areas and still have an impact, despite an on-going process of attenuation that might be occurring on the way. What is a point source and what is a diffuse source of pollution is also partly a matter of scale.

Point Source: Point sources of pollution are those for which a particular point of entry of pollution into the environment can be identified. They can be associated with localized gradients in the concentration of pollutants and can often be traced and found in this way. Point sources are usually found for industrial plants, sewage outfalls, reclamations and other earth works, but can occur in other pollution categories not normally thought of as point sources, such as ground waters exiting in a lagoon. Point sources of pollution may only account for a fraction of the land-based sources affecting marine environments.

Non-point Source: Non-point or diffuse sources are harder to identify and result from broad-scale activities that cannot be as readily identified as originating from a single source (GESAMP, 2001). These are harvested from large areas within which polluting activities are occurring and are usually mobilized by water or air. They usually are carried by urban storm water runoff, overflow discharges, and run-off from forests, agriculture and aquaculture (UNEP 2000)

7.1.2. Sea Based Marine Pollution

It is a potential threat to the coastal and marine environment. Result mainly from the crude oil transportation systems, water-oil from different sea cargo, ships and mechanized vessels, workshop, refinery handling loss, dumping of ballast and bilge water etc. Besides this, in Bangladesh more than 50% of the marine oil pollution comes from urban activities and throw river run-off (UNEP 1986, Alam, 2004). In addition, a number of accidental spillage or discharge of crude petroleum was also reported at the coast of Bay of Bengal, Bangladesh or recent offshore hydro carbon drilling operation in the EEZ of Bangladesh could be a factor of marine pollution, though not much reported. Some important seabased sources of marine pollution are given below-

- Crude Petroleum- (PAHs)
- Antifouling Agents- (TBT)
- Volatile Organic Compound (VOC)- PCBs, DDTs, Dioxins, Furans
- Oil Spill, Bilge from Ship, Boats □ Dumping of Wastes
- Introduction of Alien species through ballast water etc.

7.1.3. Priority Categories of Parameters, Bangladesh

Based on the pollution sources in the coastal water body of Bangladesh, the Priority Concerns parameters should be:

- Heavy metals: Hg, As, Pb, Cr, Cd, Ni etc.
- Nutrients & Fertilizers: BOD, Nitrate, Phosphate etc.
- PAHs and other hydrocarbons, including tar balls, oil, grease etc.
- Total suspended solids (TSS), total dissolved solids (TDS) etc.
- Microbes & health hazards bacteria (e.g. F. coliform, F. streptococci, Salmonella etc.)
- Persistent organic pollutants (POPs) and pesticides.
- Marine litters etc.

7.2 Present Status of Marine Pollution

Rivers of Bangladesh are heavily contaminated with untreated municipal sewage, industrial effluent, agricultural run-off and sediments. One of the most serious impacts is the decline in estuarine and coastal water quality caused by rising levels of nutrients from land-based sources. Expansion of intensive agricultural practices has resulted in increasing agrochemical pollution, particularly in developing countries of the region. Some important marine pollution in Bangladesh are given below-

- Nutrient Pollution
- Oil Pollution and Oil Spill, Refinery Waste Water and Offshore Operations
- Heavy Metals
- Persistent Organic pollutants (POPs)
- Municipal Waste
- Industrial Pollution
- Agriculture and Aquaculture Pollution
- Ship Breaking Activities
- Siltation and turbidity

7.3 Water Quality Parameters of Sea Water

Patenga is a sea beach of the Bay of Bengal, located 14 kilometres south from the port city of Chattogram, Bangladesh. It is near to the mouth of the Karnaphuli River. Patenga is a popular and renowned tourist spot. The beach is very close to the Bangladesh Naval Academy of the Bangladesh Navy and Shah Amanat International Airport. To monitor water quality of sea water for the month of January to December in 2019. Water samples were collected from Four locations of the sea e.g. Karnaphuli Mohona, 1.0 km straight from Patenga Sea Beach, Charpara and 1.0 km straight from CEPZ. Detail data is attached Annex-5 (Table: 268-272).

In 2019, pH level of sea water was within EQS (6.5-8.5) for inland surface water. It varied from 7.06 to 8.6 (Fig. 48a). In 2018, pH varied form 7.0-8.5. In 2019, DO was above the EQS (≥ 5 mg/l) for fisheries and varied from 6.3 mg/l to 8.74 mg/l (Fig. 48b). The maximum DO (8.74 mg/l) was found at 1.0 km straight from Patenga Sea Beach & Karnaphuli Mohona in December and the minimum DO (6.3 mg/l) was found in August at Charpara. In 2018, DO varied form 7.1 mg/l to 8.5 mg/l. TDS was above the EQS (≤ 2100 mg/l) for industries and varied from 1227 mg/l to 19620 mg/l (Fig. 48c). The maximum TDS (19620 mg/l) was found at Karnaphuli Mohona in December and the minimum TDS (1272 mg/l) was found at 1.0 km straight from Patenga Sea Beach in August. In 2018, TDS varied form 4030 mg/l to 18940 mg/l. SS was varied from 90 mg/l to 488 mg/l (Fig. 48d) where the EQS

(≤ 150 mg/l) for industries. The maximum SS (835 mg/l) was found in October at Karnaphuli Mohona in the EQS (≤ 150 mg/l) and the minimum SS (90 mg/l) was found at Charpara point in April. In 2018, SS varied from 226 mg/l to 488 mg/l. EC was above the EQS (1200 $\mu\text{mhos/cm}$) for industries and varied from 8060 $\mu\text{mhos/cm}$ to 32800 $\mu\text{mhos/cm}$ (Fig. 48e). The maximum EC (32380 $\mu\text{mhos/cm}$) was found in March at Charpara and the minimum EC (2250 $\mu\text{mhos/cm}$) was found at 1.0 km straight from Patenga Sea Beach in August. In 2018, EC varied from 8060 $\mu\text{mhos/cm}$ to 29901 $\mu\text{mhos/cm}$.

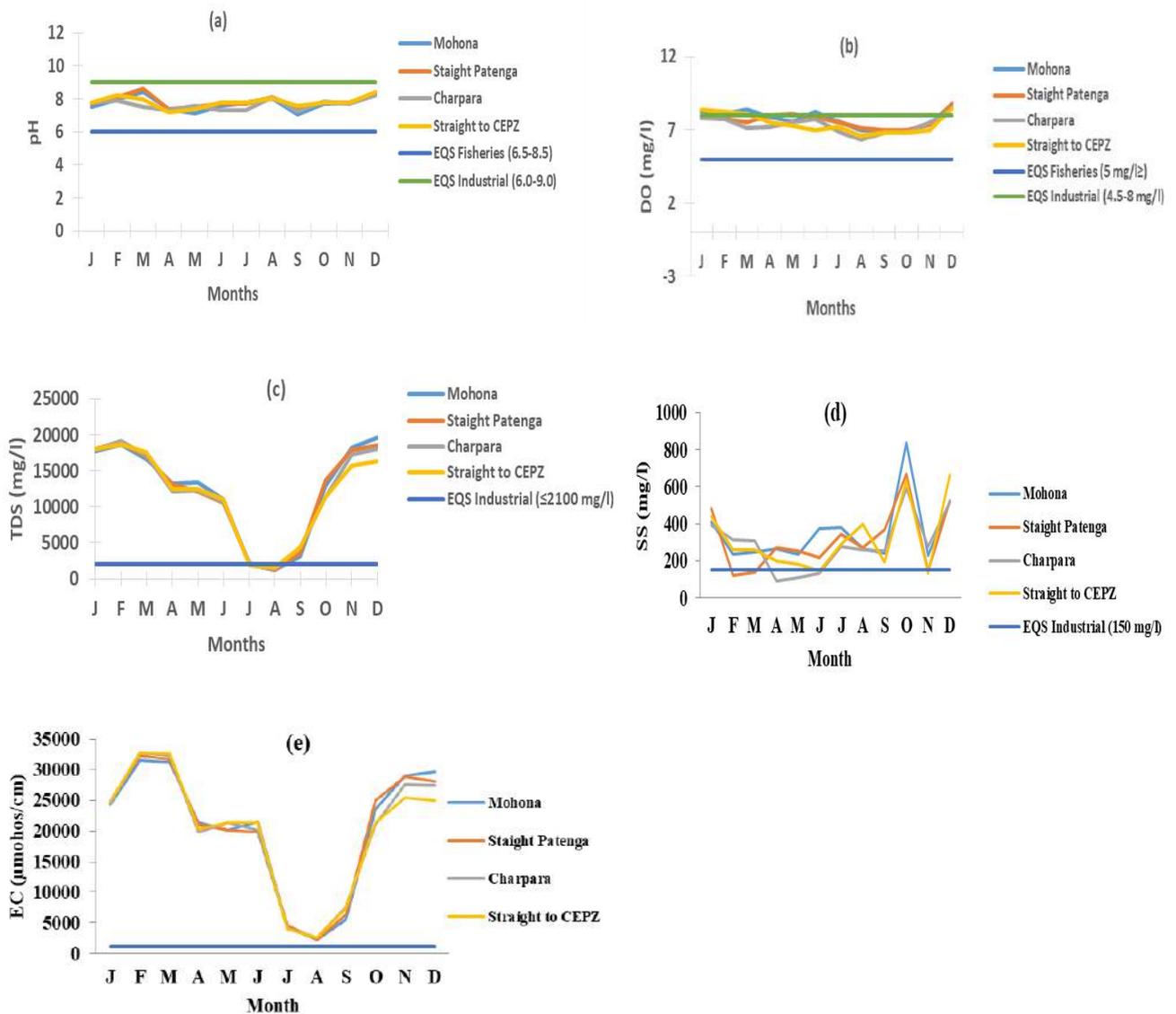


Fig.48: Status of pH, DO, TDS, SS, and EC of Sea Water.

CHAPTER 8: TREND ANALYSIS OF LAKE WATER QUALITY

8.1 Gulshan Lake

Gulshan Lake is a lake in Dhaka, Bangladesh, that borders Gulshan Thana, Shahjadpur, and Baridhara Diplomatic Zone. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997.

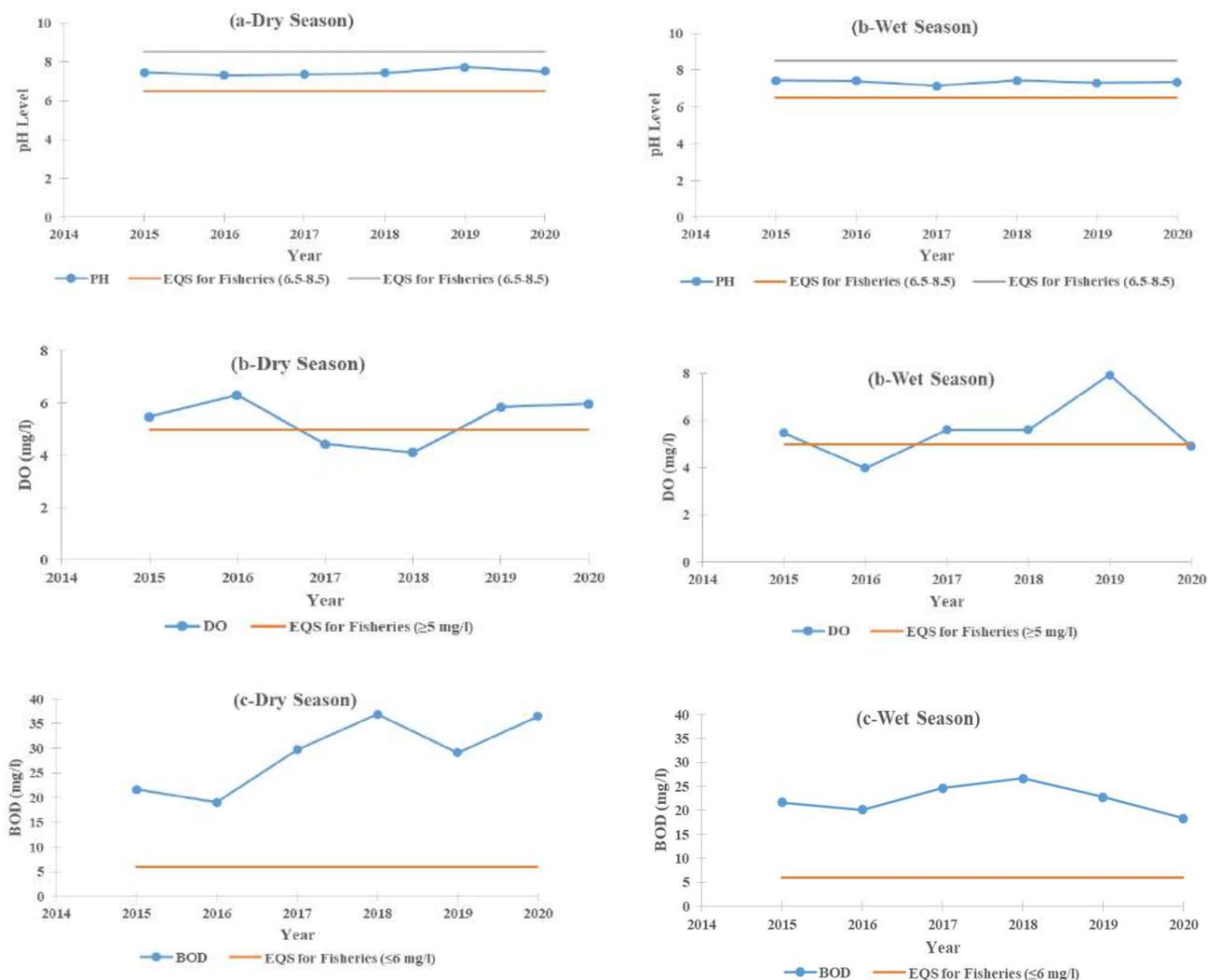


Fig 49. Trend of pH, DO and BOD of Gulshan Lake water from 2015 to 2020

During 2015-2020, pH of Gulshan Lake water was within the EQS (6.5-8.5) for inland surface water for fisheries. In 2017 to 2018, DO of Gulshan lake water was below the EQS (≥ 5 mg/l) in dry season. In 2015 to 2020, BOD content was higher than EQS (≤ 6 mg/l) irrespective of dry and wet season. Direct discharge of untreated effluent from domestic wastes into the lake and reduced flow of water are the proximate causes for increase of BOD in dry and wet season (Fig.49).

8.2 Dhanmondi Lake

Dhanmondi Lake is in the Dhanmondi residential area in Dhaka, Bangladesh. The lake has become a well visited tourist spot, with cultural hubs such as the Rabindra-Sarobar located along its side. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997.

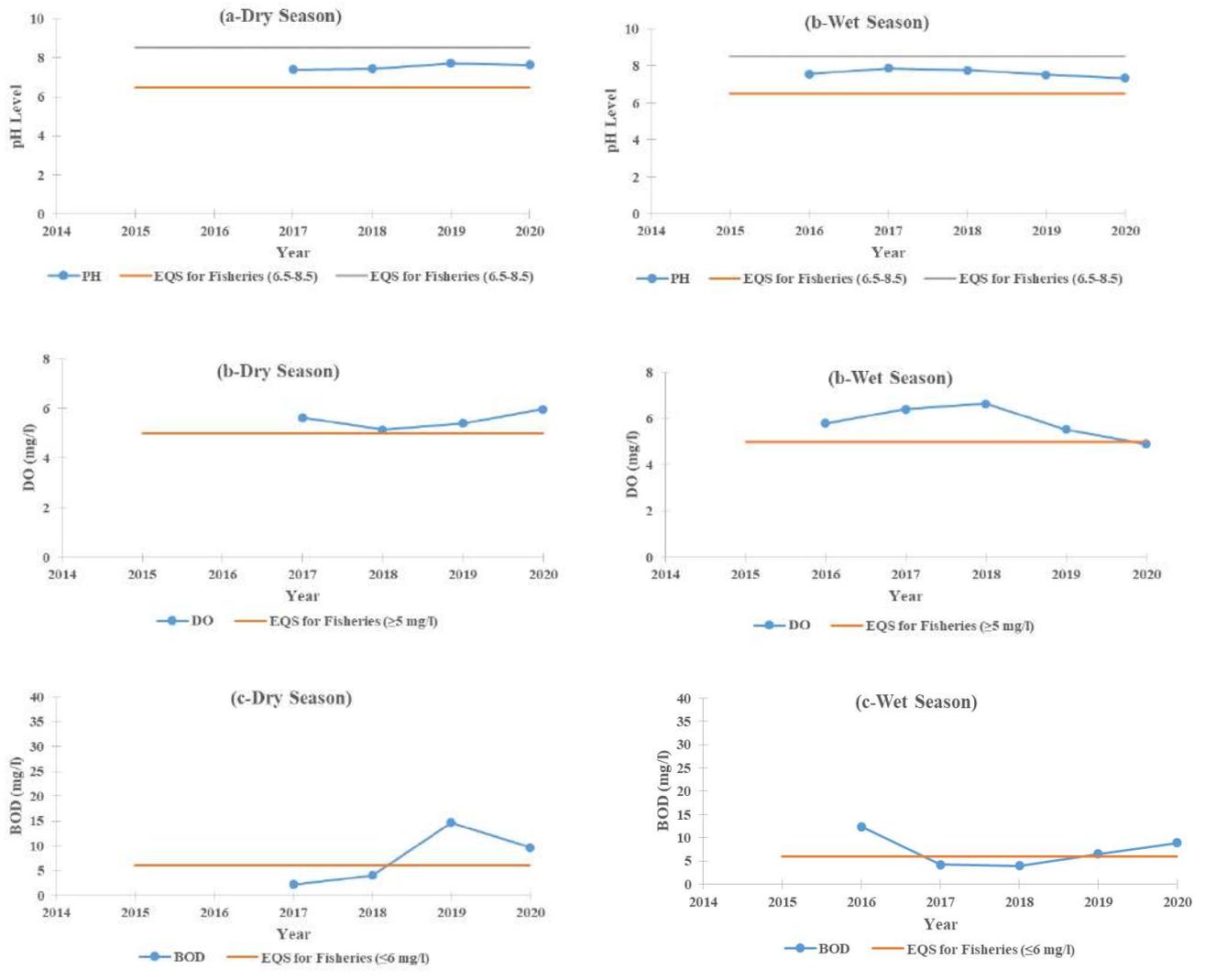


Fig 50. Trend of pH, DO and BOD of Dhanmondi Lake water from 2015 to 2020

In 2017-2020, pH of Dhanmondi lake water was within the EQS (6.5-8.5) for inland surface water for fisheries. Data were not available in 2015. In 2017 to 2020, DO of Dhanmondi lake water was higher than the EQS (≥ 5 mg/l) in dry and wet season. In 2019-2020, BOD content was higher than EQS (≤ 6 mg/l) irrespective of dry season. But in 2017-2018, BOD content was within the EQS (Fig.50).

8.3 Hatirjheel Lake

Hatir-Jheel is a lake front in Dhaka. Hatir Jheel, the new projects of beautification Dhaka city. It has already become an attractive location to visit in Dhaka City. 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. Value in each cell is seasonal (Dry: November to April, Wet: May to October) as well as average of sampling locations. EQS of pH, DO, BOD is for fisheries, as per ECR, 1997.

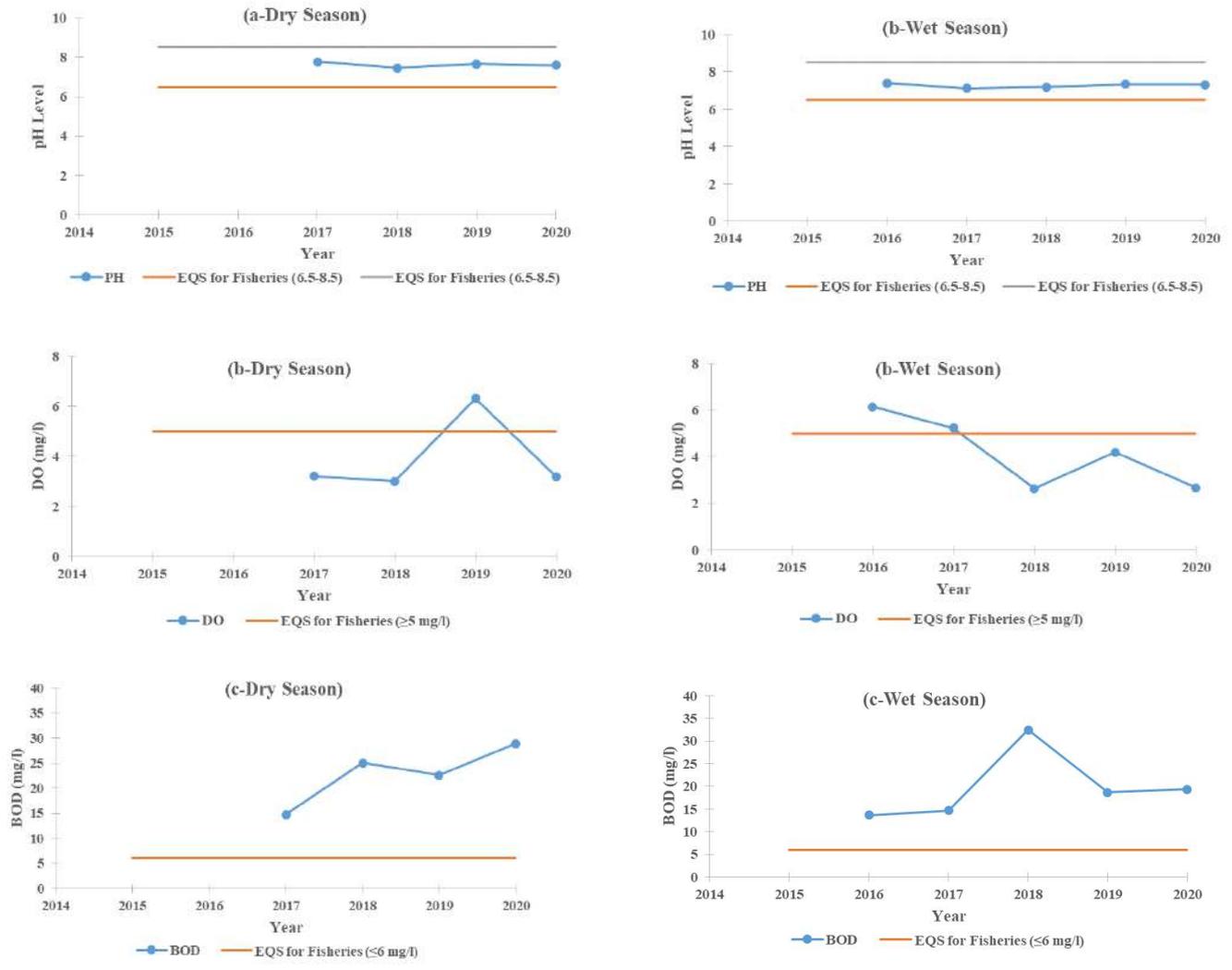


Fig 51. Trend of pH, DO and BOD of Hatirjheel Lake water from 2015 to 2020

In 2016-2020, pH of Hatirjheel lake water was within the EQS (6.5-8.5) for inland surface water for fisheries. Data were not available in 2015. In 2018 to 2020, DO level of Hatirjheel lake water was lower the EQS (≥ 5 mg/l) in wet season. In 2017-2020, BOD content was higher than EQS (≤ 6 mg/l) irrespective of dry season. (Fig.51).

CHAPTER 9: DATA ANALYSIS ALONG WITH GRAPHICAL REPRESENTATION OF HOTEL, MOTEL & RESTAURANT IN 2019

9.1 Water Quality Parameters of Hotel, Motel & Restaurant

Water is a transparent and nearly colorless chemical substance that is the main constituent of Earth's streams, lakes, and oceans, and the fluids of most living organisms. Water is an excellent solvent for a wide variety of chemical substances; as such it is widely used in industrial processes, and in cooking and washing. Hotels, Motels & Restaurants are one of the major users of water and part of the management duty is to maintain water's cleanliness and safety, for attaining this hotels use water filtration system to filtrate and purify the water that came from the water sources which they will become safe to the guests.

9.2 Analysis of Drinking Water Quality of Hotel, Motel & Restaurant

In 2019, the monitoring program covered sampling of 101 points/stations of 07 district (Barisal Dist.-30 points, Bhola Dist.-15 points, Bogura Dist.-10 points, Naogaon Dist.-10 points, Pirojpur Dist.-16 points, Rajshahi Dist.-10 points, Rangour Dist.-10 points) in the month of January and February for analysis of drinking water quality. Detail data is attached Annex-6 (Table: 273-279).

In 2019, the maximum Coliform Bacteria 160 CFU/100ml against the EQS of 0/100 ml for Drinking water at Hotel Otithi, Port Road, Barisal in January.

In 2019, the maximum Coliform Bacteria 140 CFU/100ml against the EQS of 0/100 ml for Drinking water at Hotel Ahsan, Sadar Road, Bhola in February.

In 2019, the maximum Coliform Bacteria 120 CFU/100ml against the EQS of 0/100 ml for Drinking water at Quality Sweets and Restaurent, Thana Road, Bogra and Selim Hotel, 1 No Rail Gate, Bogra in July and August.

In 2019, the maximum Coliform Bacteria 210 CFU/100ml against the EQS of 0/100 ml for Drinking water at Al Amin Sweets, Miste potti, Naogaon in January to March.

In 2019, the maximum Coliform Bacteria 150 CFU/100ml against the EQS of 0/100 ml for Drinking water at Café Al Modina Restaurant and Sawrma House, Sadar, Pirojpur in January.

In 2019, the maximum Coliform Bacteria 100 CFU/100ml against the EQS of 0/100 ml for Drinking water at Kisan Hotel and Restaurant, Saheb bazar, Rajshahi in January to March.

In 2019, the maximum Coliform Bacteria 120 CFU/100ml against the EQS of 0/100 ml for Drinking water at Boisakhi Restaurent, Dhap Jail Road, Rangpur in July and August.

CHAPTER 10: CONCLUSION AND RECOMMENDATIONS

10.1 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. An impact of seasonal variation of flow, industrialization and urbanization has been assumed to be responsible for poor water quality for the rivers around Dhaka city, Chattagram and Khulna city. Spatial and temporal variation in water quality has been evident from the data analysis. Ninety percent of surface water flows through the 57 transboundary rivers. Low rainfall and upstream intake of water by the neighboring countries reduces the flow of water in dry season. During monsoon water quality of most monitoring stations was improved, when compared to the Environmental Quality Standard (EQS) set in the ECR, 1997. High density of industries, poor solid waste management by the City Corporations and untreated liquid wastes including sewage are assumed to be responsible for poor quality water quality of rivers around Dhaka city, Chattagram and Khulna city. The difference in pollution level among the sampling points along a single river was also evident because of urbanization.

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.

10.2 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.

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Annex-1

List of Tables for Different Parameters of River Water

1.0 Buriganga River (Table: 1-10)

Table-1. Level of pH of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	7.52	8.27	7.36	8.31	7.37	6.87	7.15	7.37	7.23	7.01	7.15	7.19
Hajaribag	7.27	7.72	7.4	8.26	7.41	6.94	7.54	7.23	7.05	6.94	7.23	7.09
Kamrangir Char	7.44	8.12	7.55	8.17	7.42	6.96	6.89	7.1	7.12	7.02	7.2	7.19
Chadnighat	7.41	8.06	7.52	8.1	7.41	6.99	6.78	7	7.06	6.92	7.06	7.15
Sadar Ghat	7.41	8.01	7.52	8.14	7.38	7.04	6.8	7.14	6.93	7.01	7.11	7.14
Dlolaikhal	7.69	8.11	7.41	8.13	7.52	7.03	6.81	7.09	6.97	6.9	7.15	7.09
Pagla	-	-	-	8.08	7.46	-	6.71	7.09	7.08	7.06	7.09	7.11
Bangladesh China Frp. Brg.	7.65	8.11	7.34	8.21	7.49	7.02	6.79	7.1	6.9	6.77	7.2	7.03
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-2. Level of DO (mg/l) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	0.76	0.44	0.34	0.41	0.82	1.6	2.5	4.7	5	4.9	2.8	1.3
Hajaribag	0.81	0.32	0.32	0.2	0.29	0.8	2.2	4.6	3.2	3.6	1.8	1.4
Kamrangir Char	0.96	0.38	0.41	0.38	0.78	0.4	1.3	4	3.3	3.3	2.6	1.1
Chadnighat	0.7	0.3	0.53	0.3	0.25	0.2	1	2.3	2.1	3	2.8	1.2
Sadar Ghat	0.46	0.51	0.29	0.39	0.68	0.7	1.1	3.2	2.8	3.4	2.6	1.4
Dlolaikhal	1.2	0.46	0.3	0.53	0.37	0.7	2	3.6	2.9	3.5	2.8	0.9
Pagla	-	-	-	0.48	0.89	-	2.3	3.9	3	3.5	2.8	1
Bangladesh China Frp. Brg.	0.23	0.27	0.31	0.29	0.69	0.5	2.2	3.8	3.2	0	2.6	1.2
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (4.5-8 mg/l)												

Table-3. Level of BOD (mg/l) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	12	8.4	26	20	12	6.5	4.5	6	0.6	3.2	16.4	14.2
Hajaribag	18	7.8	20	18	8	8	4	3.6	3.1	4.2	15	16.2
Kamrangir Char	14	7.2	21	20	13	8	5	4.2	2.1	6.2	10	9.6
Chadnighat	12	6.6	24	18	16	8.5	5.5	3.2	3	4.2	10.8	10
Sadar Ghat	14	20.4	23	21	8	6.5	5.5	4.6	4.2	4	10.2	9.2
Dlolaikhal	16	9	34	25	8	6.5	4.5	5	4.3	6.2	9.6	9.6
Pagla	-	-	-	22	10	-	6	4.8	4.6	3	10	9.2
Bangladesh China Frp. Brg.	18	18	24	21	13	7	5	4.4	6	4.6	11.4	12.4
EQS Fisheries (\leq6 mg/l)												
EQS Industrial (\leq50 mg/l)												

Table-4. Level of COD (mg/l) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	40	27	92	92	66	12	10	24	10	15	37	32
Hajaribag	45	25	65	65	78	14	12	26	12	10	32	34
Kamrangir Char	38	24	72	72	58	26	24	12	15	26	41	39
Chadnighat	32	20	99	99	58	30	28	10	7	13	31	39
Sadar Ghat	48	58	109	109	121	12	14	12	19	12	9.7	38
Dlolaikhal	42	27	120	110	90	10	12	12	5	47	2.4	42
Pagla	-	-	-	90	160	-	10	12	10	15	17	42
Bangladesh China Frp. Brg.	50	53	72	97	90	18	16	12	29	14	15	38
EQS Industrial (\leq200 mg/l)												

Table-5. Level of TDS (mg/l) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	345	257	487	272	378	226	87.2	67.3	82	88	157.9	243
Hajaribag	371	234	508	281	368	224	99.7	70.2	92.9	106	135.1	254
Kamrangir Char	376	237	506	278	356	116	75.6	69	88.7	96	141	249
Chadnighat	370	238	707	260	353	109	104.1	75.8	93.1	110	165.1	245
Sadar Ghat	377	232	508	255	359	105	88.1	74.3	94.9	96	146.3	242
Dlolaikhal	344	236	523	261	363	105	84.4	70.1	102.7	104	140.8	246
Pagla	-	-	-	243	380	-	86.7	70.7	99.4	98	136.3	242
Bangladesh China Frp. Brg.	374	225	504	263	359	112	85.2	71.2	96.6	109	136.8	246
EQS Industrial (≤ 2100 mg/l)												

Table-6. Level of Turbidity (NTU) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	23	81	48	25	24.3	19	24.3	27.4	30.7	14	12.8	13.1
Hajaribag	11	25.8	21	19.2	39.8	14	7.21	14.8	16.7	11.5	8	17.6
Kamrangir Char	12	39	70	22.4	16.1	19	6.81	16.4	32.6	28.2	12.8	19.6
Chadnighat	14	28.2	18	27.8	15.3	21	7.81	10.4	17.5	12.1	10.9	10.7
Sadar Ghat	10	52.2	48	20.3	23.8	19	12.7	8.62	25.6	22.6	8.34	9.8
Dlolaikhal	33	37.3	20	19.6	53.7	20	5.96	10.5	5.14	10.2	5.7	17.1
Pagla	-	-	-	18.8	27.9	-	4.34	13.2	8.83	7.56	10.2	20
Bangladesh China Frp. Brg.	12	46.7	56	34.1	24.6	16.2	4.31	9.77	22.1	26.6	4.36	14.6
EQS Industrial (10 NTU)												

Table-7. Level of Chloride (mg/l) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	25	23	84	45	60	14	10.5	20	11	12	22	28.5
Hajaribag	24	21	92	42	67	17	12	22	12	12	21	31.5
Kamrangir Char	23	22	90	43	64	18	12	24	10	13	22	31.5
Chadnighat	24	23	92	40	60	20	16	25	12	14	22	34.5
Sadar Ghat	22	24	94	40	62	15	13	24	10	14	23	34
Dlolaikhal	24	22	90	40	61	17	14	24	12	12	21	32.5
Pagla	-	-	-	42	66	-	-	24	12	15	22	34
Bangladesh China Frp. Brg.	23	23	90	42	65	18	14.5	23	13	16	23	32
EQS Industrial (150-600 mg/l)												

Table-8. Level of SS (mg/l) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	36	150	143	47	23	5	13	41	36	14	20	26
Hajaribag	22	77	84	37	49	14	9	13	20	16	12	38
Kamrangir Char	30	98	106	39	22	13	5	15	24	26	24	35
Chadnighat	16	80	183	42	23	10	7	16	4	14	22	21
Sadar Ghat	30	91	102	41	36	14	18	7	24	22	17	22
Dlolaikhal	61	113	82	32	78	17	5	16	5	12	18	36
Pagla	-	-	-	33	35	-	10	15	14	9	12	29
Bangladesh China Frp. Brg.	-	120	142	62	43	12	6	10	12	27	9	30
EQS Industrial (150 mg/l)												

Table-9. Level of Total Alkalinity (mg/l) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	220	218	66	320	180	61	60	43	110	19	176	245
Hajaribag	224	217	64	310	192	62	109	52	114	112	184	286
Kamrangir Char	226	218	70	308	205	60	68	55	110	120	186	273
Chadnighat	232	217	230	312	209	64	107	45	108	118	169	266
Sadar Ghat	244	218	80	320	215	65	85	59	110	120	189	274
Dlolaikhal	240	218	82	340	210	62	87	51	112	119	192	267
Pagla	-	-	-	-	235	-	81	42	110	115	202	259
Bangladesh China Frp. Brg.	242	217	70	614	215	63	75	42	108	122	186	269
EQS Industrial (150 mg/l)												

Table-10. Level of EC (µmohs/cm) of Buriganga River Water in 2019

Location of Buriganga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mirpur Bridge	661	513	1043	620	754	490	188.2	153.9	151.6	173	284	454
Hajaribag	714	494	1084	632	735	483	215.5	160.4	170	205	243	480
Kamrangir Char	712	472	1081	628	711	253	164	162	175.3	187	252	465
Chadnighat	701	470	1084	609	704	257	226	173	167.6	213	294	456
Sadar Ghat	699	469	1084	603	719	227	191	169.5	173.6	185	261	453
Dlolaikhal	710	455	1124	611	727	229	180.8	159.9	177.6	202	255	463
Pagla	-	-	-	634	758	-	187.2	161.6	179.4	188	246	452
Bangladesh China Frp. Brg.	690	467	1079	614	718	244	183.9	162.6	191.3	213	245	462
EQS Industrial (1200µmohs/cm)												

2.0 Shitalakhya River (Table: 11-19)**Table-11. Level of pH of Shitalakhya River Water in 2019**

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	7.28	-	7.29	7.2	6.94	6.9	6.98	7.4	7.46	7.08	7.17
Ghorashal F.F.	7.32	7.28	7.32	7.15	6.3	-	6.72	7.92	7.37	7.2	-	3.32
Near ACI Factory	7.3	7.21	7.3	7.8	6.92	6.52	-	7.23	7.3	7.32	-	7.34
Near Kanchpur Bridge	7.3	7.21	7.3	7.15	6.3	6.52	6.72	6.98	7.3	7.2	7.08	3.32
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-12. Level of DO (mg/l) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	0.6	-	1	1.4	1	3	4.2	4.6	4.5	1.4	1
Ghorashal F.F.	6.5	5.6	6.5	5.3	5.6	-	3.4	5.4	5	4.7	-	4.5
Near ACI Factory	2.1	2.4	2.1	1.2	1.8	0.8	-	3.8	4.7	4.5	-	2
Near Kanchpur Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (4.5-8 mg/l)												

Table-13. Level of BOD (mg/l) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	30		12	10	10	3	9.6	4.8	2.4	10	11
Ghorashal F.F.	6	15	6	3.2	5	-	0.9	3.9	2.3	0.4	-	6.2
Near ACI Factory	10	4.2	10	13	9	8	-	8.4	4.2	1.9	-	8
Near Kanchpur Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (≤ 6 mg/l)												
EQS Industrial (≤ 50 mg/l)												

Table-14. Level of COD (mg/l) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	112	-	40	36	36	22	32	17	41	15	33
Ghorashal F.F.	36	12	36	8	18	-	8	9	14	49	-	16
Near ACI Factory	41	50	41	38	27	28		24	18	40	-	30
Near Kanchpur Bridge	-	112	-	40	36	36	22	32	17	41	15	33
EQS Industrial (≤ 200 mg/l)												

Table-15. Level of TDS (mg/l) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	192.8	-	190.2	178	74	61.7	106.9	87.1	178	122.5	192
Ghorashal F.F.	260	436	260	210	154	-	56.7	60.3	65.9	101	-	154
Near ACI Factory	418	118.2	418	402	412	130	-	113.4	85.1	174	-	175
Near Kanchpur Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industrial (≤ 2100 mg/l)												

Table-16. Level of Chloride (mg/l) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	15	-	27	109	17	6	22	12	11	22	34
Ghorashal F.F.	26	16	26	30	90	-	5	9	10	11	-	18
Near ACI Factory	25	16	25	39	121	32	-	16	12	12	-	32
Near Kanchpur Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industrial (150-600 mg/l)												

Table-17. Level of SS (mg/l) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	43		10	8	16	12	34	20	187	11	42
Ghorashal F.F.	70	46	70	12	6	-	37	39	12	127	-	18
Near ACI Factory	72	45	72	18	5	1		42	18	185	-	35
Near Kanchpur Bridge	70	43	70	10	5	1	12	34	12	127	11	18
EQS Industrial (150 mg/l)												

Table-18. Level of EC (μ mhos/cm) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	398		380	361	165	125.7	246	164.6	320	222	332
Ghorashal F.F.	512	827	512	430	405	-	108.6	129.6	111.6	193	-	230
Near ACI Factory	817	247	817	810	779	276	-	234	120.2	310	-	330
Near Kanchpur Bridge	817	827	817	810	779	276	125.7	246	164.6	320	222	332
EQS Industrial (1200 μ mhos/cm)												

Table-19. Level of Total Alkalinity (mg/l) of Shitalakhya River Water in 2019

Location of Shitalakhya river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Demra Ghat	-	44	-	112	25	56	48	78	114	158	137	166
Ghorashal F.F.	154	221	154	117	24	-	50	66	116	60	-	120
Near ACI Factory	150	140	150	122	30	94	-	86	115	155	-	162
Near Kanchpur Bridge	154	221	154	122	30	94	50	86	116	158	137	166
EQS Industrial (150 mg/l)												

3.0 Turagh River (Table: 20-28)**Table-20. Level of pH of Turagh River Water in 2019**

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	7.98	7.02	-	7.37	7.02	7.08	7.23	7.12	7.22	7.23	7.24	7.03
Mirpur Diabary BIWTA L.S	7.64	7.12	-	7.41	7.08	7.01	7.08	6.96	6.75	7.22	7.22	7.34
Ashulia BIWTA L.S	8.39	7.16	-	7.43	7.25	7.34	6.99	7.18	7.35	7.25	7.31	7.73
Tongi Istima Mat	8.12	7.18	-	7.16	7.28	7.08	7.23	7.22	7.25	7.25	-	7.69
North Side of Tongi Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-21. Level of DO (mg/l) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	0.17	0.21	-	0.12	1.5	2	3.2	5.7	4.5	4.5	2.2	0
Mirpur Diabary BIWTA L.S	0.31	0.18	-	0	0.5	1	2.1	4.7	2.2	4.5	2	0
Ashulia BIWTA L.S	1.5	0.17	-	0	2	3.8	3	6.2	6	4.6	3	0
Tongi Istima Mat	2.4	0.18	-	0	3	4	3.1	5.5	5	4	-	0
North Side of Tongi Bridge	2.4	0.21	-	0.12	3	4	3.2	6.2	6	4.6	3	0
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (4.5-8 mg/l)												

Table-22. Level of BOD (mg/l) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	25	22	-	16.2	16	10	3.9	0.6	8	8.2	6.4	12.6
Mirpur Diabary BIWTA L.S	27	24	-	11	20	12	5.4	12	10	8	6.2	12.4
Ashulia BIWTA L.S	26	24	-	44.5	29	12	5.2	0.9	6	6.2	6.4	12.2
Tongi Istima Mat	25	20	-	62.4	27	15	4	2.4	5.4	6	-	8.6
North Side of Tongi Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (6.0-9.0)												

Table-23. Level of COD (mg/l) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	72	68	-	100	180	31	46	10	29	46	15	73
Mirpur Diabary BIWTA L.S	97	72	-	86	238	41	22	22	20	63	18	66
Ashulia BIWTA L.S	70	68	-	191	87	46	17	8	20	10	30	56
Tongi Istima Mat	75	54	-	225	83	46	20	9	16	10	-	39
North Side of Tongi Bridge	72	68	-	100	180	31	46	10	29	46	15	73
EQS Industrial (\leq200 mg/l)												

Table-24. Level of TDS (mg/l) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	170	244	-	386	283	95	76.7	61	93.3	107	256.2	361
Mirpur Diabary BIWTA L.S	163	270	-	457	282	90	75.5	71.8	86.2	105	131.7	264
Ashulia BIWTA L.S	212	277	-	375	435	96	64.4	80.8	74.4	96	150.8	387
Tongi Istima Mat	218	278	-	412	313	236	75.2	86.3	81	98	-	350
North Side of Tongi Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industrial (≤ 2100 mg/l)												

Table-25. Level of Chloride (mg/l) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	10	95	-	27	46	18	7.5	21	10	12	18	72
Mirpur Diabary BIWTA L.S	11	67	-	30	99	19	9	24	11	11	18.5	30
Ashulia BIWTA L.S	12	95	-	25	46	20	6	18	11	10	22	46
Tongi Istima Mat	13	91	-	28	59	21	8	22	11	11	-	56
North Side of Tongi Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industrial (150-600 mg/l)												

Table-26. Level of SS (mg/l) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	20	50	-	114	53	10	20	33	24	39	18	120
Mirpur Diabary BIWTA L.S	46	52	-	166	35	13	19	22	1	19	23	83
Ashulia BIWTA L.S	28	50	-	104	49	14	7	39	20	20.2	19	53
Tongi Istima Mat	22	46	-	179	62	22	12	40	56	26	-	92
North Side of Tongi Bridge	46	52	-	179	62	22	20	40	56	39	23	120
EQS for Industrial Discharge (150 mg/l)												

Table-27. Level of EC (μ mhos/cm) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	333	476	-	813	522	208	148	126.6	176.6	189	280	634
Mirpur Diabary BIWTA L.S	331	538	-	954	518	196	145.2	148.3	163	186	242	469
Ashulia BIWTA L.S	430	550	-	783	794	210	125.7	167.8	136	170	275	679
Tongi Istima Mat	464	552	-	864	554	514	125.3	172.6	147	173	-	617
North Side of Tongi Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS for Industrial Discharge (1200 μmhos/cm)												

Table-28. Level of Total Alkalinity (mg/l) of Turagh River Water in 2019

Location of Turagh river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Gabtoli Bridge	270	160	-	230	196	136	47	52	110	120	170	246
Mirpur Diabary BIWTA L.S	274	162	-	235	205	126	50	45	110	128	158	183
Ashulia BIWTA L.S	272	158	-	228	249	186	46	42	108	129	162	192
Tongi Istima Mat	270	162	-	232	170	170	45	50	104	106	-	250
North Side of Tongi Bridge	-	-	-	-	-	-	-	-	-	-	-	-
EQS for Industrial Discharge (150 mg/l)												

4.0 Balu River (Table: 29-38)

Table-29. Level of pH of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	8.5	-	-	7.58	7.49	7.42	7.4	7.85	7.17	7.13	7.23	7.03
Near Hossain Dyeing Ltd. Pagar, Tongi	7.93	7.95	-	7.59	6.94	7	7.07	7.84	7.19	7.22	7.56	7.34
Near Damra University College, Demra, Dhaka	7.35	7.2	7.49	8.14	7.2	7.37	7.21	6.99	7.2	7.29	7.36	7.73
Near Balu Bridge, 300 feet Road, Dhaka	7.5	7.13	7.44	8.49	7.4	7.15	6.73	7.33	7.22	7.3	7.16	7.69
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-30. Level of DO (mg/l) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	1.16	-	-	0.5	0	1.5	2.5	5.1	3.6	2.5	1.8	0
Near Hossain Dyeing Ltd. Pagar, Tongi	1	1.2	-	0	2.3	0.4	0	5.3	3.2	2.3	1.4	0
Near Damra University College, Demra, Dhaka	0	0.5	0	0.21	1.4	0	1	4.2	2.1	2.2	1.6	0
Near Balu Bridge, 300 feet Road, Dhaka	0	0.36	0	0.1	0	0	1.5	5.2	3	2.4	1.6	0
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (4.5-8 mg/l)												

Table-31. Level of BOD (mg/l) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	32	-	-	20	41	12	6.2	4.2	8	6	12	12.6
Near Hossain Dyeing Ltd. Pagar, Tongi	27	28	-	22	26	14	6.6	5.1	10	5.5	14.4	12.4
Near Damra University College, Demra, Dhaka	28	26	29.1	56.5	7	10	6.2	6.6	12	5.9	9.6	12.2
Near Balu Bridge, 300 feet Road, Dhaka	30	27	28	60	7	12	6.5	4.8	10	6	10	8.6
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (\leq6 mg/l)												
EQS Industrial (\leq50 mg/l)												

Table-32. Level of COD (mg/l) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	120	-	-	60	172	45	38	20	32	18	45	73
Near Hossain Dyeing Ltd. Pagar, Tongi	93	92	-	65	85	51	22	21	30	17	48	66
Near Damra University College, Demra, Dhaka	90	96	100	212	87	42	18	24	36	15.9	36	56
Near Balu Bridge, 300 feet Road, Dhaka	97	97	98	224	53	40	22	18	35	17.5	24	39
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	120	97	100	224	172	51	38	24	36	18	48	73
EQS Industrial (≤ 200 mg/l)												

Table-33. Level of TDS (mg/l) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	470	-	-	398	445	307	288	75.3	131.9	136	144	361
Near Hossain Dyeing Ltd. Pagar, Tongi	672	672	-	427	302	258	80	77.2	103.9	136	138	264
Near Damra University College, Demra, Dhaka	423	470	469	924	178	76	75.1	108	128.1	106	117	387
Near Balu Bridge, 300 feet Road, Dhaka	648	652	458	1089	362	176	83	86.3	130.8	108	102.3	350
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industrial (≤ 200 mg/l)												

Table-34. Level of Chloride (mg/l) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	38	-	-	26	55	55	52	25	20	11	25	72
Near Hossain Dyeing Ltd. Pagar, Tongi	25	26	-	27	29	29	9	24	19	11	24	30
Near Damra University College, Demra, Dhaka	24	24	62	109	26	28	8	38	20	18	22	46
Near Balu Bridge, 300 feet Road, Dhaka	42	43	64	115	57	17	7	26	21	15	20	56
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industrial (150-600 mg/l)												

Table-35. Level of SS (mg/l) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	55	-	-	120	80	18	15	32	9	20	23	120
Near Hossain Dyeing Ltd. Pagar, Tongi	73	120	-	132	28	33	5	35	9	18	25	83
Near Damra University College, Demra, Dhaka	100	187	123	154	11	10	6	45	26	23	23	53
Near Balu Bridge, 300 feet Road, Dhaka	120	180	120	390	44	16	7	42	24	24	18	92
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industrial (≤ 150 mg/l)												

Table-36. Level of EC ($\mu\text{mhos/cm}$) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	1000	-	-	770	775	657	650	146.5	241	240	286	634
Near Hossain Dyeing Ltd. Pagar, Tongi	672	1250	-	786	538	551	153.6	145.1	187	242	276	469
Near Damra University College, Demra, Dhaka	712	888	1015	1902	361	169	144	248	243	193	234	679
Near Balu Bridge, 300 feet Road, Dhaka	1248	1260	984	2165	724	390	168	172	240	194	185.5	617
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS (1200 $\mu\text{mhos/cm}$)												

Table-37. Level of T.alkalinity (mg/l) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	272	-	-	229	125	149	143	68	160	150	180	246
Near Hossain Dyeing Ltd. Pagar, Tongi	270	271	-	230	125	108	62	70	158	147	176	183
Near Damra University College, Demra, Dhaka	228	228	266	365	116	66	58	86	156	184	168	192
Near Balu Bridge, 300 feet Road, Dhaka	258	260	270	350	219	124	51	78	157	155	156	250
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS (150 mg/l)												

Table-38. Level of Turbidity (NTU) of Balu River Water in 2019

Location of Balu river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Jaber & Jubair Fabrics Ltd. Tongi	29	-	-	78.3	41.5	17.8	17.8	28.2	15.7	20.5	24.6	111
Near Hossain Dyeing Ltd. Pagar, Tongi	53	45	-	80.3	23.9	23	7.54	29.3	20.5	18.3	23.5	59
Near Damra University College, Demra, Dhaka	32	32	64	56.7	8.95	24.2	10.1	28.6	22.9	14.7	24.2	50
Near Balu Bridge, 300 feet Road, Dhaka	30	35	77	28.3	31.2	14.5	11	32.8	23	18.5	14.6	70
Near Fulpukuria Dyeing Ltd. Pagar, Tongi	-	-	-	-	-	-	-	-	-	-	-	-
EQS (10 NTU)												

5.0 Dhalaeswari River (Table: 39-44)**Table-39. Level of pH of Dhaleshwari River Water in 2019**

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
200m up of CETP	-	-	-	-	-	-	-	7.21	7.46	7.46	7.25	7.43
Dropping Point of CETP	-	-	-	-	-	-	-	6.94	7.21	7.21	7.17	7.45
200m Down of CETP	-	-	-	-	-	-	-	7.12	7.23	7.23	7.25	7.39
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-40. Level of DO (mg/l) of Dhaleshwari River Water in 2019

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
200m up of CETP	-	-	-	-	-	-	-	5.1	5.6	4	2.2	4.2
Dropping Point of CETP	-	-	-	-	-	-	-	3.6	4.5	3.7	2.8	3
200m Down of CETP	-	-	-	-	-	-	-	5.1	5.2	3.8	2.4	2.6
EQS Fisheries (5 mg/l \geq)												
EQS Industrial (4.5-8 mg/l)												

Table-41. Level of BOD (mg/l) of Dhaleshwari River Water in 2019

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
200m up of CETP	-	-	-	-	-	-	-	0.9	1.6	3.3	4.8	3
Dropping Point of CETP	-	-	-	-	-	-	-	2.1	2.4	3.9	12.6	6.2
200m Down of CETP	-	-	-	-	-	-	-	0.9	1.2	3.3	4.8	4
EQS Fisheries (\leq 6 mg/l)												
EQS Industrial (\leq 50 mg/l)												

Table-42. Level of COD (mg/l) of Dhaleshwari River Water in 2019

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
200m up of CETP	-	-	-	-	-	-	-	12	10	16	10	12
Dropping Point of CETP	-	-	-	-	-	-	-	18	16	24	46	18
200m Down of CETP	-	-	-	-	-	-	-	15	10	16	10	28
EQS Industries (\leq 200 mg/l)												

Table-43. Level of TDS (mg/l) of Dhaleshwari River Water in 2019

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
200m up of CETP	-	-	-	-	-	-	-	76.5	86.2	97.6	150.8	261
Dropping Point of CETP	-	-	-	-	-	-	-	132.8	90.6	99.6	421	267
200m Down of CETP	-	-	-	-	-	-	-	73.7	86.8	95.4	165.7	293
EQS Industries (\leq 2100 mg/l)												

Table-44. Level of EC (1200 μ mhos/cm) of Dhaleshwari River Water in 2019

Location of Dhaleshwari river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
200m up of CETP	-	-	-	-	-	-	-	164.9	168.6	172.8	282	442
Dropping Point of CETP	-	-	-	-	-	-	-	285	176.2	180.4	786	461
200m Down of CETP	-	-	-	-	-	-	-	159.4	168.2	180.3	297	490
EQS industrial (1200 μ mhos/cm)												

6.0 Brahmaputra River (Table: 45-50)**Table-45. Level of pH of Brahmaputra River Water in 2019**

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh	-	-	-	7.85	7.77	8.25	-	7.68	-	-	7.62	-
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-46. Level of DO (mg/l) of Brahmaputra River Water in 2019

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh	-	-	-	7.2	7.3	6.4	-	6.6	-	-	5.8	-
EQS Fisheries (5 mg/l \geq)												
EQS Industrial (4.5-8 mg/l)												

Table-47. Level of BOD (mg/l) of Brahmaputra River Water in 2019

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh	-	-	-	-	-	1.8	-	3.1	-	-	2.4	-
EQS Fisheries (\leq 6 mg/l)												
EQS Industrial (\leq 50 mg/l)												

Table-48. Level of TDS (mg/l) of Brahmaputra River Water in 2019

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh	-	-	-	153	140	45.3	-	106.2	-	-	112	-
EQS Industries (\leq 2100 mg/l)												

Table-49. Level of SS (mg/l) of Brahmaputra River Water in 2019

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh	-	-	-	29	89	125	-	23	-	-	23	-
EQS Industrial (150 mg/l)												

Table-50. Level of Chloride (mg/l) of Brahmaputra River Water in 2019

Location of Brahmaputra river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Mymensingh	-	-	-	36	37	7	-	25	-	-	18	-
EQS Industrial (150-600 mg/l)												

7.0 Kaligonga River (Table: 51-56)**Table-51. Level of pH of Kaligonga River Water in 2019**

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat	7.32	-	7.69	7.71	7.31	7.7	-	7.56	-	-	7.51	-
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-52. Level of DO (mg/l) of Kaligonga River Water in 2019

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat	7	-	6.6	5.6	5.9	6	-	6.8	-	-	5.9	-
EQS Fisheries (5 mg/l \geq)												
EQS Industrial (4.5-8 mg/l)												

Table-53. Level of BOD (mg/l) of Kaligonga River Water in 2019

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat	5	-	2.4	1.5	1	1.5	-	2.3	-	-	12	-
EQS Fisheries (\leq 6 mg/l)												
EQS Industrial (\leq 50 mg/l)												

Table-54. Level of TDS (mg/l) of Kaligonga River Water in 2019

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat	275	-	276	228	217	45.3	-	84.6	-	-	98	-
EQS Industries (≤ 2100 mg/l)												

Table-55. Level of SS (mg/l) of Kaligonga River Water in 2019

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat	39	-	8	32	4	30	-	21	-	-	39	-
EQS Industrial (150 mg/l)												

Table-56. Level of Chloride (mg/l) of Kaligonga River Water in 2019

Location of Kaligonga river	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bheutha Ghat	25	-	8.99	29	25	28	-	12	-	-	7	-
EQS Industrial (150-600 mg/l)												

8.0 Jamuna River (Table: 57-62)**Table-57. Level of pH of Jamuna River Water in 2019**

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhadurabad Ghat	8.27	8.27	-	-	-	-	-	-	-	-	-	-
Near Jamuna Fertilizer Factory	7.93	7.93	-	-	-	-	-	-	-	-	-	-
Near Bangabandhu Bridge (US)	7.48	7.48	7.48	7.5	7.49	7.49	7.49	7.47	7.47	7.48	7.48	7.48
Near Bangabandhu Bridge (US)	7.46	7.46	7.46	7.5	7.49	7.49	7.49	7.47	7.47	7.47	7.47	7.47
Fulchari Ghat, Gibanda (US)	7.44	7.44	7.54	7.54	7.56	7.56	7.56	7.54	7.54	7.53	7.53	7.53
Fulchari Ghat, Gibanda (DS)	7.45	7.45	7.55	7.54	7.54	7.54	7.54	7.52	7.52	7.52	7.52	7.52
Shariakandi Groin Badth (US)	7.46	7.46	7.46	7.48	7.46	7.46	7.48	7.46	7.46	7.46	7.46	7.46
Shariakandi Groin Badth (DS)	7.47	7.47	7.47	7.48	7.46	7.46	7.48	7.46	7.46	7.46	7.46	7.46
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-58. Level of DO (mg/l) of Jamuna River Water in 2019

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhadurabad Ghat	6.2	6.2	-	-	-	-	-	-	-	-	-	-
Near Jamuna Fertilizer Factory	5.6	5.6	-	-	-	-	-	-	-	-	-	-
Near Bangabandhu Bridge (US)	7.3	7.3	7.3	7.2	7.3	7.3	7.3	7.3	7.3	7.3	7.2	7.2
Near Bangabandhu Bridge (US)	7.2	7.2	7.3	7.2	7.3	7.3	7.3	7.3	7.3	7.3	7.1	7.1
Fulchari Ghat, Gibanda (US)	7	7	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.1	7.1
Fulchari Ghat, Gibanda (DS)	7	7	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7	7
Shariakandi Groin Badth (US)	7.1	7.1	7.3	7.3	7.3	7.3	7.4	7.4	7.4	7.4	7.1	7.1
Shariakandi Groin Badth (DS)	7.1	7.1	7.3	7.3	7.3	7.3	7.4	7.4	7.4	7.4	7.2	7.2
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (4.5-8 mg/l)												

Table-59. Level of BOD (mg/l) of Jamuna River Water in 2019

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhadurabad Ghat	-	2.1	-	-	-	-	-	-	-	-	-	-
Near Jamuna Fertilizer Factory	3	3	-	-	-	-	-	-	-	-	-	-
Near Bangabandhu Bridge (US)	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.1
Near Bangabandhu Bridge (US)	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2	2
Fulchari Ghat, Gibanda (US)	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Fulchari Ghat, Gibanda (DS)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1
Shariakandi Groin Badth (US)	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1
Shariakandi Groin Badth (DS)	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
EQS Fisheries (≤ 6 mg/l)												
EQS Industrial (≤ 50 mg/l)												

Table-60. Level of SS of Jamuna River Water in 2019

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhadurabad Ghat	18	18	-	-	-	-	-	-	-	-	-	-
Near Jamuna Fertilizer Factory	20	20	-	-	-	-	-	-	-	-	-	-
Near Bangabandhu Bridge (US)	80	80	80	80	80	80	80	80	80	80	80	80
Near Bangabandhu Bridge (US)	80	80	80	80	80	80	80	80	80	80	80	80
Fulchari Ghat, Gibanda (US)	60	60	60	60	60	60	60	60	60	60	80	80
Fulchari Ghat, Gibanda (DS)	60	60	60	60	60	60	60	60	60	60	80	80
Shariakandi Groin Badth (US)	70	70	70	70	70	70	80	80	80	80	50	50
	70	70	70	70	70	70	80	80	80	80	50	50
EQS Industrial (150 mg/l)												

Table-61. Level of TDS (mg/l) of Jamuna River Water in 2019

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhadurabad Ghat	118.6	118.6	-	-	-	-	-	-	-	-	-	-
Near Jamuna Fertilizer Factory	192.8	192.8	-	-	-	-	-	-	-	-	-	-
Near Bangabandhu Bridge (US)	150	150	150	130	130	130	130	130	130	130	142	142
Near Bangabandhu Bridge (US)	150	150	150	130	130	130	130	130	130	130	132	132
Fulchari Ghat, Gibanda (US)	140	140	140	130	130	130	130	130	130	130	142	142
Fulchari Ghat, Gibanda (DS)	140	140	140	130	130	130	130	130	130	130	142	142
Shariakandi Groin Badth (US)	150	150	150	140	140	140	140	140	140	140	162	162
Shariakandi Groin Badth (DS)	150	150	150	140	140	140	140	140	140	140	160	160
EQS Industries (≤ 2100 mg/l)												

Table-62. Level of Chloride (mg/l) of Jamuna River Water in 2019

Location of Jamuna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhadurabad Ghat	13	13	-	-	-	-	-	-	-	-	-	-
Near Jamuna Fertilizer Factory	12	12	-	-	-	-	-	-	-	-	-	-
Near Bangabandhu Bridge (US)	25	25	25	25	25	25	25	25	25	25	30	30
Near Bangabandhu Bridge (US)	25	25	25	25	25	25	25	25	25	25	30	30
Fulchari Ghat, Gibanda (US)	30	30	30	30	30	30	30	30	30	30	24	24
Fulchari Ghat, Gibanda (DS)	30	30	30	30	30	30	30	30	30	30	26	26
Shariakandi Groin Badth (US)	30	30	30	30	30	30	30	30	30	30	32	32
Shariakandi Groin Badth (DS)	30	30	30	30	30	30	30	30	30	30	32	32
EQS Industrial (150-600 mg/l)												

9.0 Meghna River (Table: 63-68)

Table-63. Level of pH of Meghna River Water in 2019

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhairob Bazar	-	6.97	6.6	7.03	7.03	-	8.65	8.56	7.07	7.41	-	6.24
Meghna Ghat	-	6.48	-	7.15	-	6.8	7.48	7.89	7.07	6.99	-	6.59
Near Shahjalal Paper Mills	-	6.25	-	7.28	-	7.25	7.27	8.11	7.55	7.05	-	6.25
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-64. Level of DO (mg/l) of Meghna River Water in 2019

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhairob Bazar	-	5.2	6	4.8	4.6	-	4.9	6.8	6.3	6.2	-	4.9
Meghna Ghat	-	5.4	-	4.2	-	5.5	5.8	5.6	6.9	6.5	-	4.3
Near Shahjalal Paper Mills	-	4.6	-	2.9	-	3.1	3.5	5.2	6.2	4.9	-	4.8
EQS Fisheries (5 mg/l≥)												
EQS Industrial (4.5-8 mg/l)												

Table-65. Level of BOD (mg/l) of Meghna River Water in 2019

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhairob Bazar	-	3.1	2.2	6	2	-	4.9	1.8	2.3	3	-	6
Meghna Ghat	-	3.1	-	3.2	-	4.4	5.8	4.2	2.4	5	-	5
Near Shahjalal Paper Mills	-	3.2	-	12	-	31	3.5	5.4	2.4	2	-	8
EQS Fisheries (≤6 mg/l)												
EQS Industrial (≤50 mg/l)												

Table-66. Level of TDS (mg/l) of Meghna River Water in 2019

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhairob Bazar	-	85.4	74.2	58	58	-	37.2	32.4	34.7	55	-	45.3
Meghna Ghat	-	267	-	180	-	152	37.8	43.2	56.2	36	-	88
Near Shahjalal Paper Mills	-	146	-	98	-	109	36.8	37.2	58	76	-	47.6
EQS Industries (≤2100 mg/l)												

Table-67. Level of SS (mg/l) of Meghna River Water in 2019

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhairob Bazar	-	20	10	20	46	-	12	28	5	58	-	16
Meghna Ghat	-	42	-	63	-	61	18	32	4	49	-	39
Near Shahjalal Paper Mills	-	45	-	52	-	50	15	34	2	90	-	15
EQS Industrial (150 mg/l)												

Table-68. Level of Chloride (mg/l) of Meghna River Water in 2019

Location of Meghna river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bhairob Bazar	-	7	20.99	17	48	-	5	4	6	12	-	18
Meghna Ghat	-	11	-	16	-	14	12	5	4	14	-	15.5
Near Shahjalal Paper Mills	-	9	-	27	-	20	15.5	5	6	15	-	18
EQS Industrial (150-600 mg/l)												

10.0 Padma River (Table: 69-74)

Table-69. Level of pH of Padma River Water in 2019

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat	-	7.82	8.2	7.81	7.01	-	-	7.68	-	-	7.36	-
Shimulia Ghat	-	-	-	6.96	6.91	-	-	7.74	-	-	7.41	-
Pakshi Ghat (US)	7.65	7.65	7.65	7.65	7.64	7.64	7.64	7.62	7.62	7.62	7.62	7.52
Pakshi Ghat (DS)	7.66	7.66	7.66	7.65	7.65	7.65	7.65	7.6	7.6	7.6	7.6	7.53
Baro kuti Ghat (U.S)	7.56	7.56	7.56	7.56	7.56	7.56	7.56	7.54	7.54	7.52	7.52	7.62
Baro kuti Ghat (D.S)	7.54	7.54	7.54	7.56	7.55	7.55	7.55	7.53	7.53	7.53	7.53	7.6
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-70. Level of DO (mg/l) of Padma River Water in 2019

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat	-	6.5	6.8	8	7.8	-	-	7.2	-	-	7.3	-
Shimulia Ghat	-	-	-	7.8	7	-	-	6.8	-	-	6.8	-
Pakshi Ghat (US)	7.1	7.1	7.5	7.3	7.3	7.3	7.3	7.3	7.3	7.1	7	7
Pakshi Ghat (DS)	7.1	7.1	7.5	7.3	7.3	7.3	7.3	7.3	7.3	7.1	7.1	7.1
Baro kuti Ghat (U.S)	7.2	7.2	7.4	7.3	7.4	7.4	7.4	7.4	7.4	7.2	7.2	7.2
Baro kuti Ghat (D.S)	7.2	7.2	7.4	7.3	7.4	7.4	7.4	7.4	7.4	7.2	7.1	7.1
EQS for Fisheries (5 mg/l\geq)												
EQS Industrial Discharge (4.5-8 mg/l)												

Table-71. Level of BOD (mg/l) of Padma River Water in 2019

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat	-	1.1	1.4	2.5	-	-	-	2.1	-	-	4.2	-
Shimulia Ghat	-	-	-	2.3	-	-	-	2.6	-	-	3.8	-
Pakshi Ghat (US)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3
Pakshi Ghat (DS)	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Baro kuti Ghat (U.S)	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2
Baro kuti Ghat (D.S)	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.1
EQS for Fisheries (\leq6 mg/l)												
EQS Industrial Discharge (\leq50 mg/l)												

Table-72. Level of TDS (mg/l) of Padma River Water in 2019

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat	-	102.3	96	84.1	64	-	-	54.6	-	-	92.7	-
Shimulia Ghat	-	-	-	88.3	67	-	-	56.2	-	-	78.2	-
Pakshi Ghat (US)	120	120	120	120	120	120	120	120	120	120	156	156
Pakshi Ghat (DS)	120	120	120	120	120	120	120	120	120	120	142	142
Baro kuti Ghat (U.S)	140	140	140	130	130	130	130	130	130	130	144	144
Baro kuti Ghat (D.S)	140	140	140	130	130	130	130	130	130	130	132	132
EQS for Industrial Discharge (\leq2100mg/l)												

Table-73. Level of SS (mg/l) of Padma River Water in 2019

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat	-	40	18	18	74	-	-	56	-	-	68	-
Shimulia Ghat	-	-	-	15	134	-	-	46	-	-	45	-
Pakshi Ghat (US)	80	80	80	80	80	80	80	80	80	80	60	60
Pakshi Ghat (DS)	80	80	80	80	80	80	80	80	80	80	70	70
Baro kuti Ghat (U.S)	70	70	70	70	70	70	70	70	70	70	60	60
Baro kuti Ghat (D.S)	70	70	70	70	70	70	70	70	70	70	70	70
EQS for Industrial Discharge (\leq150mg/l)												

Table-74. Level of EC ($\mu\text{mhos/cm}$) of Padma River Water in 2019

Location of Padma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mawa Ghat	-	201.3	178	206.3	126	-	-	108.3	-	-	164.3	-
Shimulia Ghat	-	-	-	95	131	-	-	110.6	-	-	156	-
Pakshi Ghat (U.S)	240	240	240	240	250	250	250	250	250	250	316	316
Pakshi Ghat (D.S)	240	240	240	240	250	250	250	250	250	250	298	298
Baro kuti Ghat (U.S)	280	280	280	260	260	260	260	260	260	260	320	320
Baro kuti Ghat (D.S)	280	280	280	260	260	260	260	260	260	260	316	316
EQS for Industrial Discharge (1200$\mu\text{mhos/cm}$)												

11.0 Korotoa River (Table: 75-80)**Table-75. Level of pH of Korotoa River Water in 2019**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Dutta Bari Bridge (U.S)	6.94	6.94	6.94	6.96	6.93	6.96	7.4	7.54	7.52	7.52	6.96	6.97
Near Dutta Bari Bridge (D.S)	6.94	6.96	6.94	6.96	6.93	6.96	7.41	7.52	7.52	7.51	6.95	6.96
Near Foteh Ali Bridge (U.S)	6.88	6.88	6.88	6.95	6.91	6.95	7.43	7.52	7.52	7.51	6.94	6.93
Near Foteh Ali Bridge (D.S)	6.89	6.89	6.89	6.95	6.91	6.95	7.44	7.5	7.5	7.5	6.94	6.93
Near Matidali Bridge (U.S)	6.96	6.96	6.96	6.98	6.95	6.97	7.44	7.62	7.62	7.6	7	6.98
Near Matidali Bridge (D.S)	6.97	6.97	6.97	6.97	6.95	6.97	7.45	7.6	7.6	7.6	7	6.98
Near S.P Bridge (U.P)	6.87	6.87	6.87	6.91	6.88	6.92	7.38	7.5	7.5	7.5	6.9	6.9
Near S.P Bridge (D.S)	6.87	6.87	6.87	6.9	6.88	6.92	7.38	7.5	7.5	7.5	6.9	6.91
Shahjadpur (U.S)	7.41	7.4	7.41	7.45	7.41	7.41	7.41	7.41	7.41	7.41	7.42	7.42
Shahjadpur (D.S)	7.41	7.41	7.41	7.44	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-76. Level of DO (mg/l) of Korotoa River Water in 2019

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Dutta Bari Bridge (U.S)	2.8	2.8	2.9	3.1	3	3	5.2	5.2	5.3	5.2	3.6	3.5
Near Dutta Bari Bridge (D.S)	2.9	2.8	2.9	3.1	3	3	5.1	5.1	5.3	5	3.6	3.5
Near Foteh Ali Bridge (U.S)	2.7	2.7	2.8	2.9	2.8	2.8	5	5	5.2	5	3.4	3.4
Near Foteh Ali Bridge (D.S)	2.7	2.7	2.8	2.9	2.8	2.8	5	5	5.2	5	3.4	3.4
Near Matidali Bridge (U.S)	3.3	3.2	3	3.2	3.1	3.1	5.4	5.4	5.4	5.2	3.8	3.6
Near Matidali Bridge (D.S)	3.4	3.2	3	3.2	3.1	3.1	5.4	5.4	5.4	5.2	3.8	3.6
Near S.P Bridge (U.P)	2.7	2.7	2.7	2.8	2.9	2.9	5.1	5.1	5.1	5.1	3.1	3
Near S.P Bridge (D.S)	2.8	2.7	2.7	2.8	2.9	2.9	5.1	5.1	5.1	5.1	3.1	3
Shahjadpur (U.S)	7	7.2	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.2	6.9	6.9
Shahjadpur (D.S)	7	7.2	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.2	6.9	6.9
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (4.5-8 mg/l)												

Table-77. Level of BOD (mg/l) of Korotoa River Water in 2019

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Dutta Bari Bridge (U.S)	6.4	6.6	6.3	6.3	6.4	6.4	2.3	2.3	2.8	2.3	6.3	6.3
Near Dutta Bari Bridge (D.S)	6.4	6.6	6.3	6.3	6.4	6.4	2.4	2.4	2.8	2.4	6.2	6.3
Near Foteh Ali Bridge (U.S)	6.2	6.4	6.2	6.2	6.3	6.3	2.4	2.4	2.6	2.4	6.2	6.1
Near Foteh Ali Bridge (D.S)	6.2	6.4	6.4	6.4	6.3	6.3	2.4	2.4	2.6	2.4	6.2	6.1
Near Matidali Bridge (U.S)	6.2	6	5.4	5.4	5.6	5.6	2.2	2.2	2.4	2.2	6.2	6
Near Matidali Bridge (D.S)	6	6	5.4	5.4	5.6	5.6	2.2	2.2	2.4	2.2	6	6
Near S.P Bridge (U.P)	6	6.1	6.5	6.5	6.7	6.7	2.4	2.4	2.4	2.4	6.1	6.2
Near S.P Bridge (D.S)	6	6.1	6.5	6.5	6.7	6.7	2.4	2.4	2.4	2.4	6	6.2
Shahjadpur (U.S)	7	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.1
Shahjadpur (D.S)	7	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2
EQS Fisheries (≤ 6 mg/l)												
EQS Industrial (≤ 50 mg/l)												

Table-78. Level of TDS (mg/l) of Korotoa River Water in 2019

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Dutta Bari Bridge (U.S)	330	340	320	310	320	300	150	150	140	150	370	360
Near Dutta Bari Bridge (D.S)	330	340	320	310	320	300	150	150	140	150	360	360
Near Foteh Ali Bridge (U.S)	320	320	320	300	310	290	150	150	140	150	360	320
Near Foteh Ali Bridge (D.S)	320	320	320	300	310	290	150	150	140	150	350	320
Near Matidali Bridge (U.S)	290	290	290	280	290	280	150	150	130	150	330	330
Near Matidali Bridge (D.S)	290	290	290	280	290	280	150	150	130	150	320	330
Near S.P Bridge (U.P)	340	320	340	270	280	290	150	150	140	150	330	350
Near S.P Bridge (D.S)	340	320	340	270	280	290	150	150	140	150	330	350
Shahjadpur (U.S)	140	140	140	130	140	140	140	140	140	140	140	140
Shahjadpur (D.S)	140	130	140	130	140	140	140	140	140	140	140	140

EQS Industrial ($\leq 2100\text{mg/l}$)**Table-79. Level of SS (mg/l) of Korotoa River Water in 2019**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Dutta Bari Bridge (U.S)	110	100	110	100	100	100	70	70	70	70	110	90
Near Dutta Bari Bridge (D.S)	110	100	110	100	100	100	70	70	70	70	100	100
Near Foteh Ali Bridge (U.S)	90	90	90	90	90	90	70	70	70	70	90	90
Near Foteh Ali Bridge (D.S)	80	90	80	90	90	90	70	70	70	70	80	80
Near Matidali Bridge (U.S)	100	100	100	100	100	100	70	70	70	70	100	100
Near Matidali Bridge (D.S)	100	100	100	100	100	100	70	70	70	70	90	90
Near S.P Bridge (U.P)	100	100	100	100	100	110	70	70	70	70	100	100
Near S.P Bridge (D.S)	100	100	100	100	100	110	70	70	70	70	90	90
Shahjadpur (U.S)	70	80	70	70	70	70	70	70	70	70	80	80
Shahjadpur (D.S)	70	80	70	70	70	70	70	70	70	70	80	80

EQS Industrial ($\leq 150\text{mg/l}$)**Table-80. Level of EC ($\mu\text{mhos/cm}$) of Korotoa River Water in 2019**

Location of Korotoa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Dutta Bari Bridge (U.S)	660	680	640	620	640	600	220	230	280	230	740	720
Near Dutta Bari Bridge (D.S)	660	680	640	620	640	600	220	230	280	230	730	720
Near Foteh Ali Bridge (U.S)	640	640	640	600	620	580	220	230	270	230	720	710
Near Foteh Ali Bridge (D.S)	640	640	640	600	620	580	220	230	270	230	730	710
Near Matidali Bridge (U.S)	580	580	580	560	580	560	220	240	260	240	650	660
Near Matidali Bridge (D.S)	580	580	580	560	580	560	220	240	260	240	640	660
Near S.P Bridge (U.P)	680	640	680	540	560	580	220	240	280	240	680	690
Near S.P Bridge (D.S)	680	640	680	540	560	580	220	240	280	240	680	690
Shahjadpur (U.S)	280	270	280	260	280	280	280	280	280	280	280	280
Shahjadpur (D.S)	280	270	280	260	280	280	280	280	280	280	280	280

EQS Industrial ($1200\mu\text{mhos/cm}$)**12.0 Teesta River (Table: 81-86)****Table-81. Level of pH of Teesta River Water in 2019**

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Tista Bridge (U.S)	7.58	7.58	7.58	7.58	7.56	7.56	7.56	7.58	7.58	7.57	7.57	7.57
Near Tista Bridge (D.S)	7.57	7.57	7.57	7.58	7.57	7.57	7.57	7.56	7.56	7.56	7.56	7.56

EQS Fisheries (6.5-8.5)

EQS Industrial (6.0-9.0)

Table-82. Level of DO (mg/l) of Teesta River Water in 2019

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Tista Bridge (U.S)	6.8	6.9	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.1	7.1
Near Tista Bridge (D.S)	6.8	6.9	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2

EQS Fisheries (5 mg/l \geq)

EQS Industrial (4.5-8 mg/l)

Table-83. Level of BOD (mg/l) of Teesta River Water in 2019

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Tista Bridge (U.S)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Near Tista Bridge (D.S)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1
EQS Fisheries (≤ 6 mg/l)												
EQS Industrial (≤ 50 mg/l)												

Table-84. Level of TDS (mg/l) of Teesta River Water in 2019

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Tista Bridge (U.S)	230	230	230	230	230	230	230	230	130	230	102	102
Near Tista Bridge (D.S)	230	230	230	230	230	230	230	230	130	230	98	98
EQS Industrial (≤ 2100 mg/l)												

Table-85. Level of SS (mg/l) of Teesta River Water in 2019

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Tista Bridge (U.S)	70	70	70	70	70	70	70	70	70	70	90	90
Near Tista Bridge (D.S)	70	70	70	70	70	70	70	70	70	70	90	90
EQS Industrial (≤ 2100 mg/l)												

Table-86. Level of Turbidity (NTU) of Teesta River Water in 2019

Location of Teesta river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Near Tista Bridge (U.S)	23.1	23.1	23.1	23.2	13.4	13.4	13.4	13.4	13.4	13.4	14.2	14.2
Near Tista Bridge (D.S)	23.1	23.1	23.1	23.2	13.4	13.4	13.4	13.4	13.4	13.4	14.1	14.1
EQS for Industrial Discharge (10 NTU)												

13.0 Karnaphuli River (Table: 87-92)**Table-87. Level of pH of Karnaphuli River Water in 2019**

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	7.9	7.8	7.9	7	7.1	7.5	7.6	8.1	7.82	7.7	7.82	8.23
TSP	7.8	8	8.2	7.1	7.3	7.5	7.9	8.8	8.14	7.73	7.74	7.65
Karnafully River Chaktai Khal, ctg	7.6	7.5	7.8	6.8	6.9	7.6	7.7	8.4	7.68	7.63	7.88	8.14
Karnafully Mohona	7.5	8	8.4	7.4	7.1	7.6	7.8	8.02	7.06	7.73	7.8	8.26
1km Straight from patenga sea beach	7.7	8.1	8.6	7.4	7.5	7.7	7.7	8.09	7.47	7.78	7.78	8.27
Patenga charpara	7.8	7.9	7.5	7.3	7.6	7.3	7.3	8.07	7.27	7.85	7.68	8.24
1km Straight from CEPZ	7.8	8.2	8	7.2	7.4	7.8	7.8	8.03	7.56	7.76	7.75	8.46
Vattiyari shipyard area	-	-	-	-	7.8	7.5	7.5	7.5	7.48	7.41	7.41	8.12
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-88. Level of DO (mg/l) of Karnaphuli River Water in 2019

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	8.5	8.2	8.1	6.5	6.3	8	7.1	5.09	6.54	6.79	6.87	8.6
TSP	7.5	7.7	7.5	6	6.1	8.4	7.7	4.59	6.61	6.57	7	7.38
Karnafully River Chaktai Khal, ctg	5.7	5.9	5.7	4.5	4.6	6.1	6.1	4.2	7.18	3.27	3.99	4.8
Karnafully Mohona	8.2	8.1	8.4	7.83	7.6	8.2	7.6	7	6.9	6.9	7.44	8.74
1km Straight from patenga sea beach	7.9	7.8	7.5	8	8.1	7.9	7.5	7.1	7	7	7.34	8.74
Patenga charpara	7.8	7.7	7.1	7.2	7.5	7.7	6.9	6.3	6.8	6.8	7.52	8.44
1km Straight from CEPZ	8.4	8.2	8.1	7.5	7.3	7	7.2	6.6	6.8	6.8	6.98	8.44
Vattiyari shipyard area	-	-			7.2	7.1	7.3	7.5	7.1	7.1	7.01	7.67
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-89. Level of COD (mg/l) of Karnaphuli River Water in 2019

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	-	-	-	-	-	-	42	66	68	1002	937	1371
TSP	-	-	--	-	-	-	31	12	34	876	737	1011
Karnafully River Chaktai Khal, ctg	-	-	-	-	-	-	37	89	46	134	322	359
Karnafully Mohona	-	-	-	-	-	-	-	-	177	-	816	1295
1km Straight from patenga sea beach	-	-	-	-	-	-	-	-	146	-	1103	1051
Patenga charpara	-	-	-	-	-	-	-	-	148	-	765	1048
1km Straight from CEPZ	-	-	-	-	-	-	-	-	140	-	600	1490
Vattiyari shipyard area	-	-	-	-	-	-	-	-	210	-	655	610
EQS Industries (≤ 200 mg/l)												

Table-90. Level of TDS (mg/l) of Karnaphuli River Water in 2019

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	16750	8960	8520	13080	12670	10440	1235	727.9	751	12860	18640	18630
TSP	10430	3510	3434	6580	6290	7450	48.3	69	71.7	12560	17400	13010
Karnafully River Chaktai Khal, ctg	232	212	496	405	421	435	81.2	191.9	56.2	982	6180	4470
Karnafully Mohona	17720	18730	16720	13220	13435	11010	2050	1295	3170	12910	18200	19620
1km Straight from patenga sea beach	18010	18956	16990	13090	12189	10659	2169	1272	3600	13770	17960	18470
Patenga charpara	17870	19130	17138	12130	12290	10781	2107	1470	4320	11360	17240	18050
1km Straight from CEPZ	18125	18643	17587	12480	12510	11115	1915	1520	4300	11360	15690	16290
Vattiyari shipyard area	-	-	-	-	14585	8130	3130	2870	5155	11610	14360	16530
EQS Industries (≤ 200 mg/l)												

Table-91. Level of SS (mg/l) of Karnaphuli River Water in 2019

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	306	219	249	193	182	160	287	252	284	284	482	252
TSP	256	160	172	200	192	172	184	66	111	920	206	278
Karnafully River Chaktai Khal, ctg	307	278	286	353	329	280	280	176	150	469	556	256
Karnafully Mohona	-	-	247	268	235	372	380	267	242	835	229	520
1km Straight from patenga sea beach	-	-	142	270	256	220	345	272	369	672	149	524
Patenga charpara	-	-	306	90	113	137	278	259	253	589	279	520
1km Straight from CEPZ	-	-	258	199	185	148	290	396	197	630	134	662
Vattiyari shipyard area	-	-	-	-	177	138	247	272	260	476	356	445
EQS Industries (≤ 150 mg/l)												

Table-92. Level of EC (mg/l) of Karnaphuli River Water in 2019

Location of Karnaphuli river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
CUFL	33512	17932	17118	20840	21510	19678	2310	1360	1399	23600	29800	28300
TSP	20869	7017	6729	11220	10717	13190	97.6	128.9	142	23100	28000	20520
Karnafully River Chaktai Khal, ctg	453	418	438	768	790	810	162.8	360	110.1	2092	10850	7560
Karnafully Mohona	-	-	31290	21320	20154	21541	4340	2280	5550	23600	29100	29700
1km Straight from patenga sea beach	-	-	31689	21070	20125	19743	4575	2250	6280	24900	28800	28100
Patenga charpara	-	-	32380	19780	21376	20149	4080	2580	7570	20990	27700	27500
1km Straight from CEPZ	-	-	32690	20190	21280	21310	3964	2620	7420	21430	25500	25000
Vattiyari shipyard area	-	-	-	-	23654	15270	5520	5038	9443	15130	25780	25866
EQS Industries (1200µmohos/cm)												

14.0 Halda River (Table: 93-98)**Table-93. Level of pH of Halda River Water in 2019**

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mohona	7.43	7.58	7.88	7.31	7.43	6.98	-	8.95	7.32	8.29	7.42	-
Khandakiya Khal	7.4	7.61	7.23	6.94	6.87	7.14	-	9.17	7.46	8.05	7.54	7.85
Madari Khal	7.27	7.3	7.45	7.36	7.2	7.23	-	9.07	7.37	8.44	7.45	7.81
Katakhali Khal	7.09	7.28	7.2	7.07	7.18	7.24	-	8.98	7.43	8.36	7.49	7.73
Krishna Khal	7.52	7.6	7.51	7.08	6.99	7.17	-	8.9	7.33	8.1	7.52	7.8
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-94. Level of DO (mg/l) of Halda River Water in 2019

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mohona	5.4	5.33	5.2	5.1	5.23	6.37	-	5.57	7.34	5.8	6.14	7.65
Khandakiya Khal	5.22	5.5	5.66	3.61	4.18	6.43	-	5.17	7.81	7.1	7.57	8.43
Madari Khal	5.58	5.42	5.38	4.7	4.76	6.72	-	5.42	7.88	6.56	6.63	8.28
Katakhali Khal	5.8	5.71	5.63	4.35	4.4	6.35	-	5.88	7.21	7.15	7.41	8.24
Krishna Khal	4.8	4.79	4.85	4.67	4.77	4.77	-	5.85	7.86	7	7.42	8.41
EQS Fisheries (5 mg/l≥)												
EQS Industries (4.5-8 mg/l)												

Table-95. Level of COD (mg/l) of Halda River Water in 2019

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mohona	-	-	-	-	-	-	-	-	-	43	47	39
Khandakiya Khal	-	-	-	-	-	-	-	-	-	24	51	48
Madari Khal	-	-	-	-	-	-	-	-	-	33	30	36
Katakhali Khal	-	-	-	-	-	-	-	-	-	39	38	42
Krishna Khal	-	-	-	-	-	-	-	-	-	11	20	34
EQS Industries (≤200 mg/l)												

Table-96. Level of TDS (mg/l) of Halda River Water in 2019

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mohona	69	81	87	88	82	443	60.8	44.5	41.3	60.8	85.7	61.8
Khandakiya Khal	74	69	58	205	217	86.9	64.8	47.5	40.2	64.8	57	56.1
Madari Khal	60	74	66	78	83	61.4	71.2	44.7	39.1	71.2	66.1	69.1
Katakhali Khal	78	70	78	130	123	69.1	66.1	50.5	39.4	66.1	68	65.9
Krishna Khal	57	62	70	134	129	104	64.5	45.1	41.2	64.5	56.6	54.5
Mohona	69	81	87	88	82	443	60.8	44.5	41.3	60.8	85.7	61.8
EQS Industries (≤ 200 mg/l)												

Table-97. Level of SS (mg/l) of Halda River Water in 2019

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mohona	54	50	55	85	80	102	-	55	87	134	101	98
Khandakiya Khal	40	39	43	233	224	138	-	50	82	108	96	65
Madari Khal	62	58	55	40	45	125	-	54	98	168	52	75
Katakhali Khal	45	51	48	86	77	222	-	73	96	114	87	50
Krishna Khal	21	36	32	205	190	190	-	50	101	110	98	37
EQS Industries (≤ 150 mg/l)												

Table-98. Level of EC (mg/l) of Halda River Water in 2019

Location of Halda river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mohona	142	156	172	185	161	839	-	97.5	80.8	135.2	178.9	131.9
Khandakiya Khal	155	145	139	429	445	170	-	103	80.5	145.3	119.5	119.2
Madari Khal	135	155	149	165	156	120	-	97.8	76.2	156.6	137.6	144.3
Katakhali Khal	163	132	129	267	235	135	-	110	77.3	147	142	181.8
Krishna Khal	112	122	131	277	267	202	-	98.4	80.1	144.5	118.7	116.9
EQS Industries (1200μmhos/cm)												

15.0 Moyuri River (Table: 99-106)**Table-99. Level of pH of Moyuri River Water in 2019**

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	7.56	7.58	7.63	7.69	7.74	7.71	7.72	-	7.71	7.66	7.72	7.64
Gallamari Bridge (M)	7.57	7.58	7.68	7.68	7.74	7.72	7.71	-	7.71	7.65	7.71	7.64
Gallamari Bridge (O)	7.56	7.56	7.64	7.67	7.73	7.73	7.73	-	7.73	7.65	7.71	7.65
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-100. Level of DO (mg/l) of Moyuri River Water in 2019

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	0.4	0.4	0.8	1	1	0.8	0.9	-	4.46	4.44	4.46	2.36
Gallamari Bridge (M)	0.3	0.3	0.8	1.1	1.1	0.8	0.9	-	4.4	4.43	4.47	2.36
Gallamari Bridge (O)	0.3	0.3	0.8	1	1	0.8	0.9	-	4.44	4.44	4.45	2.36
EQS Fisheries (5 mg/l\geq)												
EQS Industries (4.5-8 mg/l)												

Table-101. Level of TDS (mg/l) of Moyuri River Water in 2019

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	488	516	1306	1352	1406	612	610	-	540	538	534	372
Gallamari Bridge (M)	490	518	1312	1352	1412	614	613	-	544	538	533	388
Gallamari Bridge (O)	492	520	1312	1352	1410	610	611	-	594	538	532	372
EQS Industries (≤ 2100mg/l)												

Table-102. Level of Chloride (mg/l) of Moyuri River Water in 2019

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	120	114	788	794	802	304	300	-	290	288	284	289
Gallamari Bridge (M)	120	114	788	794	802	304	302	-	294	288	284	288
Gallamari Bridge (O)	120	116	788	794	802	304	303	-	296	287	284	289
EQS Industries (150-600 mg/l)												

Table-103. Level of Turbidity (NTU) of Moyuri River Water in 2019

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	37.2	38.2	45.6	46.2	48.2	40.2	40.1	-	40.2	37.3	36.2	33.2
Gallamari Bridge (M)	37.2	38.3	45.7	46.3	48.3	40.3	40.2	-	40.2	37.4	36.3	34.3
Gallamari Bridge (O)	37.3	38.3	45.8	46.4	48.4	40.4	40.3	-	40.3	38.1	36.3	34.3
EQS Industries (≤ 10 NTU)												

Table-104. Level of SS (mg/l) of Moyuri River Water in 2019

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	52	54	65	72	75	58	58	-	56	54	52	49
Gallamari Bridge (M)	46	50	62	72	75	58	56	-	54	53	51	48
Gallamari Bridge (O)	52	52	64	72	75	58	60	-	58	56	52	51
EQS Industries (150 mg/l)												

Table-105. Level of EC (μ mhos/cm) of Moyuri River Water in 2019

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	976	1028	2612	2704	2812	1224	1220	-	1076	1076	1068	744
Gallamari Bridge (M)	980	1034	2618	2704	2824	1228	1226	-	1080	1076	1066	746
Gallamari Bridge (O)	982	1038	2618	2704	2818	1220	1220	-	1082	1074	1064	744
EQS Industries (1200 μmhos/cm)												

Table-106. Level of Total Alkalinity (mg/l) of Moyuri River Water in 2019

Location of Moyuri river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Gallamari Bridge (S)	976	1028	2612	2704	2812	1224	1220	-	1076	1076	1068	744
Gallamari Bridge (M)	980	1034	2618	2704	2824	1228	1226	-	1080	1076	1066	746
Gallamari Bridge (O)	982	1038	2618	2704	2818	1220	1220	-	1082	1074	1064	744
EQS Industries (150 mg/l)												

16.0 Bhairab River (Table: 107-114)**Table-107. Level of pH of Bhairab River Water in 2019**

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	7.62	7.66	7.79	7.82	7.82	7.77	7.73	-	7.71	7.69	7.71	8.55
Noapara Ghat (M)	7.62	7.65	7.78	7.79	7.79	7.78	7.75	-	7.72	7.69	7.7	8.55
Noapara Ghat (O)	7.63	7.64	7.78	7.8	7.8	7.78	7.75	-	7.73	7.68	7.72	8.56
Fultala Ghat(S)	7.62	7.64	7.81	7.84	7.84	7.81	7.8	-	7.77	6.82	7.76	7.82
Fultala Ghat (M)	7.61	7.65	7.8	7.83	7.83	7.8	7.81	-	7.78	6.92	7.77	7.81
Fultala Ghat (O)	7.62	7.65	7.81	7.82	7.82	7.8	7.8	-	7.79	6.82	7.76	8.82
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-108. Level of DO (mg/l) of Bhairab River Water in 2019

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	5.1	5.5	6.1	6.5	6.5	6.2	6.4	-	6.7	6.4	6.5	6.56
Noapara Ghat (M)	5.1	5.4	6.1	6.4	6.5	6.1	6.3	-	6.6	6.4	6.6	6.56
Noapara Ghat (O)	5.1	5.5	6.2	6.4	6.5	6.1	6.3	-	6.5	6.5	6.4	6.56
Fultala Ghat(S)	5.2	5.6	6.3	6.7	6.9	6.2	6.2	-	5.8	5.6	6.2	6.24
Fultala Ghat (M)	5.2	5.7	6.4	6.6	6.9	6.2	6.1	-	5.9	5.7	6.2	6.24
Fultala Ghat (O)	5.2	5.8	6.3	6.9	6.9	6.3	6.2	-	5.9	5.7	6.1	6.24
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-109. Level of BOD (mg/l) of Bhairab River Water in 2019

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	0.7	1.3	1.3	1.3	1.4	0.9	0.8	-	0.6	0.4	0.3	0.2
Noapara Ghat (M)	0.7	1.3	1.3	1.5	1.4	0.9	0.8	-	0.6	0.4	0.3	0.2
Noapara Ghat (O)	0.7	1.3	1.3	1.5	1.4	0.9	0.8	-	0.6	0.4	0.3	0.2
Fultala Ghat(S)	0.8	1.3	1.3	1.6	1.6	0.8	0.7	-	0.6	0.5	0.4	0.3
Fultala Ghat (M)	0.8	1.4	1.4	1.5	1.6	0.8	0.7	-	0.6	0.5	0.4	0.3
Fultala Ghat (O)	0.8	1.4	1.4	1.6	1.6	0.9	0.7	-	0.6	0.5	0.4	0.3
EQS Fisheries (\leq 6 mg/l)												
EQS Industrial (\leq 50 mg/l)												

Table-110. Level of TDS (mg/l) of Bhairab River Water in 2019

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	90	122	6498	10324	11056	2024	2026	-	2022	2017	1918	507
Noapara Ghat (M)	90	126	6500	10330	11060	2028	2024	-	2020	2018	1917	508
Noapara Ghat (O)	88	126	6498	10328	11058	2026	2026	-	2026	2017	1917	507
Fultala Ghat(S)	92	136	6522	10360	11067	2032	2030	-	2028	2027	1976	576
Fultala Ghat (M)	90	134	6524	10362	11070	2034	2032	-	2029	2028	1975	579
Fultala Ghat (O)	90	134	6522	10362	11066	2032	2031	-	2031	2028	1976	575
EQS Industries (\leq 2100mg/l)												

Table-111. Level of Chloride (mg/l) of Bhairab River Water in 2019

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	74	82	4026	6892	7046	966	958	-	950	946	947	877
Noapara Ghat (M)	72	82	4026	6896	7046	966	958	-	948	946	945	879
Noapara Ghat (O)	72	82	4026	6896	7046	966	958	-	946	945	943	879
Fultala Ghat(S)	76	86	4030	6954	7048	972	962	-	958	956	951	833
Fultala Ghat (M)	72	86	4030	6958	7048	972	970	-	960	957	953	881
Fultala Ghat (O)	72	86	4030	6958	7048	972	968	-	966	958	955	882
EQS Industries (150-600 mg/l)												

Table-112. Level of Turbidity (NTU) of Bhairab River Water in 2019

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	46.2	47.2	79.2	83.6	89.6	72.1	72.4	-	70.2	66.8	62.2	58.2
Noapara Ghat (M)	46.3	47.3	79.3	83.7	89.7	72.3	72.6	-	77.1	67.9	63.5	58.4
Noapara Ghat (O)	46.4	47.4	79.4	83.9	89.9	72.4	72.3	-	71.2	68.7	61.4	58.5
Fultala Ghat(S)	47.2	48.2	80.3	84.2	89.2	72.5	72.4	-	72.2	68.2	62.3	59.3
Fultala Ghat (M)	47.3	48.3	80.4	84.3	89.3	72.6	72.6	-	72.2	69.2	63.4	59.1
Fultala Ghat (O)	47.2	48.2	80.5	84.3	89.3	72.4	72.3	-	72.1	68.2	62.4	59.2
EQS Industries (\leq 10 NTU)												

Table-113. Level of EC ($\mu\text{mhos/cm}$) of Bhairab River Water in 2019

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	178	240	12994	20646	22112	4048	4045	-	4038	4034	3836	1014
Noapara Ghat (M)	176	248	12998	20658	22118	4054	4048	-	4037	4036	3834	1016
Noapara Ghat (O)	174	246	12994	20654	22114	4052	4050	-	4036	4034	3834	1014
Fultala Ghat(S)	182	268	13042	20718	22134	4062	4061	-	4058	4054	3952	1010
Fultala Ghat (M)	180	266	13046	20724	22138	4068	4065	-	4059	4056	3950	1010
Fultala Ghat (O)	178	262	13044	20722	22130	4064	4062	-	4057	4056	3952	1008
EQS Industries ($\mu\text{mhos/cm}$)												

Table-114. Level of Total Alkalinity (mg/l) of Bhairab River Water in 2019

Location of Bhairab river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Noapara Ghat (S)	32	32	34	36	36	34	34	-	34	34	34	34
Noapara Ghat (M)	32	32	34	36	36	34	34	-	34	34	34	34
Noapara Ghat (O)	32	32	34	36	36	34	34	-	34	34	34	34
Fultala Ghat(S)	32	32	34	36	36	34	34	-	34	34	34	34
Fultala Ghat (M)	32	32	34	36	36	34	34	-	34	34	34	34
Fultala Ghat (O)	32	32	34	36	36	34	34	-	34	34	34	34
EQS Industries (150 mg/l)												

17.0 Rupsa River (Table: 115-122)**Table-115. Level of pH of Rupsa River Water in 2019**

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (S)	7.62	7.68	7.84	7.88	7.93	7.81	7.8	-	8.35	8.35	8.31	7.64
Rupsa Ghat (M)	7.63	7.69	7.82	7.9	7.94	7.82	7.79	-	8.34	8.35	8.3	7.65
Rupsa Ghat (O)	7.62	7.68	7.82	7.87	7.93	7.83	7.78	-	8.35	8.36	8.31	7.65
Labanchara Ghat (S)	7.62	7.71	7.85	7.9	7.93	7.82	7.75	-	8.37	8.34	8.32	7.67
Labanchara Ghat (M)	7.64	7.73	7.85	9.92	7.93	7.82	7.74	-	8.38	8.34	8.31	7.67
Labanchara Ghat (O)	7.63	7.73	7.84	7.91	7.92	7.83	7.74	-	8.37	8.35	8.31	7.66
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-116. Level of DO (mg/l) of Rupsa River Water in 2019

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (S)	5.2	5.8	6.5	6.8	7.1	6.4	6.6	-	7.35	7.38	7.4	6.73
Rupsa Ghat (M)	5.3	5.8	6.6	6.7	7.2	6.4	6.5	-	7.34	7.38	7.39	6.73
Rupsa Ghat (O)	5.3	5.7	6.6	6.6	7.1	6.4	6.5	-	7.33	7.38	7.38	6.73
Labanchara Ghat (S)	5.3	6.2	6.7	6.9	7.3	6.4	6.3	-	6.38	6.34	6.34	6.75
Labanchara Ghat (M)	5.3	6.2	6.8	6.8	7.4	6.5	6.3	-	6.37	6.34	6.34	6.74
Labanchara Ghat (O)	5.2	6.1	6.8	6.8	7.3	6.5	6.3	-	6.36	6.34	6.34	6.74
EQS Fisheries (5 mg/l\geq)												
EQS Industrial (4.5-8 mg/l)												

Table-117. Level of BOD (mg/l) of Rupsa River Water in 2019

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (S)	0.8	0.8	1.3	1.3	1.7	1.1	1.2	-	1.1	1.1	1.1	1.1
Rupsa Ghat (M)	0.8	0.8	1.3	1.3	1.7	1.1	1.2	-	1.1	1.2	1.2	1.2
Rupsa Ghat (O)	0.8	0.8	1.3	1.3	1.7	1.1	1.2	-	1.1	1	1	1
Labanchara Ghat (S)	0.8	0.8	1.4	1.4	1.6	1.1	1.2	-	1.2	1.1	1.2	1.2
Labanchara Ghat (M)	0.8	0.8	1.4	1.4	1.6	1.1	1.2	-	1.2	1.1	1.2	1.2
Labanchara Ghat (O)	0.8	0.8	1.4	1.4	1.6	1.1	1.2	-	1.2	1	1.1	1.1
EQS Fisheries (≤ 6 mg/l)												
EQS Industrial (≤ 50 mg/l)												

Table-118. Level of Chloride (mg/l) of Rupsa River Water in 2019

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (S)	82	90	4574	7102	7134	984	980	-	978	974	967	956
Rupsa Ghat (M)	80	92	4578	7102	7138	984	981	-	977	975	969	954
Rupsa Ghat (O)	82	90	4580	7102	7134	984	981	-	976	977	970	954
Labanchara Ghat (S)	82	94	4580	7108	7140	984	980	-	980	976	977	957
Labanchara Ghat (M)	82	92	4580	7106	7142	984	982	-	982	978	975	958
Labanchara Ghat (O)	82	90	4580	7102	7142	984	982	-	982	975	973	958
EQS Industrial (150-600 mg/l)												

Table-119. Level of SS (mg/l) of Rupsa River Water in 2019

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (S)	52	56	84	92	102	74	64	-	60	72	66	63
Rupsa Ghat (M)	56	58	86	90	102	76	64	-	62	70	67	64
Rupsa Ghat (O)	54	58	88	92	102	76	64	-	61	68	68	65
Labanchara Ghat (S)	52	62	86	94	104	78	74	-	74	72	66	63
Labanchara Ghat (M)	54	60	88	92	104	74	74	-	74	73	65	62
Labanchara Ghat (O)	52	62	88	90	104	76	74	-	73	72	64	62
EQS Industrial (150 mg/l)												

Table-120. Level of Turbidity (NTU) of Rupsa River Water in 2019

Location of Rupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rupsa Ghat (S)	48.2	49.2	85.4	96.4	105.3	73.5	74.3	-	74.2	72.2	69.5	59.5
Rupsa Ghat (M)	48.2	49.2	85.3	96.3	105.4	73.6	74.4	-	74.3	72.4	69.3	59.2
Rupsa Ghat (O)	48.1	49.1	85.4	96.4	105.4	73.7	74.3	-	74.1	72.3	69.4	58.4
Labanchara Ghat (S)	48.2	47.7	85.4	98.5	107.1	74.2	74.3	-	74.3	73.5	69.2	57.6
Labanchara Ghat (M)	48.3	49.8	85.5	98.4	107.2	74.3	74.2	-	74.2	73.4	69.33	57.2
Labanchara Ghat (O)	48.2	49.6	85.5	98.3	107.1	74.3	74.2	-	74.2	73.2	69.3	57.3
EQS Industrial (≤ 10 NTU)												

Table-121. Level of EC (μ mhos/cm) of Rupsa River Water in 2019

Location of RupsaRupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
RupsaRupsa Ghat (S)	188	274	14256	21108	22512	4076	4068	-	1080	1076	1070	940
RupsaRupsa Ghat (M)	186	279	14260	21102	22528	4076	4071	-	1081	1078	1072	942
RupsaRupsa Ghat (O)	184	276	14264	21104	22520	4078	4072	-	1080	1076	1072	940
Labanchara Ghat (S)	196	284	14268	21126	22534	4076	4072	-	1120	1116	1068	948
Labanchara Ghat (M)	196	280	14264	21122	22536	4078	4074	-	1116	1118	1068	950
Labanchara Ghat (O)	194	282	14260	21118	22536	4076	4070	-	1118	1116	1070	946
EQS (1200 μmhos/cm)												

Table-122. Level of Total Alkalinity (mg/l) of Rupsa River Water in 2019

Location of RupsaRupsa river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
RupsaRupsa Ghat (S)	32	32	34	36	36	34	34	-	34	34	34	34
RupsaRupsa Ghat (M)	32	32	34	36	36	34	34	-	34	34	34	34
RupsaRupsa Ghat (O)	32	32	34	36	36	34	34	-	34	34	34	34
Labanchara Ghat (S)	32	32	34	36	36	34	34	-	34	34	34	34
Labanchara Ghat (M)	32	32	34	36	36	34	34	-	34	34	34	34
Labanchara Ghat (O)	32	32	34	36	36	34	34	-	34	34	34	34
EQS Industrial (150 mg/l)												

18.0 Mathavanga River (Table: 126-130)

Table-123. Level of pH of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	6.57	6.58	6.68	6.99	6.78	6.71	7.78	-	7.71	-	-	7.88
Pipe Ghat, (U.S)	6.59	6.59	6.63	6.65	6.76	6.7	6.78	-	6.72	-	-	8.28
PipeGhat, (D.S)	6.58	6.58	6.65	6.65	6.76	6.71	6.79	-	6.73	-	-	7.64
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-124. Level of DO (mg/l) of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	4.3	4.4	4.8	4.8	5.1	5.1	5.3	-	5.5	-	-	7.21
Pipe Ghat, (U.S)	4.2	4.4	4.8	4.8	5.1	5.1	5.4	-	5.6	-	-	2.01
PipeGhat, (D.S)	4.1	4.4	4.8	4.8	5.1	5.1	5.4	-	5.7	-	-	5.58
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-125. Level of BOD (mg/l) of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	0.6	0.6	0.6	0.6	0.7	0.7	0.6	-	0.5	-	-	0.5
Pipe Ghat, (U.S)	0.6	0.6	0.6	0.6	0.7	0.7	0.6	-	0.5	-	-	0.9
PipeGhat, (D.S)	0.6	0.6	0.6	0.6	0.7	0.7	0.6	-	0.5	-	-	0.2
EQS Fisheries (\leq 6 mg/l)												
EQS Industries (\leq 50 mg/l)												

Table-126. Level of TDS (mg/l) of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	88	98	168	372	380	132	129	-	128	-	-	162
Pipe Ghat, (U.S)	86	100	170	370	378	132	130	-	134	-	-	162
PipeGhat, (D.S)	88	98	166	364	380	132	131	-	130	-	-	177
EQS Industries (\leq 2100mg/l)												

Table-127. Level of Chloride (mg/l) of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	28	28	32	32	34	32	30	-	30	-	-	29
Pipe Ghat, (U.S)	26	26	32	32	34	32	29	-	29	-	-	29
PipeGhat, (D.S)	28	28	32	30	34	32	28	-	28	-	-	34
EQS Industries (150-600 mg/l)												

Table-128. Level of Turbidity (NTU) of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	32.3	33.2	36.2	37.2	38.2	34.2	33.1	-	33.1	-	-	31.5
Pipe Ghat, (U.S)	32.4	33.4	36.4	37.4	38.4	34.4	33.2	-	33.2	-	-	41.7
PipeGhat, (D.S)	32.5	33.5	36.5	37.5	38.5	34.5	33.1	-	33.1	-	-	47.2
EQS Industries (\leq 10 NTU)												

Table-129. Level of EC ($\mu\text{mhos/cm}$) of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	174	194	334	744	758	262	258	-	256	-	-	325
Pipe Ghat, (U.S)	170	196	338	738	754	264	260	-	268	-	-	324
PipeGhat, (D.S)	172	194	330	728	758	264	262	-	260	-	-	354
EQS Industries (1200 $\mu\text{mhos/cm}$)												

Table-130. Level of Total Alkalinity (mg/l) of Mathavanga River Water in 2019

Location of Mathavanga river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Pipe Ghat,(M.P)	32	32	32	32	32	32	32	-	32	-	-	32
Pipe Ghat, (U.S)	32	32	32	32	32	32	32	-	32	-	-	32
PipeGhat, (D.S)	32	32	32	32	32	32	32	-	32	-	-	32
EQS Industries (150 mg/l)												

19.0 Pashur River (Table: 131-138)**Table-131. Level of pH of Pashur River Water in 2019**

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	7.67	7.72	7.84	7.92	7.99	7.86	7.84	-	8.38	7.69	8.34	7.79
Mongla Poart (M.P)	7.68	7.75	7.86	7.91	7.98	7.88	7.86	-	8.38	7.69	8.32	7.78
Mongla Poart (O.P)	7.62	7.77	7.84	7.92	7.96	7.89	7.82	-	8.37	7.69	8.31	7.78
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-132 Level of DO (mg/l) of Pashur River Water in 2019

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	5.2	6.8	7.2	7.2	7.6	7.1	6.81	-	6.07	6.04	6.98	6.68
Mongla Poart (M.P)	5.3	6.9	7.1	7.3	7.7	7.1	6.81	-	6.08	6.04	6.97	6.64
Mongla Poart (O.P)	5.4	6.8	7.1	7.3	7.7	7.1	6.81	-	6.08	6.04	6.96	6.67
EQS Fisheries (5 mg/l\geq)												
EQS Industries (4.5-8 mg/l)												

Table-133. Level of BOD (mg/l) of Pashur River Water in 2019

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	0.8	1	1.3	1.3	1.7	0.9	0.8	-	0.8	0.5	0.5	0.4
Mongla Poart (M.P)	0.8	1	1.3	1.5	1.7	0.9	0.8	-	0.8	0.6	0.6	0.4
Mongla Poart (O.P)	0.8	1	1.3	1.5	1.7	0.9	0.8	-	0.8	0.5	0.5	0.4
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-134. Level of TDS (mg/l) of Pashur River Water in 2019

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	166	335	9062	12436	14460	2124	2122	-	2116	544	277	528
Mongla Poart (M.P)	166	338	9064	12436	14458	2126	2124	-	2120	546	278	528
Mongla Poart (O.P)	166	338	9064	12438	14456	2128	2124	-	2120	544	279	529
EQS Industries (≤ 2100mg/l)												

Table-135. Level of Chloride (mg/l) of Pashur River Water in 2019

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	92	124	6418	7528	8150	1044	1046	-	1046	1042	1032	1028
Mongla Poart (M.P)	98	128	6418	7528	8150	1048	1045	-	1045	1040	1033	1027
Mongla Poart (O.P)	92	128	6418	7530	8144	1048	1044	-	1044	1043	1035	1028
EQS Industries (150-600 mg/l)												

Table-136. Level of Turbidity (NTU) of Pashur River Water in 2019

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	54.2	56.2	89.7	102.2	110.3	76.2	76	-	72.1	70.2	70.2	68.8
Mongla Poart (M.P)	54.3	56.3	89.8	103.4	110.3	76.3	76.1	-	71.2	72.3	72.3	69.2
Mongla Poart (O.P)	54.4	56.4	89.8	102.2	110.4	76.4	76.2	-	72.1	70.2	70.2	69.2
EQS Industries (≤ 10 NTU)												

Table-137. Level of EC (μ mohos/cm) of Pashur River Water in 2019

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	328	668	18128	24872	28920	4246	4244	-	4232	1088	554	1056
Mongla Poart (M.P)	326	672	18126	24870	28916	4250	4246	-	4390	1089	556	1056
Mongla Poart (O.P)	326	674	18126	24876	28910	4256	4248	-	4240	1088	557	1058
EQS Industries (1200 μ mohos/cm)												

Table-138. Level of Total Alkalinity (mg/l) of Pashur River Water in 2019

Location of Pashur river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mongla Poart (S.P)	34	34	36	36	36	34	34	-	34	34	34	34
Mongla Poart (M.P)	34	34	36	36	36	34	34	-	34	34	34	34
Mongla Poart (O.P)	34	34	36	36	36	34	34	-	34	34	34	34
EQS Industries (150 mg/l)												

20.0 Khakshiali River (Table: 139-146)**Table-139. Level of pH of Khakshiali River Water in 2019**

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	7.49	7.56	7.68	7.7	7.78	7.64	7.62	-	7.62	7.82	7.89	8.15
Kaliganj (M.P)	7.5	7.58	7.66	7.69	7.79	7.66	7.64	-	7.61	7.82	7.88	8.15
Kaliganj (O.P)	7.49	7.56	7.66	7.68	7.78	7.64	7.63	-	7.6	7.82	7.88	8.15
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-140 Level of DO (mg/l) of Khakshiali River Water in 2019

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	5.1	5.6	5.6	5.8	6.2	6.1	5.8	-	6.1	3.25	3.25	8.65
Kaliganj (M.P)	5.2	5.6	5.6	5.8	6.2	6.1	5.8	-	6.2	3.25	3.25	8.65
Kaliganj (O.P)	5.1	5.6	5.6	5.8	6.2	6.1	5.8	-	6.3	3.25	3.26	8.65
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-141. Level of BOD (mg/l) of Khakshiali River Water in 2019

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	0.8	0.8	1.1	1.4	1.5	1	1	-	1.1	1.1	1.1	1.1
Kaliganj (M.P)	0.8	0.8	1.1	1.5	1.5	1	1	-	1.1	1	1	1
Kaliganj (O.P)	0.8	0.8	1.1	1.5	1.5	1	1	-	1.1	1.1	1.1	1.1
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-142. Level of TDS (mg/l) of Khakshiali River Water in 2019

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	476	674	10022	14734	16424	2856	2855	-	2856	2310	2304	936
Kaliganj (M.P)	498	677	10026	14736	16426	2858	2856	-	2858	2311	2303	936
Kaliganj (O.P)	496	677	10026	14734	16424	2856	2855	-	2856	2311	2303	936
EQS Industries (≤ 2100 mg/l)												

Table-143. Level of Chloride (mg/l) of Khakshiali River Water in 2019

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	104	208	6618	6618	8720	1148	1146	-	1148	1144	1142	1137
Kaliganj (M.P)	108	208	6618	6618	8728	1148	1146	-	1148	1142	1140	1138
Kaliganj (O.P)	108	208	6618	6618	8728	1148	1145	-	1148	1144	1142	1139
EQS Industries (150-600 mg/l)												

Table-144. Level of Turbidity (NTU) of Khakshiali River Water in 2019

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	57.6	58.6	78.6	120.4	129.1	89.2	88.1	-	88.1	87.2	87.1	87.1
Kaliganj (M.P)	57.7	58.7	78.5	120.5	129.2	89.3	88.2	-	88.2	87.3	87.1	87.1
Kaliganj (O.P)	57.7	58.7	78.5	120.3	129.3	89.4	87.1	-	87.1	87.1	87.2	87.2
EQS Industries (≤ 10 NTU)												

Table-145. Level of EC (μ mhos/cm) of Khakshiali River Water in 2019

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	984	1346	20042	29466	32846	5712	5710	-	5706	4620	4608	1876
Kaliganj (M.P)	994	1352	20048	29472	32850	5716	5711	-	5704	4622	4606	1878
Kaliganj (O.P)	990	1348	20048	29466	32850	5712	5710	-	5705	4622	4606	1876
EQS Industries (1200 μmhos/cm)												

Table-146. Level of SS (mg/l) of Khakshiali River Water in 2019

Location of Khakshiali river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kaliganj (S.P)	55	62	102	118	124	90	88	-	87	85	82	78
Kaliganj (M.P)	60	66	102	118	124	90	89	-	90	87	85	78
Kaliganj (O.P)	60	64	102	116	124	92	89	-	89	89	84	77
EQS Industries (150 mg/l)												

21.0 Gorai River (Table: 147-154)**Table-147. Level of pH of Gorai River Water in 2019**

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	7.53	7.56	7.86	7.88	7.88	7.81	7.75	-	7.71	7.79	7.64	7.79
Kustia (M.P)	7.54	7.58	7.86	7.86	7.88	7.81	7.75	-	7.7	7.79	7.64	7.78
Kustia (O.P)	7.53	7.61	7.87	7.87	7.87	7.82	7.76	-	7.71	7.79	7.65	7.78
Magura (S.P)	7.5	7.56	7.84	7.84	7.85	7.8	7.73	-	7.71	6.98	6.95	7.24
Magura (M.P)	7.54	7.57	7.83	7.85	7.85	7.81	7.73	-	7.7	6.98	6.95	7.25
Magura (O.P)	7.52	7.55	7.84	7.84	7.85	7.82	7.74	-	7.7	6.99	6.99	7.25
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-148. Level of DO (mg/l) of Gorai River Water in 2019

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	5.2	6.1	6.2	6.6	7.1	6.6	6.7	-	6.8	7.05	7.07	7.02
Kustia (M.P)	5.2	6.2	6.2	6.7	7.2	6.6	6.7	-	6.9	7.05	7.06	7.03
Kustia (O.P)	5.2	6.1	6.1	6.4	7.2	6.6	6.6	-	7	7.06	7.05	7.02
Magura (S.P)	5.1	6.2	6.2	6.5	7.1	6.4	6.2	-	6.4	6.26	6.31	6.26
Magura (M.P)	5.1	6.2	6.3	6.4	7.1	6.4	6	-	6.3	6.26	6.3	6.26
Magura (O.P)	5.1	6.1	6.1	6.4	7.1	6.4	6.2	-	6.5	6.26	6.31	6.26
EQS Fisheries (5 mg/l\geq)												
EQS Industries (4.5-8 mg/l)												

Table-149. Level of BOD (mg/l) of Gorai River Water in 2019

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	0.6	0.8	1.2	1.8	1.8	1	1	-	1.1	1	1	1
Kustia (M.P)	0.6	0.8	1.2	1.6	1.8	1	0.9	-	1	1	1	1
Kustia (O.P)	0.6	0.8	1.2	1.6	1.8	1	0.9	-	1	1	1	1
Magura (S.P)	0.7	0.8	1.1	1.9	1.8	0.9	0.8	-	0.7	0.5	0.4	0.4
Magura (M.P)	0.7	0.8	1.2	1.8	1.8	0.9	0.8	-	0.7	0.5	0.4	0.4
Magura (O.P)	0.7	0.8	1.1	1.8	1.8	0.9	0.8	-	0.7	0.5	0.4	0.4
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-150. Level of TDS (mg/l) of Gorai River Water in 2019

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	74	122	372	414	418	144	143	-	142	556	554	552
Kustia (M.P)	76	124	374	410	420	144	142	-	141	558	554	552
Kustia (O.P)	74	124	372	410	422	144	142	-	142	556	556	552
Magura (S.P)	78	126	394	400	408	134	130	-	131	562	557	555
Magura (M.P)	80	128	396	404	410	136	134	-	130	564	557	556
Magura (O.P)	80	128	394	404	410	138	136	-	132	562	558	558
EQS Industries (≤ 2100 mg/l)												

Table-151. Level of Chloride (mg/l) of Gorai River Water in 2019

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	28	32	34	40	44	36	34	-	34	32	30	35
Kustia (M.P)	28	32	34	42	44	36	34	-	34	33	28	35
Kustia (O.P)	28	32	34	38	44	36	34	-	34	32	29	36
Magura (S.P)	28	36	36	36	40	32	30	-	30	28	25	22
Magura (M.P)	28	36	36	36	40	32	30	-	30	29	24	21
Magura (O.P)	28	36	36	36	40	32	30	-	30	27	26	24
EQS Industries (150-600 mg/l)												

Table-152. Level of Turbidity (NTU) of Gorai River Water in 2019

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	30.3	36.3	39.2	40.2	49.2	40.1	39.2	-	39.2	36.5	34.2	32.2
Kustia (M.P)	30.4	36.4	39.4	40.3	49.3	40.2	39.2	-	39.2	37.4	33.4	32.4
Kustia (O.P)	30.5	36.5	39.5	40.4	49.4	40.3	39.2	-	39.2	36.4	34.4	32.4
Magura (S.P)	31.1	34.1	38.1	39.5	42.5	38.6	36.8	-	36.8	34.2	34.2	29.2
Magura (M.P)	31.2	34.2	38.2	39.5	42.5	38.4	35.2	-	35.2	35.2	35.1	28.1
Magura (O.P)	31.3	34.3	38.3	39.6	42.6	38.5	36.3	-	36.3	33.8	33.4	29.4
EQS Industries (≤ 10 NTU)												

Table-153. Level of EC (μ mhos/cm) of Gorai River Water in 2019

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	146	243	742	826	836	288	286	-	284	1112	1108	1104
Kustia (M.P)	148	248	746	820	840	286	284	-	282	1113	1108	1104
Kustia (O.P)	144	246	743	818	844	286	284	-	284	1111	1110	1104
Magura (S.P)	152	252	788	798	814	268	264	-	262	1122	1114	1110
Magura (M.P)	156	254	790	802	820	270	264	-	260	1123	1114	1112
Magura (O.P)	154	254	788	802	820	274	263	-	264	1122	1115	1114
EQS Industries (1200 μ mhos/cm)												

Table-154. Level of SS (mg/l) of Gorai River Water in 2019

Location of Gorai river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kustia (S.P)	56	58	68	70	70	58	56	-	52	49	46	42
Kustia (M.P)	54	57	64	66	70	60	56	-	54	48	45	41
Kustia (O.P)	54	56	64	66	70	60	58	-	56	48	44	40
Magura (S.P)	58	58	66	66	68	54	52	-	50	49	44	42
Magura (M.P)	57	57	65	65	68	56	56	-	54	49	46	44
Magura (O.P)	55	55	62	62	68	56	54	-	52	50	45	42
EQS Industries (150 mg/l)												

22.0 Modhumoti River (Table: 155-162)**Table-155. Level of pH of Modhumoti River Water in 2019**

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	7.38	7.42	7.48	7.54	7.56	7.52	7.5	-	7.4	6.73	6.71	8.37
Bagerhat (M.S)	7.41	7.43	7.49	7.51	7.59	7.54	7.49	-	7.41	6.73	6.72	8.37
Bagerhat (O.S)	7.4	7.42	7.48	7.5	7.59	7.56	7.51	-	7.42	6.74	6.71	8.37
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-156. Level of DO (mg/l) of Modhumoti River Water in 2019

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	4.6	4.9	5.3	5.4	5.7	5.5	5.6	-	5.7	5.5	5.8	7.95
Bagerhat (M.S)	4.7	4.9	5.3	5.3	5.7	5.5	5.6	-	5.8	5.6	5.9	7.95
Bagerhat (O.S)	4.8	4.9	5.3	5.3	5.7	5.5	5.2	-	5.8	5.6	5.7	7.94
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-157. Level of BOD (mg/l) of Modhumoti River Water in 2019

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	0.6	0.7	0.8	0.8	0.8	0.7	0.9	-	0.8	0.5	0.4	0.4
Bagerhat (M.S)	0.6	0.7	0.8	0.8	0.8	0.7	0.9	-	0.9	0.6	0.5	0.5
Bagerhat (O.S)	0.6	0.7	0.8	0.8	0.8	0.7	0.7	-	0.7	0.5	0.3	0.3
EQS Fisheries (\leq 6 mg/l)												
EQS Industries (\leq 50 mg/l)												

Table-158. Level of TDS (mg/l) of Modhumoti River Water in 2019

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	84	114	224	372	380	162	160	-	156	154	153	153
Bagerhat (M.S)	82	116	228	372	380	164	162	-	150	155	152	152
Bagerhat (O.S)	84	116	230	370	378	162	163	-	150	153	151	151
EQS Industries (\leq 2100mg/l)												

Table-159. Level of Chloride (mg/l) of Modhumoti River Water in 2019

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	26	42	42	48	52	32	29	-	27	25	23	23
Bagerhat (M.S)	28	43	44	46	52	32	30	-	28	27	25	25
Bagerhat (O.S)	28	44	44	44	52	32	31	-	29	27	26	26
EQS Industries (150-600 mg/l)												

Table-160. Level of Turbidity (NTU) of Modhumoti River Water in 2019

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	27.2	32.2	33.5	44.6	45.6	40.2	40.1	-	38.2	36.4	34.2	34.2
Bagerhat (M.S)	27.2	32.2	33.6	44.7	45.7	40.3	40.2	-	38.4	36.2	32.4	32.4
Bagerhat (O.S)	27.2	32.2	33.7	44.8	45.8	40.4	40	-	38.1	36.3	33.2	33.2
EQS Industries (≤ 10 NTU)												

Table-161. Level of EC (μ mhos/cm) of Modhumoti River Water in 2019

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	166	224	448	744	758	324	322	-	310	308	306	306
Bagerhat (M.S)	164	228	452	742	760	328	324	-	302	310	304	304
Bagerhat (O.S)	166	228	458	740	754	322	326	-	302	306	302	302
EQS Industries (1200 μ mhos/cm)												

Table-162. Level of SS (mg/l) of Modhumoti River Water in 2019

Location of Modhumoti river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Bagerhat (O.S)	30	36	40	46	46	46	44	-	42	44	41	41
Bagerhat (M.S)	28	38	38	42	46	46	43	-	40	43	42	42
Bagerhat (O.S)	30	34	36	40	46	46	44	-	44	44	43	43
EQS Industries (150 mg/l)												

23.0 Beel Dakatia River (Table: 163-173)**Table-163. Level of pH of Beel Dakatia River Water in 2019**

Location of Beel Dakatia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Khulna (O.S)	7.64	7.66	7.69	7.7	7.72	7.63	7.6	-	7.42	7.37	7.38	8.17
Khulna (M.S)	7.63	7.65	7.68	7.68	7.71	7.65	7.48	-	7.45	7.37	7.39	8.17
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-164. Level of DO (mg/l) of Beel Dakatia River Water in 2019

Location of Beel Dakatia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Khulna (O.S)	4.9	4.9	5.6	6.1	6.4	6.2	6.3	-	6.1	5.6	5.7	8.77
Khulna (M.S)	4.9	4.9	5.5	6	6.3	6.2	6.3	-	6.2	5.6	5.8	8.77
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-165. Level of TDS (mg/l) of Beel Dakatia River Water in 2019

Location of Beel Dakatia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Khulna (O.S)	560	572	1672	1682	1734	1134	1130	-	1070	1068	1018	366
Khulna (M.S)	562	570	1670	1680	1736	1134	1132	-	1071	1069	1019	366
EQS Industries (≤ 2100 mg/l)												

Table-166. Level of Chloride (mg/l) of Beel Dakatia River Water in 2019

Location of Beel Dakatia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Khulna (O.S)	204	218	932	942	966	512	510	-	508	502	498	504
Khulna (M.S)	204	218	932	937	966	512	510	-	506	501	497	503
EQS Industries (150-600 mg/l)												

Table-167. Level of Turbidity (NTU) of Beel Dakatia River Water in 2019

Location of Beel Dakatia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Khulna (O.S)	54.6	55.6	64.3	64.9	68.9	61.3	61.2	-	51.2	62.2	60.1	58.5
Khulna (M.S)	54.2	55.2	64.2	64.8	68.8	61.4	61.2	-	50.4	63.2	60.2	57.4
EQS Industries (≤ 10 NTU)												

Table-168. Level of EC (μ mhos/cm) of Beel Dakatia River Water in 2019

Location of Beel Dakatia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Khulna (O.S)	1118	1142	3342	3360	3466	2266	2260	-	2140	2136	2036	732
Khulna (M.S)	1124	1138	3338	3352	3472	2268	2260	-	2142	2138	2038	732
EQS Industries (1200 μ mhos/cm)												

Table-169. Level of SS (mg/l) of Beel Dakatia River Water in 2019

Location of Beel Dakatia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Khulna (O.S)	55	56	74	77	78	70	70	-	68	65	63	58
Khulna (M.S)	52	55	72	74	78	70	69	-	69	65	63	57
EQS Industries (150 mg/l)												

24.0 Kirtankhola River (Table: 170-175)**Table-170. Level of pH of Kirtankhola River Water in 2019**

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	7.49	7.42	7.79	7.81	7.84	7.61	7.66	7.56	7.66	7.68	7.4	7.5
Launch Ghat (M)	7.56	7.5	7.76	7.78	7.8	7.57	7.68	7.51	7.62	7.66	7.5	7.6
Dopdopia Kheyaghat (S)	7.7	7.64	7.72	7.74	7.77	7.77	7.79	7.68	7.74	7.77	7.5	7.7
Dopdopia Kheyaghat (M)	7.73	7.66	7.75	7.75	7.81	7.74	7.77	7.7	7.7	7.73	7.6	7.6
Beltola Fery Gaht (S)	7.69	7.62	7.74	7.74	7.79	7.51	7.78	7.52	7.58	7.61	7.5	7.6
Beltola Fery Gaht (M)	7.67	7.58	7.72	7.75	7.78	7.46	7.76	7.48	7.54	7.57	7.7	7.8
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-171. Level of DO (mg/l) of Kirtankhola River Water in 2019

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	6.6	6.7	6.2	6.4	6.2	5.6	5.2	5.6	5.3	6.2	5.5	6.4
Launch Ghat (M)	6.8	6.6	6.2	6.5	6.2	5.48	5.3	5.5	5.2	6.4	5.6	6.5
Dopdopia Kheyaghat (S)	6.5	6.4	6	6.2	6	5.8	5.25	5.3	5.3	6	5.6	7
Dopdopia Kheyaghat (M)	6.6	6.6	6.1	6.3	6	5.6	5.28	5.28	5.3	6.2	5.8	7.1
Beltola Fery Gaht (S)	6.6	6.5	6.2	6.5	5.8	5.6	5.65	5.8	5.5	6.1	5.8	7.6
Beltola Fery Gaht (M)	6.5	6.5	6	6.4	5.9	5.5	5.6	5.7	5.4	6.3	6	6.7
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-172. Level of BOD (mg/l) of Kirtankhola River Water in 2019

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	2.1	2.1	2	1.8	2	2	2.1	2	1.8	2	2.2	1.8
Launch Ghat (M)	2	2	2	2	2	2.2	2	2.1	2.4	1.8	2	1.5
Dopdopia Kheyaghat (S)	2.2	2.2	2.1	2.2	2.1	2	2.2	2	2	2.2	2.2	1.7
Dopdopia Kheyaghat (M)	2.1	2.1	2.1	2.1	2.1	2.2	2	2.2	2.3	2	2	1.6
Beltola Fery Gaht (S)	2	2	2	2	2.2	2	2.1	2	2	2.3	2.2	1.7
Beltola Fery Gaht (M)	2.1	2	2.1	2.1	2	2.1	2.15	2.1	2.2	2.1	2	1.5
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-173. Level of TDS (mg/l) of Kirtankhola River Water in 2019

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	136	133	169	170	172	94	105	109	105	200	139	144
Launch Ghat (M)	133	131	170	171	174	92	103	107	103	203	140.4	143
Dopdopia Kheyaghat (S)	130	130	215	216	218	84	95	101	98	201	140	145
Dopdopia Kheyaghat (M)	132	128	213	215	217	87	94	100	96	204	138	146
Beltola Fery Gaht (S)	134	132	183	182	184	95	107	110	106	205	129	142
Beltola Fery Gaht (M)	135	133	186	185	187	98	108	113	108	203	128.7	141
EQS Industries (≤ 2100mg/l)												

Table-174. Level of TS (mg/l) of Kirtankhola River Water in 2019

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	152	148	187	186	190	114	129	125	123	220	158	161
Launch Ghat (M)	147	145	188	187	192	110	125	123	121	221	156.4	158
Dopdopia Kheyaghat (S)	146	144	243	232	236	102	115	119	114	219	160	163
Dopdopia Kheyaghat (M)	146	142	241	231	235	105	112	116	110	220	158	161
Beltola Fery Gaht (S)	150	148	201	198	202	113	127	126	126	225	149	167
Beltola Fery Gaht (M)	151	151	204	201	205	114	126	127	126	223	146.7	157
EQS Industries (2250 mg/l)												

Table-175. Level of EC (μ mhos/cm) of Kirtankhola River Water in 2019

Location of Kirtankhola river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Launch Ghat (S)	271	266	337	340	344	188	210	218	210	400	279	288
Launch Ghat (M)	264	262	341	341	347	184	206	214	206	406	280	286
Dopdopia Kheyaghat (S)	261	260	429	431	436	168	190	202	196	402	278	313
Dopdopia Kheyaghat (M)	264	258	426	430	434	174	188	200	193	408	276	311
Beltola Fery Gaht (S)	266	262	366	364	369	190	214	220	212	410	256	284
Beltola Fery Gaht (M)	268	266	372	370	374	196	216	226	216	406	257	282
EQS Industries ($\leq 1200$$\mu$mhos/cm)												

25.0 Tatulia River (Table: 176-181)**Table-176. Level of pH of Tatulia River Water in 2019**

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	-	7.51	-	7.54	-	7.62	-	7.6	-	7.65	-	7.2
Vadura Launch Ghat (M)	-	7.42	-	7.46	-	7.6	-	7.57	-	7.62	-	7.3
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-177. Level of DO (mg/l) of Tatulia River Water in 2019

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	-	6.4	-	6.6	-	6.8	-	2.3	-	6.8	-	5.7
Vadura Launch Ghat (M)	-	6.2	-	6.4	-	6.6	-	2.1	-	6.9	-	5.8
EQS Fisheries (5 mg/l\geq)												
EQS Industries (4.5-8 mg/l)												

Table-178. Level of BOD (mg/l) of Tatulia River Water in 2019

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	-	2	-	2	-	2	-	2.3	-	2.2	-	1.4
Vadura Launch Ghat (M)	-	2.3	-	2.2	-	2.1	-	2.1	-	2	-	1.5
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-179. Level of TDS (mg/l) of Tatulia River Water in 2019

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	-	106	-	111	-	128	-	132	-	135	-	92
Vadura Launch Ghat (M)	-	104	-	109	-	129	-	135	-	136	-	88
EQS Industries (≤ 2100 mg/l)												

Table-180. Level of EC (μ mhos/cm) of Tatulia River Water in 2019

Location of Tatulia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	-	212	-	222	-	255	-	264	-	269	-	173
Vadura Launch Ghat (M)	-	208	-	218	-	258	-	271	-	272	-	169
EQS Industries (1200 μ mhos/cm)												

Table-181. Level of TS (mg/l) of Tatulia River Water in 2019

Location of Tatulia river	Jan	Feb	Mar	Apl	Ma y	Jun	July	Aug	Sep	Oct	Nov	Dec
Vadura Launch Ghat (S)	-	122	-	127	-	148	-	150	-	153	-	113
Vadura Launch Ghat (M)	-	118	-	125	-	149	-	151	-	152	-	106
EQS Industrial (≤ 2250 mg/l)												

26.0 Sugandha River (Table: 182-187)**Table-182. Level of pH of Sugandha River Water in 2019**

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jhalkathi Launch Ghat (S)	7.54	-	7.61	-	7.64	-	7.71	-	7.74	7.8	8	-
Jhalkathi Launch Ghat (M)	7.51	-	7.58	-	7.61	-	7.68	-	7.2	7.7	7.9	-
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-183. Level of DO (mg/l) of Sugandha River Water in 2019

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jhalkathi Launch Ghat (S)	6.2	-	6	-	6	-	5.8	-	5.7	6.4	6	-
Jhalkathi Launch Ghat (M)	6.1	-	5.8	-	5.8	-	5.6	-	5.5	6.2	6.2	-
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-184. Level of BOD (mg/l) of Sugandha River Water in 2019

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jhalkathi Launch Ghat (S)	2	-	2	-	2	-	2	-	2.1	2	2	-
Jhalkathi Launch Ghat (M)	2.1	-	2.2	-	2.2	-	2.2	-	2.3	1.8	1.8	-
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-185. Level of TDS (mg/l) of Sugandha River River Water in 2019

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jhalkathi Launch Ghat (S)	113	-	198	-	198	-	206	-	203	156	129	-
Jhalkathi Launch Ghat (M)	108	-	194	-	194	-	200	-	199	153	132	-
EQS Industries (≤ 2100 mg/l)												

Table-186. Level of EC (μ mhos/cm) of Sugandha River Water in 2019

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jhalkathi Launch Ghat (S)	226	-	397	-	397	-	411	-	406	312	258	-
Jhalkathi Launch Ghat (M)	219	-	388	-	388	-	400	-	397	306	262	-
EQS Industries (1200 μ mhos/cm)												

Table-187. Level of TS (mg/l) of Sugandha River Water in 2019

Location of Sugandha river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Jhalkathi Launch Ghat (S)	129	-	216	-	216	-	226	-	223	174	149	-
Jhalkathi Launch Ghat (M)	122	-	210	-	210	-	218	-	217	169	147	-
EQS Industrial (≤ 2250 mg/l)												

27.0 Lohalia River (Table: 188-193)**Table-188. Level of pH of Lohalia River Water in 2019**

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)	-	7.51	-	7.56	-	7.6	-	7.63	-	7.63	-	7.8
Patuakhali Launch Ghat (M)	-	7.47	-	7.52	-	7.58	-	7.61	-	7.61	-	7.7
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-189. Level of DO (mg/l) of Lohalia River Water in 2019

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)	-	6	-	6.2	-	6.2	-	6	-	6	-	7
Patuakhali Launch Ghat (M)	-	5.8	-	6	-	6	-	5.8	-	5.8	-	7.2
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-190. Level of BOD (mg/l) of Lohalia River Water in 2019

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)	-	2	-	2	-	2	-	2.1	-	2.1	-	1.5
Patuakhali Launch Ghat (M)	-	2.1	-	2.1	-	2.1	-	2.2	-	2.2	-	1.6
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-191. Level of TDS (mg/l) of Lohalia River Water in 2019

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)	-	109	-	116	-	133	-	135	-	360	-	145
Patuakhali Launch Ghat (M)	-	107	-	114	-	126	-	129	-	372	-	147
EQS Industries (≤ 2100 mg/l)												

Table-192. Level of TS (mg/l) of Lohalia River Water in 2019

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)	-	125	-	132	-	153	-	153	-	376	-	165
Patuakhali Launch Ghat (M)	-	121	-	128	-	144	-	145	-	386	-	165
EQS Industrial (≤ 2250 mg/l)												

Table-193. Level of EC (μ mhos/cm) of Lohalia River Water in 2019

Location of Lohalia river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Patuakhali Launch Ghat (S)	-	218	-	231	-	266	-	270	-	720	-	286
Patuakhali Launch Ghat (M)	-	213	-	228	-	252	-	258	-	372	-	289
EQS Industries (1200 μ mhos/cm)												

28.0 Surma River (Table: 194-199)

Table-194. Level of pH of Surma River Water in 2019

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point	7.2	7.8	8.9	-	-	8.7	-	7.6	-	-	-	-
Kin Bridge Point	7.1	8.4	6.9	-	-	8.6	-	7.4	-	-	-	-
Sheaik Ghat	7	7.9	6.8	-	-	8.5	-	7.3	-	-	-	-
Chhatak (up)	-	-	-	-	-	7.9	-	-	-	-	-	-
Chhatak (Down)	7.4	-	-	-	-	8.1	-	7.7	-	-	-	-
Kazir Bazar	-	-	-	-	-	-	-	-	-	-	-	-
Jokiganj Point	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-195. Level of DO (mg/l) of Surma River Water in 2019

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point	6.8	4.8	8.5	-	-	6.8	-	6.7	-	-	-	-
Kin Bridge Point	6.8	4.8	8.5	-	-	6.8	-	6.7	-	-	-	-
Sheaik Ghat	7.3	4.6	6.6	-	-	6.6	-	7.2	-	-	-	-
Chhatak (up)	7.2	4.5	5.9	-	-	6.5	-	6.8	-	-	-	-
Chhatak (Down)	-	-	-	-	-	6.9	-	-	-	-	-	-
Kazir Bazar	6.7	-	-	-	-	8.2	-	7.3	-	-	-	-
Jokiganj Point	-	-	-	-	-	-	-	-	-	-	-	-
Mendibag Point	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-196. Level of BOD (mg/l) of Surma River Water in 2019

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point	2.1	2.8	2.6	-	-	2.3	-	5	-	-	-	-
Kin Bridge Point	1.9	2.6	2.9	-	-	2.4	-	6	-	-	-	-
Sheaik Ghat	2	2.4	3.1	-	-	2.5	-	6.2	-	-	-	-
Chhatak (up)	-	-	-	-	-	2.1	-	-	-	-	-	-
Chhatak (Down)	2.2	-	-	-	-	2.6	-	4.9	-	-	-	-
Kazir Bazar	-	-	-	-	-	-	-	-	-	-	-	-
Jokiganj Point	-	-	-	-	-	-	-	-	-	-	-	-
EQS Fisheries (\leq 6 mg/l)												
EQS Industries (\leq 50 mg/l)												

Table-197. Level of COD (mg/l) of Surma River Water in 2019

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point	11	11	11	-	-	11	-	13	-	-	-	-
Kin Bridge Point	12	10	10	-	-	12	-	14	-	-	-	-
Sheaik Ghat	13	21	11	-	-	14	-	15	-	-	-	-
Chhatak (up)	-	-	-	-	-	10	-	-	-	-	-	-
Chhatak (Down)	9	-	-	-	-	11	-	11	-	-	-	-
Kazir Bazar	-	-	-	-	-	-	-	-	-	-	-	-
Jokiganj Point	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industries (\leq 200mg/l)												

Table-198. Level of TDS (mg/l) of Surma River Water in 2019

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point	67	141	126	-	-	41	-	53	-	-	-	-
Kin Bridge Point	66	151	141	-	-	40	-	52	-	-	-	-
Sheaik Ghat	65	138	153	-	-	39	-	50	-	-	-	-
Chhatak (up)	-	-	-	-	-	42	-	-	-	-	-	-
Chhatak (Down)	64	-	-	-	-	39	-	55	-	-	-	-
Kazir Bazar	-	-	-	-	-	-	-	-	-	-	-	-
Jokiganj Point	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industries (\leq 2100mg/l)												

Table-199. Level of EC ($\mu\text{mhos/cm}$) of Surma River Water in 2019

Location of Surma river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mendibag Point	135	287	258	-	-	88	-	106	-	-	-	-
Kin Bridge Point	132	292	288	-	-	86	-	102	-	-	-	-
Sheaik Ghat	127	321	311	-	-	83	-	99	-	-	-	-
Chhatak (up)	-	-	-	-	-	89	-	-	-	-	-	-
Chhatak (Down)	129	-	-	-	-	86	-	111	-	-	-	-
Kazir Bazar	-	-	-	-	-	-	-	-	-	-	-	-
Jokiganj Point	-	-	-	-	-	-	-	-	-	-	-	-
EQS Industries ($\leq 1200 \mu\text{mhos/cm}$)												

29.0 Kushiara River (Table: 200-205)**Table-200. Level of pH of Kushiara River Water in 2019**

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kushiayara Point	7.3	8.2	7.4	-	-	-	-	-	-	-	-	-
EQS Fisheries (6.5-8.5)												
EQS Industrial (6.0-9.0)												

Table-201. Level of DO (mg/l) of Kushiara River Water in 2019

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kushiayara Point	6.8	6.3	7.1	-	-	-	-	-	-	-	-	-
EQS Fisheries (5 mg/l \geq)												
EQS Industries (4.5-8 mg/l)												

Table-202. Level of BOD (mg/l) of Kushiara River Water in 2019

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kushiayara Point	2.1	3.4	2.9	-	-	-	-	-	-	-	-	-
EQS Fisheries (≤ 6 mg/l)												
EQS Industries (≤ 50 mg/l)												

Table-203. Level of COD (mg/l) of Kushiara River Water in 2019

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kushiayara Point	12	18	14	-	-	-	-	-	-	-	-	-
EQS Industries (200 mg/l)												

Table-204. Level of TDS (mg/l) of Kushiara River Water in 2019

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kushiayara Point	82	143	139	82	-	-	-	-	-	-	-	-
EQS Industries (2100 mg/l)												

Table-205. Level of EC ($\mu\text{mhos/cm}$) of Kushiara River Water in 2019

Location of Kushiara river	Jan	Feb	Mar	Apl	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Kushiayara Point	162	289	185	162	-	-	-	-	-	-	-	-
EQS Industries (1200 $\mu\text{mhos/cm}$)												

Annex-2

List of Tables for different parameters of Lake Water

I. Gulshan Lake (Table: 206-214)

Table-206. Level of pH of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	7.59	7.4	7.8	8.4	7.61	7.25	7.16	7.28	7.1	7.05	7.11	7.16
Near Housing, South Bridge	7.51	7.43	7.77	9.07	7.19	7.49	7.01	7.49	7.4	8.22	7.47	7.23
Near Lake View Clinic	7.53	7.43	7.71	9.35	7.6	7.4	7.07	7.27	7.5	7.42	7.9	7.16
North Side Gulshan Baridhara Lake	7.5	7.69	7.67	9.1	6.69	7.46	7.16	7.38	6.9	7.48	7.29	7.5
Taltola Shooting Complex, South Side	7.73	7.42	7.65	8.29	7.45	7.5	7.08	7.41	7.17	7.38	7.67	7.2
EQS for fisheries 6.5-8.5												

Table-207. Level of DO (mg/l) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	3.73	3.91	6.8	13.73	6	5.6	11.2	13.6	10.4	1	2	0.4
Near Housing, South Bridge	1.99	9.97	5.2	16.43	8.3	7.1	8	15.4	8.4	15.5	2.6	1.2
Near Lake View Clinic	2.1	9.98	5.6	13.41	7.4	5.6	9	10.1	9.7	4.9	1.8	1.1
North Side Gulshan Baridhara Lake	2.25	6.84	8	18.81	9	9	5.7	6.8	4.7	5.8	2.6	1
Taltola Shooting Complex, South Side	2.81	5.1	7	9.02	5.9	7.5	6.2	7.6	5.9	6.8	8.9	1
EQS for fisheries ≥ 5 mg/l												

Table-207. Level of BOD (mg/l) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	21	29	35	30	40	16	13	27	12	18.6	24	33
Near Housing, South Bridge	23	29	35	32	46	16	12	27	13	22	44	34
Near Lake View Clinic	25	21	34	28	47	14	19	34	18	30	33	25
North Side Gulshan Baridhara Lake	21	27	31	26	18	18	15	33	14	33	38	24
Taltola Shooting Complex, South Side	25	27	26	30	24	13	13	32	12	34	48	16
EQS for fisheries $6 \leq$ mg/l												

Table-208. Level of COD (mg/l) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	64	104	136	108	148	92	92	92	88	100	68	132
Near Housing, South Bridge	69	153	140	105	153	28	78	91	82	75	104	107
Near Lake View Clinic	70	85	140	95	157	24	109	70	76	92	92	78
North Side Gulshan Baridhara Lake	72	110	136	89	75	27	107	68	112	84	102	76
Taltola Shooting Complex, South Side	78	83	114	110	107	19	97	72	102	98	194	117
EQS for wastewater after treatment from industrial units 200 mg/l												

Table-209. Level of TDS (mg/l) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	277	292	235	94.7	196	221	154.9	182.6	160.2	216	245	238
Near Housing, South Bridge	284	238.3	237	119	197	199	155.5	179.6	150.7	199	227	240
Near Lake View Clinic	291	290	236	221	195	179	154.6	182.2	162.1	219	219.8	239
North Side Gulshan Baridhara Lake	285	324	237	95	252	166	176.1	198	178.1	189	228	245
Taltola Shooting Complex, South Side	295	333	236	111	247	166	196.9	186	180.3	196	235	251
EQS for wastewater after treatment from industrial units 2100 mg/l												

Table-210. Level of Turbidity (NTU) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	65.6	66	72.4	47	42	64	19.1	48.4	18.2	58.1	23.4	65.9
Near Housing, South Bridge	47	71	77.1	47.9	40	28	27.1	48.6	28.2	48.9	27.6	71.9
Near Lake View Clinic	58	71	75.3	45.9	37	24	16.5	38.1	26.6	50.2	28.2	57.2
North Side Gulshan Baridhara Lake	52	44	75.3	42.3	40	27	13.1	40.6	32.6	48.6	26.6	60
Taltola Shooting Complex, South Side	62	62	76	44.5	34	19	57.9	41.6	56.2	49.2	24	66.3
EQS for wastewater after treatment from industrial units 10 NTU												

Table-211. Level of Chloride (mg/l) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	18	18	35	34	30	32	25	25	26	36	35	40
Near Housing, South Bridge	17	19	34	33	30	29	24	48	22	48	38	42
Near Lake View Clinic	19	18	34	34	32	30	23.5	31	23.8	30	36	43
North Side Gulshan Baridhara Lake	20	19	33	33	39	28	29	28	28	34	38	43
Taltola Shooting Complex, South Side	21	18	34	34	40	20	37	29	36	35	40	45
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-212. Level of SS (mg/l) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	178	204	233	162	162	67	63	107	441.1	121	135	139
Near Housing, South Bridge	146	230	237	155	157	74	43	113	174.7	101	107	167
Near Lake View Clinic	170	225	236	158	190	43	41	92	370.2	99	148	159
North Side Gulshan Baridhara Lake	154	141	351	150	67	74	38	110	408.1	98	120	147
Taltola Shooting Complex, South Side	179	148	229	130	75	36	44	108	428.3	100	98	156
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-213. Level of Total Alkalinity (mg/l) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	224	230	240	242	200	167	188	151	178	112	210	298
Near Housing, South Bridge	226	233	244	240	198	158	172	172	174	132	218	321
Near Lake View Clinic	232	235	246	242	183	160	157	150	160	138	210	322
North Side Gulshan Baridhara Lake	234	235	222	242	213	149	184	172	176	138	220	311
Taltola Shooting Complex, South Side	232	233	230	240	232	132	192	176	188	136	210	352
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-214. Level of EC (μ mohos/cm) of Gulshan Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Near United Hospital, Kalachadpur	530	528	460	230	412	471	335	411	340	390	638	438
Near Housing, South Bridge	529	508	464	289	408	430	334	404	324	365	419	432
Near Lake View Clinic	541	519	459	526	406	390	335	410	342	390	419	443
North Side Gulshan Baridhara Lake	527	574	460	239	524	358	378	420	380	374	420	447
Taltola Shooting Complex, South Side	553	588	461	272	507	359	427	420	370	388	425	455

II. Dhanmondi Lake (Table: 215-224)**Table-215. Level of pH of Dhanmondi Lake Water in 2019**

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	7.18	-	7.53	7.6	7.75	6.87	7.12	7.43	7.38	8.19	8.21	7.59
Near Gigatola Pilkhana More	7.52	-	7.49	7.53	7.8	7.59	7.28	7.31	7.8	7.64	8.3	8.18
Near Dhanmondi-32 Bangabandhu Jadughor	7.58	-	7.82	7.88	7.6	7.44	7.26	7.57	7.9	7.57	7.91	8
Near Dhanmondi-32 Bridge	7.4	-	7.31	7.35	7.34	7.28	7.36	7.22	7.51	8.16	8.07	7.86
EQS for fisheries 6.5-8.5												

Table-216. Level of DO (mg/l) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	5.4	-	4.8	4.3	4.3	5	2.4	7.7	2.2	5	6.8	5.5
Near Gigatola Pilkhana More	3.9	-	3.8	3.9	3.8	8.7	2.5	8.9	9.2	5.3	12.4	9.8
Near Dhanmondi-32 Bangabandhu Jadughor	3.8	-	3.4	3.5	4.9	7	2.6	7.9	6.5	2.9	7.8	5.6
Near Dhanmondi-32 Bridge	3.5	-	3.7	3.9	4.8	6.4	3.3	6.5	7.2	8	7.9	4.5
EQS for fisheries ≥ 5 mg/l												

Table-217. Level of BOD (mg/l) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	6	-	10	12	8.6	9	5.6	4	6	2.8	3.6	22
Near Gigatola Pilkhana More	12	-	12	12.5	12	7	5.8	3.6	8	3.3	3.5	28
Near Dhanmondi-32 Bangabandhu Jadughor	6	-	24	24	10	8	7.2	3.2	8	4.8	3.5	23
Near Dhanmondi-32 Bridge	15	-	21	22	11	8	7.8	2.8	6	4.2	4.6	29
EQS for fisheries 6≤mg/l												

Table-218. Level of COD (mg/l) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	24	-	34	39	26	43	66	19	29	19	20	68
Near Gigatola Pilkhana More	39	-	48	50	36	24	70	10	27	7	27	66
Near Dhanmondi-32 Bangabandhu Jadughor	24	-	78	79	28	22	39	12	20	15	19	70
Near Dhanmondi-32 Bridge	56	-	70	72	34	58	53	9	12	12	17	73
EQS for wastewater after treatment from industrial units 200 mg/l												

Table-219. Level of TDS (mg/l) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	148	-	321	330	132	152	148	140.5	182.4	136	144	132
Near Gigatola Pilkhana More	130	-	142	170	140	136	128	116.8	118.3	129	140	135
Near Dhanmondi-32 Bangabandhu Jadughor	124	-	138	140	138	126	126	90.4	152.4	158	233	138
Near Dhanmondi-32 Bridge	134	-	134	136	136	134	140	146.4	190.3	142	150	144
EQS for wastewater after treatment from industrial units 2100 mg/l												

Table-220. Level of Turbidity (NTU) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	3	-	10	20.1	9	4	5.02	9.39	11	12	8.86	16.9
Near Gigatola Pilkhana More	4	-	16	18.3	6.5	7	5.32	7.16	5.63	9.65	9.06	7.16
Near Dhanmondi-32 Bangabandhu Jadughor	5	-	5	22.2	59	7	4.88	7.85	3.06	9.25	36.2	68
Near Dhanmondi-32 Bridge	10	-	11	19.3	7	7	6.01	12.3	4.63	11.9	10	12.3
EQS for wastewater after treatment from industrial units 10 NTU												

Table-221. Level of Chloride (mg/l) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	10	-	32	18	33	31	29	32	24	33	32	27.5
Near Gigatola Pilkhana More	11	-	21	20	34	27	24.5	49	25	31	33	10.5
Near Dhanmondi-32 Bangabandhu Jadughor	12	-	22	16	30	24	21	42	24	30	39	5.5
Near Dhanmondi-32 Bridge	11	-	21	19	33	27	26.5	49	25	35	35	20.3
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-222. Level of SS (mg/l) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	35	-	19	18	20	44	7	19	15	161	21	12
Near Gigatola Pilkhana More	36	-	16	20	22	50	9	12	8	150	25	12
Near Dhanmondi-32 Bangabandhu Jadughor	41	-	21	16	81	52	8	17	5	180	12	22
Near Dhanmondi-32 Bridge	45	-	18	19	25	55	11	27	7	172	17	27
EQS for wastewater after treatment from industrial units 15 mg/l												

Table-223. Level of Total Alkalinity (mg/l) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	102	-	126	128	100	95	105	102	114	76	181	113
Near Gigatola Pilkhana More	98	-	116	118	97	90	86	67	118	79	182	110
Near Dhanmondi-32 Bangabandhu Jadughor	90	-	118	115	95	88	85	89	116	15	304	101
Near Dhanmondi-32 Bridge	100	-	114	110	98	87	85	87	118	79	222	106
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-224. Level of EC (μ mhos/cm) of Dhanmondi Lake Water in 2019

Location of Gulshan Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
8 No. Road Bridge	289	-	639	620	276	333	289	318	379	250	8.21	245
Near Gigatola Pilkhana More	255	-	283	298	250	286	253	265	246	238	8.3	245
Near Dhanmondi-32 Bangabandhu Jadughor	246	-	275	275	239	275	250	204.2	317	288	7.91	256
Near Dhanmondi-32 Bridge	261	-	287	270	248	293	277	331	390	259	8.07	266
EQS for wastewater after treatment from industrial units 1200 μmhos/cm												

III. Hatir Jheel Lake (Table: 225-234)

Table-225. Level of pH of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	7.68	-	7.35	7.4	7.09	7.76	7.25	7.23	7.43	7.18	7.9	7.76
Raampura Bridge	7.7	-	7.84	7.82	7.17	7.81	7.29	7.34	7.58	7.38	7.84	7.6
FDC More Bridge	7.69	-	7.16	7.3	6.87	7.32	7.13	7.16	7.86	7	7.84	7.84
EQS for fisheries 6.5-8.5												

Table-226. Level of DO (mg/l) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	3.91	-	3.91	2.9	4.5	4	1.1	4	5.5	0.8	4.9	16.4
Raampura Bridge	4.95	-	4.95	4.6	4.2	3.8	1.4	9.3	3.2	5	8	7
FDC More Bridge	4.3	-	4.3	3.8	2.9	1	0.4	1.4	14.4	8.8	8.8	12.2
EQS for fisheries ≥ 5 mg/l												

Table-227. Level of BOD (mg/l) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	6	-	30	30	27	20	12	10	8.2	15	14	24
Raampura Bridge	6	-	21	22	29	22	15	25.8	11	9	6.2	48
FDC More Bridge	8	-	32	32	66	15	16	16	8.6	10	20	40
EQS for fisheries $6 \leq$ mg/l												

Table-228. Level of COD (mg/l) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	22	-	107	110	139	87	50	19	46	46	27.6	119
Raampura Bridge	20	-	83	90	129	90	87	53	33	61	19.4	90
FDC More Bridge	18	-	119	120	201	39	48	40	40	83	94.1	173
EQS for wastewater after treatment from industrial units 200 mg/l												

Table-229. Level of TDS (mg/l) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	344	-	346	350	303	229	245	218.5	226	257	142	250
Raampura Bridge	351	-	333	339	315	209	235	214.8	225	240	300	276
FDC More Bridge	323	-	439	444	299	234	273	226	235	276	47	280
EQS for wastewater after treatment from industrial units 2100 mg/l												

Table-230. Level of Turbidity (NTU) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	10.22	-	44	43.3	68	58	52.2	40.7	72.2	44.4	40.9	48.3
Raampura Bridge	9.21	-	58	38.2	31	60	38.6	66	51.5	38	160	19.4
FDC More Bridge	6.11	-	35	59.3	29	14	59.6	19.6	65.7	75.6	49.2	59.5
EQS for wastewater after treatment from industrial units 10 NTU												

Table-231. Level of Chloride (mg/l) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	18	-	35	36	60	37	38	49	35	50	35	29
Raampura Bridge	19	-	38	36	59	35	32	50	33	45	46	42
FDC More Bridge	20	-	34	35	7	33	42	51	34	65	57	11.9
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-232. Level of SS (mg/l) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	40	-	94	95	87	144	90	70	138	327	72	21
Raampura Bridge	43	-	89	85	64	132	52	63	63	301	29	29
FDC More Bridge	42	-	45	47	61	58	80	52	52	367	108	108
EQS for wastewater after treatment from industrial units 15 mg/l												

Table-233. Level of Total Alkalinity (mg/l) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	280	-	298	299	255	185	175	157	210	129	260	300
Raampura Bridge	276	-	336	310	259	190	178	179	188	145	292	325
FDC More Bridge	278	-	340	330	265	155	185	164	200	150	342	352
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-234. Level of EC (µmhos/cm) of Hatir Jheel Lake Water in 2019

Location of Hatir Jheel Lake	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Badda-Gulshan Link Road Bridge	632	-	677	698	648	487	483	490	464	458	288	492
Raampura Bridge	644	-	855	659	626	449	535	431	466	431	438	505
FDC More Bridge	596	-	647	820	651	500	459	507	504	498	539	511
EQS for wastewater after treatment from industrial units 1200 µmhos/cm												

Annex-3

List of Tables for different parameters of Ground Water

IV. Ground Water (Deep Tubewell) in Khulna District (Table: 235-240)

Table-235. Level of pH of Ground Water at Khulna District in 2019

Locations of Khulna District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Divisional Commissioner office, Boyra	7.5	7.52	7.56	7.59	7.59	7.52	-	-	7.5	7.48	7.41	7.46
KUET University Main Gate, Fulbari Gate	7.23	7.26	7.32	7.37	7.37	7.35	-	-	7.32	7.47	7.42	7.45
Govt. B.L College, Daulatpur	7.35	7.35	7.35	7.36	7.36	7.36	-	-	7.36	7.46	7.43	7.44
Govt. Mohasin College, Khalishpur	7.28	7.28	7.33	7.33	7.33	7.31	-	-	7.32	7.3	7.29	7.36
Govt. Girls College, Boyra	7.32	7.34	7.34	7.38	7.38	7.34	-	-	7.34	7.31	7.29	7.35
Khulna Public College, Boyra	7.32	7.32	7.32	7.37	7.37	7.31	-	-	7.32	7.3	7.31	7.34
Boyra Bazar More, Boyra	7.36	7.39	7.42	7.44	7.44	7.4	-	-	7.02	7.26	7.2	7.26
Aizer More, Boyra	7.35	7.35	7.36	7.39	7.39	7.32	-	-	7.3	7.28	7.26	7.29
Govt. Comercial College, Sonadanga	7.38	7.38	7.42	7.42	7.42	7.4	-	-	7.44	7.42	7.32	7.32
Sonadanga Bus Stand, Sonadanga	7.42	7.44	7.44	7.44	7.44	7.44	-	-	7.38	7.38	7.3	7.36
Sarjical Clinic, Sonadanga	7.4	7.4	7.46	7.46	7.46	7.42	-	-	7.39	7.39	7.23	7.27
Jia Hall, Sib Bary	7.38	7.37	7.38	7.4	7.4	7.4	-	-	7.45	7.42	7.35	7.33
Islami Bank Hospital, Santidham Mor	7.25	7.28	7.35	7.38	7.38	7.32	-	-	7.24	7.22	7.18	7.22
Moynlapota More	7.27	7.27	7.32	7.39	7.39	7.33	-	-	7.36	7.33	7.24	7.27
Seba Clinic, Sher-E-Bangal Road	7.33	7.38	7.38	7.38	7.38	7.35	-	-	7.29	7.31	7.28	7.32
Nirala More	7.21	7.26	7.32	7.34	7.34	7.32	-	-	7.31	7.29	7.24	7.34
Gollamari Bus Stand, Gollamari	7.44	7.44	7.48	7.48	7.48	7.44	-	-	7.38	7.35	7.31	7.35
Khulna University, Vaskarja Chattar	7.4	7.4	7.44	7.44	7.44	7.4	-	-	7.33	7.34	7.32	7.33
Rupsha Bus Stand, Rupsha	7.24	7.24	7.26	7.28	7.28	7.26	-	-	7.22	7.17	7.11	7.16
Sundarban Adorso College	7.3	7.3	7.33	7.38	7.38	7.33	-	-	7.32	7.29	7.24	7.28
Hazi Mohasin College, Khulna	7.26	7.26	7.3	7.35	7.35	7.32	-	-	7.26	7.24	7.24	7.26
Khulna Medical College	7.34	7.34	7.36	7.4	7.4	7.4	-	-	7.38	7.36	7.23	7.3
Ad-din Medical College and Hospital, Khulna	7.38	7.38	7.38	7.38	7.38	7.32	-	-	7.34	7.32	7.29	7.33
Natun Bazar, Rupsha	7.42	7.42	7.48	7.48	7.48	7.44	-	-	7.68	7.6	7.61	7.55
Sarkit House	7.28	7.32	7.34	7.39	7.39	7.32	-	-	7.3	7.26	7.22	7.25
Govt. Khulna Gila School	7.26	7.3	7.35	7.35	7.35	7.34	-	-	7.29	7.25	7.19	7.24
D.C Office	7.33	7.36	7.36	7.36	7.36	7.27	-	-	7.28	7.26	7.18	7.21
Dak Banglo More	7.33	7.38	7.38	7.42	7.42	7.4	-	-	7.41	7.38	7.31	7.33
Govt. Azom Khan Commerce College	7.36	7.38	7.39	7.39	7.39	7.32	-	-	7.29	7.27	7.2	7.22
Govt. Majid Memorial City College	7.44	7.44	7.45	7.45	7.45	7.38	-	-	7.29	7.27	7.22	7.24

EQS (6.5-8.5) for drinking

Table-236. Level of EC ($\mu\text{mhos/cm}$) of Ground Water at Khulna District in 2019

Locations of Khulna	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Divisional Commissioner office, Boyra	2212	2228	2278	2282	2288	2268	-	-	2272	2268	2258	2250
KUET University Main Gate, Fulbari Gate	2188	2194	2236	2238	2242	2234	-	-	2226	2266	2256	2251
Govt. B.L College, Daulatpur	2136	2138	2188	2188	2188	2166	-	-	2168	2167	2164	2158
Govt. Mohasin College, Khalishpur	2096	2098	2142	2148	2152	2144	-	-	2148	2144	2141	2134
Govt. Girls College, Boyra	2114	2116	2158	2162	2162	2152	-	-	2150	2148	2142	2137
Khulna Public College, Boyra	2028	2028	2112	2118	2124	2116	-	-	2110	2108	2105	2102
Boyra Bazar More, Boyra	2187	2187	2198	2214	2220	2220	-	-	2214	2206	2202	2201
Aizer More, Boyra	2146	2146	2162	2170	2170	2166	-	-	2168	2159	2150	2146
Govt. Comercial College, Sonadanga	2104	2104	2146	2152	2152	2152	-	-	2148	2139	2130	2126
Sonadanga Bus Stand, Sonadanga	2088	2088	2148	2148	2148	2140	-	-	2139	2137	2131	2132
Sarjical Clinic, Sonadanga	2080	2080	2126	2134	2140	2144	-	-	2139	2136	2134	2130
Jia Hall, Sib Bary	2088	2094	2148	2154	2160	2148	-	-	2142	2138	2130	2124
Islami Bank Hospital, Santidham Mor	2188	2192	2214	2226	2234	2234	-	-	2236	2236	2231	2227
Moylapota More	2143	2143	2174	2177	2177	2170	-	-	2160	2155	2150	2126
Seba Clinic, Sher-E-Bangal Road	2088	2088	2106	2116	2128	2128	-	-	2150	2149	2136	2131
Nirala More	2142	2148	2157	2162	2162	2154	-	-	2147	2142	2134	2123
Gollamari Bus Stand, Gollamari	2080	2080	2109	2124	2130	2130	-	-	2124	2151	2142	2151
Khulna University, Vaskarja Chattar	2096	2096	2126	2136	2140	2140	-	-	2132	2131	2129	2123
Rupsha Bus Stand, Rupsha	2043	2043	2086	2090	2090	2090	-	-	2089	2036	2025	2022
Sundarban Adorso College	1988	1988	2043	2046	2046	2046	-	-	2041	2040	2041	2036
Hazi Mohasin College, Khulna	2012	2024	2038	2044	2048	2048	-	-	2035	2034	2031	2028
Khulna Medical College	2027	2029	2074	2074	2074	2074	-	-	2065	2064	2061	2054
Ad-din Medical College and Hospital, Khulna	2002	2018	2049	2049	2054	2054	-	-	2084	2084	2047	2042
Natun Bazar, Rupsha	1982	1986	2016	2024	2034	2028	-	-	2023	2019	2011	2013
Sarkit House	2082	2082	2098	2104	2122	2118	-	-	2118	2114	2110	2114
Govt. Khulna Gila School	2079	2084	2096	2114	2118	2118	-	-	2110	2112	2101	2104
D.C Office	2008	2008	2046	2058	2058	2044	-	-	2052	2050	2046	2049
Dak Banglo More	1964	1972	1988	2002	2014	2014	-	-	2014	2012	2001	2004
Govt. Azom Khan Commerce College	1934	1934	1934	1938	1938	1932	-	-	1936	1930	1931	1924
Govt. Majid Memorial City College	2212	2228	2278	2282	2288	2268	-	-	2272	2268	2258	2250
EQS for wastewater after treatment from industrial units 1200 $\mu\text{mhos/cm}$												

Table-237. Level of Chloride (mg/l) of Ground Water at Khulna District in 2019

Locations of Khulna	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Divisional Commissioner office, Boyra	220	226	234	234	234	228	-	-	220	218	217	218
KUET University Main Gate, Fulbari Gate	270	272	278	278	278	270	-	-	248	242	236	239
Govt. B.L College, Daulatpur	278	278	288	288	288	266	-	-	260	255	245	248
Govt. Mohasin College, Khalishpur	276	276	282	282	282	274	-	-	246	241	237	239
Govt. Girls College, Boyra	218	218	224	224	224	224	-	-	224	222	220	240
Khulna Public College, Boyra	220	220	228	228	228	228	-	-	221	215	222	226
Boyra Bazar More, Boyra	250	250	253	253	253	250	-	-	248	238	234	230
Aizer More, Boyra	220	220	226	226	226	222	-	-	219	217	212	211
Govt. Comercial College, Sonadanga	220	220	228	228	228	228	-	-	227	220	218	215
Sonadanga Bus Stand, Sonadanga	252	252	259	262	262	252	-	-	255	248	243	241
Sarjical Clinic, Sonadanga	284	284	288	288	288	274	-	-	268	248	241	237
Jia Hall, Sib Bary	280	280	287	287	287	278	-	-	274	237	233	232
Islami Bank Hospital, Santidham Mor	238	238	242	244	244	240	-	-	200	205	201	205
Moylapota More	268	268	268	268	268	260	-	-	251	248	244	248
Seba Clinic, Sher-E-Bangal Road	282	282	284	284	284	284	-	-	276	271	268	269
Nirala More	277	277	282	282	282	276	-	-	278	274	264	266
Gollamari Bus Stand, Gollamari	290	290	290	290	290	284	-	-	279	274	262	267
Khulna University, Vaskarja Chattar	270	270	270	274	274	270	-	-	265	262	262	264
Rupsha Bus Stand, Rupsha	250	250	255	255	255	250	-	-	251	250	242	248
Sundarban Adorso College	280	280	286	286	286	282	-	-	280	278	271	276
Hazi Mohasin College, Khulna	282	282	282	282	282	282	-	-	281	277	270	274
Khulna Medical College	277	277	284	284	284	280	-	-	281	276	273	272
Ad-din Medical College and Hospital, Khulna	282	282	286	286	286	286	-	-	284	281	274	276
Natun Bazar, Rupsha	270	270	276	276	276	270	-	-	268	260	250	255
Sarkit House	272	274	278	280	280	276	-	-	271	266	256	253
Govt. Khulna Gila School	280	284	286	286	286	282	-	-	278	267	261	253
D.C Office	277	284	289	289	289	286	-	-	281	279	272	276
Dak Banglo More	272	272	284	288	288	288	-	-	280	278	271	275
Govt. Azom Khan Commerce College	280	288	292	296	296	290	-	-	281	282	279	278
Govt. Majid Memorial City College	282	282	289	289	289	280	-	-	282	280	277	280
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-238. Level of Total Hardness (mg/l) of Ground Water at Khulna District in 2019

Locations of Khulna	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Divisional Commissioner office, Boyra	264	266	272	288	288	280	-	-	240	238	232	228
KUET University Main Gate, Fulbari Gate	246	246	253	262	262	254	-	-	242	240	238	230
Govt. B.L College, Daulatpur	288	288	294	294	294	282	-	-	270	268	261	256
Govt. Mohasin College, Khalishpur	270	274	286	290	290	284	-	-	260	261	263	287
Govt. Girls College, Boyra	276	276	279	283	283	278	-	-	270	269	260	245
Khulna Public College, Boyra	274	274	279	279	279	272	-	-	271	267	261	265
Boyra Bazar More, Boyra	277	277	282	288	288	280	-	-	277	275	273	265
Aizer More, Boyra	270	270	274	274	274	270	-	-	274	270	268	265
Govt. Comercial College, Sonadanga	274	274	279	282	282	282	-	-	274	271	266	266
Sonadanga Bus Stand, Sonadanga	282	282	288	288	288	282	-	-	279	268	268	264
Sarjical Clinic, Sonadanga	272	272	279	279	279	274	-	-	270	266	261	257
Jia Hall, Sib Bary	272	272	276	279	279	272	-	-	272	262	258	252
Islami Bank Hospital, Santidham Mor	268	271	273	277	277	270	-	-	260	257	253	251
Moylapota More	268	286	289	289	289	282	-	-	282	278	272	270
Seba Clinic, Sher-E-Bangal Road	258	264	277	277	277	277	-	-	272	276	274	271
Nirala More	282	282	286	288	288	288	-	-	270	269	264	260
Gollamari Bus Stand, Gollamari	260	268	273	278	278	278	-	-	277	262	260	260
Khulna University, Vaskarja Chattar	288	288	293	293	293	282	-	-	281	255	251	253
Rupsha Bus Stand, Rupsha	278	284	286	286	286	284	-	-	275	271	264	263
Sundarban Adorso College	264	268	276	280	280	282	-	-	281	286	262	264
Hazi Mohasin College, Khulna	279	279	283	283	283	280	-	-	275	267	257	255
Khulna Medical College	276	279	284	284	284	280	-	-	274	264	254	254
Ad-din Medical College and Hospital, Khulna	288	288	288	288	288	288	-	-	286	277	270	274
Natun Bazar, Rupsha	254	254	267	272	272	272	-	-	270	271	269	263
Sarkit House	230	234	239	242	242	232	-	-	231	228	226	224
Govt. Khulna Gila School	248	248	253	253	253	250	-	-	252	250	235	231
D.C Office	226	232	244	247	247	240	-	-	236	234	230	233
Dak Banglo More	244	248	256	259	259	252	-	-	250	257	257	254
Govt.Azom Khan Commerce College	258	258	267	272	272	266	-	-	261	266	261	254
Govt. Majid Memorial City College	280	286	292	292	292	288	-	-	283	282	278	272
EQS for wastewater after treatment from industrial units 200-500 mg/l												

Table-239. Level of Iron (mg/l) of Ground Water at Khulna District in 2019

Locations of Khulna	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Divisional Commissioner office, Boyra	0.46	0.48	0.52	0.52	0.52	0.48	-	-	0.46	0.44	0.35	0.33
KUET University Main Gate, Fulbari Gate	0.44	0.44	0.48	0.48	0.48	0.42	-	-	0.4	0.36	0.36	0.32
Govt. B.L College, Daulatpur	0.48	0.48	0.48	0.5	0.5	0.5	-	-	0.48	0.42	0.39	0.39
Govt. Mohasin College, Khalishpur	0.45	0.52	0.52	0.52	0.52	0.48	-	-	0.44	0.4	0.38	0.33
Govt. Girls College, Boyra	0.46	0.46	0.49	0.52	0.52	0.44	-	-	0.41	0.37	0.37	0.33
Khulna Public College, Boyra	0.52	0.52	0.58	0.58	0.58	0.5	-	-	0.49	0.43	0.4	0.36
Boyra Bazar More, Boyra	0.38	0.38	0.38	0.42	0.42	0.42	-	-	0.4	0.34	0.32	0.3
Aizer More, Boyra	0.38	0.38	0.4	0.4	0.4	0.4	-	-	0.41	0.34	0.31	0.3
Govt. Comercial College, Sonadanga	0.42	0.42	0.44	0.44	0.44	0.4	-	-	0.41	0.39	0.33	0.33
Sonadanga Bus Stand, Sonadanga	0.39	0.39	0.42	0.46	0.46	0.46	-	-	0.42	0.39	0.31	0.31
Sarjical Clinic, Sonadanga	0.49	0.49	0.49	0.52	0.52	0.44	-	-	0.39	0.36	0.32	0.32
Jia Hall, Sib Bary	0.53	0.53	0.56	0.56	0.56	0.56	-	-	0.51	0.49	0.46	0.35
Islami Bank Hospital, Santidham Mor	0.38	0.4	0.45	0.48	0.48	0.44	-	-	0.43	0.41	0.35	0.32
Moylapota More	0.42	0.42	0.46	0.46	0.46	0.46	-	-	0.42	0.4	0.34	0.3
Seba Clinic, Sher-E-Bangal Road	0.4	0.43	0.43	0.47	0.47	0.42	-	-	0.38	0.36	0.32	0.31
Nirala More	0.46	0.46	0.46	0.46	0.46	0.46	-	-	0.41	0.39	0.31	0.62
Gollamari Bus Stand, Gollamari	0.58	0.58	0.63	0.69	0.69	0.64	-	-	0.66	0.62	0.62	0.5
Khulna University, Vaskarja Chattar	0.5	0.53	0.53	0.53	0.53	0.5	-	-	0.51	0.5	0.5	0.36
Rupsha Bus Stand, Rupsha	0.36	0.36	0.45	0.45	0.45	0.44	-	-	0.45	0.42	0.41	0.34
Sundarban Adorso College	0.38	0.38	0.46	0.38	0.38	0.36	-	-	0.38	0.36	0.31	0.34
Hazi Mohasin College, Khulna	0.32	0.32	0.42	0.42	0.42	0.42	-	-	0.44	0.4	0.34	0.34
Khulna Medical College	0.34	0.36	0.46	0.46	0.46	0.46	-	-	0.47	0.41	0.34	0.3
Ad-din Medical College and Hospital, Khulna	0.38	0.42	0.42	0.44	0.44	0.44	-	-	0.47	0.42	0.35	0.3
Natun Bazar, Rupsha	0.59	0.59	0.59	0.59	0.59	0.52	-	-	0.49	0.41	0.34	0.32
Sarkit House	0.37	0.39	0.48	0.49	0.49	0.45	-	-	0.42	0.36	0.32	0.3
Govt. Khulna Gila School	0.34	0.34	0.44	0.44	0.44	0.42	-	-	0.39	0.35	0.3	0.3
D.C Office	0.48	0.48	0.56	0.59	0.59	0.54	-	-	0.47	0.44	0.43	0.43
Dak Banglo More	0.45	0.48	0.53	0.58	0.58	0.58	-	-	0.53	0.51	0.47	0.47
Govt. Azom Khan Commerce College	0.48	0.48	0.59	0.62	0.62	0.6	-	-	0.6	0.56	0.44	0.44
Govt. Majid Memorial City College	0.58	0.59	0.59	0.59	0.59	0.59	-	-	0.53	0.51	0.48	0.48
EQS for wastewater after treatment from industrial units 0.3-1.0 mg/l												

Table-240. Level of Salinity of Ground Water at Khulna District in 2019

Locations of Khulna	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Divisional Commissioner office, Boyra	0.1	0.1	0.1	0.1	0.2	0.2	-	-	0.2	0.2	0.2	0.2
KUET University Main Gate, Fulbari Gate	0.1	0.1	0.1	0.1	0.1	0.1	-	-	0.1	0.1	0.1	0.1
Govt. B.L College, Daulatpur	0.1	0.1	0.2	0.2	0.3	0.3	-	-	0.2	0.2	0.2	0.2
Govt. Mohasin College, Khalishpur	0.1	0.1	0.1	0.1	0.1	0.1	-	-	0.1	0.1	0.1	0.1
Govt. Girls College, Boyra	0.1	0.1	0.2	0.2	0.3	0.2	-	-	0.2	0.2	0.2	0.2
Khulna Public College, Boyra	0.1	0.1	0.2	0.2	0.2	0.2	-	-	0.2	0.2	0.2	0.2
Boyra Bazar More, Boyra	0.1	0.1	0.1	0.1	0.4	0.3	-	-	0.2	0.1	0.1	0.1
Aizer More, Boyra	0.2	0.2	0.3	0.3	0.3	0.3	-	-	0.1	0.1	0.1	0.1
Govt. Comercial College, Sonadanga	0.1	0.1	0.2	0.2	0.2	0.2	-	-	0.2	0.2	0.2	0.2
Sonadanga Bus Stand, Sonadanga	0.2	0.2	0.2	0.2	0.3	0.2	-	-	0.1	0.1	0.1	0.1
Sarjical Clinic, Sonadanga	0.1	0.1	0.3	0.3	0.3	0.2	-	-	0.3	0.1	0.1	0.1
Jia Hall, Sib Bary	0.2	0.2	0.2	0.2	0.2	0.1	-	-	0.1	0.2	0.2	0.2
Islami Bank Hospital, Santidham Mor	0.1	0.1	0.1	0.1	0.2	0.2	-	-	0.2	0.1	0.1	0.1
Moypapota More	0.1	0.1	0.2	0.2	0.2	0.1	-	-	0.2	0.1	0.1	0.1
Seba Clinic, Sher-E-Bangal Road	0.1	0.1	0.1	0.1	0.2	0.2	-	-	0.1	0.1	0.1	0.1
Nirala More	0.2	0.2	0.2	0.2	0.2	0.1	-	-	0.2	0.2	0.2	0.2
Gollamari Bus Stand, Gollamari	0.1	0.1	0.1	0.1	0.2	0.2	-	-	0.1	0.2	0.2	0.2
Khulna University, Vaskarja Chattar	0.1	0.1	0.1	0.1	0.1	0.1	-	-	0.2	0.2	0.2	0.2
Rupsha Bus Stand, Rupsha	0.2	0.2	0.2	0.2	0.2	0.1	-	-	0.1	0.1	0.1	0.1
Sundarban Adorso College	0.2	0.2	0.2	0.2	0.2	0.2	-	-	0.2	0.2	0.2	0.2
Hazi Mohasin College, Khulna	0.1	0.1	0.1	0.1	0.1	0.1	-	-	0.1	0.1	0.1	0.1
Khulna Medical College	0.2	0.2	0.3	0.3	0.3	0.1	-	-	0.2	0.1	0.1	0.1
Ad-din Medical College and Hospital, Khulna	0.2	0.2	0.2	0.2	0.2	0.2	-	-	0.2	0.2	0.2	0.2
Natun Bazar, Rupsha	0.2	0.3	0.3	0.3	0.3	0.2	-	-	0.2	0.2	0.2	0.2
Sarkit House	0.1	0.1	0.2	0.2	0.2	0.2	-	-	0.1	0.1	0.1	0.1
Govt. Khulna Gila School	0.2	0.2	0.2	0.2	0.3	0.2	-	-	0.2	0.1	0.1	0.1
D.C Office	0.1	0.1	0.1	0.1	0.1	0.1	-	-	0.2	0.2	0.2	0.2
Dak Banglo More	0.1	0.1	0.2	0.2	0.2	0.1	-	-	0.1	0.1	0.1	0.1
Govt. Azom Khan Commerce College	0.1	0.1	0.1	0.1	0.2	0.2	-	-	0.2	0.1	0.1	0.1
Govt. Majid Memorial City College	0.1	0.1	0.1	0.1	0.1	0.1	-	-	0.2	0.3	0.3	0.3
EQS for wastewater after treatment from industrial units 400 ppt												

V. Ground Water (Deep Tubewell) in Barisal district (Table: 241-246)

Table-241: Level of pH of Ground Water at Barisal District in 2019

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kalizira bazar	-	-	-	-	7.36	-	-	-	-	-	-	-
Notun hat ali madrasha	-	-	-	-	7.39	-	-	-	-	-	-	-
Govt board primary school	-	-	-	-	7.33	-	-	-	-	-	-	-
Rupatoly Bus stand	-	-	-	-	7.31	-	-	-	-	-	-	-
Rupatoly Alia madrasha	-	-	7.24	-	-	-	-	-	-	-	-	-
Rupatoly jagua secondary school	-	-	-	-	7.24	-	-	-	-	-	-	-
Karitas office	-	-	-	-	7.41	-	-	-	-	-	-	-
Sadar upzila poishad	-	7.3	-	-	7.38	-	-	-	-	-	-	-
Amtolar mour	-	-	-	-	7.27	-	-	-	-	-	-	-
Khan bari mosque	-	-	-	-	7.32	-	-	-	-	-	-	-
Sher-E-Bangla medical college	-	7.28	7.23	-	7.36	-	-	-	-	-	-	-
Water development board	-	-	-	-	7.39	-	-	-	-	-	-	-
Barisal mission boyes school	-	-	-	-	7.33	-	-	-	-	-	-	-
Barisal mission girls school	-	-	-	-	7.31	-	-	-	-	-	-	-
T & T Office	-	-	-	-	7.29	-	-	-	-	-	-	-
Chowmatha bazar	-	7.28	7.26	-	-	-	-	-	-	-	-	-
Police hospital police line	-			-	-	-	-	-	-	-	-	-
Terminal , launch ghat	-	7.33	7.21	-	-	-	-	-	-	-	-	-
City Market, Vatar khal	-	7.31		-	-	-	-	-	-	-	-	-
Govt.B M school	-		7.12	-	-	-	-	-	-	-	-	-
Govt Halima Khatun Secondary school	-	7.3	7.36	-	-	-	-	-	-	-	-	-
Kashipur High school	-	7.35		-	-	-	-	-	-	-	-	-
Kashipur bazar	-	7.33	7.38	-	-	-	-	-	-	-	-	-
Fisharighat more	-	7.29		-	-	-	-	-	-	-	-	-
Natullabad, sadar	-	7.36	7.33	-	-	-	-	-	-	-	-	-
Munshir Garaze	-	7.34	7.27	-	-	-	-	-	-	-	-	-
Steamerghat	-	7.31	7.29	-	-	-	-	-	-	-	-	-
Hazi omarshah Madrasha, bottala	-	7.33	7.24	-	-	-	-	-	-	-	-	-
Divisional Commisionar office	-	7.37	-	-	-	-	-	-	-	-	-	-
Shagordi bazar	-	7.85	-	-	-	-	-	-	-	-	-	-
Udayon Secondary school	-	-	-	-	-	-	-	-	-	-	-	-
Sadar Hospital	-	-	-	-	-	-	-	-	-	-	-	-
Law college	-	-	-	-	-	-	-	-	-	-	-	-
Amirto Lal dey college	-	-	-	-	-	-	-	-	-	-	-	-
T.T.C Lane	-	-	-	-	-	-	-	-	-	-	-	-
EQS (6.5-8.5) for drinking												

Table-242: Level of EC of Ground Water at Barisal District in 2019

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kalizira bazar	-	-	-	-	634	-	-	-	-	-	-	-
Notun hat ali madrasha	-	-	-	-	631	-	-	-	-	-	-	-
Govt board primary school	-	-	-	-	626	-	-	-	-	-	-	-
Rupatoly Bus stand	-	-	-	-	624	-	-	-	-	-	-	-
Rupatoly Alia madrasha	-	-	502	-	-	-	-	-	-	-	-	-
Rupatoly jagua secondary school	-	-	-	-	628	-	-	-	-	-	-	-
Karitas office	-	-	-	-	623	-	-	-	-	-	-	-
Sadar upzila poishad	-	395	-	-	627	-	-	-	-	-	-	-
Amtolar mour	-	-	-	-	623	-	-	-	-	-	-	-
Khan bari mosque	-	-	-	-	634	-	-	-	-	-	-	-
Sher-E-Bangla medical college	-	388	500	-	632	-	-	-	-	-	-	-
Water development board	-	-	-	-	631	-	-	-	-	-	-	-
Barisal mission boyes school	-	-	-	-	626	-	-	-	-	-	-	-
Barisal mission girls school	-	-	-	-	624	-	-	-	-	-	-	-
T & T Office	-	-	-	-	630	-	-	-	-	-	-	-
Chowmatha bazar	-	392	496	-	-	-	-	-	-	-	-	-
Police hospital police line	-			-	-	-	-	-	-	-	-	-
Terminal , launch ghat	-	400	494	-	-	-	-	-	-	-	-	-
City Market, Vatar khal	-	385		-	-	-	-	-	-	-	-	-
Govt.B M school	-		510	-	-	-	-	-	-	-	-	-
Govt Halima Khatun Secondary school	-	395	511	-	-	-	-	-	-	-	-	-
Kashipur High school	-	410	-	-	-	-	-	-	-	-	-	-
Kashipur bazar	-	412	522	-	-	-	-	-	-	-	-	-
Fisharighat more	-	399	-	-	-	-	-	-	-	-	-	-
Natullabad, sadar	-	396	518	-	-	-	-	-	-	-	-	-
Munshir Garaze	-	393	514	-	-	-	-	-	-	-	-	-
Steamerghat	-	382	508	-	-	-	-	-	-	-	-	-
Hazi omarshah Madrasha, bottala	-	386	512	-	-	-	-	-	-	-	-	-
Divisional Commisionar office	-	389	-	-	-	-	-	-	-	-	-	-
Shagordi bazar	-	421	-	-	-	-	-	-	-	-	-	-
Udayon Secondary school	-	-	496	-	-	-	-	-	-	-	-	-
Sadar Hospital	-	-	516	-	-	-	-	-	-	-	-	-
Law college	-	-	498	-	-	-	-	-	-	-	-	-
Amirto Lal dey college	-	-	508	-	-	-	-	-	-	-	-	-
T.T.C Lane	-	-	511	-	-	-	-	-	-	-	-	-
EQS for wastewater after treatment from industrial units 1200 µmohos/cm												

Table-243: Level of TDS of Ground Water at Barisal District in 2019

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kalizira bazar	-	-	-	-	317	-	-	-	-	-	-	-
Notun hat ali madrasha	-	-	-	-	315	-	-	-	-	-	-	-
Govt board primary school	-	-	-	-	313	-	-	-	-	-	-	-
Rupatoly Bus stand	-	-	-	-	312	-	-	-	-	-	-	-
Rupatoly Alia madrasha	-	-	-	-	315	-	-	-	-	-	-	-
Rupatoly jagua secondary school	-	-	-	-	314	-	-	-	-	-	-	-
Karitas office	-	-	-	-	312	-	-	-	-	-	-	-
Sadar upzila poishad	-	196	-	-	314	-	-	-	-	-	-	-
Amtolar mour	-	-	-	-	312	-	-	-	-	-	-	-
Khan bari mosque	-	-	-	-	317	-	-	-	-	-	-	-
Sher-E-Bangla medical college	-	194	250	-	316	-	-	-	-	-	-	-
Water development board	-	-	-	-	315	-	-	-	-	-	-	-
Barisal mission boyes school	-	-	-	-	313	-	-	-	-	-	-	-
Barisal mission girls school	-	-	-	-	312	-	-	-	-	-	-	-
T & T Office	-	-	-	-	315	-	-	-	-	-	-	-
Chowmatha bazar	-	195	249	-	-	-	-	-	-	-	-	-
Police hospital police line	-	-	-	-	-	-	-	-	-	-	-	-
Terminal , launch ghat	-	200	248	-	-	-	-	-	-	-	-	-
City Market, Vatar khal	-	193	-	-	-	-	-	-	-	-	-	-
Govt.B M school	-	-	-	-	-	-	-	-	-	-	-	-
Govt Halima Khatun Secondary school	-	196	255	-	-	-	-	-	-	-	-	-
Kashipur High school	-	205	-	-	-	-	-	-	-	-	-	-
Kashipur bazar	-	206	255	-	-	-	-	-	-	-	-	-
Fisharighat more	-	199	-	-	-	-	-	-	-	-	-	-
Natullabad, sadar	-	197	259	-	-	-	-	-	-	-	-	-
Munshir Garaze	-	195	257	-	-	-	-	-	-	-	-	-
Steamerghat	-	191	254	-	-	-	-	-	-	-	-	-
Hazi omarshah Madrasha, bottala	-	193	256	-	-	-	-	-	-	-	-	-
Divisional Commisionar office	-	195	-	-	-	-	-	-	-	-	-	-
Shagordi bazar	-	211	-	-	-	-	-	-	-	-	-	-
Udayon Secondary school	-	-	249	-	-	-	-	-	-	-	-	-
Sadar Hospital	-	-	258	-	-	-	-	-	-	-	-	-
Law college	-	-	250	-	-	-	-	-	-	-	-	-
Amirto Lal dey college	-	-	254	-	-	-	-	-	-	-	-	-
T.T.C Lane	-	-	255	-	-	-	-	-	-	-	-	-
EQS for wastewater after treatment from industrial units 2100 mg/l												

Table-244: Level of Iron of Ground Water at Barisal District in 2019

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kalizira bazar	-	-	-	-	0.16	-	-	-	-	-	-	-
Notun hat ali madrasha	-	-	-	-	0.2	-	-	-	-	-	-	-
Govt board primary school	-	-	-	-	0.21	-	-	-	-	-	-	-
Rupatoly Bus stand	-	-	-	-	0.15	-	-	-	-	-	-	-
Rupatoly Alia madrasha	-	-	0.19	-	0.19	-	-	-	-	-	-	-
Rupatoly jagua secondary school	-	-	-	-	0.12	-	-	-	-	-	-	-
Karitas office	-	-	-	-	0.21	-	-	-	-	-	-	-
Sadar upzila poishad	-	0.26	-	-	0.22	-	-	-	-	-	-	-
Amtolar mour	-	-	-	-	0.15	-	-	-	-	-	-	-
Khan bari mosque	-	-	-	-	0.19	-	-	-	-	-	-	-
Sher-E-Bangla medical college	-	0.21	0.14	-	0.12	-	-	-	-	-	-	-
Water development board	-	-	-	-	0.2	-	-	-	-	-	-	-
Barisal mission boyes school	-	-	-	-	0.21	-	-	-	-	-	-	-
Barisal mission girls school	-	-	-	-	0.15	-	-	-	-	-	-	-
T & T Office	-	-	-	-	0.19	-	-	-	-	-	-	-
Chowmatha bazar	-	0.24	0.21	-	-	-	-	-	-	-	-	-
Police hospital police line	-	-	-	-	-	-	-	-	-	-	-	-
Terminal , launch ghat	-	0.23	-	-	-	-	-	-	-	-	-	-
City Market, Vatar khal	-	0.3	-	-	-	-	-	-	-	-	-	-
Govt.B M school	-	-	0.19	-	-	-	-	-	-	-	-	-
Govt Halima Khatun Secondary school	-	0.24	0.2	-	-	-	-	-	-	-	-	-
Kashipur High school	-	0.21	-	-	-	-	-	-	-	-	-	-
Kashipur bazar	-	0.23	0.38	-	-	-	-	-	-	-	-	-
Fisharighat more	-	0.28	-	-	-	-	-	-	-	-	-	-
Natullabad, sadar	-	0.18	0.24	-	-	-	-	-	-	-	-	-
Munshir Garaze	-	0.28	0.27	-	-	-	-	-	-	-	-	-
Steamerghat	-	0.18	0.22	-	-	-	-	-	-	-	-	-
Hazi omarshah Madrasha, bottala	-	0.26	0.23	-	-	-	-	-	-	-	-	-
Divisional Commisionar office	-	0.28	-	-	-	-	-	-	-	-	-	-
Shagordi bazar	-	0.33	-	-	-	-	-	-	-	-	-	-
Udayon Secondary school	-	-	0.21	-	-	-	-	-	-	-	-	-
Sadar Hospital	-	-	0.16	-	-	-	-	-	-	-	-	-
Law college	-	-	0.18	-	-	-	-	-	-	-	-	-
Amirto Lal dey college	-	-	0.26	-	-	-	-	-	-	-	-	-
T.T.C Lane	-	-	0.2	-	-	-	-	-	-	-	-	-
EQS For Drinking (0.3-1 mg/l)												

Table-245: Level of Total Alkalinity of Ground Water at Barisal District in 2019

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kalizira bazar	-	-	-	-	24	-	-	-	-	-	-	-
Notun hat ali madrasha	-	-	-	-	28	-	-	-	-	-	-	-
Govt board primary school	-	-	-	-	26	-	-	-	-	-	-	-
Rupatoly Bus stand	-	-	-	-	22	-	-	-	-	-	-	-
Rupatoly Alia madrasha	-	-	24	-	20	-	-	-	-	-	-	-
Rupatoly jagua secondary school	-	-	-	-	24	-	-	-	-	-	-	-
Karitas office	-	-	-	-	26	-	-	-	-	-	-	-
Sadar upzila poishad	-	28	-	-	22	-	-	-	-	-	-	-
Amtolar mour	-	-	-	-	20	-	-	-	-	-	-	-
Khan bari mosque	-	-	-	-	24	-	-	-	-	-	-	-
Sher-E-Bangla medical college	-	26	22	-	22	-	-	-	-	-	-	-
Water development board	-	-	-	-	28	-	-	-	-	-	-	-
Barisal mission boyes school	-	-	-	-	26	-	-	-	-	-	-	-
Barisal mission girls school	-	-	-	-	22	-	-	-	-	-	-	-
T & T Office	-	-	-	-	20	-	-	-	-	-	-	-
Chowmatha bazar	-	26	28	-	-	-	-	-	-	-	-	-
Police hospital police line	-	-	-	-	-	-	-	-	-	-	-	-
Terminal , launch ghat		25	25	-	-	-	-	-	-	-	-	-
City Market, Vatar khal	-	22	-	-	-	-	-	-	-	-	-	-
Govt.B M school	-	-	28	-	-	-	-	-	-	-	-	-
Govt Halima Khatun Secondary school	-	27	22	-	-	-	-	-	-	-	-	-
Kashipur High school	-	32	-	-	-	-	-	-	-	-	-	-
Kashipur bazar	-	30	22	-	-	-	-	-	-	-	-	-
Fisharighat more	-	28	-	-	-	-	-	-	-	-	-	-
Natullabad, sadar	-	24	20	-	-	-	-	-	-	-	-	-
Munshir Garaze	-	24	30	-	-	-	-	-	-	-	-	-
Steamerghat	-	32	26	-	-	-	-	-	-	-	-	-
Hazi omarshah Madrasha, bottala	-	26	30	-	-	-	-	-	-	-	-	-
Divisional Commisionar office	-	24	-	-	-	-	-	-	-	-	-	-
Shagordi bazar	-	28	-	-	-	-	-	-	-	-	-	-
Udayon Secondary school	-	-	28	-	-	-	-	-	-	-	-	-
Sadar Hospital	-	-	22	-	-	-	-	-	-	-	-	-
Law college	-	-	24	-	-	-	-	-	-	-	-	-
Amirto Lal dey college	-	-	26	-	-	-	-	-	-	-	-	-
T.T.C Lane	-	-	22	-	-	-	-	-	-	-	-	-
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-246: Level of Total Hardness of Ground Water at Barisal District in 2019

Locations of Barisal District	Jan	Feb	Mar	Apl	May	July	June	Aug	Sep	Oct	Nov	Dec
Kalizira bazar	-	-	-	-	140	-	-	-	-	-	-	-
Notun hat ali madrasha	-	-	-	-	100	-	-	-	-	-	-	-
Govt board primary school	-	-	-	-	130	-	-	-	-	-	-	-
Rupatoly Bus stand	-	-	-	-	110	-	-	-	-	-	-	-
Rupatoly Alia madrasha	-	-	110	-	120	-	-	-	-	-	-	-
Rupatoly jagua secondary school	-	-	-	-	140	-	-	-	-	-	-	-
Karitas office	-	-	-	-	120	-	-	-	-	-	-	-
Sadar upzila poishad	-	100	-	-	100	-	-	-	-	-	-	-
Amtolar mour	-	-	-	-	110	-	-	-	-	-	-	-
Khan bari mosque	-	-	-	-	130	-	-	-	-	-	-	-
Sher-E-Bangla medical college	-	140	100	-	120	-	-	-	-	-	-	-
Water development board	-	-	-	-	100	-	-	-	-	-	-	-
Barisal mission boyes school	-	-	-	-	130	-	-	-	-	-	-	-
Barisal mission girls school	-	-	-	-	110	-	-	-	-	-	-	-
T & T Office	-	-	-	-	120	-	-	-	-	-	-	-
Chowmatha bazar	-	120	140	-	-	-	-	-	-	-	-	-
Police hospital police line	-	-	-	-	-	-	-	-	-	-	-	-
Terminal , launch ghat	-	140	120	-	-	-	-	-	-	-	-	-
City Market, Vatar khal	-	110	-	-	-	-	-	-	-	-	-	-
Govt.B M school			120	-	-	-	-	-	-	-	-	-
Govt Halima Khatun Secondary school	-	100	120	-	-	-	-	-	-	-	-	-
Kashipur High school	-	120	-	-	-	-	-	-	-	-	-	-
Kashipur bazar	-	160	100	-	-	-	-	-	-	-	-	-
Fisharighat more	-	120	-	-	-	-	-	-	-	-	-	-
Natullabad, sadar	-	110	110	-	-	-	-	-	-	-	-	-
Munshir Garaze	-	110	150	-	-	-	-	-	-	-	-	-
Steamerghat	-	160	130	-	-	-	-	-	-	-	-	-
Hazi omarshah Madrasha, bottala	-	110	110	-	-	-	-	-	-	-	-	-
Divisional Commisionar office	-	130	-	-	-	-	-	-	-	-	-	-
Shagordi bazar	-	160	-	-	-	-	-	-	-	-	-	-
Udayon Secondary school	-	-	120	-	-	-	-	-	-	-	-	-
Sadar Hospital	-	-	130	-	-	-	-	-	-	-	-	-
Law college	-	-	110	-	-	-	-	-	-	-	-	-
Amirto Lal dey college	-	-	140	-	-	-	-	-	-	-	-	-
T.T.C Lane	-	-	120	-	-	-	-	-	-	-	-	-
EQS For Drinking (200-500 mg/l)												

VI. Ground water (Deep Tubewell) in Bogura District (Table: 247-251)

Table-247. Level of pH of Ground Water at Bogura District in 2019

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School	-	7.42	-	7.42	-	-	7.42	7.42	-	-	-	7.42
VM School, Sadar	-	7.46	-	7.46	-	-	7.46	7.46	-	-	-	7.46
Zilla Parishad	-	7.35	-	7.35	-	-	7.35	7.35	-	-	-	7.35
Office of the Duputy Commissioner	-	7.62	-	7.62	-	-	7.62	7.62	-	-	-	7.62
Office of the Bogra Municipality	-	7.78	-	7.78	-	-	7.78	7.78	-	-	-	7.78
Yakubiya Girls High School	-		-		-	-			-	-	-	
Head Post Office	-	7.38	-	7.38	-	-	7.38	7.38	-	-	-	7.38
Biddut Office	-	7.21	-	7.21	-	-	7.21	7.21	-	-	-	7.21
T & T Office	-	7.38	-	7.38	-	-	7.38	7.38	-	-	-	7.38
Commercial College	-	7.31	-	7.31	-	-	7.31	7.31	-	-	-	7.31
Office of the Police Super	-	7.42	-	7.42	-	-	7.42	7.42	-	-	-	7.42
EQS (6.5-8.5) for drinking												

Table-248. Level of EC of Ground Water at Bogura District in 2019

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bogra Zilla School	-	374	-	374	-	-	374	374	-	-	-	374
VM School, Sadar	-	359	-	359	-	-	359	359	-	-	-	359
Zilla Parishad	-	420	-	420	-	-	420	420	-	-	-	420
Office of the Duputy Commissioner	-	392	-	392	-	-	392	392	-	-	-	392
Office of the Bogra Municipality	-	390	-	390	-	-	390	390	-	-	-	390
Yakubiya Girls High School	-		-		-	-			-	-	-	
Head Post Office	-	422	-	422	-	-	422	354	-	-	-	354
Biddut Office	-	320	-	320	-	-	320	320	-	-	-	320
T & T Office	-	368	-	368	-	-	368	368	-	-	-	368
Commercial College	-	422	-	422	-	-	422	422	-	-	-	422
Office of the Police Super	-	330	-	330	-	-	330	330	-	-	-	330
EQS For Industries (1200 µmhos/cm)												

Table-249. Level of Iron of Ground Water at Bogura District in 2019

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

Table-250. Level of T. Alkalinity of Ground Water at Bogura District in 2019

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

Table-251. Level of T. Hardness of Ground Water at Bogura District in 2019

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

VII. Ground water (Deep Tubewell) in Sylhet district (Table: 252-256)**Table-252. Level of pH of Ground Water at Sylhet District in 2019**

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MC College, Tilagor	-	-	7.2	-	7	-	-	7.3	-	-	-	-
Kadamtoli Bus Terminal	-	-	6.9	-	7.6	-	-	7.5	-	-	-	-
Sylhet Railway Station	-	-		-		-	-		-	-	-	-
Durgakumar Govt. Primary School	-	-	6.9	-	7.1	-	-	7.6	-	-	-	-
Agrogami Girls High School	-	-	7.2	-	7.8	-	-	7.5	-	-	-	-
Lalbazar, Bandarabazar	-	-	7.1	-	7.8	-	-	7.2	-	-	-	-
EQS (6.5-8.5) for drinking												

Table-253. Level of EC of Ground Water at Sylhet District in 2019

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MC College, Tilagor	-	-	76	-	73	-	-	72	-	-	-	-
Kadamtoli Bus Terminal	-	-	165	-	200	-	-	189	-	-	-	-
Sylhet Railway Station	-	-		-		-	-		-	-	-	-
Durgakumar Govt. Primary School	-	-	132	-	136	-	-	134	-	-	-	-
Agrogami Girls High School	-	-	117	-	172	-	-	170	-	-	-	-
Lalbazar, Bandarabazar	-	-	149	-	214	-	-	212	-	-	-	-
EQS for wastewater after treatment from industrial units 1200 µmhos/cm												

Table-254. Level of Chloride of Ground Water at Sylhet District in 2019

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MC College, Tilagor	-	-	20	-	21	-	-	19	-	-	-	-
Kadamtoli Bus Terminal	-	-	14	-	20	-	-	18	-	-	-	-
Sylhet Railway Station	-	-		-		-	-		-	-	-	-
Durgakumar Govt. Primary School	-	-	14	-	25	-	-	23	-	-	-	-
Agrogami Girls High School	-	-	13	-	13	-	-	12	-	-	-	-
Lalbazar, Bandarabazar	-	-	18	-	15	-	-	13	-	-	-	-
EQS for wastewater after treatment from industrial units 150-600 mg/l												

Table-255. Level of Alkalinity of Ground Water at Sylhet District in 2019

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MC College, Tilagor	-	-	28	-	32	-	-	29	-	-	-	-
Kadamtoli Bus Terminal	-	-	98	-	36	-	-	34	-	-	-	-
Sylhet Railway Station	-	-		-		-	-		-	-	-	-
Durgakumar Govt. Primary School	-	-	38	-	36	-	-	35	-	-	-	-
Agrogami Girls High School	-	-	42	-	44	-	-	43	-	-	-	-
Lalbazar, Bandarabazar	-	-	60	-	26	-	-	25	-	-	-	-
EQS for wastewater after treatment from industrial units 150 mg/l												

Table-256. Level Iron of Ground Water at Sylhet District in 2019

Locations of Sylhet Dist.	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
MC College, Tilagor	-	-	0.4	-	1.07	-	-	1.01	-	-	-	-
Kadamtoli Bus Terminal	-	-	0.2	-	0.03	-	-	0.91	-	-	-	-
Sylhet Railway Station	-	-		-		-	-		-	-	-	-
Durgakumar Govt. Primary School	-	-	0.91	-	0.92	-	-	0.94	-	-	-	-
Agrogami Girls High School	-	-	0.2	-	0.1	-	-	0.11	-	-	-	-
Lalbazar, Bandarabazar	-	-	0.93	-	0.66	-	-	0.89	-	-	-	-
EQS For Drinking (0.3-1 mg/l)												

Annex-4

List of Tables for Trend Analysis of Water Quality of Major Rivers

Table-257. Trend of pH, DO and BOD of Buriganga river from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Buriganga river	2010	Dry	7.25	0.47	26.44
		Wet	7.31	3.83	8.23
	2011	Dry	7.27	1.35	26.06
		Wet	7.03	2.24	22.48
	2012	Dry	7.42	0.54	18.748
		Wet	7.19	2.55	15.90
	2013	Dry	7.38	2.3	21.18
		Wet	6.84	2.56	9.17
	2014	Dry	7.24	0.61	24.97
		Wet	7.27	2.58	10.29
	2015	Dry	7.54	0.14	17.09
		Wet	7.22	2.96	7.42
	2016	Dry	7.54	0.17	17.09
		Wet	7.05	2.98	6.53
	2017	Dry	7.34	0.78	14.58
		Wet	7.29	2.64	5.69
	2018	Dry	7.42	1.28	12.14
		Wet	7.47	2.82	5.98
	2019	Dry	7.56	0.93	15.67
		Wet	7.07	2.2	5.98
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-258. Trend of pH, DO and BOD of Shitalakhya river from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Shitalakhya River	2010	Dry	7.22	3.77	9.58
		Wet	7.05	5.53	4.67
	2011	Dry	7.14	3.80	10.62
		Wet	7.22	5.63	3.983
	2012	Dry	7.22	2.18	11.17
		Wet	7.37	3.56	5.21
	2013	Dry	7.7	2.69	22.83
		Wet	7.11	4.10	5.75
	2014	Dry	7.19	0.66	16.8
		Wet	7.43	3.86	6.64
	2015	Dry	7.51	3.84	6.46
		Wet	6.93	3.53	3.78
	2016	Dry	7.26	4.25	19.99
		Wet	7.22	4.14	5.49
	2017	Dry	7.56	2.41	17.74
		Wet	7.36	4.92	6.94
	2018	Dry	7.5	2.66	12.28
		Wet	7.86	4.96	3.89
	2019	Dry	7.05	2.97	10.03
		Wet	7.06	3.46	5.26
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-259. Trend of pH, DO and BOD of Turag river from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Turag River	2010	Dry	7.49	0	30.91
		Wet	6.39	3.73	9.5
	2011	Dry	7.74	0.47	22.33
		Wet	7.52	3.94	9.12
	2012	Dry	7.6	0.65	24.87
		Wet	7.48	2.67	12.95
	2013	Dry	7.46	0.742	31.96
		Wet	7.31	2.93	4.58
	2014	Dry	7.67	0.69	35.44
		Wet	7.36	2.75	7.21
	2015	Dry	7.67	0.11	35.70
		Wet	6.79	3.63	7.45
	2016	Dry	7.18	0.4	30.48
		Wet	7.31	4.51	4.84
	2017	Dry	7.57	1.20	21.98
		Wet	7.36	4.09	7.03
	2018	Dry	7.53	1.6	25.72
		Wet	7.5	4.52	6.31
	2019	Dry	7.43	0.82	19.91
		Wet	7.14	3.78	9.69
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-260. Trend of pH, DO and BOD of Dhaleshwari river from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Dhaleshwari River	2010	Dry	7.03	5.36	2.85
		Wet	6.86	6.15	3.42
	2011	Dry	7.17	6.01	3.91
		Wet	6.86	6.00	2.52
	2012	Dry	7.57	4.50	6.61
		Wet	7.82	6.0	8.64
	2013	Dry	7.81	4.15	14.37
		Wet	7.25	4.91	4.28
	2014	Dry	7.48	2.87	11.55
		Wet	7.16	4.475	6.65
	2015	Dry	7.15	1.4	7.2
		Wet	6.90	5.35	1.38
	2016	Dry	7.21	2.75	4.98
		Wet	7.56	6.05	2.41
	2017	Dry	7.60	2.71	8.25
		Wet	7.48	4.25	5.01
	2018	Dry	7.88	1.38	17.39
		Wet	7.8	4.89	17.38
	2019	Dry	7.32	2.86	5.9
		Wet	7.23	4.51	2.17
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-261. Trend of pH, DO and BOD of Brahmaputra river from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Brahmaputra River	2010	Dry	7.14	5.44	4.5
		Wet	6.97	5.62	2.42
	2011	Dry	7.08	5.85	2.86
		Wet	6.74	6.35	2.36
	2012	Dry	7.31	6.9	3.1
		Wet	7.28	6.25	2.6
	2013	Dry	8.22	11.36	16
		Wet	7.69	5.9	0
	2014	Dry	7.89	9.7	5.1
		Wet	-	-	-
	2015	Dry	7.08	7.5	1.5
		Wet	7.56	6.55	0.55
	2016	Dry	7.19	7.06	1.66
		Wet	7.48	6.4	1.58
	2017	Dry	7.35	7.3	2.25
		Wet	8.05	6.8	1.2
	2018	Dry	-	-	-
		Wet	7.83	6.04	2.2
	2019	Dry	14.32	15.1	2.4
		Wet	7.9	6.76	2.45
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-262. Trend of pH, DO and BOD of Halda River from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Halda River	2010	Dry	7.13	-	-
		Wet	7	-	-
	2011	Dry	7.13	5.71	1.12
		Wet	7.16	5.65	1.13
	2012	Dry	7.22	5.31	0.77
		Wet	7.15	4.54	0.78
	2013	Dry	7.19	5.34	0.41
		Wet	7.12	5.31	0.32
	2014	Dry	7.22	5.26	0.37
		Wet	7.186	5.44	0.24
	2015	Dry	7.49	6.03	-
		Wet	7.37	6.69	-
	2016	Dry	7.22	6.68	-
		Wet	6.95	7.15	-
	2017	Dry	7.3	6.24	-
		Wet	7.45	7.00	-
	2018	Dry	7.22	5.75	-
		Wet	7.34	5.5	-
	2019	Dry	7.44	5.96	19.6
		Wet	7.78	6.13	17.6
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-263. Trend of pH, DO and BOD of Moyuri River from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Moyuri River	2010	Dry	7.6	0.36	26.6
		Wet	7.52	2.33	5.66
	2011	Dry	7.40	0.69	19.5
		Wet	7.59	2.7	9.73
	2012	Dry	7.59	0.93	16.0
		Wet	7.53	0.5	9.2
	2013	Dry	7.63	0.06	21.5
		Wet	7.63	-	13
	2014	Dry	7.67	-	-
		Wet	7.75	-	-
	2015	Dry	7.66	1.2	-
		Wet	7.49	2.46	-
	2016	Dry	7.68	1.55	-
		Wet	7.65	1.98	-
	2017	Dry	7.54	0.84	-
		Wet	7.52	0.68	-
	2018	Dry	7.54	0.84	-
		Wet	7.52	0.68	-
	2019	Dry	7.63	1.55	-
		Wet	7.70	2.31	-
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-264. Trend of pH, DO and BOD of Surma River from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Surma River	2010	Dry	7.48	6.3	1.2
		Wet	7.45	6.76	1.16
	2011	Dry	7.63	7.39	1.17
		Wet	7.63	7.24	1.23
	2012	Dry	7.66	5.88	1.12
		Wet	7.35	5.8	1.21
	2013	Dry	6.89	6.4	1.30
		Wet	6.63	6.54	0.9
	2014	Dry	6.95	5.02	32.37
		Wet	6.76	5.49	36.12
	2015	Dry	7.055	5.85	15.03
		Wet	7.1	6.23	17.87
	2016	Dry	7.22	6.07	26.54
		Wet	7.14	6.58	26.88
	2017	Dry	7.60	6.57	2.4
		Wet	6.85	6.66	2.26
	2018	Dry	8.01	7.11	2.02
		Wet	8.09	6.74	2.08
	2019	Dry	7.57	6.21	2.50
		Wet	7.9	7	3.95
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-265. Trend of pH, DO and BOD of Korotoa River from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Korotoa River	2011	Dry	7.22	5.54	20.70
		Wet	7.07	5.80	16.22
	2012	Dry	6.91	5.74	13.44
		Wet	6.79	6.38	2.51
	2013	Dry	7.27	5.17	2.67
		Wet	7.13	4.87	4.31
	2014	Dry	7.37	4.58	3.57
		Wet	7.33	4.38	2.79
	2015	Dry	7.42	1.78	11.85
		Wet	7.24	5.36	4.05
	2016	Dry	6.77	2.57	5.74
		Wet	7.39	2.56	6.09
	2017	Dry	7.03	3.33	4.57
		Wet	7.01	3.37	4.81
	2018	Dry	7.03	3.79	4.41
		Wet	7.02	4.14	3.27
	2019	Dry	7.02	3.87	5.53
		Wet	7.33	4.98	3.40
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-266. Trend of pH, DO and BOD of Mathavanga River Water from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Mathavanga River	2010	Dry	7.46	2.11	144.08
		Wet	7.62	3.6	82.85
	2011	Dry	7.50	5.03	11.69
		Wet	7.65	4.83	15.40
	2012	Dry	7.71	6.53	17.61
		Wet	7.85	6.7	0.53
	2013	Dry	7.62	6.83	0.9
		Wet	7.62	5.8	0.8
	2014	Dry	7.62	5.4	0.6
		Wet	7.465	5.67	0.69
	2015	Dry	7.67	5.16	0.8
		Wet	7.67	5.32	0.76
	2016	Dry	7.67	5.16	0.8
		Wet	7.47	5.21	0.8
	2017	Dry	7.65	5.46	1.05
		Wet	7.71	5.82	1.01
	2018	Dry	7.05	4.66	0.905
		Wet	6.8	4.34	0.7
	2019	Dry	6.9	4.626	0.586
		Wet	6.92	5.275	0.625
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Table-267. Trend of pH, DO and BOD of Pashur River Water from 2010 to 2019.

Sampling Location	Year	Season	pH	DO	BOD
Pashur River	2010	Dry	7.65	4.93	0.9
		Wet	7.65	4.9	0.9
	2011	Dry	7.57	5.31	0.96
		Wet	7.64	4.91	0.88
	2012	Dry	7.78	6.26	0.78
		Wet	7.82	5.78	0.66
	2013	Dry	7.71	6.92	0.6
		Wet	7.67	6.1	0.73
	2014	Dry	7.74	6.32	0.82
		Wet	7.81	5.85	0.88
	2015	Dry	7.8	6.52	0.86
		Wet	7.82	6.04	0.96
	2016	Dry	7.81	6.56	0.86
		Wet	7.8	6.05	1
	2017	Dry	7.87	6.4	0.76
		Wet	7.9	6.25	0.8
	2018	Dry	7.82	6.49	1.07
		Wet	7.77	5.81	0.95
	2019	Dry	7.82	7.02	0.91
		Wet	7.94	6.73	0.94
EQS for fisheries			6.5-8.5	≥5 mg/l	≤6 mg/l

Annex-5

List of Tables for Sea Water Quality Data

Table-268. pH Level of Sea Water in January'19 to December'19.

Locations of Sea Water Sampling Point	Jan, 19	Feb, 19	Mar, 19	Apr, 19	May, 19	June, 19	July, 19	Aug, 19	Sep, 19	Oct, 19	Nov, 19	Dec, 19
Karnafully Mohona	7.5	8	8.4	7.4	7.1	7.6	7.8	8.02	7.06	7.73	7.8	8.26
1km Straight from patenga sea beach	7.7	8.1	8.6	7.4	7.5	7.7	7.7	8.09	7.47	7.78	7.78	8.27
Patenga charpara	7.8	7.9	7.5	7.3	7.6	7.3	7.3	8.07	7.27	7.85	7.68	8.24
1km Straight from CEPZ	7.8	8.2	8	7.2	7.4	7.8	7.8	8.03	7.56	7.76	7.75	8.46
EQS Fisheries (6.5-8.5)												

Table-269. DO Level of Sea Water in January'19 to December'19.

Locations of Sea Water Sampling Point	Jan, 19	Feb, 19	Mar, 19	Apr, 19	May, 19	June, 19	July, 19	Aug, 19	Sep, 19	Oct, 19	Nov, 19	Dec, 19
Karnafully Mohona	8.2	8.1	8.4	7.83	7.6	8.2	7.6	7	6.9	6.9	7.44	8.74
1km Straight from patenga sea beach	7.9	7.8	7.5	8	8.1	7.9	7.5	7.1	7	7	7.34	8.74
Patenga charpara	7.8	7.7	7.1	7.2	7.5	7.7	6.9	6.3	6.8	6.8	7.52	8.44
1km Straight from CEPZ	8.4	8.2	8.1	7.5	7.3	7	7.2	6.6	6.8	6.8	6.98	8.44
EQS Fisheries (5 mg/l\geq)												

Table-270. TDS Level of Sea Water in January'19 to December'19.

Locations of Sea Water Sampling Point	Jan, 19	Feb, 19	Mar, 19	Apr, 19	May, 19	June, 19	July, 19	Aug, 19	Sep, 19	Oct, 19	Nov, 19	Dec, 19
Karnafully Mohona	17720	18730	16720	13220	13435	11010	2050	1295	3170	12910	18200	19620
1km Straight from patenga sea beach	18010	18956	16990	13090	12189	10659	2169	1272	3600	13770	17960	18470
Patenga charpara	17870	19130	17138	12130	12290	10781	2107	1470	4320	11360	17240	18050
1km Straight from CEPZ	18125	18643	17587	12480	12510	11115	1915	1520	4300	11360	15690	16290
EQS Industrial (\leq2100 mg/l)												

Table-271. SS Level of Sea Water in January'19 to December'19.

Locations of Sea Water Sampling Point	Jan, 19	Feb, 19	Mar, 19	Apr, 19	May, 19	June, 19	July, 19	Aug, 19	Sep, 19	Oct, 19	Nov, 19	Dec, 19
Karnafully Mohona	-	-	247	268	235	372	380	267	242	835	229	520
1km Straight from patenga sea beach	-	-	142	270	256	220	345	272	369	672	149	524
Patenga charpara	-	-	306	90	113	137	278	259	253	589	279	520
1km Straight from CEPZ	-	-	258	199	185	148	290	396	197	630	134	662
EQS Industrial (150 mg/l)												

Table-272. EC Level of Sea Water in January'19 to December'19.

Locations of Sea Water Sampling Point	Jan, 19	Feb, 19	Mar, 19	Apr, 19	May, 19	June, 19	July, 19	Aug, 19	Sep, 19	Oct, 19	Nov, 19	Dec, 19
Karnafully Mohona	-	-	31290	21320	20154	21541	4340	2280	5550	23600	29100	29700
1km Straight from patenga sea beach	-	-	31689	21070	20125	19743	4575	2250	6280	24900	28800	28100
Patenga charpara	-	-	32380	19780	21376	20149	4080	2580	7570	20990	27700	27500
1km Straight from CEPZ	-	-	32690	20190	21280	21310	3964	2620	7420	21430	25500	25000
EQS Industrial (1200 μmhos/cm)												

Annex-6

*List of Tables for Level of Drinking Water
(Coliform Bacteria) of Hotel, Motel and
Restaurant in 2019*

Table-273. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Barisal District in 2019

Locations of Barisal District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Bismillah Restaurant, Gournodi Bus Stand, Barisal	-	0	-	-	-	-	-	-	-	-	-	-
Khan Hotel, Gournodi Bus Stand, Barisal	-	110	-	-	-	-	-	-	-	-	-	-
Sokal-Sondha Kabab House, Gournodi Bus Stand, Barisal	-	100	-	-	-	-	-	-	-	-	-	-
Sinha Mini Chinese Restaurant, Gournodi Bus Stand, Barisal	-	0	-	-	-	-	-	-	-	-	-	-
Islamia Mistanno Vander, Gournodi Bus Stand, Barisal	-	0	-	-	-	-	-	-	-	-	-	-
Dilip Kumar Mistanno Vander, Gournodi Bus Stand, Barisal	-	140	-	-	-	-	-	-	-	-	-	-
Saha Mistanno Vander, Gournodi Bus Stand, Barisal	-	0	-	-	-	-	-	-	-	-	-	-
Gournodi Mistanno Vander, Gournodi Bus Stand, Barisal	-	120	-	-	-	-	-	-	-	-	-	-
Matbor Hotel & Restaurant, Gournodi Bus Stand, Barisal	-	110	-	-	-	-	-	-	-	-	-	-
Vai Vai Mini Chinese and Restaurant, Gournodi Bus Stand, Barisal	-	0	-	-	-	-	-	-	-	-	-	-
Tin Bela Bangla Chinese & Restaurant, Gournodi Bus Stand, Barisal		0	-	-	-	-	-	-	-	-	-	-
Gournodi Ghos Mistanno Vander, Gournodi Bondor, Barisal	-	0	-	-	-	-	-	-	-	-	-	-
Sree Guru Mistanno Vander, Sadar Road, Gournodi Bondor, Barisal	-	130	-	-	-	-	-	-	-	-	-	-
Gour Nitai Mistanno Vander, Gournodi Bondor, Barisal	-	140	-	-	-	-	-	-	-	-	-	-
Sree Guru Mistanno Vander, Dud Bazar, Gournodi Bondor, Barisal	-	120	-	-	-	-	-	-	-	-	-	-
Mostofa Hotel and Kabab House, Bogra Road, Barisal	0	-	-	-	-	-	-	-	-	-	-	-
Nazems Restaurant, Bogra Road, Barisal	110	-	-	-	-	-	-	-	-	-	-	-
Ammajan Hotel and Fast food, Kalibari Road, Barisal	100	-	-	-	-	-	-	-	-	-	-	-
New Hotel Radhuni, Kalibari Road, Barisal	140	-	-	-	-	-	-	-	-	-	-	-
Mannan Sweets, Fokirbari Road,	0	-	-	-	-	-	-	-	-	-	-	-
Ma Gournodi Mistanno Vander, Sadar Road, Barisal	140	-	-	-	-	-	-	-	-	-	-	-
Faruk Hotel & Restaurant, Kathpotti , Barisal	0	-	-	-	-	-	-	-	-	-	-	-
Ghos Mistanno Vander, Police Line Road, Barisal	120	-	-	-	-	-	-	-	-	-	-	-
New Bonoful Sweets , Bazar Road, Barisal	0	-	-	-	-	-	-	-	-	-	-	-
Alauddin Sweets , Bazar Road, Barisal	100	-	-	-	-	-	-	-	-	-	-	-
Chaurongi Hotel & Restaurant, Chakerpol , Barisal	0	-	-	-	-	-	-	-	-	-	-	-
New Modhu Sweets , Bazar Road, Barisal	0	-	-	-	-	-	-	-	-	-	-	-
Hotel Otithi , Port Road, Barisal	160	-	-	-	-	-	-	-	-	-	-	-
Hotel Al Jamia, Girja Moholla, Barisal	110	-	-	-	-	-	-	-	-	-	-	-
Hotel Ghoroa & Restaurant, Girja Moholla, Barisal	120	-	-	-	-	-	-	-	-	-	-	-
EQS For Drinking 0 (Zero)/100 ml												

Table-274. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Bhola District in 2019

Locations of Bhola District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Hotel Mayer Doa, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
Hotel Arju, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
Five Star Hotel and Restaurant, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
Hawlder Hotel and Restaurant, Sadar, Bhola	-	120	-	-	-	-	-	-	-	-	-	-
Riyad Doi Ghor, Sadar, Bhola	-	100	-	-	-	-	-	-	-	-	-	-
Di Ghos Mistanno Vandar, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
Rosona Bilas Café and Restaurant, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
Five Star Hotel and Restaurant, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
New Rajpur Hotel and Restaurant, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
Welcome Mistanno Vandar, Sadar, Bhola	-	110	-	-	-	-	-	-	-	-	-	-
Ghos Vandar and Doi Ghor, Sadar, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
Nurjahan Hotel and Restaurant, Sadar, Bhola	-	110	-	-	-	-	-	-	-	-	-	-
Hotel Ahsan, Sadar Road, Bhola	-	140	-	-	-	-	-	-	-	-	-	-
Bhola Food Garden, Sadar Road, Bhola	-	80	-	-	-	-	-	-	-	-	-	-
Sawma House, Sadar Road, Bhola	-	0	-	-	-	-	-	-	-	-	-	-
EQS For Drinking 0 (Zero)/100 ml												

Table-275. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Bogura District in 2019

Locations of Bogura District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Shamoli Hotel and Restaurant, Thana Road, Bogura	-	-	-	-	-	-	80	80	-	-	-	-
Akboria Grand Hotel, Thana Road, Bogura	-	-	-	-	-	-	100	100	-	-	-	-
Quality Sweets and Restaurant, Thana Road, Bogura	-	-	-	-	-	-	120	120	-	-	-	-
Selim Hotel, 1 No Rail Gate, Bogura	-	-	-	-	-	-	120	120	-	-	-	-
Soikot Hotel and Restaurant, Sat Matha, Bogura	-	-	-	-	-	-	70	70	-	-	-	-
Onnoponna Hotel and Restaurant, Thana Road, Bogura	-	-	-	-	-	-	80	80	-	-	-	-
Ruposi Bangla Underground Hotel, BRTC Market, Bogura	-	-	-	-	-	-	0	0	-	-	-	-
Sopnopuri Hotel and Restaurant, Station Road, Bogura	-	-	-	-	-	-	0	0	-	-	-	-
Surma Hotel, College Road, Bogura	-	-	-	-	-	-	0	0	-	-	-	-
Ptisruti Hotel, College Road, Bogura	-	-	-	-	-	-	0	0	-	-	-	-
EQS For Drinking 0 (Zero)/100 ml												

Table-276. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Naogaon District in 2019

Locations of Naogaon District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Munsi Hotel, Tajer More, Naogaon	0	0	0	-	-	-	-	-	-	-	-	-
Kalur Hotel, Dhaka Bus Stand, Naogaon	0	0	0	-	-	-	-	-	-	-	-	-
Ahmedia Hotel and Restaurant, Tajer More, Naogaon	0	0	0	-	-	-	-	-	-	-	-	-
Naogaon Mistanno vander, Miste potti, Naogaon	120	120	120	-	-	-	-	-	-	-	-	-
Mukta Mistanno vander, Miste potti, Naogaon	160	160	160	-	-	-	-	-	-	-	-	-
Pranto Mistanno vander, Miste potti, Naogaon	0	0	0	-	-	-	-	-	-	-	-	-
Das Hotel, Miste potti, Naogaon	0	0	0	-	-	-	-	-	-	-	-	-
Shamoli Hotel, Miste potti, Naogaon	200	200	200	-	-	-	-	-	-	-	-	-
Al Amin Sweets, Miste potti, Naogaon	210	210	210	-	-	-	-	-	-	-	-	-
Chisti Hotel, Dhaka Bus Stand, Naogaon	0	0	0	-	-	-	-	-	-	-	-	-
EQS For Drinking 0 (Zero)/100 mg												

Table-277. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Pirojpur District in 2019

Locations of Pirojpur District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Siqdar Mistanno Vander, CO office Mor, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
Vai Vai Hotel and Restaurant, CO office Mor, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
Café Al Modina Restaurant and Sawrma House, Sadar, Pirojpur	150	-	-	-	-	-	-	-	-	-	-	-
Bismillah Vat Ghor, Hospital Road, Pirojpur	120	-	-	-	-	-	-	-	-	-	-	-
Ghoroa Hotel and Restaurant, Hospital Road, Pirojpur	100	-	-	-	-	-	-	-	-	-	-	-
Blue Bright Friday chicken, Parer hat Road, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
Satkhira Ghos Diary, Sadar Road, Pirojpur	140	-	-	-	-	-	-	-	-	-	-	-
Hotel Appayon, Bazar Road, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
Oisi Mistanno Vandar, Bazar Road, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
Sree Guru Mistanno Vander, Sadar Road, Pirojpur	110	-	-	-	-	-	-	-	-	-	-	-
Padma Mistanno Vandar, Bazar Road, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
Satkhira Ghos Diary, Bridge Road, Pirojpur	110	-	-	-	-	-	-	-	-	-	-	-
New Nirob Hotel and Restaurant, Bridge Road, Pirojpur	40	-	-	-	-	-	-	-	-	-	-	-
Ovijat Sweemet, Bridge Road, Pirojpur	80	-	-	-	-	-	-	-	-	-	-	-
Nirob Hotel and Restaurant, Bridge Road, Pirojpur		-	-	-	-	-	-	-	-	-	-	-
Star Hotel and Restaurant, Sadar, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
Sagorika Abasik hotel, Kathpotti, Pirojpur	0	-	-	-	-	-	-	-	-	-	-	-
EQS For Drinking 0 (Zero)/100 m/												

Table-278. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Rajshahi District in 2019

Locations of Rajshahi District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
Al Modina Hotel and Restaurant, Siroel Bus Stand, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
Sikdar Hotel, Siroel, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
Mostak Hotel, Siroel, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
Sujon Hotel and Restaurant, Siroel, Rajshahi	80	80	80	-	-	-	-	-	-	-	-	-
Kisan Hotel and Restaurant, Saheb bazar, Rajshahi	100	100	100	-	-	-	-	-	-	-	-	-
Biddut Hotel, Saheb bazar, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
Hotel Memori, Saheb bazar, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
Padma Hotel and Restaurant, Siroel Bus Stand, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
Pappu Restaurant, Siroel Bazar, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
Boisakhi Hotel, Talaimari Bazar, Rajshahi	0	0	0	-	-	-	-	-	-	-	-	-
EQS For Drinking 0 (Zero)/100 ml												

Table-279. Level of Drinking Water (Coliform Bacteria) of Hotel, Motel and Restaurant at Rajshahi District in 2019

Locations of Rangpur District	Jan	Feb	Mar	Apl	May	June	July	Aug	Sep	Oct	Nov	Dec
New Piasi Hotel, Kachari Bazar, Rangpur	-	-	-	-	-	-	90	90	-	-	-	-
Moubon Hotel, Kachari Bazar, Rangpur	-	-	-	-	-	-	70	70	-	-	-	-
M/S Pias Hotel, Kachari Bazar, Rangpur	-	-	-	-	-	-	60	60	-	-	-	-
Hotel Monis, Kachari Bazar, Rangpur	-	-	-	-	-	-	100	100	-	-	-	-
Ma Moni Hotel, Dhaph Jail Road, Rangpur	-	-	-	-	-	-	40	40	-	-	-	-
Boisakhi Restaurant, Dhaph Jail Road, Rangpur	-	-	-	-	-	-	120	120	-	-	-	-
Chadni Restaurant, Dhaph Jail Road, Rangpur	-	-	-	-	-	-	40	40	-	-	-	-
Mamun Hotel, Dhaph Jail Road, Rangpur	-	-	-	-	-	-	70	70	-	-	-	-
Parvez Hotel, Dhaph Jail Road, Rangpur	-	-	-	-	-	-	80	80	-	-	-	-
Mohua Hotel, Kachari Bazar, Rangpur	-	-	-	-	-	-	90	90	-	-	-	-
EQS For Drinking 0 (Zero)/100 ml												

***** End *****