

## **Title of the project:**

### **“Study of the Present Status of The Buriganga River Water”**

## **Motivation and Background:**

Water is one of the essential elements in our daily life. But can also be a great hazardous substance. Water bodies can be polluted by a wide variety of substances, including pathogenic microorganisms, putrescible organic waste, fertilizers and plant nutrients, toxic chemicals, sediments, heat, petroleum (oil), and radioactive substances.

As the world groundwater level is decreasing day by day, now it's high time to utilize our surface water properly. So, the reason of this experiment is to determine some parameters of water quality for our selected area, compare the parameters with the standard values, and to verify whether the water is usable in or not in the future. We have to find out what will be the impact of this water to the stakeholders.

Bangladesh is one of the most densely populated countries in the world. It has plentiful water sources, but these sources are being polluted continuously. Both surface water and groundwater sources are contaminated with different contaminants like toxic trace metals, coliforms as well as other organic and inorganic pollutants. The problem of the availability of quality drinking water and drainage and sewage treatment systems is one of the key weaknesses in the situation analysis of the economic development strategy.

The Buriganga River in Bangladesh is dependent upon serious contamination and considered as one of the most terrible polluted streams in the World. Particularly, the advancement of tannery industry at Hazaribagh that has contributed to Bangladesh economy is causing contamination and the disturbance of the biological system. Subsequently, the ecological issues are getting worse. This is liable for the high Biochemical Oxygen Demand (BOD). Besides for the Sadarghat launch terminal, the water is also being polluted. This polluted water creates hazardous effects on the stakeholders.

The biological quality of water represents the presence and concentration of microorganisms in the water, is an important part. How much amount of the water is useable should be determined by using the water quality parameters. As the water is so much polluted that we could not get the standard value. Therefore, EPA recommends *E. coli*, which comes from human and animal wastes and is the most common form of fecal coliform, as the best indicator of health quality standards and are monitoring accordingly. Additionally, the presence of (*E. coli*) in a body of water may indicate that more harmful bacteria, viruses, or other microorganisms have contaminated that body of water. But we could not determine it properly.

## **Study Area:**

Our group members choose Buringanga river as a sewerage water. The Port of Dhaka is a major river port on the Buriganga River in Dhaka, the capital and largest city of Bangladesh the port is located in the southern part of the city. Sadarghat is known for its bustling river port and boat trips along the Buriganga.

The Buriganga is of great economic importance to Dhaka. It provides river connection by launch and country boats. Large steamers can no longer ascend the river in the dry season.

Water pollution in the river Buriganga is as its highest. The most significant source of pollution appears to be from tanneries in the Hazaribagh area. In the dry season, the dissolved oxygen level becomes very low or non-existent and the river becomes toxic. The Hazaribagh leather complex housing 250 industries contributed only 6 percent to the Buriganga's pollution. The remaining 94 percent remain unaddressed with no future plan to deal with the major cause of pollution, nor is there any commitment other than some actions that are little more than eyewash.

Despite the critical role of the Buriganga River in supporting and sustaining the development of Dhaka, it is the most polluted river in the country. This river is struggling for its existence, and it is under threat of becoming a “Dead River.”



## **Stakeholders:**

Water pollution in the River Buriganga is at its highest. The most significant source of pollution appears to be from tanneries in the Hazaribagh area. In the dry season, the dissolved oxygen level becomes very low or non-existent and the river becomes toxic.

Four million people, out of the 30 million living in the metropolitan area of the capital of Bangladesh, directly depend on the waters of the Buriganga River and hundreds of families live in boats moored to its shores. The Buriganga is of great economic importance to Dhaka. It provides river connection by launch and country boats

The Buriganga river is afflicted by the noisome problem of pollution. The chemical waste of mills and factories, household waste, medical waste, sewage, dead animals, plastics, and oil are some of the Buriganga's pollutants.

Various industrial factories for example- garments factories, cement factories, leather factories and so forth use Buriganga river water, as well as dump their factories waste directly in the waterway.

Launches and small boats use the Buriganga river water for cleaning. People who work at the launch terminal they also use it for their daily life.





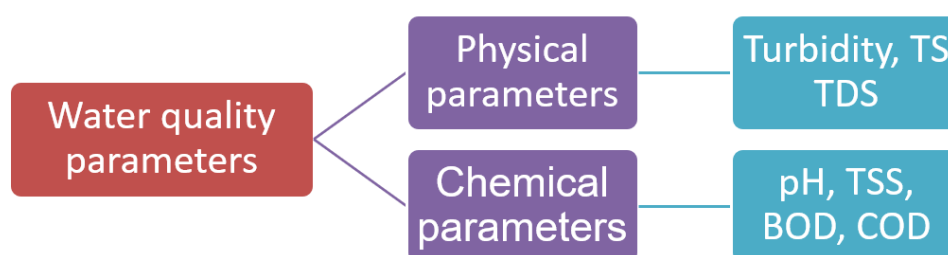
## **(ii) Water Quality Parameters:**

Mainly there are three water quality parameters. we performed two parameters which are physical parameters and chemical parameters. These parameters help us to measure the quality of water

The physical parameters include, Turbidity and Total Solids.

Chemical parameters include pH, (Total Suspended Solids) TSS and Biological Oxygen Demand (BOD)

Here dissolved oxygen is the most important parameters when measuring a river's water quality. The amount of dissolved oxygen in the water defines how polluted the water sample is. Low amounts of dissolved oxygen indicate that the water is highly polluted the organic contaminants are consuming the dissolved oxygen.



**Flow Chart on Water Quality Parameters**

## **(v) Limitations:**

In this project, we performed 5 test, but we could not performed CO<sub>2</sub> of water, total coliform and fecal coliform, phosphate, sulphate, and free chlorine for the time limitations of the laboratory.

As we choose river water as surface water so don't required to perform Iron and Arsenic tastes because Iron and Arsenic mainly found in ground water.

**(iv) Laboratory Analysis**

The table below shows which apparatus, reagents, program number are used during our experiment:

No. of Tests	Experiment Name	Apparatus	Reagents	Program Number & Wave Length
01	Determination of pH of Water	1. pH multimeter [HQ11D]	Standard pH solution for calibration of pH meter.	
02	Determination of Turbidity of Water	1. Spectrophotometer [HACH-DR2800]	Formazin polymer standards	Programme no- 950 Wave length-860 nm
03	Determination of Total Solids, Dissolved Solids & Suspended Solids	1. Spectrophotometer [HACH-DR6000]		Programme no- 630 Wave length-810 nm
04	Determination of Biochemical Oxygen Demand (BOD) of Water	1. Measuring Cylinder 2. BOD Incubator 3. BOD Bottle 4. Beaker		
05	Determination of Chemical Oxygen Demand (COD) of Water	1. COD Vial 2. COD Reactor 3. Beaker 4. Spectrophotometer [HACH-DR6000]	1. Dilute sulfuric acid 2. Standard potassium permanganate 3. Standard Ammonium Oxalate	Programme no- 430 Wave length-420 nm

## **Results:**

The table below shows our experimental results and also comparison between the standard values:

No	Experiment Name	Experimental Result	Unit	Standard value	
				According to E.C.R	WHO Guideline
01	Determination of pH of Water	7.84		6.5-8.5 (by E.C.R)	6.5-8.5
02	Determination of Turbidity of Water	118.46	Ftu	10	5
03	Determination of Total Solids, Dissolved Solids & Suspended Solids	TSS - 76 TDS - 489 TS - 565	mg/L	TSS-10 TDS-1000	
04	Determination of Biochemical Oxygen Demand (BOD) of Water	7.5	mg/L	5-6 2 or less (by E.C.R)	
05	Determination of Chemical Oxygen Demand (COD) of Water	65	mg/L	200 (by E.C.R)	

## **Discussion:**

### 1. For pH:

- According to Bangladesh Environmental Preservation act (1997) and WHO guideline, drinking water standard for pH is 6.5-8.5. But our sample water pH is 7.84.
- Which is satisfied the standard value. So, the water is drinkable if we justify pH according to pH range and the water doesn't need to waste water treatment.

### 2. For Turbidity:

- According to Bangladesh Environmental Preservation act (1997) and WHO guideline, drinking water standard value of turbidity is 10 Ftu and 5 Ftu.
- Which is doesn't satisfy the standard value of turbidity.
- The water needs to treatment and decrease all the turbidity if we want to use it to drink and use for our various uses because the more turbidity number means the more particle in the water.

3. For TDS, TSS:

- According to Bangladesh Environment Preservation act (1997), portable water should not contain more than 1000 mg/L for TDS and ECR limits of TSS in water is 10 mg/L.
- But our sample water TDS and TSS result is 489 mg/L and 76 mg/L.
- As the TSS satisfied the standard but the TDS doesn't satisfy the standard. So, we can't drink the water directly. We need to water treatment before drinking.

4. For BOD:

- According to Bangladesh environmental conservation rules (1997) drinking water standard for BOD is 0.2 mg/L and for the surface water the value will be 5-6 mg/L. But our experimental result is mg/L. So our source water is not adequate on both parameters.
- If the BOD goes below 4-5 mg/L due to decomposition of organic waste from of life that can survive being to be reduced.

5. For COD:

- From the experiment we found COD of the sample water 65 mg/L. According to ECR the limit is 200 mg/L. So, our sample water did not cross the standard COD limit.
- COD is the measurement of oxygen demand of the waste interns of the total quantity of oxygen required for oxidation of the waste of carbon dioxide and water.
- COD is also used for measuring the organic strengths.

**Conclusion:**

The Buriganga river represents a good case study about the emerging problems and threads that the rivers in Bangladesh are now facing. After all our experiment result, we can say that the water of Buriganga river is absolutely incompetent for normal used purpose. We should find out the problems and reasons why and how Buriganga river water is polluting and take necessary steps upon it for the benefits of the stake holders. We should also focus on the treatment of Buriganga river water.