

## THE POLLUTION OF BURIGANGA RIVER CAUSES CHALLENGE FOR THE SURVIVAL OF DHAKA RESIDENCES; A SOCIOLOGICAL STUDY

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### Abstract

Dhaka, the capital of Bangladesh was established on the north bank of the river Buriganga in 1610. Several water channels crossed through and around the city in the past and were of hydrographic importance linking the peripheral rivers mainly with Buriganga. The river Buriganga has been the lifeline of Dhaka city for over 500 years. Dhaka's life and living depend largely on the health of buriganga for instant communication infrastructure, trading, drainage, water way, aquatic life, recreation and sources of fresh air. While Dhaka was developing and it is continued at a great pace, the river was totally ignored for the cause of rapid and unplanned urbanization, deteriorating waste dumping, riverside encroachment and improper management. Desperately short of urban amenities as well as the river is being turned into a narrow channel by land grabbers and illegal occupants, and the river itself has become polluted with industrial effluents, especially tannery waste and sewage. The river water becomes so polluted that even bacteria won't survive. The results are millions of people are living with various health hazards, untreated toxic industrial wastes are polluting the environment and exhaust emissions of hydrocarbons (HC) and other organic compounds are implicating on health and aquatic life. The paper attempts to put forward the importance of the Buriganga River and to assess the root causes of deteriorating and its impact on Dhaka city as well as offer policy level suggestions as a guideline for sustainable management of the river Buriganga for the sustainability of Dhaka. This paper has been prepared based on primary and secondary sources. For primary sources interview and case study were used for data collection through random sampling and for secondary sources data were collected mainly by reviewing official publications both national and international, seminar and conference.

**Keywords:** Buriganga River, Dhaka, Worsening, Environment.

### INTRODUCTION

Dhaka, the capital of Bangladesh, was established on the bank of the River Buriganga in 1610 and it is surrounded by a river structure comprising Buriganga, Balu, Turag, Tongi Khal and Lakhya.

One a greater number of water channels passed through and around the city in the past and even now of hydrographic significance linking the peripheral rivers mainly with Buriganga. Most of these channels do not survive any longer as they have been filled in due to unplanned development devoid of environmental concern.

The rivers around Dhaka take delivery of a massive quantity of waste (both solid waste and wastewater), surface runoff, untreated industrial effluents and partly treated sewage effluents openly or obliquely from the city. These wastes pollute the river water affecting its aquatic life and ecological health.

Study of long-term data from some of the major rivers in Bangladesh are given an idea about that Buriganga is more polluted than any other river in the country. Most significantly, the quality of the Buriganga river water has constantly been deteriorating. Besides the pollution problems, Buriganga is also under threat of becoming a „Dead River. In the Future as dominant people are grabbing the riverbanks resulting in narrowing down of the channel.

Buriganga has been the lifeline of Dhaka city for over 500 years. It offers drainage for its internal waters; it is a impending source of water for domestic and drinking purposes, an important waterway linking with the southern part of the country and navigation around the city, a home to various marine creatures, a place of recreation and the scenic beauty, and a number of other human activities.

The paper attempts to pick up the importance of the Buriganga River and to assess the causes of deterioration and its impacts on Dhaka city. The paper also tried to put forward how to diminish the problems and develop lessons to get better the position.

## **OBJECTIVE OF THE STUDY**

- 1) To make out the causes of water pollution of Burigonga river.
- 2) To know the states of water pollution of Burigonga River.
- 3) To know impacts of water pollution of Burigonga river.
- 4) To uncover a way to mitigate the water pollution of Burigonga river.

## **REVIEW OF LITERATURE**

Several research have been studied on water pollution of Buriganga river of Dhaka city. Dr. Z. Karim, Dr. Saleemul Haque, Md. Mahiuddin Ahmed, Masud Nabi Khan worked on water pollution of Buriganga river. They analyzed that polluted water has been damaging living beings partially or fully.

They classified pollutants in four classes e.g. a) Pathogens b) Nutritious and biodegradable substances c) Organic agents and d) Toxic substances. Md. Anwarul Islam also worked on it. On the other hand, Prof. Jasim Uddin Ahmed worked on arsenic pollution of Buriganga River.

## METHODOLOGY

Both qualitative and quantitative research was carried out in this study based on primary and secondary data. Primary data was collected with the help of a questionnaire, focused group discussion and personal interviews with the respondents through random sampling. The basic sources of secondary data for this study were previous studies, journals, books, reports, and different websites.

## RESULT AND DISCUSSION

### Contemporary Feature of Buriganga River:

Once, the banks of the Buriganga were a key location when the Mughals made Dhaka their capital in 1610. The house-turned-museum of the Nawab (ruler) overlooks the river, which is the country's main waterway for trading and ferry travel. It was for a thousand years the major source of drinking water for Dhaka's inhabitants and an hour downstream from the capital city the river is still crystal-clear. In the current scenario, the river carries only wastewater during the seven months of the dry season (November-May). Even during the wet season no aquatic animal can survive in the dead river water. All through the year, residents near the river and thousands of people who voyage through Sadarghat suffer a lot from the foul-smelling water of the Buriganga. In the latest water quality tests, the Department of Environment observed the quantity of dissolved oxygen, which determines the degree of pollution, is still too low for aquatic lives to continue to exist in the Buriganga. Laboratory analysis of the samples explained that presence of dissolved oxygen was between 0.50-0.84 mgs per litre (mg/L), while standard surface water is 5 mg/L in Bangladesh.

Earlier, researchers from various institutes found that oxygen levels were 0.7 and 0.25 at Chadnighat point, 0.27 and 0.63 in Norai near Trimohini, and 0.27 and 0.63 in the Turag at Tongi before and after the monsoon correspondingly. The researchers included. The Institute of Water Modelling (IWM) and the World Bank conducted a survey of pollution in Dhaka rivers in 2007 that showed there are over 300 various effluent discharge outlets in the capital and Narayanganj. Of these, 19 outlets carry mixed flows of industrial and household waste into the rivers around the capital.

### Basis for pollution

There are a lot of sources for instant untreated wastes of industries, solid wastes of urban and commercial area, wastes of sewerage in municipality, feces of animals, pesticides, fertilizers, radioactive wastes, erosion of lands riverbanks etc., are the prime sources of water pollution. Even the hot water emerges of die engine also pollute water. Because hot water assists in removing the DO as gaseous oxy-gen. Oil from ships, industries also accelerate polluting water of Buriganga River. Researchers uncover the factors of pollutants are Liquid Organic wastes, Nutrient substances, Liquid Inorganic Wastes Micro-organisms/germs, Synthetic compounds, Inorganic chemicals, Silt and sediment, Hot water, Industrial, Municipal and urban waste. Some still pictures are added the following to further clarification the pollution agents-



**Fig 1: Tannery wastewater of Buriganga**



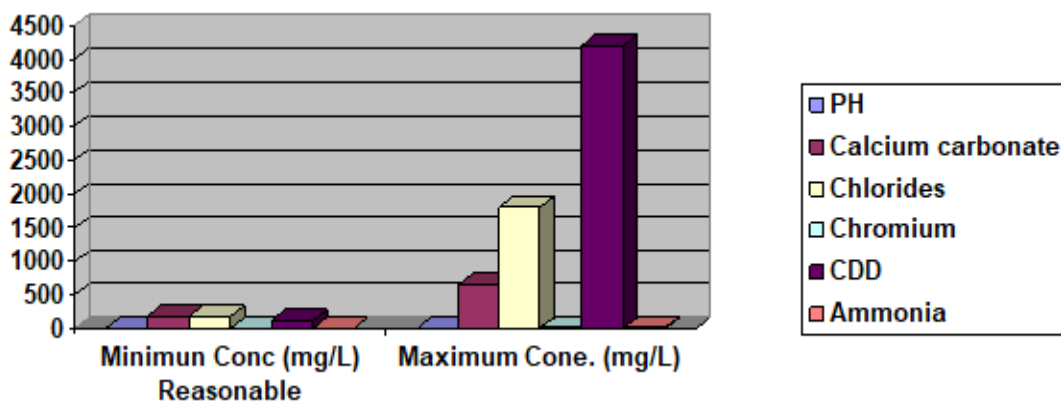
**Fig 2: Industrial wastage of Buriganga**

(sources – Field Observation, 2015)

**Table 1: Analysis of Waste of Buriganga River Water**

Parameters	Minimum Conc.(mg/L)	Maximum Cone. (mg/L)
pH	4	10
Calcium carbonate	185	647.5
Chlorides	175	1800
Chromium	2.6	17
COD	120	4200
Ammonia	12	19.7

(Source: Environmental Chemistry, A. K. Be, 2010)



**Chart 1: Water Quality Analysis**

### Impact of the Deterioration of Buriganga:

As the Buriganga is the life of Dhaka city, however the pollution has been creating the followings effects of Dhaka dwellers:

- Millions of people living in the city and on its banks are exposed to various health hazards as untreated toxic industrial wastes are polluting the environment
- Once rich agricultural lands have now turned barren for the toxic industrial wastes and other dumping chemical wastes.
- Many fishermen, farmers and boatmen have been rendered jobless and have shifted their jobs.
- In 1992, the Department of Environment officially prohibited use of the Buriganga river water for both human consumption and all kinds of use.
- The combustion of hydrocarbon fuels in water transport produces carbon dioxide (CO<sub>2</sub>), water (H<sub>2</sub>O) and nitrogen (N). Engine inefficiency adds unburnt or partially burnt fuel into the air. This results in the additional presence in exhaust emissions of hydrocarbons (HC) and other organic compounds. These components also have implications on health and aquatic life.
- The River Buriganga has already lost its aquatic life.

- The DoE in a study found the dissolved oxygen (DO) level in the Buriganga water at 2mg/litre of river water against standard minimum level of 4 mg/litre
- In the Buriganga water, level of chromium was counted at 6 ppm, which is 60 times higher than tolerable limit to human body.
- Due to the tannery waste, other industrial wastes and garbage disposals it is almost impossible in dry season to stay near the river, as an unbearable strong stench is always present in the atmosphere
- The encroachment near Kholamora is so distinct and large that on the other side of the river the diverted water is causing erosion and claiming fresh land every day.
- Due to the lack of dredging at regular intervals, the water level becomes very high even in dry season. So during rainy season, after a few spells of rainfall, the river flows much above the danger mark and thus more city areas go under water like Lalbagh, Islampur, Bangshal, Swarighat, Sadarghat etc. on the western fringe which are situated at almost the Buriganga river side.

### **The Importance of the River Buriganga:**

The population in Dhaka City grew from 0.1 million in 1906 to 17 million in 2017. The river Buriganga has been serving millions of people for thousands of years. The prime aspects through which the significance of river Buriganga could be understood are as follows-

**Navigation infrastructure:** The river Buriganga still remains the prime gateway between Dhaka and the southern part of Bangladesh. Despite development of communication infrastructure on land, Dhaka inland port established in 1967 as to link the two seaports of Bangladesh as well as for cargo and passengers travelling in and out of Dhaka city. It has also promoted the make-up of hundreds of mills and factories, shops and business centers, boat terminals, dockyards, residential buildings etc on both banks of the river. 80 percent respondents backed Buriganga has helped Dhaka to flourish, to develop and communicate with other countries.

**Trading:** The river Buriganga is of immense financial consequence to Dhaka. Trade enlarged, Merchants carried their goods to far-away lands, by sailing on the river. Transportation links developed, and people exchanged ideas and soon Dhaka became commercially vital. It is also the prime artery of communication between Dhaka and other parts of Bangladesh. 93 percent respondents supported the notion.

**Household use:** The water of Buriganga River is used for a range of domestic purposes. The study revealed that nearly 30 percent of the riverbank population depends completely on the river water for drinking and other household purposes.

**Drainage:** The study uncovered that the River Buriganga is one of the key waterways through which a huge volume of water from Dhaka city and its neighboring areas are expelled. The sewerage system of Dhaka city totally depends on the river Buriganga as well as it has a vast wetland to avert flooding of Dhaka city.

**Aquatic life:** A FGD report focused that Buriganga has played an important role for a huge source of fisheries to meet the daily needs of the population of Dhaka city, but unfortunately this has deteriorated in recent times.

**Recreation:** In the study 96 percent confessed that still at this time Bangladesh Parjatan Corporation arranges grand tours along the Buriganga for local as well as the foreigners a major tourist attraction in every winter. Festivals like Boat Race are celebrated every year with great participation from the local people. Many cities dweller used to take a ride on the river to get rid of their mechanical life. Its scenic view attracts people to spend their leisure time on the river.

## RECOMMENDATIONS TO REMEDIES OF BURIGANGA RIVER POLLUTION

It is very unfortunate that nobody at the policy level seems to know exactly how to solve the deep-rooted problem involving the river Buriganga. Considering this some recommendations in the light of this research work are given below -

- Removing the illegal encroachment and recover the river shores from the encroachment
- It also has the task to reform land management laws to recover thousands of acres of land inside the river Buriganga
- An awareness campaign must be conducted to grow awareness among the people living beside channel of the river
- Industries should be in separate area and code of establishing industries must follow properly
- Modern wastes management methods should be applied. Private sectors may be encouraged for introducing modern recycling process
- Urban sewerage system should be developed, and the waste should be treated before dumping it into water body.
- Carbonate pesticides are less harmful than chlorine pesticides. So, farmers should use chlorine pesticides.

## CONCLUSION

The study highlighted that the River Buriganga is threatened by four discourses for instant pollution, low flow in Buriganga, river encroachment and land grabbing. From the inception of Bangladesh liberalized industrial policy ignores environmental protection; private entrepreneurs do not necessitate consent from the environment department. Indeed, the unplanned socially and environmentally degraded increase industries pose a new challenge to Bangladesh. The authority of River management like BWDB and BIWTA is currently essential to protect the river. The rehabilitation selection is the finest elucidation of river management. It is essential to have proper enforcement mechanisms

so as not to the pollution and human persuaded hazards have gone beyond an endurable border.

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