State of Water Pollution from Industrial Effluents in Bangladesh

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Introduction

• Bangladesh has achieved rapid economic growth in recent times and aims to become a middle-income country by 2021. The textile sector has contributed 82% of the country’s total export revenue.

• Water quality is crucial for a healthy ecosystem and livelihood. Bangladesh, as a downstream part of three major rivers is dominated by floodplain and deltaic ecosystem that are increasingly being threatened by surface water pollution and excessive groundwater abstraction.

• Population increase, release of untreated industrial effluents and sewage, unplanned solid waste dumping along the river banks, encroachment and non-point source pollution from agricultural activities are major reasons for poor water quality and deterioration of river ecosystem.
Introduction (Contd.)

- Department of Environment (DoE) has been monitoring surface water quality since its establishment in 1973. DoE’s surface water quality monitoring network includes major rivers and lakes. Monitoring information provide water quality of major rivers of Bangladesh.

- The water quality of rivers surrounding Dhaka, Chattagram, Khulna city and near other major urban areas were below the Environmental Quality Standard (EQS) set in the Environment Conservation rules 1997 in dry season.
Major Sources of Pollution

- Solid Waste Dumping
- Industrial Waste Water
- Sewage Water
- Oil Spillage & Bilge Water
- River Encroachment
- Sedimentation & Siltation
Extent of Pollutant Flow to River System

• The water quality of rivers has been seriously affected by the dumping of municipal solid waste, direct connection of sewerage lines and toxic industrial discharge.

• Buriganga has become extremely polluted and is close to biological death.

• The tremendous increase in pollution has created enormous environmental problems.
Industrial Clusters – Contribution to Pollution

• The Buriganga and adjacent rivers around Dhaka City are being polluted by effluent flowing in from two directions:
  – the outflow of sewage from the Dhaka City &
  – from the clusters of industry.

• Nine hotspots of industrial pollution have been identified by IWM as major source of industrial pollution. These are:
  (1) Tongi, (2) Hazaribag, (3) Tejgaon,
  (4) Tarabo, (5) Narayanganj,
  (6) Savar, (7) DEPZ, (8) Gazipur and
  (9) Ghorashal.
Present Pollution Status - Buriganga

• The tremendous increase in pollution has created enormous environmental problems, including others disposal of solid waste, sewerage, industrial wastes.

• DOE has been collecting water quality data from Buriganga and monitors about 18 water quality parameters.

• Analysis of available data from DOE shows that the water quality in the river is deteriorating continuously.
Pollution Status of Buriganga
(Rainy Season)

DEPARTMENT OF ENVIRONMENT
DHAKA LABORATORY
RIVER WATER QUALITY
DISSOLVED OXYGEN (DO) LEVEL OF BURIGANGA RIVER
RAINY SEASONS (MAY-OCTOBER)
YEAR: 2010-2017

Concentration of DO (mg/L)

Conc. of DO...
Pollution Status of Buriganga
(Dry Season)

DEPARTMENT OF ENVIRONMENT
DHAKA LABORATORY

RIVER WATER QUALITY
DISSOLVED OXYGEN (DO) LEVEL OF BURIGANGA RIVER
DRY SEASONS (NOVEMBER-APRIL)
YEAR: 2010-2017

Concentration of DO (mg/L)
Present Pollution Status - Buriganga

RIVER WATER QUALITY
DISSOLVED OXYGEN (DO) LEVEL OF BURIGANGA RIVER
2017

DO (mg/l)

M. B.  Mirpur bridge
Hg.  Hazaribagh
K.C  Kamrangir Char
C.G  Chandni Ghat
S.G  Sadar Ghat
D1  Dholai Khal
Pg  Pagla
B.C.F.B*  Buriganga Bridge
EQS Fisheries (5 mg/l)
EQS Industrial (4.5-8 mg/l)

Months

J  F  M  A  M  J  J  A  S  O  N  D
Present Pollution Status – Turag

• The river Turag receives wastewater from Dhaka City through some khals via sluice gates.
• Pollution from non-point sources such as domestic sewage nearby habitats and industrial effluent is also considerable.
Present Pollution Status – Balu

• The river Balu is heavily polluted with organic and human wastes.
• During the dry season, as indicated by the low values of DO and high values of Coliform.
• The DO concentration in the Balu have been much below the critical level of 4 mg/l.
• Heavy metal concentrations in the river water during the dry season shows - Aluminum (Al), Cadmium (Cd), Lead (Pb), and Mercury (Hg) is higher.
Present Pollution Status – Tongi Khal

- Several industrial and commercial zones of Dhaka and Tongi area are situated near Tongi khal.
- It receives high volume of municipal and industrial wastewater discharge throughout the year.
- Water quality parameters in Tongi Khal indicated very low concentration of DO (less than 1 mg/l) in dry season.
Present Pollution Status – Sitalakhya

• Industries like textile and dyeing, etc. have been developed along Sitalakhya bank (from Kanchan to Narayangonj) discharge untreated waste into the river.

• Municipal wastes, domestic sewage from Narayangonj area and industrial wastes from the DND area also accelerate the pollution.

• The Sitalakhya receives waste load mainly through six khals or drains:
  – Majhipara khal, Killarpool khal
  – Kalibazar khal, Tanbazar khal
  – BK road khal and DND khal.
Source & Causes of Pollution – Industry

- In absence of Zoning of the industries, indiscriminate industrial growth has been found.
- Almost complete lack of treatment from about 7,000 industries.
- More than 60,000 cubic meter/day of toxic waste enters the Dhaka canal and river system (textiles, dyeing, printing, washing and pharmaceuticals are main polluters).
Source & Causes of Pollution – Sewage

• DWASA present sewerage coverage in Dhaka City is only about 30%.
• Existing sewerage system is old and inadequate to cope up with the present demand.
• There is a tendency specially in non-sewered areas to give connection of domestic sewer into the surface drains/storm sewer causing a source of pollution.
Source & Causes of Pollution – Solid Waste

• DCC is mandated with the task of solid waste disposal in DCC area.
• About 3200 metric tons of solid waste are generated each day in Dhaka City.
• Only about 44% of generated waste is collected and dumped at land fill sites.
• The rest of generated wastes are required to dump by the people at unauthorized places and water bodies.
• The wholesale markets around the Buriganga river bank also a major source of solid waste generation.
Source & Causes of Pollution – Marine Waste

- Discharge of Bilge Water, Fuel, and Oil from Boat and Ships.
- No effective regulation of discharges from boats and ships.
- Fuel and oil enters the river system.
- Runoff from ship dockyards contaminates waterways.
- Oil and fuel reduce the habitat for fish and cause tainting (kerosene-like smell and taste in fish).
Source & Causes of Pollution – Encroachment

• River encroachment narrowing the river width and reduces the water flow.
• Water abstraction reduces discharge rates in rivers in the winter; extremely poor water quality with no flows.
Source & Causes of Pollution – Encroachment
Impacts of Water Pollution

• Health Impact
  – People are suffering from different health problems.
  – A qualitative assessment found three major types of diseases appeared to be highly correlated with industrial water pollution. These are skin diseases, diarrhea and dysentery.
  – 20 types of illness were identified due to industrial pollution. It affirmed that these types of illness have been increasing in the last 10 years.
  – Nearly 80% of people reported to have suffered jaundice, skin diseases or diarrhea in the watershed area, compared to about a third or less in the control population.
Impacts of Water Pollution

• **Social Impact**
  – People are migrated from river side to other places.
  – They are socially isolated from their relatives.
  – Sometimes it affects their conjugal life.
  – Less interested to build up relationship (marriage).

• **Impact on Agriculture**
  – Agricultural land losing their fertility.
  – Highly polluted river water could not be used for irrigation.

• **Impact on Economy**
  – River based tourism industry not developed.
  – Fishermen become unemployed.
Impacts of Water Pollution

• **Impact on Ecology & Biodiversity**
  – Many flora and Fauna are almost lost.
  – Food chains are disturbed and ecological balance are under threatening due to poisonous chemicals.

• **Impact on Aesthetic Value**
  – Poor water quality discourages recreation.
  – Buriganga lost her attraction & beauty.
DOE Initiatives

- Regular monitoring and enforcement activities are being done.
- Installation of ETP is mandatory for all effluent discharging industries. Upto March, 2019 1765 ETP Installed
- Common ETP, Common STP, Water body, Green Plantation, Open Space, etc. are mandatory for all EPZ and EZ
- Introduce Online Monitoring System
- Introduce submission of three year based Zero Discharge Plan for all effluent discharging industries. The principle of “zero discharge” is recycling of all industrial wastes (including waste water). Upto March, 2019 450 ZDP approved
Conclusions

- The Surface water system is under heavy contamination due to indiscriminate discharge of mainly industrial effluent (60%) and domestic waste water (40%)
- Groundwater aquifers are also vulnerable in some places
- Immediate actions are required to arrest further contamination
- The only way to solve the environmental pollution due to industrial effluents is to restrict the polluted discharge at the source.
- Comprehensive monitoring and enforcement activities should immediately be in place.
Thank you

For More Information Please Visit the Website of DOE
www.doe.gov.bd