

# Evaluation of Water Quality along the Bank of River Hoogly (Kolkata Metropolitan Area) Using the Physico-Chemical Parameter and Water Quality Index

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**Abstract:** The Hoogly River in the Gangetic delta plays a fundamental role in local society, as a source of irrigation and drinking water and as a sink for urban waste water. In order to analyze spatial and temporal variability of the overall water quality of the watershed Water Quality Index (WQI) by aggregative and multiplicative methods were calculated from eight physico-chemical parameter taking water samples from six different locations in and around Kolkata throughout a year during both high tide and low tide conditions. Seasonally, it was found that water quality decreases from winter to summer but it improves during monsoon. Depending on the location, different parameters like BOD, COD, DO, Conductivity etc. were responsible for the episodic fluctuation of water quality. The study reveals that the tributaries like Damodar, Roopnaryan and urban waste water discharge jointly contribute to the appreciable content of toxic metal in the bottom sediment of Hoogly River.

**Key words:** Gangetic delta, Water Quality Index (WQI), physico-chemical parameter, heavy metal, urban waste water, high tide, low tide.

## Introduction

Water is one of the most important commodities which mankind has exploited more than any other resources for the sustenance of life. Only 1% of the earth's water is fresh water. The availability of water both in terms of quality and quantity is essential for the very existence of mankind. Due to the worldwide concern that good quality freshwater may become a scarce resource in the near future, developing countries and countries with transition economies have increased their interest in water quality monitoring programmes during the past decades (Bordalo et al., 2001; Jonnalagadda and Mhere, 2001). Earlier people used to recognize the importance of water from the standpoint of quantity. Recognition of the importance of water quality developed more slowly, only in the recent years. It is the result of alarming degradation in water

quality caused due to toxic pollutants of various kinds like organic, inorganic, organometallics etc. which are continuously discharged into the water bodies from domestic, agricultural and industrial sectors.

To assess the degree of pollution, several water quality parameters have been measured. Some of these are: Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), pH, Oil and Grease, Turbidity, Conductivity, Total Hardness, Alkalinity, Chloride and Nitrate.

This water quality is highly variable over time and position due to both natural and human factors (Park and Kim, 2003). Due to these spatial and temporal variations in water chemistry, a monitoring programme that will provide a representative and reliable estimation of the quality of river water is necessary. Traditional approaches to assessing river water quality are based on the

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