

# Water Quality Analysis of River Ganga

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**Abstract:** India as a nation is blessed with various water resources. India has 12 major river bank, Ganga river bank being the biggest contributor of them. But due to increasing population, urbanization and industrialization, the rivers are often being treated as disposal site causing greatest detriment to health of the various rivers. The following research article will presents the tests conducted to find out the variation of water quality of river Ganga at two different locations in pre and post monsoon seasons and the factors affecting the quality of water which has led to the development of various programs in order to sustain the life in Ganga.

## KEYWORDS

River Ganga, BIS, Water Parameters, Pre monsoon, Post monsoon.

## 1. INTRODUCTION

The Ganges or Ganga is a river of the Indian sub-continent that crosses political border with Bangladesh. Right from its origin near the Gangotri glaciers, moving down through the mountains in Uttarakhand then Uttar Pradesh and then finally merging in Bay of Bengal with a total length of 2525 km flowing south and east through the Gangetic plain of north India. Ganga is one of the most sacred rivers to Hindus. The holy river Ganga, regarded as "Maa Ganga" in India, where the water not only supports aquatic life but also the sentiments of people.

Ganga has played a vital role in the establishment of human civilization. The sanctity of Ganga is supported blindly by the people and is worshipped all over the world. A population of over 500 million depends on the river Ganga for water yet being the most polluted rivers in the world. But due to the continuous extraction of water for different reasons like agriculture, electricity generation, drinking and many more have not only affected the quantity but the quality as well. Human intervention in the form of dams, religious purpose, chemical effluents being added to river water, irrigation waste has degraded river water and affected life in Ganga. Realization of the hazard caused, has actually initiated some serious efforts to reestablish the stature it had.

## 2. METHODOLOGY

The sample collection sites were decided to cover a suitable length of the GangaRiver. Two sample points were selected along the river to study and evaluate overall quality of the river water. The sampling points were

Devprayag and Haridwar. Water samples were collected in the month of March and September 2018. The water was tested for pH, temperature and turbidity on the site and a sample was collected and preserved for other test to be performed in the laboratory. Standard methods were adopted for the testing of water sample and special attention and precautionary measures were taken during the testing of sample to avoid any error due to carelessness.

### 3. RESULT AND DISCUSSION

The result of the various test performed on the water samples are given in **Tables 1 and 2**.

| S.N | Parameters                 | Devprayag | Haridwar | BIS for class B water |
|-----|----------------------------|-----------|----------|-----------------------|
| 1.  | Temperature( $^{\circ}$ C) | 20        | 21       | 10-25                 |
| 2.  | TDS (mg/l)                 | 90.4      | 117.2    | 500-2000              |
| 3.  | Turbidity (NTU)            | 2.3       | 3        | 1-5                   |
| 4.  | Total Hardness(mg/l)       | 84        | 91       | 200-600               |
| 5.  | Dissolved Oxygen(mg/l)     | 12.2      | 9.4      | 4-5                   |
| 6.  | BOD(mg/l)                  | 3.3       | 4.1      | 3                     |
| 7.  | COD                        | 11.5      | 18       | 10                    |
| 8.  | Alkalinity (mg/l)          | 43        | 51       | 200-600               |
| 9.  | pH                         | 7.2       | 7.8      | 6.5-8.5               |
| 10. | Sulphates (mg/l)           | 16        | 24       | 200-400               |
| 11. | Iron (mg/l)                | NIL       | 0.1      | 0.3                   |
| 12. | Nitrates(mg/l)             | NIL       | 0.3      | 45                    |

**Table 1.** Parameters during pre-monsoon season

| S.N | Parameters                 | Devprayag | Haridwar | BIS for class B water |
|-----|----------------------------|-----------|----------|-----------------------|
| 1.  | Temperature( $^{\circ}$ C) | 16        | 18       | 10-25                 |
| 2.  | TDS (mg/l)                 | 67.5      | 81.6     | 500-2000              |
| 3.  | Turbidity (NTU)            | 5         | 8        | 1-5                   |
| 4.  | Total Hardness(mg/l)       | 128       | 136      | 200-600               |

|     |                   |     |      |         |
|-----|-------------------|-----|------|---------|
| 5.  | Dissolved Oxygen  | 14  | 11.2 | 4-5     |
| 6.  | BOD               | 5.4 | 5.8  | 3       |
| 7.  | COD               | 21  | 25.8 | 10      |
| 8.  | Alkalinity (mg/l) | 57  | 72   | 200-600 |
| 9.  | pH                | 7.4 | 8.5  | 6.5-8.5 |
| 10. | Sulphates (mg/l)  | 24  | 32   | 200-400 |
| 11. | Iron (mg/l)       | 0.2 | 0.3  | 0.3     |
| 12. | Nitrates          | NIL | 0.7  | 45      |

**Table 2.** Parameters during post-monsoon season

Most of the parameters were well within the limits. DO is due to minimized microbial decomposition of dead organic matter and tells us about the nature of process in water i.e. whether it is aerobic or anaerobic. The excess of BOD indicates pollution due to maximum biological activities and the pollution through used water from houses and apartments accommodating deteriorating organic matter in water is indicated by COD. The pH increases in the monsoon season to higher limits, the admissible pH of water that is fit for drinking is assigned between 6.5 – 8.5 (IS 10500 : 2012).

## CONCLUSION

It is a matter of great concern that the contamination in the Ganga river has increased over these years due to absorbing of idols of god and goddess, direct bathing of people with soap in the river water, man's activities by overcrowding, improper treatment or insufficient sanitation and discharge of waste water from the industries and sewers. The river Ganga known as the goddess and Maa Ganga is not being treated like one. The water quality though not very down line and did not followed any specific deterioration pattern but gradually decreases along the stretch.

Therefore the water from the industries and sewers should be properly treated before its discharge into the river. Public urinals and lavatories should be constructed near the Ghats and proper collection of garbage and disposal arrangement should be provided on the banks of river.

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