

Regular Article

Pollution Status of River Ramganga: Physico-chemical Characteristics at Bareilly

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ABSTRACT: The investigation is an effort to examine the impact of effluents discharged through industrial wastes and sewage into Ramganga and to observe the change in the quality of water for the period of different seasons of the year. Some physico-chemical parameters like temperature, pH, DO, Free CO₂, TDS and TSS were studied and find the Site B was much polluted due to merging of a polluted tributary Nakatia. There DO was 3.07 mg/l and Free CO₂ was 26.69 mg/l.

Key words: Ramganga river, water quality, Physico-Chemical parameters

Introduction

During past two decades there has been a rise in our interest to know and understand eco-biology of our aquatic resources. The fast pace of urbanization, industrialization and increase in population in India are creating pollution of aquatic resources of the country. Domestic sewage consist of 99.9% water coming from washing, flushing, rinsing and other activities (Botkin and Keller, 1995). Studies on physico-chemical and biological parameters of river water has been carried by several workers (Singh and Mishra, 1989; Agarkar *et al.*, 1998).

The river Ramganga originating from Garhwal hills and merges with sacred river Ganga at Farrukhabad. It flows 8 Kms, south -west of Bareilly city and received industrial wastes and city sewage

Material and Methods

Two sampling points were selected Site A and Site B for collecting water samples for analysis. These were analysed using standard methods for physico- chemical examination of water and waste water (Trivedy and Goel, 1984; APHA, 1992).

Samples were collected in a routine manner during winter, summer and rainy seasons from both sites.

A- Before the merger of sewage and polluted tributaries into Ramganga.

B- After the merger of sewage and Nakatia tributary.

Water temperature, pH were measured by water analysis kit on spot. Dissolved Oxygen (DO) was measured by Wrinkler's method, free CO₂ by Titration method. Total dissolved solids and Total suspended solids by Evaporating method.

Results and Discussion

The temperature of river Ramganga water varied from a lowest 17.2°C in winter to highest 25.3°C in summer at Site A. However the temperature increased upto 26.4°C in summer season at Site B (After the merger of sewage and Nakatia tributary).

The analysis shows that the temperature of water body is affected by sewage and industrial effluents. Studies on water temperature have been conducted by various authors. Variation in water temperature during different seasons has been recorded by Bohara (1976) in Padamasagar and Ranisagar.

Table: 1- Showing water quality at both sites of river Ramganga at Bareilly

Sites	Site-A: Before the merger of sewage and polluted tributaries into Ramganga.			Site-B: After the merger of sewage and Nakatia tributary.			
	Parameters	SUMMER	RAINY	WINTER	SUMMER	RAINY	WINTER
	WATER TEMPERATURE	25.3	20.2	17.2	26.4	21.3	18.5
	pH	7.93	7.62	7.59	8.36	7.94	7.78
	TDS	370.72	390.47	339.37	381.86	421.35	352.12
	TSS	102.73	112.82	95.93	108.54	127.66	98.69
	DO	3.89	4.12	5.62	3.07	3.64	4.02
	FREE CO ₂	29.17	27.89	26.18	26.79	24.43	21.76

*Temp. (°C), TDS, TSS, DO and Free CO₂ (mg/l)

The pH values ranged from 7.59- 8.36, the lowest pH (7.59) was observed during winter season at Site A and a maximum of 8.36 in summer at Site B. There was a change in pH in summer season at

Site A and Site B due to the wastes released in river Ramganga through Nakatia tributary. Rawat and Jakher (2002) also studied the influences if seasonal temperature on pH .

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The values of total dissolved solids and total suspended solids ranged from 339.37 to 421.35mg/l and 95.93 to 127.66 mg/l respectively. Maximum concentration of TDS and TSS was recorded at Site B in the rainy season. This might be due to high rain fall. The findings correlate with Singh and Rai (2003).

The DO values varied from 3.07 mg/l at Site B in summer season to 3.89 mg/l at Site A in winter season. The low DO observed during pre-monsoon season at both sites may be due to the decomposition of organic matter restricted flow of river water (Gonzalves and Joshy,1946; Badge and Verma,1985).

The free CO_2 was lowest 26.18 mg/l at Site A during winter. While at Site B where sewage and wastes released through Nakatia was having highest amount of free CO_2 i.e.26.69 mg/l in summer season. Our values corresponds with (Joshi,1998).

The results reveal that river Ramganga is highly polluted is not potable and has less amount of Dissolved Oxygen and high amount of free CO_2 .

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