Seasonal Variation in Water Quality of Various Water Bodies in Asana Village, Jagdalpur Chhattisgarh

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ABSTRACT: This paper presents the water quality analysis of various water samples from village Asana jadalpur baster. this zone is important as this is the place where the life line river Indravati forms a Groove like area as it flows. Total 10 parameters were analysied which would effect the human health and they were Temperature , pH ,DO BOD,COD, TDS, Turbidity,Alkalinity, Chlorides and Hardness.

Keywords: water quality analysis, river Indravati, Water parameters

INTRODUCTION

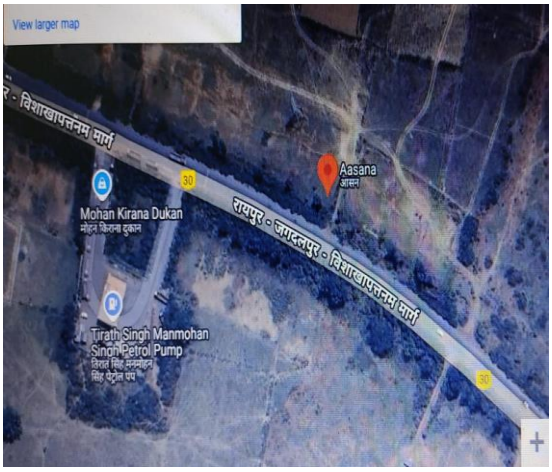
Water is a special element of the natural world and is essential to many biological activities. Water is essential to the life and flourishing of all living things. Because there are so few water resources accessible, water bodies are extremely valuable [1]. The most significant factor in forming the terrain and controlling the climate is water. Natural water bodies' water quality is declining mostly due to rapid industrialization and population growth. Fresh water may become scarce in the future as a result of excessive and uncontrolled exploitation. The demand for fresh water resources is rising, placing pressure on the water supply. Examples of these uses include portable water for residential areas, irrigation water for agriculture, industrial water usage, and water for aquaculture, which raises aquatic species. [2] In India, one of the main issues is water pollution. The amount of biological, toxic, organic, and inorganic pollutants contaminating available surface water is close to 70%, and the percentage of contaminated ground water is rising.

Many times, sources are supplying water of declining quality, making it dangerous to consume or use for other things like irrigation. [3].Water contamination poses a threat to the delicate ecosystems found in freshwater lakes and rivers.Evaluating biological characteristics in addition to physiochemical characteristics gives a clear picture of the trophic status and water body quality. [4–8]

Numerous investigations on lentic and lotic limnology have been conducted in India .In the present research paper an effort is made to check the water quality for the various types of water resources in village asana

STUDY AREA

The main source of water for Baster region is indravati river.The Indravati River flows into Godavari River.The Dandakaranya range, which rises at an elevation of 914 meters on the western slopes of the Eastern Ghats in the Kalahandi district of the state of Odisha, is determined to be its starting point. It travels 164 km west via the districts of Kalahandi, Nabarangapur, and Koraput before entering the Bastar region of Chhattisgarh after 9.5 km of marking the border between the states of Odisha and Chhattisgarh.Aasana village is located at the center of jagdalpur and is important as it is located in groove made by indravati river.Aasana shares the coordinates form 19.1087° north and 82.0322° East..This village is sourounded by Palli,Karkapal, Shasankachora, Mangdu Kachora, Halbakachora, Tamakoni, Kalipur, Balikonta, Kondawal, Titirgaon and Ghatpadmoor



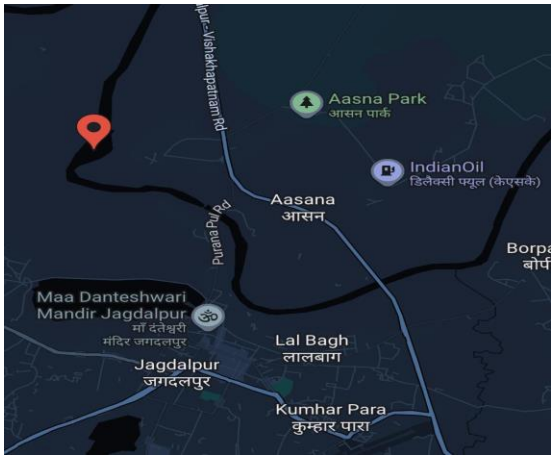


Fig.1 Map; Aasana village

MATERIALS AND METHODS

12 Water samples were gathered from Borewell, Tap water, pond water and River water and stored in glass or plastic bottles based on the req uirements.

After being put in a thermocol box, the samples wer e delivered to the lab in less than two hours after the y were collected.Eight months were spent collecting samples, with five of those months January,Februar y,march, April and May in 2023-2024 which is classified as pre-monsoon and the remaining ,September, October, November and December as post-monsoon.

Samples were taken at a specified time of day each month in order to minimize mistake. Total of 10 parameters were considered for analysis. Details of methods used for every parameter are given in the table 1. The observations were interpreted by using standard provided by Bureau of Indian Standards (BIS). In case where BIS standards were not available, WHO/CPCB standards were considered for interpretation.

Table 1: Sampling Site

S/no.	Sample no.	
1	N-1-A	Borewell
2	N-1-B	Tap water
3	N-1-C	Pond water
4	N-1-D	River water

Table: 2 Parameters Analysed

Parameter	Method used
Temperature	Thermometer
pH	Digital pH meter
DO	Wrinkler's method, Microbiological titration
BOD	Microbiological titration
COD	Wrinklers method
TDS	TDS meter
Turbidity	Nephlometric using Digital turbidity meter
Alkalinity	Volumetric Titration
Chlorides	Volumetric Titration
Hardness	Comploxometric Titration

Table.2 Chemical parameters of Various water samples in Asana during Pre monsoon 2023-2024

Parameter	Minimum	Maximum	Mean	SD	CV %
pH	6.94	9.05	7.74	0.64	8.25
EC (dS/m)	0.06	0.25	0.13	0.05	37.1
TDS(ppm)	254.2	378.2	302.75	30.89	10.2
HCO3-(meq/l)	0.735	6.66	2.69	1.41	52.24
Ca(meq/l)	0.8	4.2	2.11	0.83	39.3
Mg(meq/l)	0.4	1.45	0.84	0.32	38.45
Na(meq/l)	0.17	0.43	0.26	0.06	23.75
K(meq/l)	0.06	0.14	0.1	0.02	16.53
SO 2-(ppm)	0.3	3.25	0.92	0.63	68.92
NO3-(ppm)	0.56	18.35	5.68	4.87	85.72
Cl(ppm)	1.9	19.06	9.16	5.1	55.69

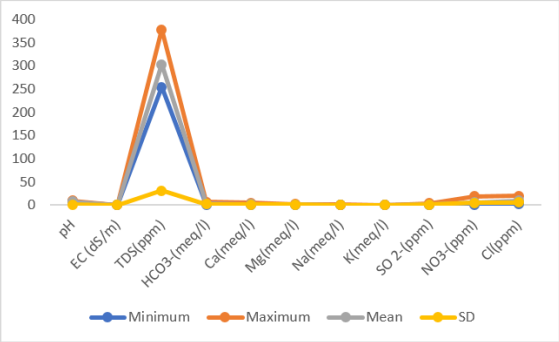


Fig. showing parameters

RESULTS AND DISCUSSION

All the water samples temperature ranged from 19 to 23 degrees Celsius during the post monsoon season, whereas it increased by about 5 degrees on average during the pre-monsoon season. The water's pH ranged from 7.1 to 8.1 over the observation period. Premonsoon season pH values were on the higher end of the scale. It was discovered that water samples dissolved oxygen content was within acceptable bounds. It was observed that there was a positive association between the amount of dissolved oxygen in the water and the temperature during the premonsoon season. In contrast to the pre-monsoon season, the biological oxygen demand was higher during the post-monsoon season. The range of the chemical oxygen demand was six to eight. COD was also found high in monsoon season. For the entire nine months, the water's alkalinity remained within acceptable ranges; but, in the post-monsoon season, it was comparatively high. For the chlorides, a similar pattern of observation was seen. In comparison to the post-monsoon season, the values of total dissolved and suspended solids in the water were comparatively higher during the pre-monsoon season. The water of bore well had low turbidity during the pre-monsoon season, but it was still transparent. mostly as a result of high total solids levels. In both seasons, the water's hardness was within permissible bounds; however, in the pre-monsoon season, the hardness measurements nearly approached the permitted limit. The mean and standard deviation of each parameter were evaluated in order to gain a better knowledge of the average fluctuation and variance in monthly values. In order to comprehend the range of variations, the highest and lowest values were recorded. The average water temperature was found to be about 24 °C, with maximum and minimum values recorded at 29.7 °C and 19.3 °C, respectively. The standard deviation of the average pH was 0.39, suggesting a somewhat alkaline state. BOD readings remained largely constant over the course of two distinct seasons, although DO and COD levels in the water changed significantly. Five parameters—alkalinity, chlorides, TDS, TSS, and hardness—showed extremely high deviations in values, even though each month's readings fell inside legal bounds.

CONCLUSION

For most of the monitoring period, all metrics of water samples of Aasana were within acceptable levels. In a few months, only elevated TdS was seen in pond . water a result of swimming and other human activities that disturb the water. Wind and other natural elements also had a part in the high TSS. The lack of human activity around the River and pond during the post-monsoon season was mostly due to less requirement for water by the common people in the immediate post-monsoon period. Only after September water is needed for irrigation. We may conclude that All the water Samples of Aasana village is of a high enough quality to be used for agriculture and other works inspite of being located in the groove of intravati river.

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