

EVALUATION OF WATER QUALITY PARAMETERS DURING TAJIA VISARJAN OF MUHARRAM FESTIVAL IN MEWAR REGION

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ABSTRACT

In this paper, an attempt has been made to examine the water quality in Rajasthan's Mewar region during Muharram. The study on water quality assessment during Muharram in Rajasthan includes sample collections from Udaipur, Bhilwara, Chittorgarh, and Rajsamand, which are all in the Mewar region. Samples were taken a day before, after, and during immersion in all four districts to compare the effect of Tajiavisarjan on Muharram on diverse water resources in the Mewar region. pH, COD, BOD, DO, Conductivity, Turbidity, TDS, and heavy metals Zinc and Iron are among the parameters investigated. In the water of Chittorgarh district, the greatest value and change in pH and turbidity were observed. Rajsamand district, on the other hand, has the highest value and fluctuation in conductivity, TDS, and COD. Udaipur recorded the highest levels of DO, BOD, and heavy metals, as well as the greatest variance in turbidity.

Keywords: BOD, DO, COD, TDS, Heavy metals.

INTRODUCTION

Water is commonly recognized as a symbol of life because it is so important for maintaining an environment and ecosystem that allows all kinds of life to thrive. It is critical not just for meeting basic human needs for life and health, but also for socioeconomic development.

Drinking water, domestic activities, livestock, agriculture, industries, power generation, and other uses are all increasing to meet the demands of an ever-increasing population, as well as to meet the increased per capita requirement due to increased human activities such as festivals, industrial waste dumping, and other unplanned activities.

Because of limited fresh water availability, irrigation, the largest water sector, is under the strain of rising demands all over the world. On the other hand, the necessity to boost agricultural productivity, for which water is also a crucial input, in order to meet the growing

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population's food and fibre requirements, is equally important. As a result of different anthropogenic activities, our natural resources are dwindling day by day. The impact of diverse religious activities on our region's water resources is numerous, intense, and serious. During numerous holidays, people used to drop holy items and flowers into water bodies due to religious convictions and beliefs. Sacred material remains are frequently seen floating on the surface, producing an unsightly scene. Water quality study of several surface waters in Rajasthan's Mewar region, comparing four districts: Bhilwara, Rajsamand, Chittorgarh, and Udaipur. Everyone in Rajasthan is aware of the challenge of water supply and quality. As a result, it is critical to keep an eye on the contamination of water reserves and to monitor them by analysing their quality on a regular basis. Religious activities in or near water bodies harm them and make them more contaminated with hazardous substances, resulting in pollution.

STUDY AREA

Mewar is a region of Rajasthan, India, located in the south-central part of the country. It covers the present-day Rajasthan districts of Bhilwara, Chittorgarh, Rajsamand, Udaipur, Pirawa Tehsil of Jhalawar District, Madhya Pradesh's Neemuch and Mandsaur, and parts of Gujarat. Rajputs dominated over the region for generations. During the British East India Company's rule in India, the princely state of Udaipur arose as an administrative unit and lasted until the end of the British Raj. The Mewar region is bordered on the northwest by the Aravali Range, on the north by Ajmer, on the south by Gujarat and the Vagad region of Rajasthan, on the southeast by the Malwa region of Madhya Pradesh, and on the east by the Hadoti region of Rajasthan.



Figure 1: Mewar region

Sampling locations

The samples were taken from Udaipur, Bhilwara, Chittorgarh, and Rajsamand, and were serially numbered 1, 2, 3, and 4 on the day before immersion, during immersion in water bodies, and after immersion at the immersion point (series 1, 2, 3). In Udaipur, samples were taken from Pichola Lake, which is located in the city's centre. In Bhilwara, samples were taken from the Meja River. Samples 3 and 4 were taken from the Gambhiri River in Chittorgarh, while the last sample point was the Rajsamand River in Rajsamand.

Sampling Technique and Analysis

Four locations in four Mewar districts were chosen for the assessment of water quality during the Muharram festival. The samples were obtained using a conventional manner in sterile polypropylene vials. The sample location and sampling coding are displayed in a graph or table. Physiochemical parameters like pH, turbidity, TDS, conductivity, DO, and BOD were assessed using the HACH handheld portable multi parameters. Heavy metals were examined using the ECIL 4139 AAS. The table summarizes the analysis methodologies in detail.

Table 1: Sample analysis methods

S.No.	Parameters of water analysis	Method employed
1	pH	Hand Held multi parameter HACH
2	Turbidity	Nephelometric
3	TDS	Handheld multi parameters HACH
4	Conductivity	Hand Held multi parameter HACH
5	DO	Hand Held multi parameter HACH
6	BOD	Hand Held multi parameter HACH
7	COD	Titrimetric
8	Zn	AAS ECIL 4139
9	Fe	AAS ECIL 4139

Results and Discussion

The research was carried out in four Mewar districts: Udaipur, Bhilwara, Chittorgarh, and Rajsamand. The greatest value and variation in pH and turbidity (only value) were observed in the water of Chittorgarh district during the observation.

On the other hand, Rajsamand district has the highest conductivity, TDS, and COD (DO fluctuation) values. Udaipur had the highest levels of DO, BOD, and heavy metals, as well as the most variance in turbidity, heavy metals, and BOD, according to the study.

The physiochemical features of surface water from various sites were investigated, as depicted in the various column figures (2-6). Udaipur, Bhilwara, Chittorgarh and Rajsamand have been assigned the numbers 1,2,3,4 for samples gathered from four districts, and samples obtained before, during, and after Pratima's immersion are represented as series 1, series 2, and series 3. Figure:2 - The pH values observed in the Mewar region throughout the investigation were within acceptable limits, ranging from 7.33 to 8.27. The recommended pH range for

drinking water is 6.5 to 8.5, therefore water from any site is safe to drink. After immersion in Chittorgarh there was a slight shift in pH.

The pH value dropped, indicating that some acidic item had been put to the water reservoir.

The pH of one sample increased, whereas the pH of another sample increased.

Turbidity ranged from 1.4 to 6.3 NTU in figure 3. Turbidity is caused by suspended materials that is colloidal and highly finely dispersed, such as clay. Turbidity is also caused by particles scattered as a result of solid waste disposal. Udaipur has the least turbulence, whereas Chittorgarh has the most. Udaipur also has the most variation following immersion.

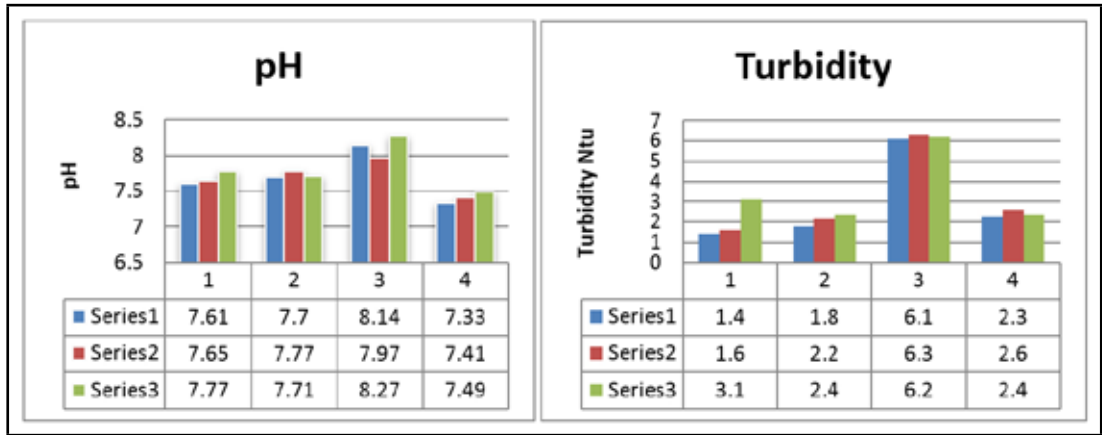


Figure 2: pH value of water sample

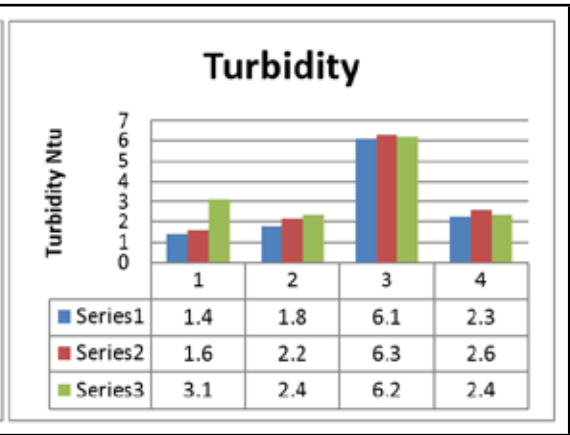


Figure 3: Turbidity

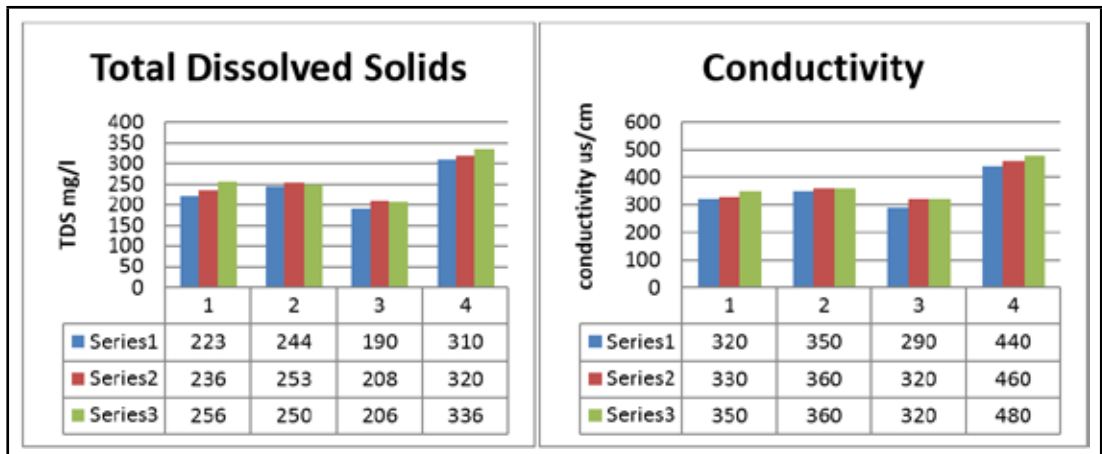


Figure 4: TDS

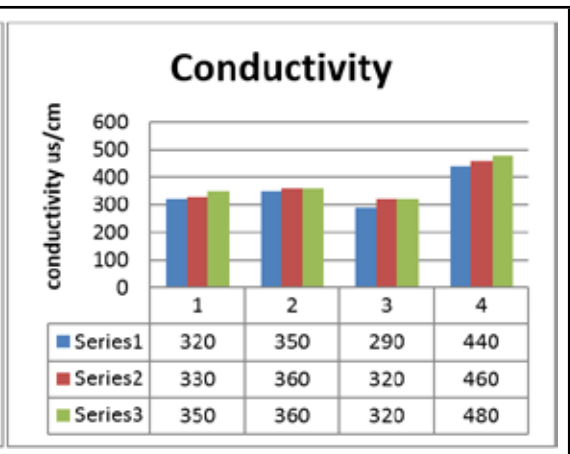


Figure 5: Conductivity

Figure 4: TDS levels ranged from 190 to 336 mg/L, with the highest value at Rajsamand indicating that more particles dissolved during the immersion of the Tajia. In Chittorgarh, the lowest result of 190 mg/l indicates that there are fewer dissolved particles in the water reservoir due to immersion. After the immersion of Holy Pratima, the TDS in the Udaipur

district changed dramatically.

Figure 5: shows the conductivity of water, which ranges from 290 to 480 ms/cm, with the lowest value in Chittorgarh and the highest in Rajsamand. Conductance measurements have no bearing on the quality of water for drinking. Rajsamand district has the greatest difference in conductivity.

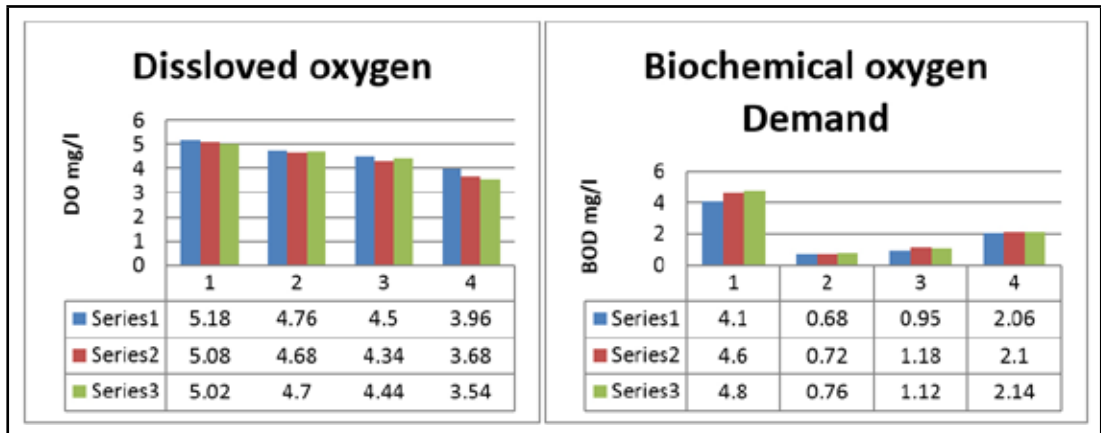


Figure 6: Dissolved Oxygen

Figure7: BOD

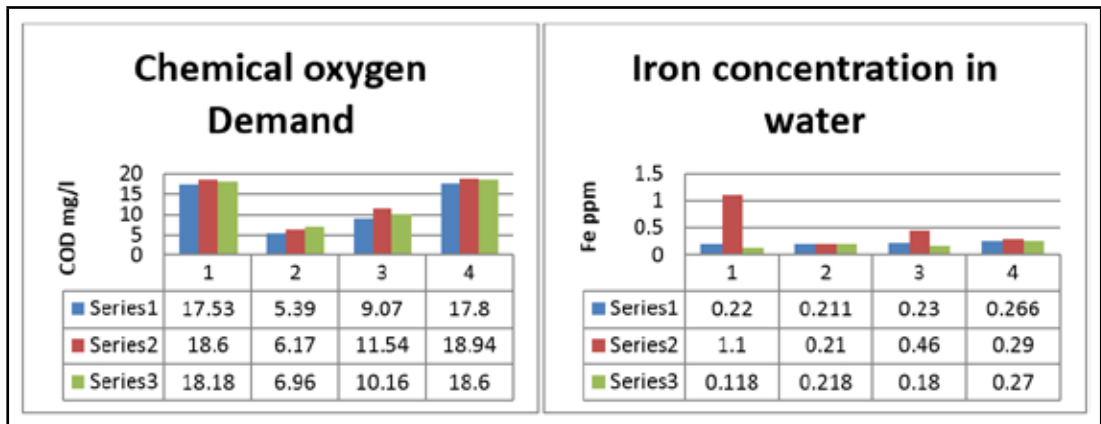


Figure 8: COD

Figure 9: Iron Concentration

Figure 6: The maximum value of DO in all regions during the investigation ranges from 3.54 to 5.18 mg/l. Low DO indicates that water bodies are mildly polluted as a result of waste generated by religious activities in water resources. Udaipur's maximum DO value of 5.18 mg/l indicates that its water is better suited for aquatic life or fish than other reservoirs. The value of BOD, which stands for bio-oxidisable organic material, was determined to be between 0.68 to 4.8 mg/l in figure 7. It is obvious that the water is slightly contaminated by organic garbage. In Udaipur, the variation in BOD was found to be the greatest. Chemical oxygen demand ranged from 5.39 to 18.94 mg/l in figure 8. The presence of chemically oxidisable

inorganic and organic materials in the water at Rajsamand and Udaipur was demonstrated by high COD levels.

In Rajsamand, the most variance was discovered. Figure 9 shows that the concentration of heavy metals rose as a result of Muharram Pratima immersion, with the greatest change occurring in Udaipur, where iron content climbed to 1.10 ppm from 22 ppm. The presence of high levels of iron in Udaipur’s water indicates that the water body has been extensively contaminated.

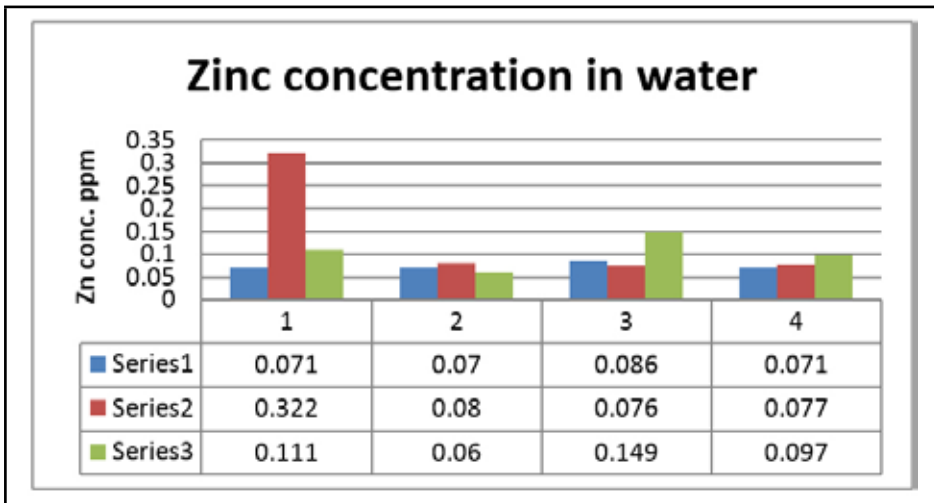


Figure 10: Concentration of Zinc

Zinc contamination levels ranged from 0.06 to 0.322 ppm in Figure 10. The highest concentration was in Udaipur, while the lowest was in Bhilwara. The water in Udaipur varies the most. The water in Chittorgarh district had the highest value and variation in pH and turbidity (only value), while the water in Rajsamand district had the highest value and variation in conductivity, TDS, and COD (DO variance). Udaipur had the highest levels of DO, BOD, and heavy metals, as well as the most variation in turbidity, heavy metals, and BOD, during the examination.

CONCLUSION

Human religious activities have a wide range of negative effects on the region’s water resources, which are several, severe, and serious. Due to their opinions and beliefs, people pour sacred artifacts and flowers into water bodies during holidays. Aquatic life and fish are exposed to a number of harmful substances and other concerns as a result of this method of inoculating various metals into water bodies. As a result, it is critical to keep an eye on various hazardous impurities in water in order to achieve the goal of integrated, efficient, environmentally and financially sustainable development and management of the region’s scarce water resources, while also ensuring that every drop of water is used optimally through water conservation, increased distributional efficiency, and the use of water-saving devices and practice.

The water sector would then drive the state’s economic growth.

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