Water Quality Assesment During Durga Puja (Murti- Visarajan) in Hadoti Region of Rajasthan

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***Abstract*—Water is a basic human need, a finite life support system and a key to prosperity. Unplanned industrialization, urbanization and impact of liberalized import of wastes intended for recycling have negatively affected the water environments in India. This is further exaggerated by lack of discipline and a weak obligation towards conservation and pollution prevention. Since water contamination of a growing city is always in the rising trend, its effect on the environment must be studied thoroughly and regularly. Considering the above factors an attempt has been made to assess the water quality of Hadoti region of Rajasthan during Durga-Puja (Murti-visarjan). The study on water quality assessment during Durga-puja in Rajasthan comprises four district of Hadoti Region including Kota, Baran, Jhalawar and Bundi. To compare the effect of Murti-visarjan on Durga-Puja at various water resources of Hadoti region sample has collected a day before, after and during immersion in all four districts. The parameters studied in study are pH, COD, BOD, DO, Conductivity, Turbidity, TDS and Heavy metals Zinc and Iron. During the observation the maximum value and variation in Ph, and turbidity (only value) noticed in the water of Jhalawar district, on other side maximum value and variation in conductivity, TDS and COD (DO variation) found in Bundi district the ancient center of Hadoti region. During the study the maximum value of DO and BOD and Heavy metals recorded in Kota, while maximum variation in turbidity noticed in Kota.**

***Keywords*—Surface Water analysis, Quality Parameters, BOD, DO, COD, TDS, Heavy metals.**

I. INTRODUCTION

Water is universally accepted as a symbol of life as it is the most crucial for maintaining an environment and ecosystem conducive to sustaining all forms of life. It plays a vital role not only in fulfilling basic human need for life and health but in socio-economic development also. The demands for drinking, domestic activities, livestock, agriculture, industries, power generation and other uses are all increasing to meet the requirements of increasing population and also to cater for the enhanced per capita requirement due to rise in various human activities like festivals industrial waste dumping, unplanned Irrigation, the largest water sector, is feeling the pressure of increasing demands all over the world because of limited fresh water availability. On the other hand the need to increase agricultural production, for which also water is the most critical input, to meet the food and fiber requirement of increasing population is equally important. While our natural resources depleting day by day either by various anthropogenic activities. The problem due to various religion activates by human to our water resource in the region is many, acute and serious. Due to religious convictions and belief people use to dump holy material and flower during the various festivals in to water bodies. Remains of holy material are often seen floating on the surface creating ugly scene.

The Present study focus on the quality assessment of various surface water bodies of Hadoti region of Rajasthan which comprises four districts Baran, Bundi, Jhalawar and Kota.The problem of water availability and quality in Rajasthan is known to everyone. So it is very important and necessary to keep eyes on contamination of water reserve and monitor them by assessing quality time to time. Religious activities in or near to water bodies making them more contaminated with hazardous impurities, and it make water reservoir more polluted and result in killing of aquatic life, fishes etc. This paper analyzes the various types of hazardous contamination and variation in physicochemical parameters of water reservoir of Hadoti.

II. MATERIAL AND METHODS

Study area- Hadoti region of Rajasthan (India).

Hadoti being rich in its natural and cultural heritage, has supporting prehistoric civilization which has its marks in the form of series of rock shelters and cave painting dating back 5000 BC.it lies between 23C^0 45 to 25 C^0 53 N latitudes and 79 C^0 09 to 77 C^0 26 longitudes, with a total area of 24156.6 Sq. KM and is 300 M above M.S.L. the geographical environment is basic determinant of its socio-economic, cultural activities.

Figure-1 – Hadoti region

The Hadoti region consists of several districts of Kota, Baran, Jhalawar, and Bundi, as shown in map of Rajsathan. Geographical boundaries also are quite significant. The Hadoti region is surrounded on the western side by the Mewar region of Rajasthan and on the south by the Malwa region of Madhya Pradesh state. The origination of the Hadoti region has got a significant story to back upon. The name of the region has been taken up from the Hada Rajputs, which comprises a branch of the Chauhan Rajput clan. As early as the 12th century, these Hada Rajputs migrated into the Hadoti region. Hada Rao Deva, a member of this Hada Rajputs group, occupied Bundi in the year 1241 and also Kota in the year 1264. In the Hadoti region, there is Kota, which had gained its status as an independent state in the year 1579. Similarly Jhalawar became separate state in the year 1838. Hadoti is a treasure house of art and sculpture. Some of the archeological wonders are found in the temples that are situated in every nook and corner of it. Bundi is an important city bearing witness to some of the striking artistry. It is located in a narrow encompassing gorge.

III. SAMPLING LOCATIONS

The samples were collected from Kota, Baran, Jhalawar, Bundi serially named as 1, 2, 3, 4, these were collected from all four sampling location as day before immersion, during the immersion in water bodies and after the immersion at immersion point (series1, 2, 3).In kota the sample are taken from kishoretaal situated in the heart of city, second sample point is Baran where sample are taken from Parvati river. Sample 3 belongs to Jhalawar where the extract taken from NayaTalab, and last sampling point from Bundi is Jeetsagar situated in vicinity of city.

IV. SAMPLING TECHNIQUE AND ANALYSIS

For assessment of water quality during Durga-Puja in Hadoti region four locations of four districts of Hadoti region chosen. Samples were collected in sterilized polypropylene bottle using standard method. Sampling location and respective sampling coding is giving is shown in graph or in table. Physiochemical parameters such as Ph, Turbidity, TDS, conductivity, DO, BOD were analyzed by using handheld portable multi parameters of HACH. While heavy metals were analyzed by using AAS of ECIL 4139.details of analysis methods are summarized in table.

Table .1-Sample analysis methods

S. No.	Parameters	Equipment and Method
1-	Ph	Hand Held multi parameter HACH
2-	Turbidity	Nephelometric
3-	TDS	Handheld multi parameters HACH
4-	Conductivity	Hand Held multi parameter
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

V. RESULTS AND DISCUSSION

This paper is an attempt to analyze the water quality of various water bodies of Hadoti region of Rajasthan during Durga-puja. Water samples were collected from 4 sampling stations of Hadoti region.The study has been carried into four district of Hadoti region Kota, Baran, Jhalawar and Bundi. During the observation the maximum value and variation in pH, and Turbidity (only value) noticed in the water of Jhalawar district, on other side maximum value and variation in conductivity, TDS and COD (DO variation) found in Bundi district the ancient center of Hadoti region. During the study the maximum value of DO and BOD and Heavy metals recorded in Kota, while maximum variation in turbidity, heavy metals, BOD noticed in Kota.

The physiochemical characteristics of surface water of different location were analyzed and shown in different column charts. Samples are collected from four district are assuming as 1,2,3,4 serial wise Kota, Baran, Jhalawar, Bundi and sample taken as before, during and after immersion of Pratima are represented as series 1, series 2, series 3.

Chart.1- pH value.

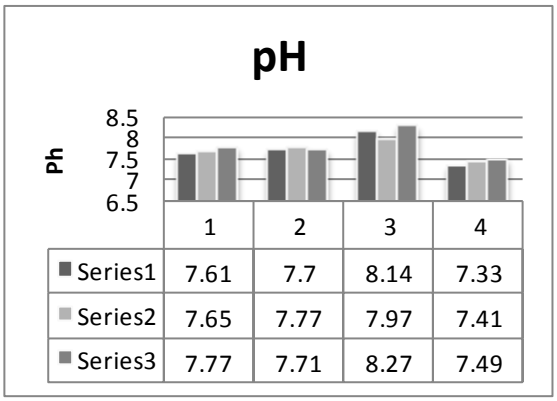


Chart.2-Turbidity

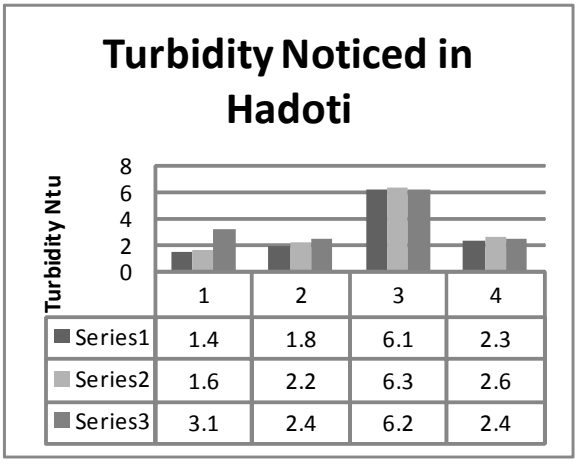


Chart.3-TDS

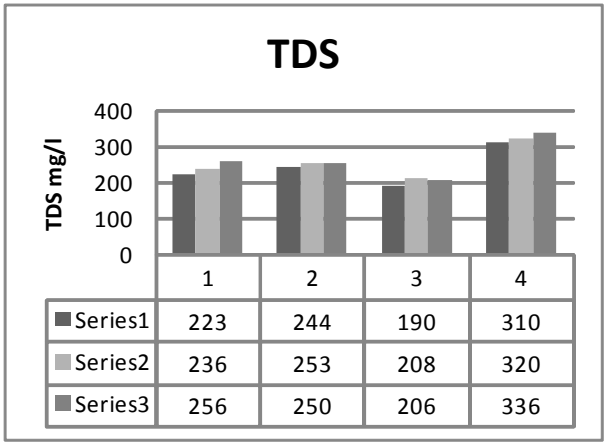
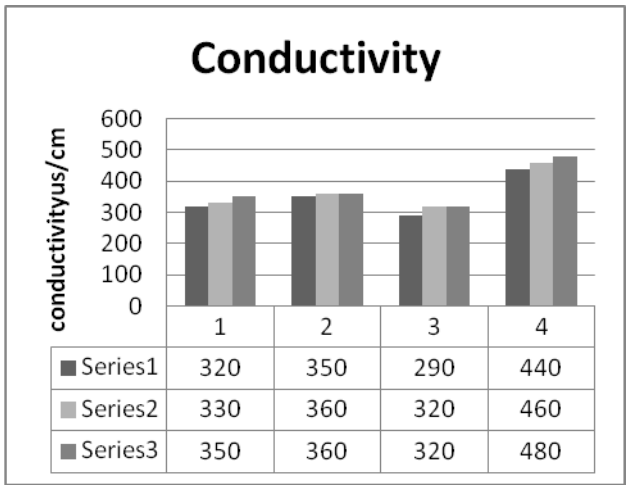


Chart.4-Conductivity



1- The pH value (Chart-1) noticed in Hadoti region during study were in permissible limit and value are varied from 7.33 to 8.27.the acceptable limit of Ph value of drinking water is 6.5 to 8.5 so it's clear that water of all location is able to drink. Slight change recorded in Ph value after immersion in Jhalawar the Ph value down which shows that some acidic material added in water reservoir; in other sample the pH increases.

2- Turbidity ranged from 1.4 to 6.3 NTU, turbidity is due to colloidal and extremely fine dispersion suspended matter such as clay contributes to turbidity. Particle dispersed due to solid waste disposal also contributes to turbidity. Least turbulence found in Kota while maximum value in Jhalawar, maximum turbulence variation after immersion found in Kota.

3- The values of TDS were ranged 190 to 336 mg/, the maximum value in Bundi showed that more particles dissolved to immersion of Devi statue. The lowest value 190 mg/l in Jhalawar shows the less amount of dissolved particle in water reservoir due to immersion, major variation in TDS after immersion of Holy Pratima observed in Kota.

4- The conductivity of water observed Between 290 to 480 us/cm, the lowest recorded in Jhalawar and maximum found in Bundi district. The values of conductance do not affect water quality for drinking purpose. Maximum variation in conductivity also noticed in Bundi district.

Chart.5- Dissolved Oxygen

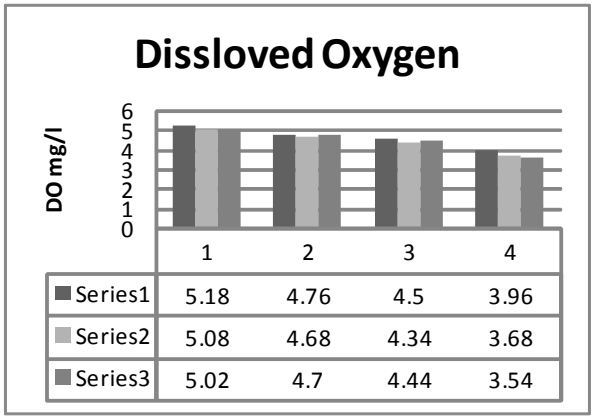


Chart.6-BOD

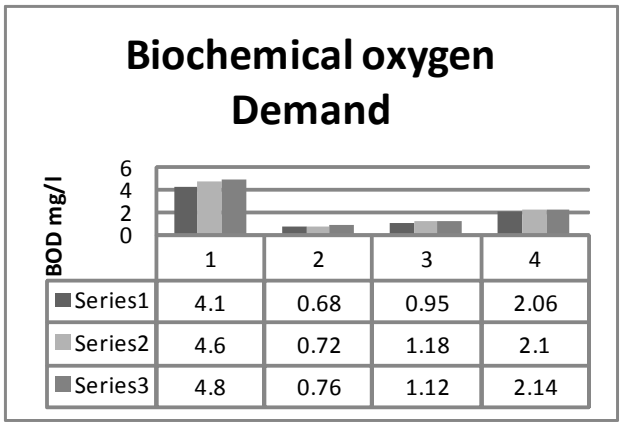


Chart.7-COD

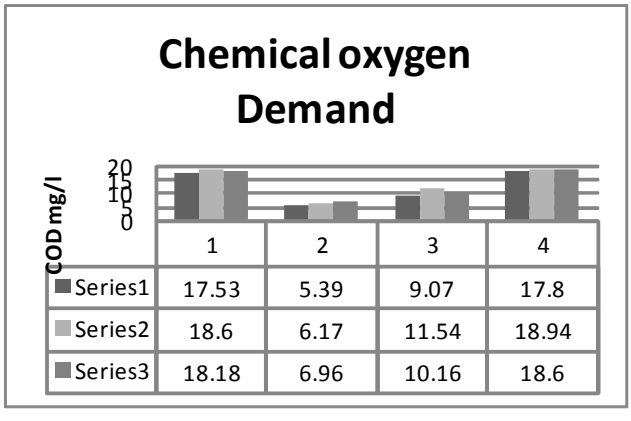
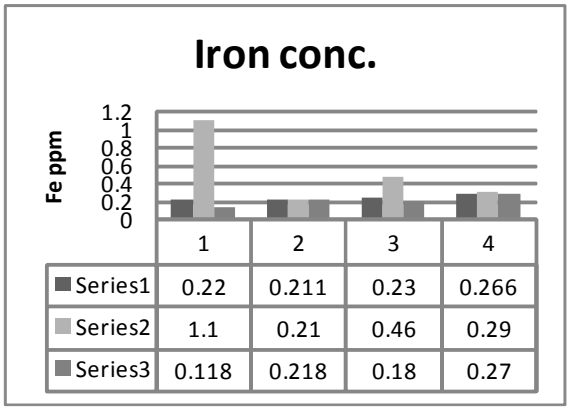


Chart.8- Fe Concentration



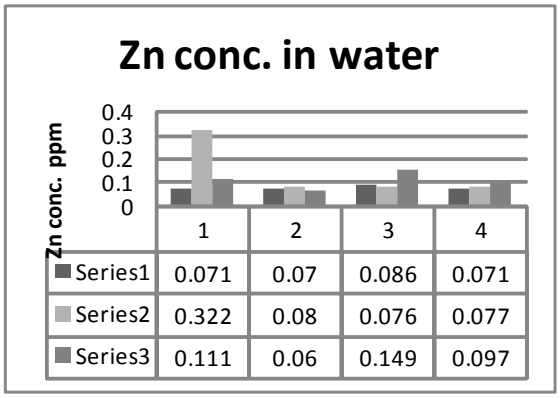
5- During the study the maximum value of DO in all region range between 3.54 to 5.18 mg/l comparative low DO indicate the mild pollution in water bodies due to waste generated by religious activities in water resources. The maximum value of DO 5.18 mg/l in Kota shows that this water is more suitable for aquatic life or fishes than other reservoir, variation measured in Bundi district.

6- Value of BOD which is sign of Bi Oxidisable organic material found in the range of .68 to 4.8 mg/l. where it's clear that water is slightly polluted with organic waste, In Kota value and variation in BOD found Maximum.

7- Chemical oxygen demand was ranging from 5.39 to 18.94 mg/l, high values of COD at Bundi and Kota showed that water was contaminated with chemically oxidisable inorganic and organic matter, here maximum variation found in Bundi.

8- The concentration heavy metals found increase due to immersion of Durga-Pratima and the maximum variation noticed in Kota where iron concentration increased due to immersion at level of 1.10 ppm from .22 ppm. Sudden high level of iron in water of Kota shows the immersion of Pratima contaminated the water body at rapid rate.

Chart.9- Concentration of Zinc



9- The Zn contamination also change and recorded between .06 to .322 ppm maximum in Kota while lowest in Baran, maximum variation also noticed in water of Kota. During the observation the maximum value and variation in pH, and turbidity (only value) noticed in the water of Jhalawar district, on other side maximum value and variation in conductivity, TDS and COD (DO variation) found in Bundi district the ancient center of Hadoti region. During the study the maximum value of DO and BOD and Heavy metals recorded in Kota, while maximum variation in Turbidity, Heavy metals, BOD noticed in Kota.

VI. CONCLUSION

The problem due to various religion activates by human to our water resource in the region is many, acute and serious. Due to religious convictions and belief people use to dump holy material and flower during the various festivals in to water bodies. Remains of holy material are often seen floating on the surface creating ugly scene. This type of inoculations of various metals into water body introducing various types' hazardous diseases and many other problems to aquatic life and fishes. So It is very important to keep eyes on various hazardous impurities in water and achieve the objective of integrated, efficient, environmentally and financially sustainable development and the management of the scarce water resources of the region and at the same time ensure optimal utilization of every drop of water, through water conservation, increased distribution efficiency and use of water saving devices and practices leading to an efficient, scientific, innovative, transparent and responsive. The water sector would then be able to accelerate economic growth of the state.

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