

Deterioration of Water Quality Due to Idol Immersion in Gandhari River in Aurangabad District, Maharashtra

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ABSTRACT

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India is a country of different cultural and religious festivals. In this, Ganesh Chaturthi and Durga Puja is celebrated all over India, in which idol immersion in water. There are several types of heavy metals in the making of the idol such as Mercury, Cadmium, Arsenic, Zinc, Chromium and Lead, not just using these metals but non-biodegradable materials and synthetic paints also used for making these idols are harmful for environment and aquatic life. The present study has been made to analyze the physicochemical parameters of the Gandhari River after idol immersion from Kannad Tehsil and nearby places for analyzing the various physicochemical parameters such as Temperature, pH, TDS, BOD, DO, Phosphate, Nitrate, COD, Oil and Grease, etc. In this study focus on the condition of River water before and after idol immersion and observe the quality of water with respect to water parameter.

Keywords: Physico-Chemical, Idol, pH, TDS, BOD, COD etc.

I. INTRODUCTION

Water pollution is a serious worldwide problem. It occurs when pollutants are flow out directly or indirectly into water bodies without any treatment to remove harmful contains. Water supports life on earth and around which the entire fabric of life is woven. The requirement of water is in all lives, *i.e.* from micro-organisms to man, is a serious problem today because all water resources have been reached to a point of crisis due to industrialization and Manmade activities such as Idol immersion. India is a rich cultural country in which diverse cultural and

religious festivals are organized. Ganesh festival is one of the prominent festivals celebrated by all communities irrespective of their cast creed and religion. Well Crafted and decorated idols are immersed into water bodies like rivers, ponds and lakes. Two major festivals in India that involve idol immersion are 'Ganesh Chaturthi', dedicated to Lord Ganesha and 'Durga Puja' dedicated to Goddess Durga. All type of idol contains Plaster of Paris is not a naturally occurring material and contains gypsum, sulphur, phosphorus and magnesium. The idols take several months to dissolve in water and in the process poison the waters of lake, ponds, rivers and seas.

Gandhari River is located in kannad taluka, Maharashtra. The River is mainly used for drinking and agricultural purpose but BOD values are 6-8 times higher than the permissible levels. On designated days of immersion, devotees assemble to immersion spots at Gandhari River and have to immersion of Ganesha idols. Due to heavy immersions in its water, the condition of dam has further deteriorated. In the current study, water samples were collected at three stages-pre-immersions, during immersion and post immersion and various physico-chemical parameters viz. pH, DO, BOD, COD, Conductivity, Turbidity, TDS, TS were analyzed. This is very essential, as it can help local administration in preparing posters, leaflets, banners etc. for mass awareness programmes.

II. MATERIAL METHOD

A number of religious activities take place every year, which affect the water quality of Gandhari River. The festival of Ganesh idol and Durga immersion is observed once in a year when the large numbers of idols are immersed into the River. Sampling was done from various sites of river. The water samples were collected from the site of idol immersion at different intervals i.e. pre-immersion, during-immersion and post-immersion. Pre-immersion samples were collected a day before the immersion activities. During immersion samples were collected during the immersion activities and post-immersion samples were collected a day after the immersion activities. The samples were related to physico-chemical analysis prescribed by standard methods. The parameters namely alkalinity, dissolved oxygen (DO), total dissolved solid (TDS), conductivity, total hardness, temperature, pH, COD, BOD were under taken. Heavy metals like lead (Pb), Arsenic (As), Zink (Zn), Mercury (Hg), Copper (Cu), Chromium (Cr) were also detected

III. RESULT AND DISSCUSION

Observations are based on the samplings done at various sites of the Gandhari River.

Sr. No.	Parameter	Pre-immersion	During-immersion	Post-immersion
1	pH	7.5	7.3	8.3
2	Temperature(⁰ c)	25	27	29.5
3	Total Hardness(mg/l)	169	186	258
4	Conductivity (μmho/cm)	478	535	545
5	Alkalinity(mg/l)	8.5	230	180
6	DO(mg/l)	3.9	3.75	4.20
7	BOD(mg/l)	527	258	95
8	COD(mg/l)	1625	942	152
9	TDS(mg/l)	376	284	454
10	Lead (Pb)(mg/l)	0.121	0.357	0.158
11	Copper (Cu)(mg/l)	1.45	1.49	0.057
12	Zinc (Zn)(mg/l)	0.039	0.84	0.38
13	Mercury (Hg)(mg/l)	---	---	---

Temperature: Temperature of water showed variation at different sites. Results shows that the temperature raise during and after immersion activities. Minimum temperature recorded was 25⁰C where as maximum temperature as 29.5⁰C.

Total Hardness: Hardness of water determined because it shows that, usefulness of water in different location, hardness noticed comparatively higher during and after immersion activities at all the sites. It was found in the range of 169 mg/l in pre-, while 186 mg/l and 258 mg/l during and post immersion activities respectively for all the sites.

Conductivity: Conductivity is useful for the measure of capacity of solution to conduct electricity. The maximum value was recorded as 545 $\mu\text{mho/cm}$ and the minimum value was found to be 478 $\mu\text{mho/cm}$. Water having conductivity more than 20 $\mu\text{mho/cm}$ is not suitable for irrigation. So the results show that River water is highly polluted by immersion activity.

Alkalinity: The total alkalinity indicates that variation at different sites, ranging from 8.5 mg/l to 230 mg/l. It was higher during and after the immersion activities compare to pre-immersion activity.

Dissolved Oxygen: Dissolved Oxygen in water is of most important to all aquatic life and is considered to be the factor that reflects the biological activity taking place in a water body and determines the biological changes.

Bio-Chemical Oxygen Demand: Biochemical Oxygen Demand (BOD) was noticed comparatively higher in preimmersion activities than it was in during and post immersion activities. It was found 527 mg/l in pre-immersion activities and 258 mg/l and 95 mg/l in during and post-immersion activities at Gandhari River.

Chemical Oxygen demand: COD was noticed comparatively higher in during and post immersion periods at all the sites. It was found 1625 mg/l in pre-immersion activities and 942 mg/l and 152 mg/l in during and post immersion activities respectively. It indicate that water is became highly polluted because of the immersion activities. The maximum permissible limit for drinking water is 150 mg/l.

Heavy Metals : The water samples were also analyzed for the heavy metals and results indicate that Heavy metal Lead (Pb) found higher than its maximum permissible limit of WHO (0.10 mg/l). The concentration of metal in pre-immersion activities was 0.121 mg/l where as it found from 0.357 mg/l and

0.158 mg/l in during and post-immersion activities at Gandhari River. Higher concentration of lead can cause problems in the synthesis of hemoglobin, affects kidney, reproductive system and can damage to the nervous system. Zinc (Zn) was also found in all the samples but it was within the permissible limit. It ranged from 0.039 to 0.84 mg/l. Copper (Cu) was found higher than its permissible limit. It was detected in pre-immersion activities and present in during and post-immersion activities. Copper (Cu) ranged from 0.057 to 1.49 mg/l at all the sites and it is higher than the maximum permissible limit. In all the samples Arsenic (As), Mercury (Hg) and chromium (Cr) were not present in all the site. Presence of Lead (Pb), Zinc (Zn) and copper (Cu) indicate that the River water became polluted because of the immersion activity.

IV. CONCLUSION

The present study investigate that idol immersion on physico-chemical analysis of Gandhari River revealed that idol immersion activity has negative impact on water quality of the river. The total hardness was also reported higher in during-idol immersion. The values of DO are lower than its standard limits which indicates harmful impact of immersion activities. BOD, COD has shown an increase during and after immersion of idols. This traditional activity cannot stop but awareness among the people and proper method we can use for idol immersion can be carried out without harming the environment and aquatic life. Some unique and new methods should be use to make eco-friendly idols, like using natural colours, immersion in small man made tank etc. which can solve this water pollution problem by using few above technique.

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