



Environmental Impact of Idol Immersion on Tapti River of Multai, Distt. Betul, MP, India

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Abstract

The Immersion of Idol of Lord Ganesh and Durga during Ganesh Utsav and Navratri festival is a major cause of contamination of Tapti River Betul, which originates from the kund popularly known as Tapti pond. Idols are made of clay alongwith non bio-degradable thermocol and paints containing heavy metals and other toxic compounds. The immersion practices resulted in degradation of water quality apart from siltation. The parameters like turbidity, total hardness, chemical oxygen demand (COD), bio-chemical oxygen demand (BOD), dissolved oxygen (DO), oil and grease have been studied in Tapti ponds of Multai to assess the impact of idol immersion on water quality of the pond and subsequently on the river. Parameter like turbidity, dissolved oxygen (DO), bio-chemical oxygen demand (BOD) and chemical oxygen demand (COD) depicted higher values after immersion of the idols.

Keywords: Contamination, Idol immersion, pond ecosystem, water quality parameter.

Introduction

Water is a god gift to all living creatures from unicellular to multi-cellular and from plants to animal on earth. The Quality of water is of vital concerns for human beings, since it is directly linked to human health. However with rapid and unplanned urbanization, the quality of water has significantly deteriorated showing its impact on vital life processes. The impact of rapid urbanization on the water front has become a cause of great concern. Millions of people all over the world particularly in the developing countries are losing their lives every year from various water borne diseases, Number of observations have reported the pollution of water resources¹. Due to anthropogenic activities and population explosion which ultimately resulted in degradation the of water quality.

Generally speaking, water pollution is a state of deviation from pure condition, whereby its normal functioning and properties are affected. The requirement of water is essential in all forms of life, i.e. from micro-organism to man. However availability of pure water now a day has become a serious problem since most of the water resources have attained a point of crisis due to unplanned urbanization and industrialization. It was recognized that mankind, animals and plants, all face a variety of problems arising from various kinds of environmental pollution² like inflow of municipal sewage, agricultural wastes, dumping of solid wastes, immersion of Idols and other religious activities. The idols are made up of Plaster of Paris, clay and cloths, supported by small iron rods and types of paints such as varnish and water colors³. The input of these biodegradable substance cause deterioration of water quality.

Thus, to study the extent of pollution in Upper and Lower ponds of Multai due to immersion of idol of Lord Ganesh and Goddess Durga during Ganesh utsav and Navratris festival, the present study was conducted.

The study deals with the assessment of water quality of Tapti River with special reference to Religious and other activities on water and soil quality of nearby area. The study area is "Tapti Pond" The origin of Tapti River, in Betul district, Madhya Pradesh. River Tapti originates from the kund in Multai (Betul), M.P., which is commonly known as Tapti pond and flows 752 km from Betul (Distt of M.P.) to join Arabian Sea. Tapti pond is the lifeline for Multai because of its religious importance in Multai; a charming town is 50 km south east of Badnur, in Betul district, Madhya Pradesh.

Material and Methods

During present investigation, sampling was done from two sites of Upper pond namely Near Gayatri Temple as A-1 and Near Tapti Temple as A-2 and two sites of Lower pond namely Near Masod Road B-1 and Bhagat Singh Colony, B-2. Water samples were collected from the site of idol immersion at different intervals. Pre-idol immersion samples were collected a week before the immersion activities. During idol immersion, samples were collected at the time of idol immersion activities and Post-idol immersion samples were collected 15 days after the completion of immersion activities. The samples were analyzed for various physico-chemical parameters following the standard methods prescribed in APHA⁴. Oil and Grease was analyzed by Solvent Extraction Method⁵.

Results and Discussion

The results obtained for various parameters are discussed below: **Turbidity:** It was comparatively high during the period of immersion at the station B-1. It was found in the range of 23-30 FAU in pre, while 25-50 FAU and 30-48 FAU in during and post samples, respectively, at both the station (figure-1). The water color is disturbed completely during the idol immersion activities causing high turbidity.

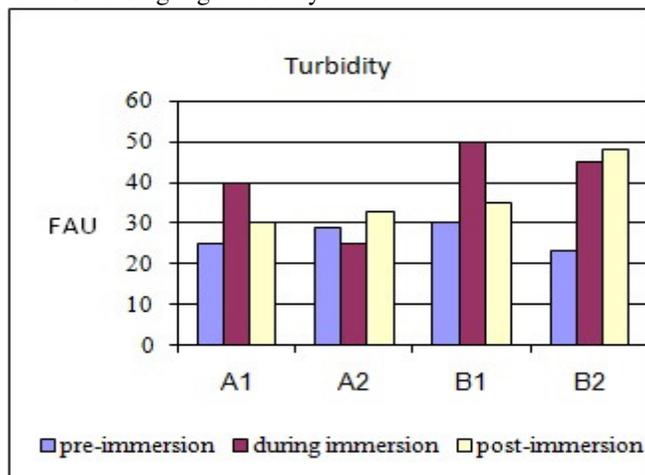


Figure-1

Variation in Turbidity (FAU) at different stations, A-1 Gayatri temple, A-2: Tapti Temple, B1 near Masoad Road, B2 Bhagat singh Ward

Total Hardness: Total Hardness as CaCO_3 was noticed comparatively high in during and in post-period at both the stations. It was found in the range of 35-52 mg/L in pre, while 42-59mg/L and 38-65 mg/L. in during and post samples, respectively, at both the stations (figure-2). The hardness of water is not a pollution parameter but indicates water quality at present in excess quantity.

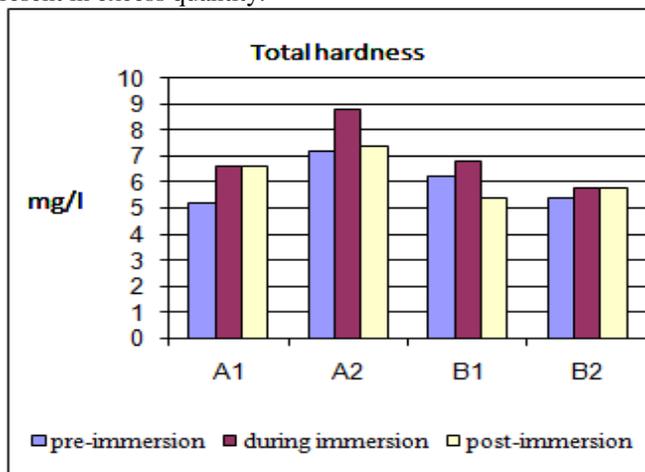


Figure-2

Variation in Total hardness (mg/L) at different stations, A-1 Gayatri temple, A-2: Tapti Temple, B1 near Masoad Road, B2 Bhagat singh Ward

Dissolved Oxygen: Dissolved Oxygen in water is of great importance to all aquatic organisms and is considered to be the factor that reflects the biological activities taking place in a water body as it determines the biological changes. DO was noticed comparatively high in during sample at station A-2. It was found in the range of 5.2-7.2 mg/L in pre, while 5.4-7.4 mg/L and 5.8-8.8 mg/L in during and post samples, respectively, for both the stations. For drinking water DO limit is 6.0mg/L according (WHO, 1968) (figure-3). On account of disturbance in the water column, DO increase at surface layer due to mixing of atmospheric oxygen.

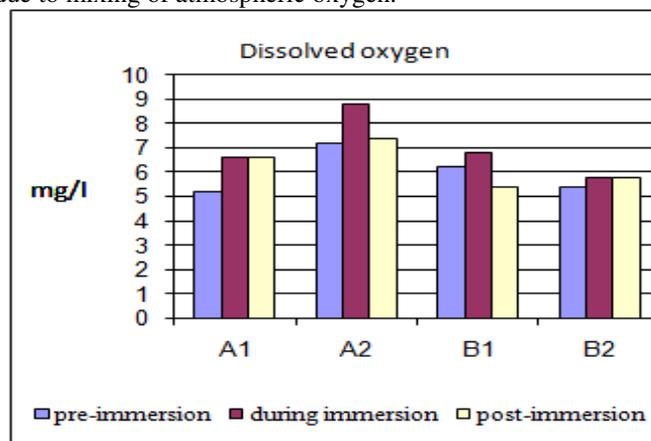


Figure-3

Variation in Dissolved oxygen (mg/L) at different stations, A-1 Gayatri temple, A-2: Tapti Temple, B1 near Masoad Road, B2 Bhagat singh Ward

Biochemical Oxygen Demand: BOD was noticed comparatively high in during and post samples at both the station. It was found in the range of 5.8-6.6 mg/L. in pre, while 5.8-7.4mg/L. and 7.8-9.4mg/l. in during and post samples. The higher values of BOD mean presence of more biodegradable organic material (ICMR, 1975). During the period of study, higher values of BOD that crosses the permissible limits have been observed at both the station.

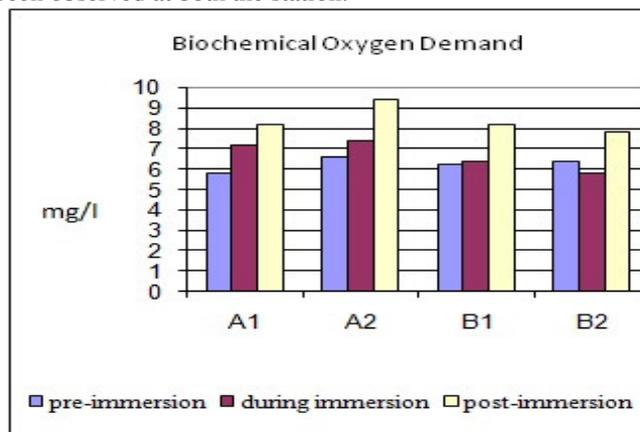


Figure-4

Variation in Biological oxygen demand (mg/L) at different stations, A-1 Gayatri temple, A-2: Tapti Temple, B1 near Masoad Road, B2 Bhagat singh Ward

Chemical Oxygen Demand: COD was noticed comparatively high in during and post samples at both the station. It was found in the range of 26-36mg/L. in pre, while 36-42mg/L. and 44-52 mg/L. in during and post samples (figure-5). Maximum limit of COD for drinking water is 150 mg/L (ISI, 1991).

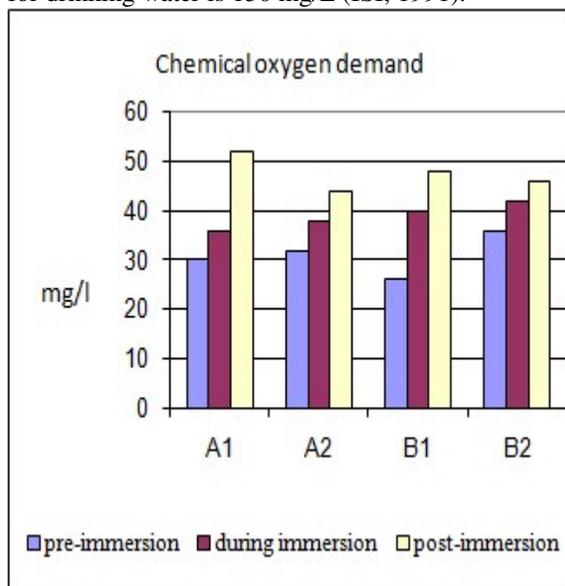


Figure-5

Variation in chemical oxygen demand (mg/L) at different stations, A-1Gayatri temple, A-2: Tapti Temple, B1 near Masoad Road, B2 Bhagat singh Ward

Oil and grease: It was noticed comparatively high in during and post samples at station B-2. It was found in nil mg/L. in pre, while 0.010-0.049 and 0.019-0.065 mg/L. in during and post samples. The permissible limit for oil in boiler feed water is 7 ppm as prescribed by American Boiler Manufacturer's Association (figure-6).

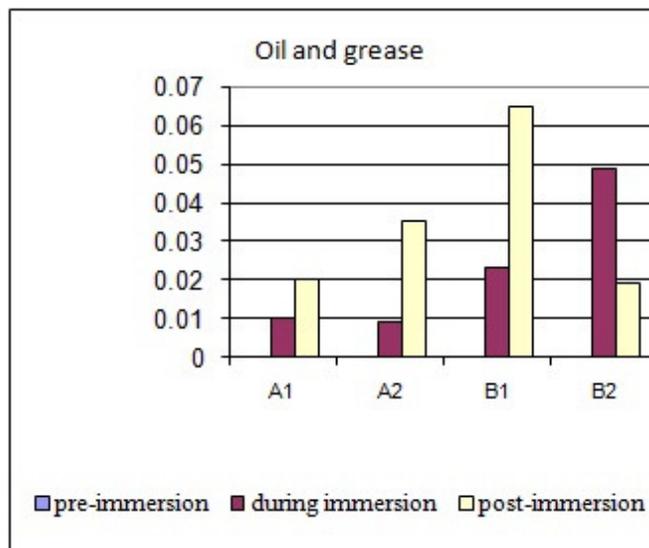
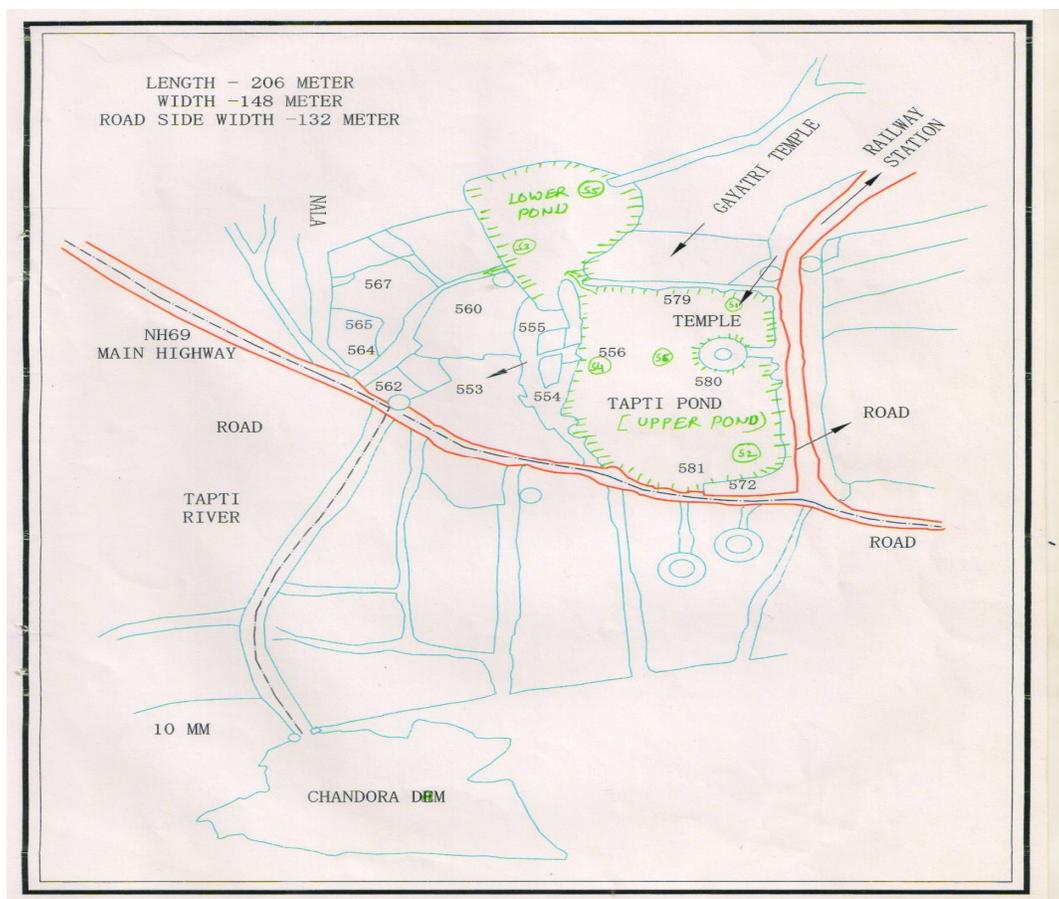


Figure-6

Variation in oil and grease (mg/L) at different stations, A-1Gayatri temple, A-2: Tapti Temple, B1 near Masoad Road, B2 Bhagat singh Ward

Table-1

S.No.	Parameter	Season	A-1	A-2	B-1	B-2
1	Turbidity	Pre-Immersion	25	29	30	23
		During-Immersion	40	25	50	45
		Post -Immersion	30	33	35	48
2	Total Hardness	Pre-Immersion	35	50	48	52
		During-Immersion	57	59	42	50
		Post -Immersion	39	65	38	49
3	Dissolved Oxygen	Pre-Immersion	5.2	7.2	6.2	5.4
		During-Immersion	6.6	8.8	6.8	5.8
		Post -Immersion	6.6	7.4	5.4	5.8
4	Bio-chemical Oxygen Demand	Pre-Immersion	5.8	6.6	6.2	6.4
		During-Immersion	7.2	7.4	6.4	5.8
		Post -Immersion	8.2	9.4	8.2	7.8
5	Chemical-Oxygen Demand	Pre-Immersion	30	32	26	36
		During-Immersion	36	38	40	42
		Post -Immersion	52	44	48	46
6	Oil and grease	Pre-Immersion	Nil	Nil	Nil	Nil
		During-Immersion	0.01	0.009	0.023	0.049
		Post -Immersion	0.02	0.035	0.065	0.019



Conclusion

The physico-chemical status of Lower pond (Multai, M.P. India) with special reference to phosphate and nitrate has also been investigated during the year 2009-2010. Ganpati festival is one of the prominent festivals celebrated by all communities irrespective of cast creed and religion. During the period of investigation, more than 500 idols of various sizes reaching a height up to 5 to 11 feet were immersed in Lower and Upper ponds Multai.

The present study on assessment of idol immersion on physico-chemical characteristics of Bhopal lakes revealed that idol immersion activity has negative impact on water quality of the lake, subsequently on Tapti River.

The values of DO, BOD, COD and oil and Grease have shown an increase in concentration during and after immersion of idols. Similar types of observation were also reported by Dhote et al., 2001 for Upper Lake, Bhopal. The total hardness was also reported higher in post-idol immersion. The input of biodegradable and non-biodegradable substances deteriorated the lake water quality and enhanced silt load in the lake. The floating material released through idols in the lake, after decomposition resulted in eutrophication of the lake.

The quality of water in lower pond has far more deteriorated than that in the upper pond. The lower ponds receive a large amount of raw sewage from its densely populated habitation. The water body is an urban eutrophic pond wherein the amount of nutrient accumulation is very high and frequent depletion of Dissolved Oxygen is very common. The untreated waste water contains effluent rich in phosphate, caustic soda etc. There are various source of phosphate to the pond water, such as firm rock deposit, runoff from surface catchments, and interaction between the water and sediment from dead plant and animal remains at the bottom of the pond. Phosphate is considered to be the most significant among the nutrients responsible for eutrophication of pond, as it is the primary initiating factor. Phosphate enters the pond through domestic waste water, accounting for the condition of eutrophication. Organic enrichment of the pond through floral offerings, idol immersion and decomposition of aquatic weeds are also the significant causes of its eutrophication thus the present study on impact of idol immersion on water quality of Bhopal pond reveals that idol immersion activities have negative effect on water quality of pond. The pollution of this pond is a matter of great concern as it has reached an alarming level due to inflow of large volume sewage and solid wastes.

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