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Effect of mass bathing on the water quality of Narmada river at district Hoshangabad, (M.P.) India

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ABSTRACT

In River Narmada, pollution load increases due to mass bathing, physico-chemical analysis of water clearly indicates that water quality deteriorates and it take longer time to recover the previous water quality through self purification process.The minimum and maximum pH was recorded in the range of 7.20 to 7.61 where the pH value of drinking water standard (6.5 to 8.5). The DO level was observed in the range of 8.20 to 10.2mg/L during study. The values of BOD were found in the range of <1 mg/L to 20 mg/L and COD were found in the range of 6 mg/l to 48 mg/L. Total Coliform were found above the standard limit during and after mass bathing .

Key words: Mass bathing. Water quality, Dissolved oxygen.(DO)

INTRODUCTION

Narmada-the largest west flowing river of India, originates from eastern Madhya Pradesh at Amarkantak (situated at 20°40'N and 80°45' E) flows towards west and joins Arabian Sea. During the festivals, mass bathing is performed by pilgrims, which significantly contributes to the pollution load in the river and as a consequence deteriorated the water quality. The study has been carried out to assess the water quality of river water during mass bathing and to find out the solution to recover the previous water quality.

MATERIAL AND METHODS

The standard method as prescribed in APHA adopted for analysis of river samples during study. The primary conditionings of the samples were carried at the site followed by analysis in the laboratory using various instruments. The following three ghats were selected for the monitoring purpose:

Near Bandhra bhan

This station located at confluence point of Narmada and Tawa and is in the upstream of all the ghats. A very limited pilgrims activity was observed at this station.

Sethanighat

This is the main ghat for pilgrim activity all the major rituals are performed here throughout the year at this place. The water quality at this ghat gets highly disturbed due to pilgrim activities.

Mangalwara Ghat

This ghat is in the down stream of Sethanighat pilgrim activity is less at this location as compared to Sethani ghat.

The water samples were collected from the mass bathing site during Sankranti at different intervals i.e. Pre-mass bathing (11.01.2008), during mass bathing (14.01.2008) and post-mass bathing (16.01.2008).

RESULT AND DISCUSSION

The physico-chemical properties of Narmada river water, as observed during the study course, is stated as follows :

pH

The determination of pH shows the alkaline and acidic nature of the water.. In the present study the variation n pH values of river water was not very significant and it varied between 7.20 to 7.61. Minimum pH i.e. 7.20 was observed at Mangalwara ghat on monitoring during post mass bathing on the occasion of Makar Sankaanti.

Dissolved Oxygen (DO)

DO is the vital parameter to assess the water pollution caused due to organic wastes. Maximum DO was observed at upstream at Bandhrabhan which i.e. 10.2mg/l and minimum DO was found to be 8.2mg/l at Sethani Ghat.The decline in DO at Sethani ghat could be due to consumption of oxygen in decomposition of organic matter present in the water due to various religious activates as well as due to mixing of domestic waste.

Chemical Oxygen Demand (COD)

During the study COD measured in the range of 06 to 48 mg/l. lowest COD was observed at upstream (u/s) near Bandhrabhan which indicates that u/s has not contributed to increase the pollution level of the Narmada river. Maximum COD values i.e. 48mg/l were observed at Sethani ghat which could be due to the influence of mass bathing activity.

Biochemical Oxygen Demand (BOD)

Test of BOD was performed to assess the bio-degradable organic pollution load in water body. BOD results ranged between < 1 to 20 mg/L at the stud site.

Table 1: Water quality of Narmadar river at district Hoshangabad during Mass bathing (Sankaranti)

S.No.	Location	Schedule	pH	DO	COD	BOD	TC
01	Bandra Bhan	Pre-mass bathing	7.39	10.2	06	>1	Nil
		During mass bathing	7.21	10.1	06	>1	Nil
		Post-mass bathing	7.31	9.8	08	>1	Nil
02	Sethani ghat	Pre-mass bathing	7.59	9.5	24	11	8600
		During mass bathing	7.61	8.2	48	20	12500
		Post-mass bathing	7.54	8.8	35	18	9800
03	Mangalwara ghat	Pre-mass bathing	7.42	9.2	16	07	7900
		During mass bathing	7.28	8.5	26	10	9600
		Post-mass bathing	7.20	8.5	21	09	8500

All the values in mg/l and Total Coliform/100ml

Total coliforms

Bacterial pollution was found higher in the river Narmada during the study. Total coliforms values was observed Nil to 12500/100ml. Presence of coliform indicates the water pollution due to mixing of human excreta in the form of sewage etc.

CONCLUSION

On the basis of the study it was observed that due to mass bathing at river, organic pollution load is increased and it affects the water quality and ecosystem adversely in down stream area**.** Bacterial pollution also makes water unfit for drinking and bathing purpose.

Recommendations

On the basis of this study following recommendations are proposed to improve the River water quality.

- Due to mass gathering and improper sanitation facilities, the human excreta and other waste increase the Coliform numbers alarmingly. There is need to educated the people through mass awareness programs for bringing the awareness among the common citizens about water pollution and its possible impact on the environment and mankind.
- Washing of cloths and vehicles, bathing of cattle and other such activities should be stopped at bank of the river to reduce the water pollution.

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