

Assessment of Water Quality of River Kshipra during Simhastha Mahakumbh Mela 2016 in Ujjain, Madhya Pradesh

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Abstract

Water is the most vital thing in the world, without which we can't survive. Indian civilization mostly started at the banks of river; therefore rivers are considered to be sacred. There are various reasons to water pollution as industries, urbanization, improper agricultural practices, water withdrawal, religious and social activities. Kumbhmela is one of the most religious event regarding ritualistic activity. It is one of the biggest hindu festivals which occur on river at four different places. Ujjain is the place where Kumbhmela occurs in every twelve years on Kshipra River. The present study is carried out to assess the impact of mass bathing on water quality of River Kshipra during Kumbhmela at Ujjain from 22 April 2016 to 21 May 2016. The Kshipra River water samples collected from four different selected ghats at different times of the day. The physico-chemical parameters were analyzed such as Dissolved Oxygen (D.O) and Temperature. All the ghats are polluted but Mangalnath ghat is most polluted as compared to three other ghats because maximum people come in this ghat and then Narsingh ghat and Lalpul ghat are some less polluted. It was also observed that all parameters were in low level levels at the Triveni ghat, which was the least used for bathing by pilgrims and remain least disturbed zone among the sampling ghats. Several cases of water born diseases like typhoid, skin, eye, ear, and urinary tract infections were reported from local and nearby city hospitals immediately after mass bath especially in summer. Further water quality of Kshipra river was assessed on the basis of water quality index. According to which water was reported to be of very bad status. As per Central pollution control board (CPCB) norms water was found to be of D class and was not fit for drinking, bathing.

Keywords: Mass Bathing, Water Quality, Physico-Chemical Parameters

I. INTRODUCTION

As described in ancient vedic scriptures the kumbh mela is derived from immortal pot of nectar, in which the word kumbh means "pot". The Kumbh mela is one of the largest mass gathering public event in India. It is a mass hindu pilgrimage of reverence in which hindus gather to dip in a holy river. According to hindu mythology, origin of this festival found in the ancient of "samudra manthan" or "churning of the ocean". The legends tell about it that gods and demones competed erectly in the churning to search of divine nectar of immortality. During the epic battle to capture the pot containing the nectar, drops of the precious liquid fell on the four places Haridwar, Prayag, Nasik and Ujjain. The four places where the Kumbh festival has been held for centuries. Saint, pilgrims and visitors from all the corner of india and giant agglomeration of pilgrims occur to perform various religious rituals. Such a large mass gathering during festivals create large amount of water pollution. Celebration of different festivals becoming more and more non-eco-friendly and made the environment polluted which disturb the whole life cycle on earth.

Recently Kumbh mela was held at Ujjain city which is also called "Simhastha" Kumbh. It is celebrated when Jupiter ascends into sun sign Leo's quarter or the simha constellation of zodiac which is why that is called 'Simhastha'. It was held from 22 April 2016 to 21 May 2016. It is believed that, a holy bath in auspicious River Kshipra during Simhastha mela has purifying effects. Hindus believe a festival dip will cleance sins and help bring salvation. For this reason Hindu follower that the Simhastha mela is most auspicious place to take holy bath.

In the present study, an attempt has been made to evaluate the water level at four locations of Ujjain during festival days of Kumbh mela 2016. Mass bathing an old age ritual in India is one of the main causes for increasing organic pollution of the river. The intense water quality deterioration can lead to several diseases like Cholera, Typhoid, skin diseases and many more that effect human body. The aim of the present study is not to draw a picture of activities but the study will provide a base line data on physico-chemical and microbiological aspects to maintain integrity and secrecy of the river in order to control water borne diseases and hence improve water quality order to conserve this holy river.

II. LITERATURE REVIEW

Sharma et. Al.,(2012) carried out study to evaluate the mass bathing on water quality of Ganga River during Maha Kumbh-2010. The water samples were collected from three different bathing ghats of river Ganga and they analyzed for different physico-chemical parameters. It was observed that all parameters were slightly affected at the ghat of saptrishi ashram, which was least used for bathing purpose and so it remains least disturbed zone among all three, whereas almost all parameters were highly affected at Har-Ki-pauri, the site used most by the pilgrims for ritualistic bathing purpose.

Kumawat D.M. and manish Sharma (2015) studied on quality status of river Kshipra situated in Ujjain; the study was carried to assess the quality status of Kshipra before its proper linkage with river Narmada. Water quality was assessed in terms of physic, chemical and biological parameter. Four the river traverse, Physical parameters included pH, temperature, conductivity and opacity, while chemical coliform (TC), Fecal Coliforms (FC), TVC were taken as microbial parameter. After studying all these parameter it was found that all parameter were above the permissible limits laid by WHO/CPCB.

III. MATERIAL AND METHOD

Methods and material used in the present study were further divided into following parts.

- Site description- Depending on the religious importance and pilgrim pressure, four sites(Ghats) of the river Kshipra, were selected for the present study namely Mangalnath,Triveni,Lalpul and Narsingh ghat.
- Sampling procedure-For collection of water sterilized bottles were used. Bottles were washed thoroughly and rinsed with distilled water, for microbial analysis each dry bottle was rinsed with 0.5ml sodium thio sulphate (10% solution). Water samples were collected from a depth of 30-40 cm by lowering pre-cleaned plastic bottles into the river. Water collected in the air tight bottles was takes to the laboratory for further analysis.
- The parameter analyzed during the study including physico-chemical characteristics are DO and TEMPERATURE.
- Temperature: For the measurement of Temperature glass thermometer was used. At the site thermometer was dipped into the water at various points (5-7) and reading was noted.
- Dissolved Oxygen: DO was determined by Winkler's Method.
- Result: The comparison of individual parameter for all the ghats have been done during the Simhastha Kumbh Mahatsav 2016 in Ujjain city the mela days shows by graph 1 to 6 to the variation DO and temperature respectively.

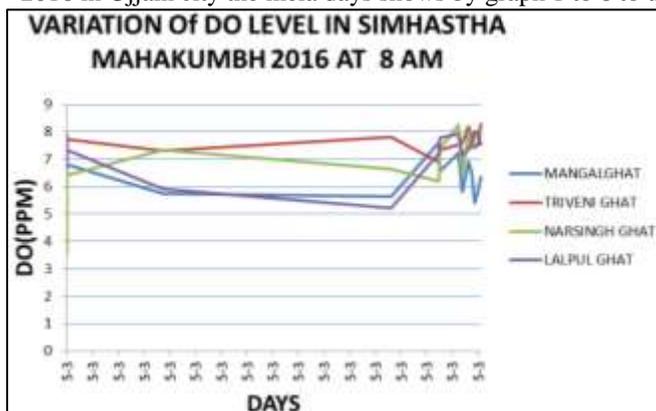


Fig. 1: DO variations (22 april to 21 may)

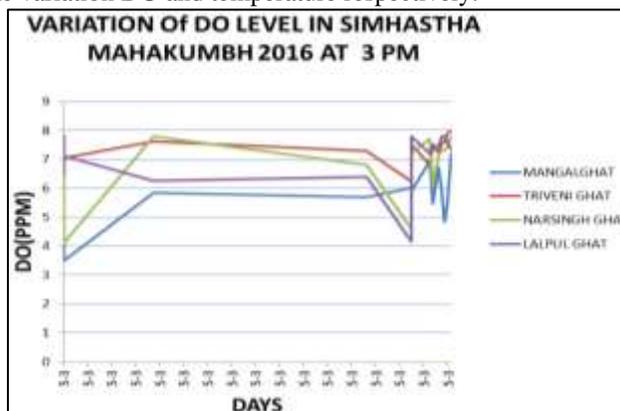


Fig. 2: DO variations (22 april to 21 may)

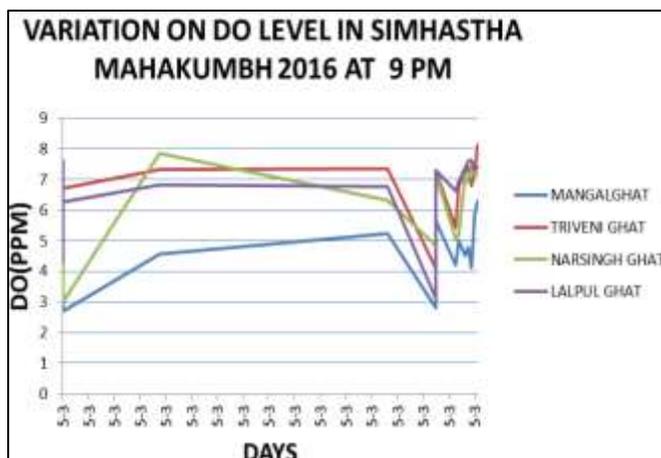


Fig. 3: DO variations (22 april to 21 may)

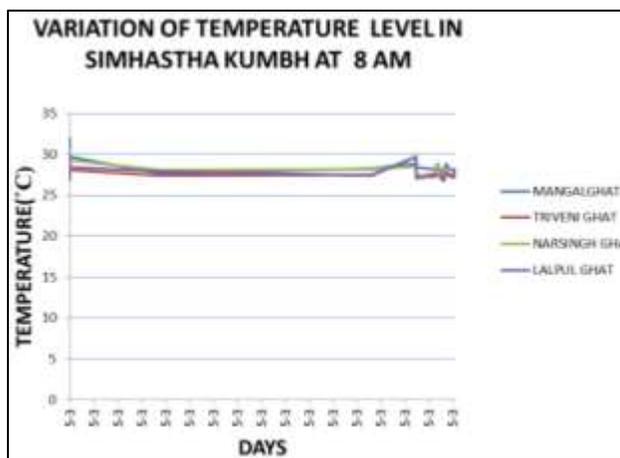


Fig. 4: Temperature variations (22 april to 21 may)

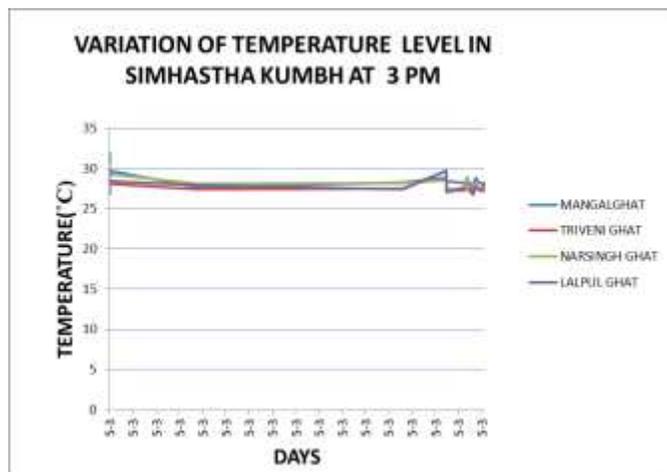


Fig. 5: Temperature variations (22 april to 21 may)

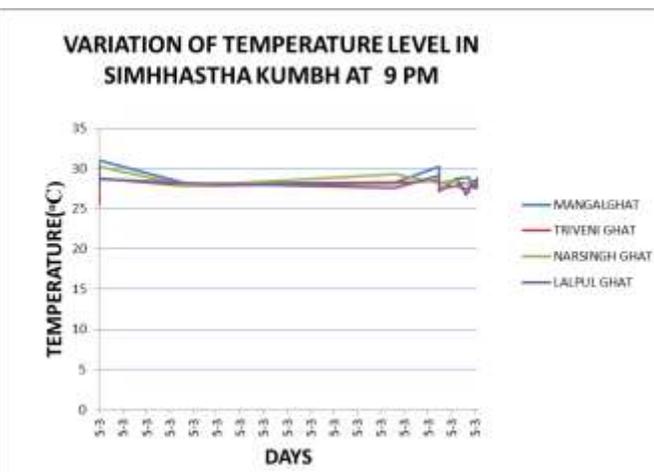


Fig. 6: Temperature variations (22 april to 21 may)

A summary of the result is given below:

A. DO

Dissolved oxygen in natural and waste water depend on the physico-chemical in the water body .The CPCB (central pollution control board) suggested that the standard parameter of DO is > 5.0 mg/l. The concentration of DO in four ghats water samples in during mela days was found to be in the range of 2.7-8.28mg/l as shown in graph 1 to 3. During the mela again the DO was recorded minimum value of 2.7mg/l observed on 21th may (3rd shahi snaan) at 9 pm and maximum value 8.28mg/l of DO was recorded on 29th April at 8 am.

B. Temperature

Temperature measurement are sometimes important to identify such as saturation values of solid and gases dissolve and BOD value are dependent on temperature of water. The CPCB (central pollution control board) suggested the permissible limit of temperature is 25-27°C. Temperature higher then 27°C is considered objectionable. The temperature in four ghats water sample in during mela days was found to be in the range of 25.5°C to 32.8°C as shown in graph 4 to 6. During the mela again the temperature was observed of minimum value 25.5°C on 7th may at 9 pm and maximum value observed 32.8°C temperature was recorded at Narsingh jyanti(20th may) at 3 pm.

IV. DISCUSSION

It is clear from the graph shown in graph 1 to 3 of DO that the least polluted ghat was Triveni ghat whether during the mela or in the Simhastha Mahakumbh duration. This is due to the fact that it was least used ghat for all the rituals. Also the mostly polluted site was Mangalnath ghat during the mela dates. This was because of the fact that this was the most used ghat by the pilgrims for bathing as compared to the other ghats. It was observed that in the beginning of kumbh mela water quality was comparatively smaller than last week of Kumbh mela. second most polluted ghat was Narsingh ghat. In fig. 4 to 6 in pH that the most polluted site was Mangalnath ghat. The maximum pH value exceed according to CPCB the permissible value on the Narsingh jyanti, 2nd & 3rd shahi snaan, shankaracharya jyanti and vishabh shankranti the fact that this was the most used Ghat by the pilgrims for bathing and all other rituals.

V. CONCLUSION

The present study is aimed to assess the water quality during the Maha Kumbh, 2016 at the four Ghats. The physicochemical characteristics like DO and TEMPERATURE during the Maha Kumbh were analyzed. It has been revealed that Mass bathing exerts some spoiling effects on the water quality. The increased values of DO and TEMPERATURE were found to be in the permissible limit during whole occasion. So it can be concluded that the mass bathing has alarming effect on the water quality of all Ghats, it should be seriously and diseases outbreak is concerned. Finally it can be concluded that during the mass bathing Mangalnath Ghat to be more affected than the other three ghat and least polluted Ghat during the mass bath is Triveni ghat. The main reason behind this is huge influx of all the sorts of waste and organic matter during the holy occasion at their vary Ghats as these are the Ghats where mainly bathing and other customs were performed. Regular monitoring at times should be performed and appropriate mitigation measures and better management of resources and provision of basic facilities although, could minimize the elevated levels of water pollution.

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