COMPARATIVE ASSESSMENT OF WATER QUALITY OF RIVER KSHIPRA DURING KUMBH MELA UJJAIN, 2016

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***Abstract*: The present study deals with the analysis of water during kumbh Mela 2016,Ujjain, Madhya Pradesh. The physico-chemical parameters like Colour, odour, pH, TDS, nitrates, sulphates, chromates as Hexavalent Cr(VI), Total Hardness as $CaCO_3$, Calcium hardness as $CaCO_3$, Magnesium Hardness as $CaCO_3$, DO, BOD and Temperature were studied for consecutive days at selected sites of Ramghat, Mangalnath, Indore Road bridge and Lalpulghat of the holy city Ujjain. The results from all the sites clearly indicates that the mass bathing coupled with ritual activities performed by bathers was most probable cause of variation in the values of different parameters.**

***Keywords*: Total Hardness, pH, TDS and BOD.**

Introduction

Water is one of the main essential component of all natural resources available on earth. The organic matter increases in such cases of mass bathing as the flowers, milk, ghee is being offered during many sacred practices[1]. Bathing also add the body hairs etc. to the river water which in turn provided food to bacteria and hence BOD increases [2]. It is believed that a dip in "Holy River" washes away all the sins. Consider it faith, people bath in holy rivers at some special occasions like as Deepawali, Amavasya, Purnima, Ganaga Dashara, Makar Sankaranti, etc. Such mass bathing poses a great threat to river health with respect to water pollution in general [3]. Recently the study was conducted in ettarakhand's river and found that five studied rivers (Alakhnanda, Bahgireathi,Ganga, Mandakini and Yamuna) were polluted[4]. Mass gatherings attract people globally and expose them to a range of health risks [5]. Communicable diseases pose a threat to global health due to international connectivity, primarily through air travel [6,7].

Material and Mehods

A systematic study was carried out during Mahakumbh 2016 for determining the impact of mass bathing on water quality. Standard methods and protocols were followed to carry out sampling and analysis of Physico-chemical parameters to check the quality of water samples collected from different sampling stations. The water samples were collected from two different sampling sites of Ujjain city namely Ramghat and Mangalnath Ghat. These sites were found to have increased anthropogenic activities during kumbh Mela as against normal days.

For the collection of water sterilized bottles were used.Bottles were pre-cleaned before sample collection and thoroughly rinsed with double distilled deionised water. The water sample was collected at the depth of 5 feet by lowering the pre-cleaned bottles into the river. After collecting it into the air tight bottle sample were taken to laboratory for analysis of various parameters.

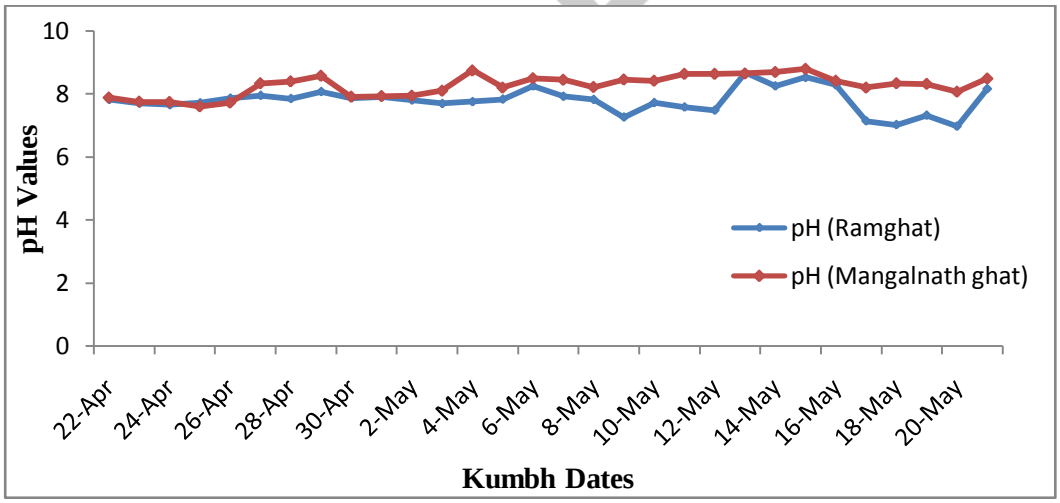

Figure 1: pH Values at Ramghat and Mangalnath Ghat

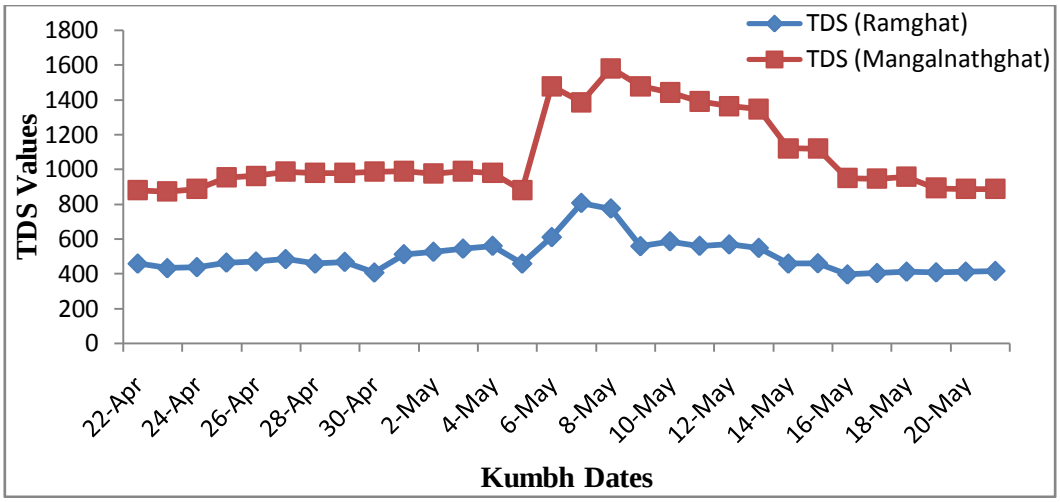

Figure 2: TDS Values at Ramghat and Mangalnath Ghat

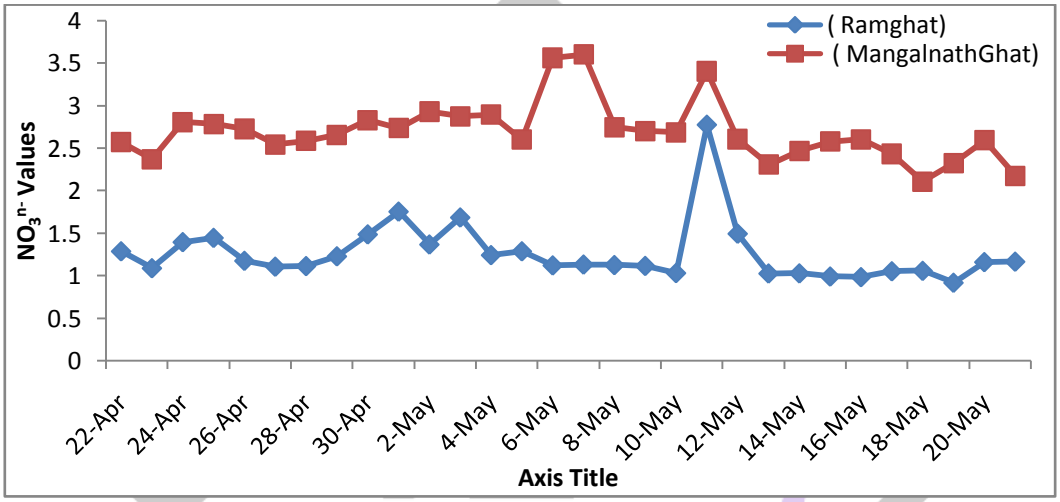

Figure 3: Nitrates values as NO_3^{n-} at Ramghat and Mangalnath Ghat.

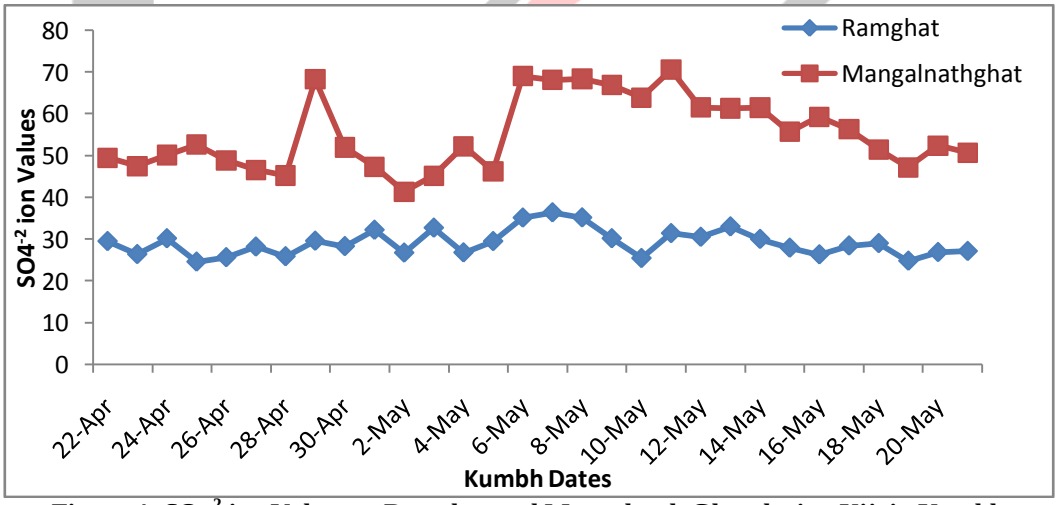

Figure 4: SO_4^{-2} ion Values at Ramghat and Mangalnath Ghat during Ujjain Kumbh

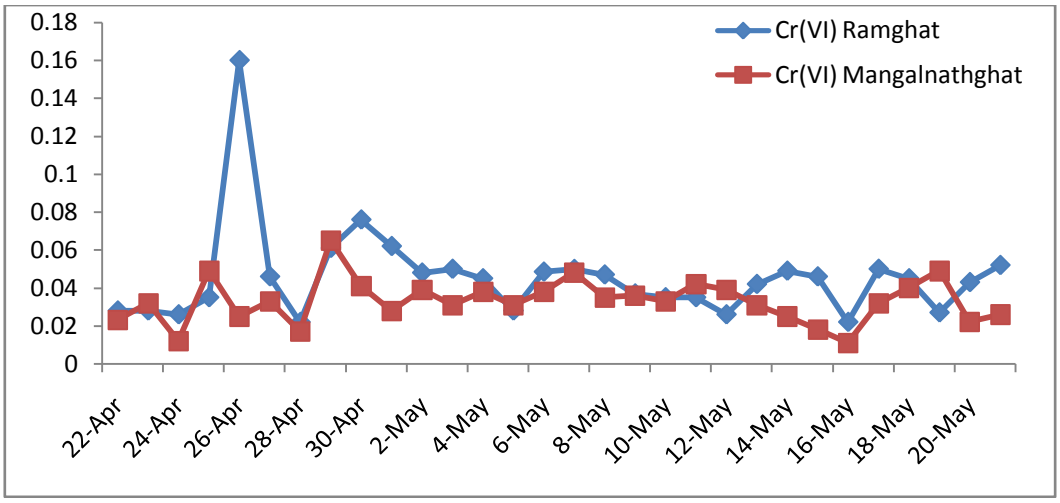

Figure 5: Cr (VI) at Ramghat and Mangalnath Ghat during Ujjain Simhastha 2016

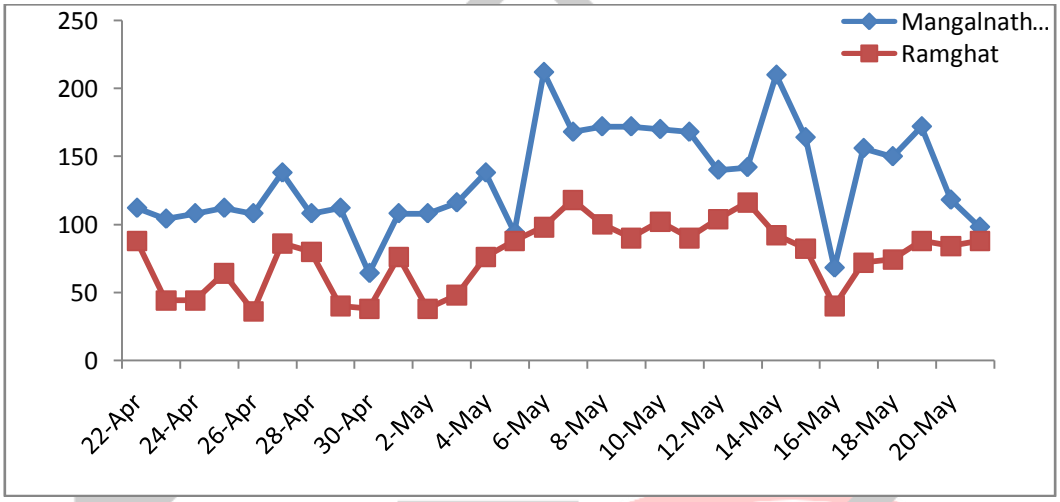

Figure 6: Total Hardness as CaCO3 at Ramghat and Mangalnath Ghat

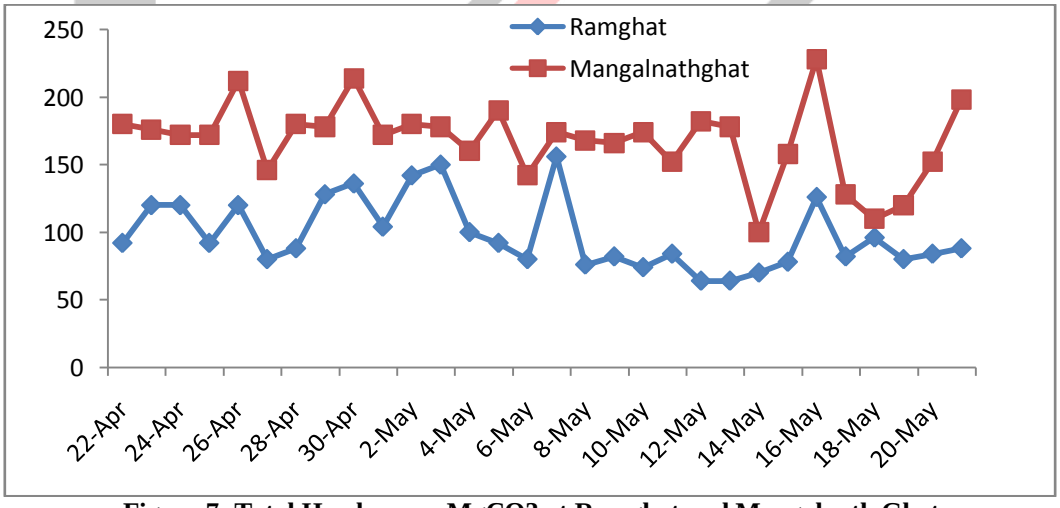

Figure 7: Total Hardness as MgCO3 at Ramghat and Mangalnath Ghat

Results and discussion

The Kumbh Mela's in its different forms alternates between the banks of the rivers; Ganga in Haridwar, Godavari in Nasik, Kshipra in Ujjain and Sangam (confluence of Ganga, Yamuna and mythical Saraswati rivers) in Allahabad. From the overall study and data it is concluded that parameters like pH, SO_4^{2-}, TDS ,Ca^{2+}, Mg^{2+} Hardness lies within the maximum permissible limit . There was no significant change in the values. The BOD remained less than 4. The TDS values fluctuated between lowest 880 mg/l to the highest value of 1580mg/l. This increased value of TDS can be attributed to the mass bathing

during the period of observation. The pH value of water samples taken ranges from 7 to 8.5 and it was slightly alkaline. The standard value for water quality on pH basis lies in the range of 6.5 to 8.5.

References

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