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## An Environmental Benign Approach for the Assessment of Water Quality during Kumbh at Allahabad

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### ABSTRACT

Water is one of the most plenty natural resources of the earth. It is important to all living resource which is getting polluted because of anthropogenic activities. The present study was carried out with an aim to impact of mass bathing during Kumbh in 2013 at Allahabad. Water sample was collected from three major location of Allahabad Namely Daraganj, Salori and Sangam for the physiochemical and biological analysis such as pH, temperature, biological oxygen demand, dissolve oxygen etc. It was concluded from the result that water quality of river Ganga shows significant changes during mass bathing. The present study indicates that the water was not fit for bathing as well drinking purposes.

**Keywords:** River Ganga, Water quality, Allahabad, Physiochemical properties

### 1. INTRODUCTION

Water is one of the essential resource for all the living resources on earth. Ganga river known as mother Ganges worshipped by Hindu as they have faith that a dip in “Holy River” washes away all the sins and it is their path towards heaven, is now one of the most polluted

river [1]. Now a day's water is contaminated due to increasing population, industrial growth, agriculture activities cause major water pollution.

Allahabad is one of the oldest city which is located in southern region of the Uttar Pradesh which is known for river Ganga such as the Kumbh Mela, Chhat Puja. Kumbh Mela is one of the largest religious gathering on earth where around 85 million Hindu from around the world participated at holy city Prayag, Mass gathering attract people and leads to number of health issue by dumping flowers, plastic in to the water body.

Present throws light on the effect of mass bathing on water quality of river Ganga at three different Ghats of Allahabad to analyze the change from Jan-Feb with time interval.

## **2. MATERIAL AND METHODS**

A systematic study was carried out for determining the impacts of mass bathing on water quality. This portion describes methods used for experiments during analysis. Water sample was collected from three different sites. During analysis temperature was recorded at fixed sites with the help of thermometer and other tests was carried out in laboratory with different methods.

Following sites were the sampling sites

Site 1: Sangam

Site 2: Salori

Site 3: Daraganj

Physio chemical methods used for analysis of water

S. N	Parameters	Methods
1	pH	PH meter
2	Temperature	thermometer
3	TDS	Gravimetric Method
4	COD	Open flux method
5	BOD	Winkler's Method
6	DO	Winkler 'method

## **3. RESULT AND DISCUSSION**

### **3. 1. Temperature**

This investigation shows that temperature increases at different after snan with given time interval. While maximum value of water temperature was recorded 20.7 °C at the same bathing ghat after the fifth Royal Bath.

Date	Month	Site1-Saangam	Site2-salori	Site2-draganj
15/1/13	January	16.5	16.7	16.2
29/1/13	January	18.2	18.1	17.3
11/2/13	February	19.8	18.9	19.1
17/2/13	February	18.8	19.8	19.8
27/2/17	February	20.6	20.2	20.7

### 3. 2. pH values

This investigation shows that pH values was recorded between 7.2-8.9. The minimum pH value was noted 7.2 at bathing ghat of Daraganj before the third Royal bath, while maximum pH value was noted 8.9 at Sangam ghat.

Date	Month	Site1-Saangam	Site2-salori	Site2-draganj
15/1/13	January	8.9	7.5	8.5
29/1/13	January	8.1	7.8	8.2
11/2/13	February	8.2	7.1	7.2
17/2/13	February	8.7	8.13	8.5
27/2/17	February	8.6	8.2	8.3

### 3. 3. TDS (mg/L)

Total dissolve solid is an important tool for water quality. In this investigation TDS ranged between of 392.2-794.3 mg/l. The highest TDS (794.3 mg/l) was found at Bathing ghat of Sangam after the third royal bath while the lowest TDS (392.2 mg/l) was found at the bathing ghat of the Salori after the third Royal bath.

Date	Month	Site1-Saangam	Site2-salori	Site2-draganj
15/1/13	January	460	402.5	508.35
29/1/13	January	678	693.8	478.6
11/2/13	February	794.3	496	693.89
17/2/13	February	569.6	679.4	456.8
27/2/17	February	667.8	680.8	700.1

### 3. 4. COD (mg/L)

This is a valuable parameter for the analysis of water quality to check chemical load in water body. In present investigation value of COD ranged between 44 mg/l - 110 mg/l. The minimum value was recorded 44 mg/l at Sangam before the second Royal Bath and the maximum value was recorded 110 mg/l at Salori ghat after the fifth royal Bath.

Date	Month	Site1-Saangam	Site2-salori	Site2-draganj
15/1/13	January	62	72	50
29/1/13	January	60	87	59
11/2/13	February	65	81	51
17/2/13	February	59	91	61
27/2/17	February	53	110	56

### 3. 5. BOD (mg/L)

Biological oxygen demand is the test analysis to check the oxygen requirement by microorganism. It is a valuable tool for the analysis of organic load into the water body. In this investigation Bio-Chemical Oxygen Demand (BOD) ranged between 4.24-9.6 mg/l. The Minimum BOD (4.24 mg/l) was found at bathing ghat of Sangam before the first Bath, while the maximum BOD (9.6 mg/l) was found at the bathing ghat of Salori during Fifth Royal bath.

Date	Month	Site1-Saangam	Site2-salori	Site2-draganj
15/1/13	January	7.55	7.55	7.5
29/1/13	January	8.2	8.2	8.2
11/2/13	February	9.2	9.2	9.1
17/2/13	February	8.9	9.0	9.0
27/2/17	February	7.9	9.6	8.6

### 3. 6. DO (mg/L)

Dissolved oxygen is the assessment of purity of water. In this investigation result reveals that Dissolved Oxygen (DO) ranged between 6.1-8.9 ppm. The Maximum DO (8.9) was found at Sangam before the fourth Royal bath while the minimum DO (6.1) was found at the Salori ghat after the fifth Royal bath.

Date	Month	Site1-Saangam	Site2-salori	Site2-draganj
15/1/13	January	7.3	7.45	8.3
29/1/13	January	8.9	7.5	8.7
11/2/13	February	7.9	8.7	7.6
17/2/13	February	8.1	6.2	7.9
27/2/17	February	8.4	6.1	8.1

#### 4. CONCLUSIONS

On the basis of physio-chemical analysis it is concluded that the quality of river water degraded during mass bathing. From the overall study and data it is concluded that water from the study area is alkaline in nature with more total solid and other parameters like higher BOD,DO,TS,TSS, TDS, values in Ganga river water is unfit for drinking purpose at selected sites.

Results clearly indicate that organic matter and untreated sewage were mixing in the river during the period of Maha Kumbh and purification is required for domestic consumption

#### References

- [1] Ruby Pandey, Divya Raghuvanshi and D.N. Shukla, *AASR*, 2014, 5(4): 181-186
- [2] Shweta Singh, Satyendra Nath, *UJERT*, 2015, 5(5), 251-258
- [3] Naveen Kumar Arora, Sakshi Tewari and Sachin Singh, *JEB*, 2013, 800-803
- [4] S. Mishra, B D Joshi, *Him. J. Env. Zool.* 2003, 17(2), 113-122.
- [5] N. B. Parashar, P. Kaushik, S Pandey, *Him. J. Env. Zool.* 2003, 17(2), 167-171.