

Water Quality Evaluation of Ganga River at Parmath Ghat and Sarsaiya Ghat, Kanpur, Uttar Pradesh

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Abstract- Water samples were collected from river Ganga at Parmathghat and Sarsaiyaghat in Kanpur. The Physico-Chemical parameters were determined using standard procedure in Jan to Dec 2019. Tanning industry is major source of Ganga pollution in Kanpur city. It is deteriorating the quality of water and aquatic flora. The Physico-Chemical parameters such as pH, Temperature, Electrical Conductivity, total dissolved solid, dissolved oxygen, total suspended solids, Chemical oxygen demand, Biological oxygen demand, Chloride, calcium, magnesium and turbidity were observed during the study period. The present study shows that all the parameters which have been studied are still under the standard limits but some of them are very closer to them is an alarm for increasing pollution status.

Keywords – Physico-Chemical Parameters

I. INTRODUCTION

In our country the river water pollution has reached a crisis point and the list of polluted rivers is a long one. Many of our rivers including Ganga, which were once considered pure and sacred, are now among the most polluted. The Ganga rises in the Garhwal Himalayas (30° 55'N, 79° 7'E) under the name of Bhagirathi. The Ice-cave of Gomukh at the snout of Gangotri glacier approximately 4100m above sea level is recognized the traditional source of the Ganga. The length of river Ganga is about 2525km. The main township of Uttarakhand and Uttar Pradesh falling at bank of Ganga river are Rishikesh, Haridwar, Garhmukteshwar, Narora, Kannauj, Kanpur, Dalmau, Allahabad, Mirzapur, Varanasi, Ghazipur, Balia and goes upto the Bay of Bengal in the Indian Ocean.

Water the most essential requisites that nature has provided to sustain life on earth. About 80% earth surface is covered by water. The deteriorate quality of water create various problems for mankind. The growth in population, about 90% of which occur in urban areas, increases the demand for water for domestic and industrial uses. Water pollution from domestic and human waste is the main cause for human being water born disease. The industrial water pollution is due to inadequate measure adopted in the industry for the abatement of pollution.

The aim of present study is compare the quality of ground water and Ganga River water with their permissible standards of drinking water and to determine the Physico-chemical parameters such as pH, Temperature Electrical conductivity, TDS, TSS, DO, COD, BOD, Chloride, Calcium, Magnesium and turbidity in Ganga river water at Paramath Ghat and Sarsaiya Ghat, Kanpur.

II. MATERIALS AND METHODS

Kanpur is densely populated city has a population of 2,920,067 as per 2011 census. It is known as Manchester of the East, the largest industrial hub of Uttar Pradesh state in India. It is bounded by 26.28 degree North latitude and 80.21 degree east longitude. Kanpur is situated on the western bank of the river Ganga.

Two sampling areas were selected areas i.e. Paramath Ghat and Sarsaiya Ghat which is situated at the bank of river Ganga in Kanpur. The samples were collected in polythene bottles from the water of river Ganga and study was examined from one year. The sample bottles used were previously soaked in 10% HNO₃ overnight and rinsed. The

collected unfiltered samples were acidified by adding 2ml of concentrated HNO₃ per liter of the sample for avoid precipitation of metals. The samples was determined using pH-meter with electronic glass electrode (LI127 of Elico, India) and conductivity was measured by conductivity meter (systronics 304) .for analysis of metals Ca and Mg atomic absorption spectrophotometer is used. The obtained data were subject to statistical analysis to test.

III. RESULTS AND DISCUSSION

The values of different parameters with respect to sampling stations (Sarsaiya Ghat & Paramath Ghat) are given in Table-1 and Table-2.

Table-1 Physico-chemical characteristics in river Ganga at SarsaiyaGhat, Kanpur.

PARAMETER	MONTH											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
pH	8.8	8.6	8.4	8.1	8.5	8.4	8.9	8.6	8.3	8.8	8.7	8.8
Temperature	16.2	18.4	23.3	32.1	35.2	35.9	28.1	22.7	23.8	18.9	18.6	18.1
EC	379	391	373	373	380	372	378	380	381	374	378	378
Turbidity	4.2	4.6	13.1	6.2	7.4	11.2	8.9	9.1	7.5	5.7	4.7	4.4
TDS (mg/l)	134	136	136	134	133	137	134	137	139	139	135	135
TSS (mg/l)	11	13	14	10	12	14	14	13	13	10	11	11
DO (mg/l)	6.9	6.4	6.0	6.3	5.6	5.9	6.2	6.7	6.5	6.3	6.6	6.8
COD (mg/l)	37	35	31	29	27	24	24	27	30	30	28	37
BOD (mg/l)	4.2	5.6	6.3	6.2	7.6	7.2	5.2	5.0	5.4	4.3	4.3	4.3
Chloride (mg/l)	12	13	14	16	15	14	13	13	16	16	18	18
Calcium (mg/l)	73	76	75	73	73	71	73	71	74	78	80	81
Magnesium (mg/l)	24	22	26	22	24	25	22	30	27	29	17	27

Table -2 Physico-chemical characteristics in river Ganga at ParamathGhat, Kanpur

PARAMETER	MONTH											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
pH	9.2	9.1	9.0	8.5	8.3	8.3	8.3	9.1	8.7	8.5	8.8	8.8
Temperature	17.0	18.5	22.8	30.1	34.5	35.2	27.3	22.9	23.8	18.1	18.5	18.1
EC	313	312	313	314	296	297	296	295	305	321	318	320
Turbidity	7.5	7.4	7.4	7.5	7.8	8.1	8.0	8.2	8.0	7.2	7.1	7.2
TDS (mg/l)	136	135	135	134	135	134	138	137	138	135	135	136
TSS (mg/l)	13	13	12	14	14	11	13	11	12	12	11	11
DO (mg/l)	7.1	6.8	6.2	6.4	5.0	5.1	5.56	6.1	5.9	6.7	7.1	7.3
COD (mg/l)	37	34	34	34	34	36	31	35	35	33	35	39
BOD (mg/l)	5.6	5.7	7.6	7.2	7.7	7.2	6.3	6.3	7.2	7.3	6.2	6.2
Chloride (mg/l)	61	60	61	63	65	66	56	55	61	60	62	61
Calcium (mg/l)	21	20	21	19	18	20	22	21	17	20	16	17
Magnesium (mg/l)	12	11	12	11	12	17	18	16	15	12	11	12

The turbidity values of sample were 4.2 to 13.1. maximum values is 13.1 in march 2019 at Sarsaiya Ghat while minimum value is 4.2 in Jan 2019 at sarsaiya Ghat. The temperature of water was 16.2 to 35.9° C. maximum value is 35.9 in June 2019 at Sarsaiya Ghat while minimum value is 16.2 in Jan 2019 at Sarsaiya Ghat. The WHO(1992) did not recommended any definite temperature for drinking water. The pH value was 8.1 to 9.2. maximum value is 9.2 in Jan 2019 at Parmat Ghat while minimum value is 8.1 in Apr 2019 at Sarsaiya Ghat

The TDS were 133 to 139 mg/l. maximum values is 139 in sep,oct 2019 at SarsaiyaGhat while minimum value is 133 in may 2019 at sarsaiya Ghat as well as ParamathGhat which are under limits. The TSS were 10 to 14 mg/l. The

Dissolved Oxygen were 5.0 to 7.3 mg/l. maximum values is 7.3 in Dec 2019 at ParamathGhat while minimum value is 5.0 in May 2019 at ParamathGhat which are permissible limit. The COD were 24 to 39 mg/l. maximum values is 39 in Dec 2019 at Paramath Ghat while minimum value is 24 in June, July 2019 at sarsaiyaGhat. The BOD were 4.2 to 7.7 mg/l. maximum values is 7.7 in may 2019 at Paramath Ghat while minimum value is 4.2 in Jan 2019 at sarsaiya Ghat. The Chloride level were 12 to 66 mg/l. maximum values is 66 in Jun 2019 at Paramath Ghat while minimum value is 12 in Jan 2019 at sarsaiya Ghat.

IV.CONCLUSION

It is need of time to protect environment to present and future generations. In results of present study we found that the Ganga River is polluted due to discharge of industrial effluent. This industrial effluent is clustered on the bank of river Ganga Kanpur. Ganga river water from Sarsaiya Ghat and Paramath Ghat is polluted, some parameters are low or high from the permissible limit. So it is not suitable for some of the beneficial uses of water.

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