

# STUDY OF POLLUTION STATUS IN RIVER GANGA AT SARSAIYA GHAT, PERMUT GHAT, BHAIKAV GHAT AND BITHOOR GHAT IN 2013 IN KANPUR IN UTTAR PRADESH

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## ABSTRACT

Samples were collected and phyco-chemical parameters were determined using standard analytical procedure in Jan.to Dec.2013..pH (7.4-9.1 ),chloride and phosphate contents of water samples were determined 09-18 mg/l and 0.04-0.16 ppm respectively. Total hardness 92.1-161.3 mg/l,fluoride level also 6.0-6.3 mg/l, DO of samples were 4.0-8.4 mg/l, BOD were 2.0-7.5 mg/l and COD were 08-39 mg/l.These results were said to their agreed with the limits set by World Health Orgnization (WHO)for drinking water.

**Keyword: Pollution Status, WHO, Drinking Water.**

## I. INTRODUCTION

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 urbon area, 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.It is need of time to protect environment for present and future generations. The purpose of study into prepares qualitative assessment of abiotic and biotic conditions prevailing in river Ganga.

## II. MATERIAL AND METHOD

The Kanpur on National Highway no.1 and 2 falls on Broad Gauge NR Railway line between Delhi and Kolkata.

Water samples were collected in clean polythene bags and subjected to chemical analysis for measurement of different parameters such as temperature, pH, DO, BOD, COD, fluoride, chloride, phosphate ,hardness and total dissolved by standard analytical methods in Jan. to Dec.2013.

### III. RESULT AND DISCUSSION

The values of different parameter with respect to sampling stations (Sarsaiya Ghat, Permut Ghat, Bhairav Ghat and Bithoor Ghat ) are given in Table-1, 2, 3 and 4. The transparency values of samples were 20.0-56.5 cm. Maximum value is 56.5 in Jan. 2013 at Bithoor Ghat while minimum value is 20.0 in Jun. 2013 at Sarsaiya Ghat. The temperature of water was 16.1-36.8°C. Maximum value is 36.8 in Jun. 2013 at Bithoor Ghat while minimum is 16.1 in Jan. 2013 at Bithoor Ghat. The WHO (1992) did not recommend any definite temperature for drinking water. The pH value were 7.4-9.1. Maximum value is 9.1 in Dec 2013 at Permut Ghat while minimum value is 7.4 in May, 2013 at Bhairav Ghat.

Total dissolved were 134-140 mg/l. Maximum value is 140 mg/l in Jul. 2013 at Permut Ghat while minimum value is 134 mg/l in Jan. 2013 at Bhairav Ghat and Bithoor, which are under limits. The total hardness of water were 92.1-161.3 mg/l. The maximum value is 161.3 in Jun. 2013 at Sarsaiya Ghat while minimum value is 92.1 in Sept. 2013 at Sarsaiya ghat. The levels of hardness are below the level (300 mg/l) as laid down by Indian standard and thus water is soft. Fluoride level were 6.0-6.3 mg/l. The maximum value is 6.3 in Jul. 2013 at Sarsaiya Ghat, Bhairav Ghat and Bithoor Ghat, in Jul./Aug. 2013 at Permut Ghat, while minimum value is 6.0 in Jan. 2013 at Sarsaiya Ghat, in Apr. 2013 at Permut Ghat and in May 2013 at Bhairav & Bithoor Ghat, which are low. The chloride contents were 09-18 mg/l. The maximum value is 18 mg/l in Jan. and Dec. 2013 at Permut Ghat while minimum value is 09 mg/l in Aug. 2013 at Bithoor Ghat, which is below the prescribed limit (250 mg/l). The COD value were 08-39 mg/l. The maximum value is 39 mg/l in Apr. 2013 at Bhairav Ghat & in Dec. 2013 at Bhairav Ghat while minimum value is 08 mg/l in Jul. & Aug. 2013 at Bithoor Ghat.

The DO values were 4.0-8.4 mg/l. The maximum value is 8.4 in Nov. 2013 at Bithoor Ghat while minimum value is 4.0 in Apr. 2013 at Bhairav Ghat, which are permissible. The BOD values were 2.0-7.5 mg/l. The maximum value is 7.5 in May 2013 at Sarsaiya Ghat while minimum value is 2.0 in Jul. & Aug. 2013 at Bhairav Ghat.

**Table-1 Physico-chemical characteristics in river Ganga at Sarsaiya Ghat, Kanpur**

Month	Temp. (°C)	Trans. (cm)	pH	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (mg/l)	Phosphate (mg/l)	Total hardness (mg/l)	TDS (mg/l)	Fluoride (mg/l)
Jan.	16.4	50.5	8.9	6.9	4.0	30	15	0.09	108.4	135	6.0
Feb.	18.9	52.0	8.8	6.3	5.5	30	15	0.09	106.4	136	6.1
Mar.	23.6	38.5	8.6	6.1	6.5	31	16	0.09	140.2	136	6.0
Apr.	31.4	37.0	8.1	6.2	6.0	30	15	0.10	149.4	135	6.1
May	35.5	29.0	8.4	5.4	7.5	26	14	0.11	159.4	136	6.2
Jun.	36.1	20.0	8.3	5.8	7.0	25	14	0.12	161.3	137	6.2
Jul.	28.1	24.0	8.8	6.1	5.0	25	14	0.10	94.2	139	6.3
Aug.	23.6	20.5	8.7	6.5	5.0	26	15	0.08	93.1	139	6.2
Sept.	24.5	24.0	8.5	6.6	5.5	31	16	0.11	92.1	138	6.1
Oct.	18.7	28.0	8.9	6.4	4.5	31	16	0.10	101.4	136	6.1
Nov.	18.4	35.5	8.8	6.7	4.5	30	17	0.10	98.5	136	6.2

Dec.	18.3	48.0	8.9	6.9	4.5	39	17	0.11	99.5	137	6.1
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**Table-2 Physico-chemical characteristics in river Ganga at Bhairav Ghat, Kanpur**

Month	Temp ( <sup>o</sup> C)	Trans. (cm)	pH	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (mg/l)	Phosphate (mg/l)	Total hardness (mg/l)	TDS (mg/l)	Fluoride (mg/l)
Jan.	16.3	52.0	8.3	7.2	3.5	35	15	0.12	114.2	134	6.1
Feb.	18.2	52.5	8.2	6.8	3.0	34	14	0.11	106.2	135	6.2
Mar.	23.1	39.0	8.1	6.5	4.0	34	16	0.13	135.5	136	6.1
Apr.	31.6	37.5	7.8	4.0	4.5	39	15	0.14	155.2	136	6.1
May	35.8	31.0	7.4	4.8	4.0	38	14	0.14	158.2	135	6.0
Jun.	36.0	21.5	7.9	4.2	5.0	13	15	0.16	160.3	136	6.2
Jul.	28.4	37.0	7.6	5.4	2.0	12	11	0.15	97.4	137	6.3
Aug.	23.9	21.0	7.9	5.9	2.0	12	10	0.15	97.5	139	6.2
Sept.	24.8	26.0	7.8	6.2	3.5	28	10	0.14	99.6	138	6.1
Oct.	18.1	27.0	8.2	6.8	3.5	29	11	0.13	94.7	135	6.1
Nov.	18.8	37.5	8.4	6.7	2.5	28	14	0.12	95.8	136	6.2
Dec.	18.2	49.5	8.1	6.9	2.5	36	15	0.12	95.9	137	6.1

**Table-3 Physico-chemical characteristics in River Ganga at Permut Ghat.**

Month	Temp, ( <sup>o</sup> C)	Trans. (cm)	pH (mg/l)	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (mg/l)	Phosphate (mg/l)	Total hardness (mg/l)	TDS (mg/l)	Flouride (mg/l)
Jan.	16.2	54.5	8.8	7.0	6.5	37.0	18.0	.14	110.2	135	6.2
Feb	18.8	53.5	8.7	6.5	6.0	36.0	17.0	.14	105.7	135	6.2
Mar	23.4	40.0	8.5	4.2	6.0	36.0	17.0	.14	136.6	136	6.1
Apr	31.8	38.5	8.7	5.2	5.0	30.0	16.0	.12	148.7	136	6.0
May	35.7	28.0	7.9	5.8	5.5	38.0	16.0	.15	156.3	138	6.2
Jun	36.2	22.0	8.0	6.1	6.5	29.0	15.0	.16	160.9	139	6.3
Jul	28.6	26.0	8.8	6.2	4.0	29.0	15.0	.15	95.7	140	6.3
Aug	23.4	22.0	8.9	6.5	4.0	28.0	15.0	.16	96.3	138	6.2
Sep	24.6	25.0	8.9	6.0	4.5	25.0	16.0	.12	94.6	137	6.2
Oct	18.3	27.5	8.4	6.8	3.5	36.0	17.0	.09	95.4	136	6.1
Nov	18.0	36.5	9.0	7.2	3.5	28.0	16.0	.08	97.6	137	6.2
Dec	18.4	50.5	9.1	7.4	3.0	36.0	18.0	.09	98.6	137	6.1

**Table-4 Physico-chemical characteristics in River Ganga at Bithoors Ghat.**

Month	Temp. ( <sup>0</sup> C)	Trans. (cm)	pH	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (mg/l)	Phosphate (/ppm)	Total hardness (mg/l)	TDS (mg/l)	Flouride (mg/l)
Jan	16.1	56.5	7.5	8.1	2.5	24.0	13.0	0.07	112.6	134	6.1
Feb	18.9	54.5	7.7	7.8	3.0	29.0	11.0	0.08	104.2	135	6.2
Mar	22.9	40.5	7.3	7.6	4.0	28.0	15.0	0.09	130.2	136	6.1
Apr	31.2	38.0	7.6	7.8	4.5	28.0	16.0	0.06	148.2	136	6.1
May	35.0	30.0	7.1	6.2	4.0	13.0	15.0	0.04	150.2	135	6.0
Jun	36.8	20.5	7.2	5.0	5.0	12.0	16.0	0.04	156.1	136	6.2
Jul	28.1	28.0	7.8	6.3	2.0	8.0	10.0	0.05	96.2	137	6.3
Aug	23.0	21.0	7.7	7.1	2.0	8.0	9.0	0.05	98.2	138	6.2
Sep	24.1	27.0	7.9	7.4	3.5	13.0	16.0	0.06	97.8	138	6.1
Oct	18.2	29.0	7.8	8.2	3.5	18.0	10.0	0.06	92.4	135	6.1
Nov	18.1	35.0	8.1	8.4	2.5	24.0	12.0	0.07	97.4	136	6.2
Dec	18.1	48.0	8.5	8.0	2.5	25.0	13.0	0.08	96.3	137	6.1

#### IV. CONCLUSION

It is need of time to protect environment for present and future generation.The purpose of study is to prepare qualitative assessment of biotic and abiotic conditions prevailing in river Ganga.

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