

STUDY OF POLLUTION STATUS IN RIVER GANGA AT GOLA GHAT, JAJAMAU BRIDGE, BITHOOR GHAT AND BHAIRAV GHAT IN 2013-14 IN KANPUR IN UTTAR PRADESH

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ABSTRACT

Water samples from river Ganga at Gola Ghat, Jajamau Bridge, Bithoor Ghat and Bhairav Ghat in Kanpur in Uttar Pradesh were collected and physico-chemical parameters were determined using standard analytical procedure in Jan. to Dec. 2013. pH (7.1-9.7), chloride and phosphate contents of water samples were determined 09-27 mg/l and 0.04-0.16 ppm respectively. Total hardness 92.4-168.4 mg/l, fluoride level also 6.0-6.3 mg/l, DO of samples were 3.0-8.4 mg/l, BOD were 2.0-15.0 mg/l and COD were 08-65 mg/l. These results were said to be agreed with the limits set by World Health Organization (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 urban 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 (Gola Ghat, Jajamau Bridge, Bithoor and Bhairav Ghat) are given in Table-1, 2, 3 and 4. The transparency values of samples were 19.5-56.5 cm. Maximum value is 56.5 in Jan. 2013 at Bithoor Ghat while minimum value is 19.5 in Jun. 2013 at Gola Ghat. The temperature of water was 16.1-36.8°C. Maximum value is 36.8 in Jun. 2013 at Gola 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 7.1-9.7. Maximum value is 9.7 at Jan. 2013 at Jajamau Bridge while minimum value is 7.1 in May, 2013 at Bithoor Ghat.

Total dissolved were 134-139 mg/l. Maximum value is 139 mg/l in Aug. 2013 at Bhairav Ghat while minimum value is 134 mg/l in Jan. 2013 at Bhairav Ghat, which are under limits. The total hardness of water were 92.4-168.4 mg/l. maximum value is 168.4 in May, 2013 at Jajamau Bridge while minimum value is 92.4 in Oct. 2013 at Bithoor 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 Gola Ghat, Jajamau Bridge, Bithoor & Bhairav Ghat while minimum value is 6.0 in May, 2013 at Gola Ghat, Jajamau Bridge, Bithoor Ghat and Bhairav Ghat, which are low. The chloride contents were 09-27 mg/l. The maximum value is 27 mg/l in Mar. 2013 at Jajamau Bridge 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 of water were 08-65 mg/l. The maximum value is 65 mg/l in May & Jun. 2013 at Jajamau Bridge while minimum value is 08 mg/l in Jul. & Aug. 2013 at Bithoor Ghat.

The DO values were 3.0-8.4 mg/l. The maximum value is 8.4 in Nov. 2013 at Bithoor Ghat while minimum value is 3.0 in Apr. 2013 at Jajamau Bridge, which are permissible. The BOD values were 2.0-15 mg/l. The maximum value is 15 in May, 2013 at Jajamau Bridge while minimum value is 2.0 in Jul. & Aug. 2013 at Bithoor Ghat.

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

Month	Temperature (°C)	Transparency (cm)	pH	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (ppm)	Phosphate (mg/l)	Total hardness (mg/l)	TDS (mg/l)	Fluorid (mg/l)
Jul. 2013	28.4	22.0	8.2	5.4	6.5	36	19	0.05	98.9	139	6.3
Aug. 2013	23.5	20.0	9.2	6.9	5.5	35	22	0.12	107.4	136	6.1
Mar.	24.2	25.0	8.9	6.4	7.5	35	25	0.11	143.8	136	6.2
Apr.	18.4	29.5	8.6	6.6	7.0	35	25	0.14	155.1	135	6.1
May	18.6	37.0	8.2	5.2	7.5	38	23	0.08	160.1	136	6.0
Jun.	18.3	49.0	8.2	5.0	7.0	30	23	0.10	166.1	137	6.2
Jul.	28.4	22.0	8.2	5.4	6.5	36	19	0.05	98.9	139	6.3
Aug.	23.5	20.0	9.2	5.9	6.5	36	19	0.06	98.8	139	6.2
Sept.	24.2	25.0	8.9	6.2	7.0	35	18	0.06	96.6	138	6.1
Oct.	18.4	29.5	8.6	6.8	7.5	36	18	0.09	99.7	136	6.1
Nov.	18.6	37.0	9.1	7.0	6.0	35	19	0.10	110.4	136	6.2
Dec.	18.3	49.0	9.0	7.1	6.0	40	19	0.11	111.1	137	6.1

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

Month	Temperature (°C)	Transparency (cm)	pH	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (ppm)	Phosphate (mg/l)	Total hardness (mg/l)	TDS (mg/l)	Fluorid (mg/l)
Jan.	16.4	53.0	9.7	5.3	13	56.0	25.0	0.11	113.2	135	6.1
Feb.	18.4	52.3	9.8	5.2	12	64.0	25.0	0.11	108.1	136	6.1
Mar.	23.5	40.0	9.9	4.9	12	65.0	27.0	0.08	150.2	136	6.2
Apr.	31.4	37.0	8.8	3.0	14	60.0	26.0	0.09	158.3	135	6.1
May	35.2	30.0	8.6	4.3	15	65.5	26.0	0.10	168.4	136	6.0
Jun.	36.5	21.0	8.9	3.5	14	65.0	22.0	0.15	168.3	137	6.2
Jul.	28.6	26.0	9.4	3.5	13	55.5	15.0	0.09	98.4	139	6.3
Aug.	23.2	22.0	9.3	3.9	13	55.5	14.0	0.08	99.4	139	6.2
Sept.	24.7	26.0	9.6	4.2	14	60.0	16.0	0.07	98.2	138	6.1
Oct.	18.6	29.5	9.2	4.8	13	66.5	19.0	0.09	102.4	136	6.1
Nov.	18.3	36.0	9.5	5.1	14	60.1	21.0	0.12	114.2	136	6.2
Dec.	18.2	50.0	9.4	5.1	12	60.0	22.0	0.13	115.1	137	6.1

Table-3 Physico-Chemical Characteristica in River Ganga at Bithoor Ghat.

Month	Temp. (0C)	Transp. (cm)	pH	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (ppm)	Phosphate (mg/l)	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	136	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	09.0	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

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

Month	Temp. (⁰ C)	Transp. (cm)	pH	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Chloride (ppm)	Phosphate (mg/l)	Total hardness (mg/l)	TDS (mg/l)	Flouride (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	53.5	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
Sep.	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

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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