



Research Paper

Physico-Chemical analysis of Parichha Dam District Jhansi India

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Abstract: The present study deals with the analysis of Physico-chemical parameter of the Parichha dam District Jhansi (U.P.) during the year 2014-2015 in the present study various physico-chemical characteristics of Parichha dam viz. Temperature, Total Dissolved Solids (TDS), Turbidity, P^H , Dissolved Oxygen, free CO_2 , Alkalinity, Chloride, Phosphate during the course of study only minor difference in physical and chemical parameter of study area were observed.

Keywords: Jhansi, Parichha dam, Physico-chemical parameters, Monthly variation.

INTRODUCTION

Water plays an essential role in human life. The (WHO, 2003) reports that approximately 36% of urban and 65% of rural Indian were without access to safe drinking water (Akoto and Adiyiah, 2007; WHO, 2006). Dams/ reservoir is the oldest and significant source of irrigation in Jhansi (U.P.) India. Dam/Reservoir occupies vital role in irrigation as well as local ecosystem

in demi arid region of (U.P.) and also provide multiple employment like source of drinking water for uncountable rural and urban communities, livestock, fish culture, and recharge of ground water and control of floods. Parichha dam/reservoir situated at 28 km away from Jhansi city in Bundelkhand region of (U.P.) India. It is constructed during 1881-1886 on Betwa River. The point able features of the dam are 1174.69 meters long and 16.77 meters high. A number of authors have studied the physical and chemical characteristics of some Indian water bodies viz. (Verma, 2004; Koli and Ranga, 2011; Gupta *et al.*, 2011; Kulkarni and Tapase, 2012; Khan *et.al.* 2012 and Naik *et.al.* 2012; Sharma and Singh, 2014; Khan and Vyas, 2015).

MATERIALS AND METHODS

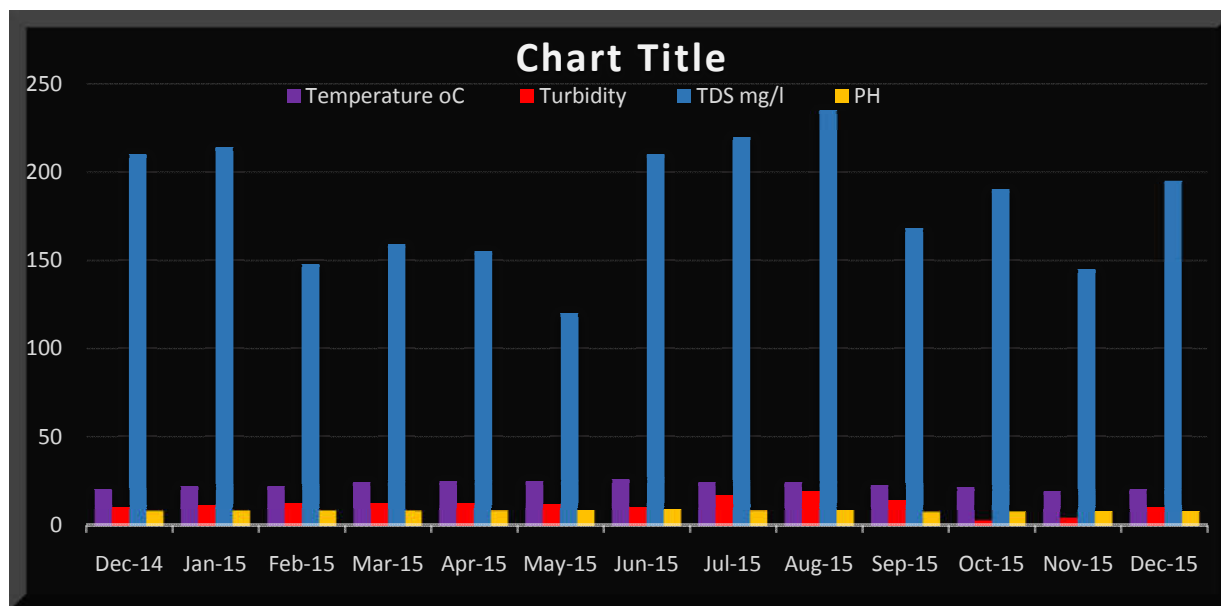
The water sample from Parichha dam/reservoir was collected from different sites of dam in the morning hours between 9 to 12 am in polythene bottle regularly for every month. The water sample were immediately brought in to Laboratory for the estimation of various physico-chemical

parameters of water viz. Total Dissolved Solids, Turbidity, Dissolved Oxygen, free CO₂, Alkalinity, Chloride and Phosphate. While other parameters viz. water temperature and p^H were recorded at the time of sample collection by using

Thermometer and pocket digital p^H meter. The samples for different parameters were analyzed with the help of procedure described by APHA, 1985.

Table No. 01: Physical parameters of Parichha dam/reservoir district Jhansi (U.P.) India.

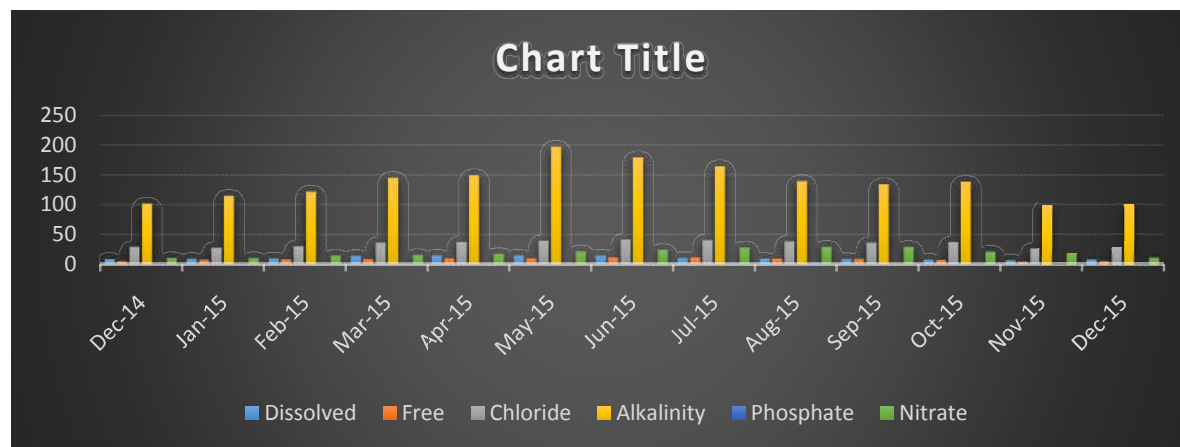
Month	Temperature °C	Turbidity	TDS mg/l	P ^H
December 2014	20	10.05	210	8.0
January 2015	22	11.18	214	8.2
February 2015	22	12.23	148	8.2
March 2015	24	12.03	159	8.1
April 2015	24.4	12.2	155	8.3
May 2015	25	11.5	118	8.5
June 2015	26	10.08	210	8.6
July 2015	24	17	220	8.3
August 2015	23.8	19.10	232	8.4
September 2015	22.4	14	168	7.6
October 2015	21.1	3.04	190	7.7
November 2015	19	4.05	145	7.9
December 2015	20	9.99	195	7.9



Graph A: Physical parameters of Parichha dam/reservoir district Jhansi (U.P.) India.

Table No. 02: Chemical parameters of Parichha dam district Jhansi (U.P.) India.

Months	Dissolved Oxygen	Free CO ₂	Chloride	Alkalinity	Phosphate	Nitrate
December 2014	9.1	5.7	30	102	0.68	10.9
January 2015	9.9	8.1	28	115	0.51	10.9
February 2015	10.5	8.9	31	122	0.51	15.1
March 2015	14.5	9.1	37	145	0.61	16.1
April 2015	15.1	10.2	38	150	0.49	18.1
May 2015	15.2	10.3	40	198	0.85	22.1
June 2015	15.4	11.8	42	180	0.10	25
July 2015	11.1	11.8	41	165	2.05	29
August 2015	10.0	10.1	39	140	2.45	30
September 2015	9.5	9.1	37	135	1.15	30
October 2015	8.2	7.9	38	139	0.98	22
November 2015	7.32	4.6	27	99	0.78	18
December 2015	8.1	5.4	28	100	0.68	11

**Graph. B: Chemical parameters of Parichha dam/reservoir district Jhansi (U.P.) India.**

DISCUSSION AND RESULT

The monthly variation in Physico-chemical parameters is presented in table no. 01 and 02 and graphs A and B.

Water temperature: Generally the weather in study area is quite cool, the maximum temperature of 25⁰C to 26⁰C were recorded in May and June and minimum of 19⁰C to 20⁰C were recorded in the months of

November and December. It showed that higher temperature in summer and relatively lowers in winter. Similar study Salve and Hiware, 2008; Manjare *et.al.* 2010 observed that during summer water temperature was high due to low water level, high temperature and clear atmosphere. Water temperature plays an important factor which

influences the chemical, Biochemical and Biological characteristics of water body.

Turbidity: The turbidity of water fluctuates from 3.04 NTU to 19.10 NTU. The maximum value of 19.10 NTU was recorded in the month of August, it may be due to human activities and presence of suspended particulate matter and the minimum value of 3.04 NTU were recorded in the month of October.

Total Dissolved Solids: The total dissolved solid fluctuates from 118 mg/l to 232 mg/l. The maximum value 232 mg/l was recorded in the month of August. It is due to rain fall and minimum value 118 mg/l in the month of May.

P^H: The P^H was alkaline values ranges from 7.6 to 8.6. The maximum P^H value 8.6 was recorded in the month of June and minimum P^H value 7.6 in the month of September. Most of biochemical and chemical reactions are influenced by the P^H. The reduced rate of photosynthetic activities reduces the assimilation of CO₂ and bicarbonate which are ultimately responsible for increase in P^H, the low oxygen values coincided with high temperature during the summer month, Kamble *et.al.* 2009. The factors like air temperature bring about changes the P^H of water. The higher P^H values observed suggests that CO₂, carbonate-bicarbonate equilibrium is affected more due to change in physical-chemical condition by Karanth 1987.

Dissolved Oxygen: The value of dissolved oxygen fluctuates from 7.32 mg/l to 15.4 mg/l. The maximum values 15.2 mg/l to 15.4 mg/l the month of May and June and minimum values 7.32 mg/l in the month of November. The long days and intense sun light during summer seem to accelerate photosynthesis by phytoplankton, utilizing CO₂ and giving off oxygen. This possibly accounts for the greater qualities of oxygen recorded during summer by Krishnamurthy 1990.

CO₂: The value of free CO₂ ranges from 4.6 mg/l to 11.8 mg/l. The maximum value 11.8 mg/l was recorded in the month of June and July and minimum value 4.6 mg/l in the month of November. This may be depends upon alkalinity and hardness of water body. The value of CO₂ was high in June this could be related to the high rate of decomposition in the warmer month.

Chloride: The values of chlorides range from 27mg/l to 42 mg/l. The maximum value 42 mg/l was recorded in the month of June (summer) and minimum value 27 mg/l in the month of November. In the present study minimum value of chloride reaches in November (Mishra and Narayan, 2016)

Alkalinity: Total alkalinity ranges from 99 mg/l 198 mg/l. The maximum value 198 mg/l was recorded in the month of May while minimum value 99 mg/l in the month of November (winter). The alkalinity was maximum due to increase in bicarbonates in the water. Hujare, 2008 also reported similar result that it was maximum in summer and minimum in winter due to high photosynthetic rate.

Phosphate: The value of phosphate fluctuates from 0.10 mg/l to 2.45 mg/l. The maximum value 2.45 mg/l was recorded in the month of August (Monsoon) and minimum value 0.10 mg/l in the month of June. The high value of phosphate in August month mainly due to rain, surface water runoff, agriculture run off and washerman activity could have also contributed to the inorganic phosphate content.

Nitrate: The values of nitrate ranges from 10.9 mg/l to 30.0 mg/l. The maximum value 30.0 mg/l was observed in the month of August and September and minimum value 10.9 mg/l to December. Basavaraja *et.al.*, 2011 also reported similar result.

RESULTS

During the course of study only minor difference in physical and chemical

parameter of study area were observed. But the result indicates that the Dam/Reservoir is not polluted and can be used for domestics, irrigation and aquaculture.

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