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Physico-Chemical Analysis of the Freshwater at Majalgaon Dam, Majalgaon, Dist. Beed-431131, Maharashtra State, India

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Abstract: The physicochemical parameters of fresh water body Majalgaon dam were analyzed for one year. A dam has been constructed across the Sindhaphana River, Majalgaon Tq, Beed district this dam water is mainly used for irrigation, drinking, domestic and aqua culture. A total of 10 water parameters were analyzed. The one year analysis of physico-chemical characters of water indicated that Majalgaon dam is less polluted. The findings show that all the physicochemical parameters measured were within the tolerable values. The water has permissible levels of Water temperature, Dissolved oxygen pH, Biological oxygen demand (BOD), Chemical oxygen demand (COD) Total hardness and Total dissolved solids. In throughout the sampling periods there is a fluctuation in the physico-chemical characters of the water throughout the year and this might be due to entry of rain water and change in the temperature as season changes.

Keywords: Sindhaphana River, Majalgaon dam, Physico-chemical parameters.

I. INTRODUCTION

Study of physico-chemical properties of an aquatic ecosystem is important, because fluctuation in the water quality has an influence on the biotic communities. Present study has been carried out to assess the water quality of a fresh water body by studying its physico-chemical characteristics. [1]. Water as a universal solvent has the capability to dissolve many substances including organic and inorganic compounds. The quality of water generally refers to the component of water present at the optimum level for suitable growth of plants and animals. Aquatic organisms need a healthy environment to live and adequate nutrients for their growth; the productivity depends on the physicochemical characteristics of the water body.

The analysis of Physico-chemical parameters of water is essential for utilization of water for different purposes such as drinking, industrial, fisheries and irrigation purposes and also helps to understand the complex processes and interaction between environment and biological process in water [2].

Majalgaon dam is constructed on the Sindhaphana River, Majalgaon Tq. Majalgaon Dist. Beed (M.S.) India. Located between latitude 19°15'N and longitude 76°18'E.

The Majalgaon dam is a multipurposing dam for Majalgaon city and surrounding villages of Majalgaon taluka for different activities which are drinking, aquaculture, and domestic and, for irrigation. Study of physico-chemical properties of an aquatic ecosystem is important, because fluctuation in the water quality has an influence on the biotic communities. Present study has been carried out to assess the water quality of a fresh water body by studying its physico-chemical characteristics.

II. MATERIALS AND METHODS

The water samples for physicochemical analysis were collected from two sampling stations (S1, and S2). Water samples were collected from selected stations during first week of every month early in the morning between 8 am to 11 am from January 2016 to December 2016.

The samples were collected in wide mouthed screw capped, air tight and opaque polythene containers. Each sample was comprised of five liters of water collected from 15 cm below surface water. The estimation of total hardness, Chlorinity, BOD, COD, TDS, were analyzed in the laboratory by titrimetric method. Separate samples were collected for each parameter analysis. Atmospheric and water temperature recorded by standard centigrade thermometer, pH recorded by standard pH meter on field. The analysis of Physico-chemical characteristics is carried out by the standard methodologies as per (Kodarkar, M. S. (1992) [3]. Trivedi R. K and Goel P.K. (1984) [4]. All data were statistically analyzed.

III. RESULTS AND DISCUSSION

The Rain fall was recorded from 0 to 483 mm. The maximum of 158 mm was recorded in the month of July. No Rain fall recorded during November, to April (Figure-1). The atmospheric temperature (AT) recorded from 250 C to 36.50C during study period. Maximum temperature recorded in the month of May 36.50C and minimum of 250C was recorded in the month of December at station A&B (Figure -2). Water Temperature(WT) ranged from 240 C to 320 C.. Minimum pH was observed in October 7.2 and Maximum 8.6 in April. The range of pH in the present study was in tolerable limit and it is suitable for aquatic organisms (Subbamma, D. V. and Rama D. V. (1992), [6]. The dissolved oxygen in Majalgaon dam varied from 7.2 to 8.5 at station A and B. The maximum of 8.5 mg/l was recorded in the month of August and minimum of 7.2 mg/l in April at station A&B (Figure -9). The total dissolved solids of Majalgaon dam varied from 176 to 270 mg/let station A&B. The maximum of 270 mg/l was recorded in the month of July and minimum of 176 mg/l was recorded in December at station A&B (Figure -10). The Total hardness varied from 92 mg/l to 120 mg/l at the A and B station. The maximum of 120 mg/l recorded in the month of December and the minimum of 92 mg/l were recorded in the month of April (Figure -5). Chlorinity varied from 19.1 to 26.5 mg/l at A and B station the maximum of 26.5 mg/l was recorded in the month of April and minimum 19.1 mg/l was recorded in the month of June at station A&B (Figure -6). Biochemical oxygen demand values ranged from 2.31 to 5.70 mg/l. Minimum biochemical oxygen demand 2.31mg/laws recorded in May and maximum 5.70mg/l was recorded in August. Seasonal analysis reveals that BOD values are more in monsoon than winter and summer at station A&B (Figure -7). Chemical oxygen demand test determines the oxygen required for chemical oxidation of organic matter with the help of strong chemical oxidant. Chemical oxygen demand values ranged from 5.1 to 8.41mg/l. Minimum 5.1mg/let. COD was recorded in December while maximum 8.41 COD was recorded in April at station A&B (Figure -8). Seasonal analysis reveals that maximum values of COD were noted in summer and minimum in winter season. Maximum values in summer may be due to less quantity of water, death and decay of aquatic flora and fauna. Higher values in monsoon may be due to inflow of dead organic matter. Minimum COD in winter is due to settlement and dilution effect. Similar results were observed by (Kudesia V. P. etal 1986) [7]. In conclusion the water of Majalgaon dam is less polluted and the physicochemical parameters studied in the present work were tolerable limit therefore water body will be used for domestic purposes, mainly for drinking water.

Figure 1. Monthly value of rain fall (mm) of Majalgaon dam
(Jan-2016- Dec-2016)

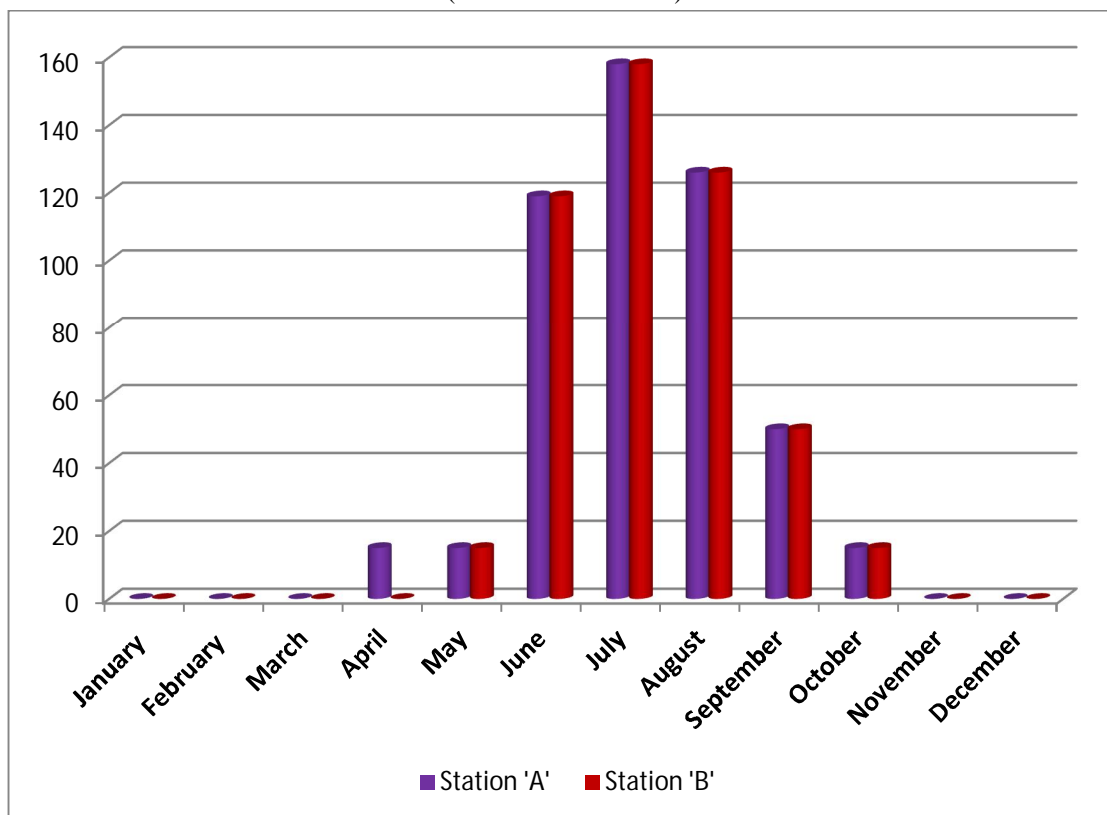


Figure 2. Monthly value of atmospheric temp ($^{\circ}\text{C}$) of Majalgaon dam
(Jan-2016-Dec-2016)

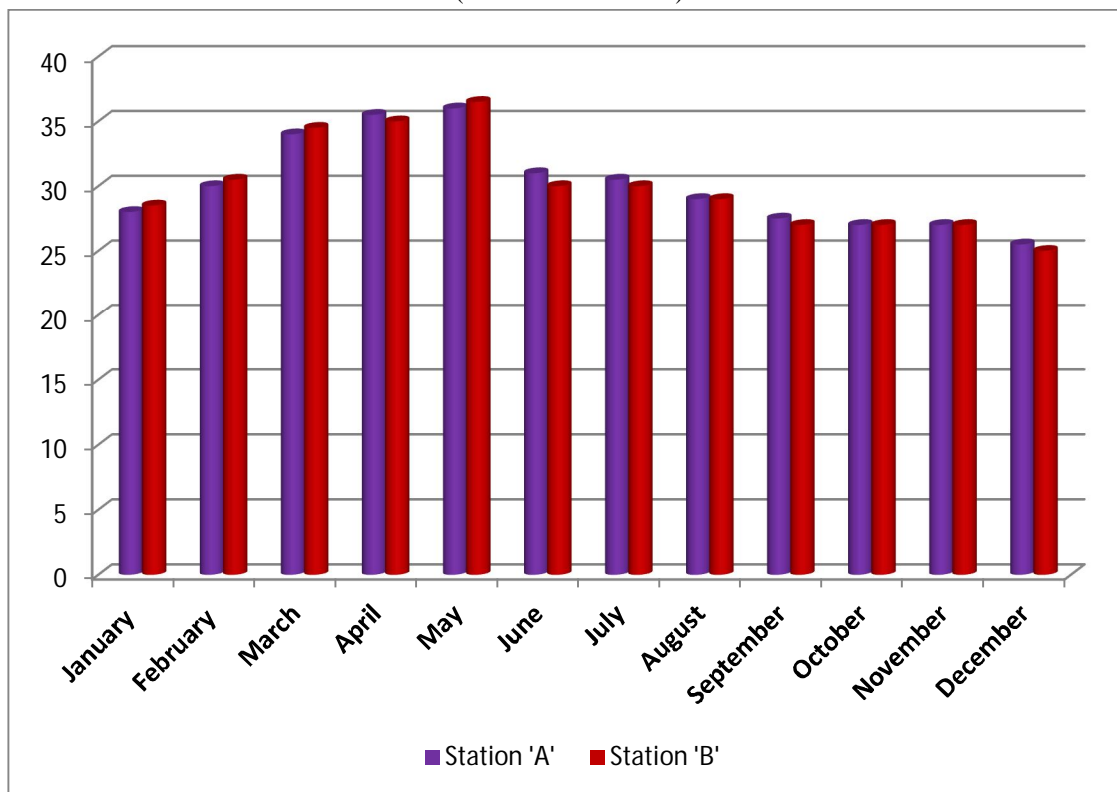


Figure 3. Monthly value of water temp ($^{\circ}\text{C}$) of Majalgaon dam
(Jan-2016-Dec-2016)

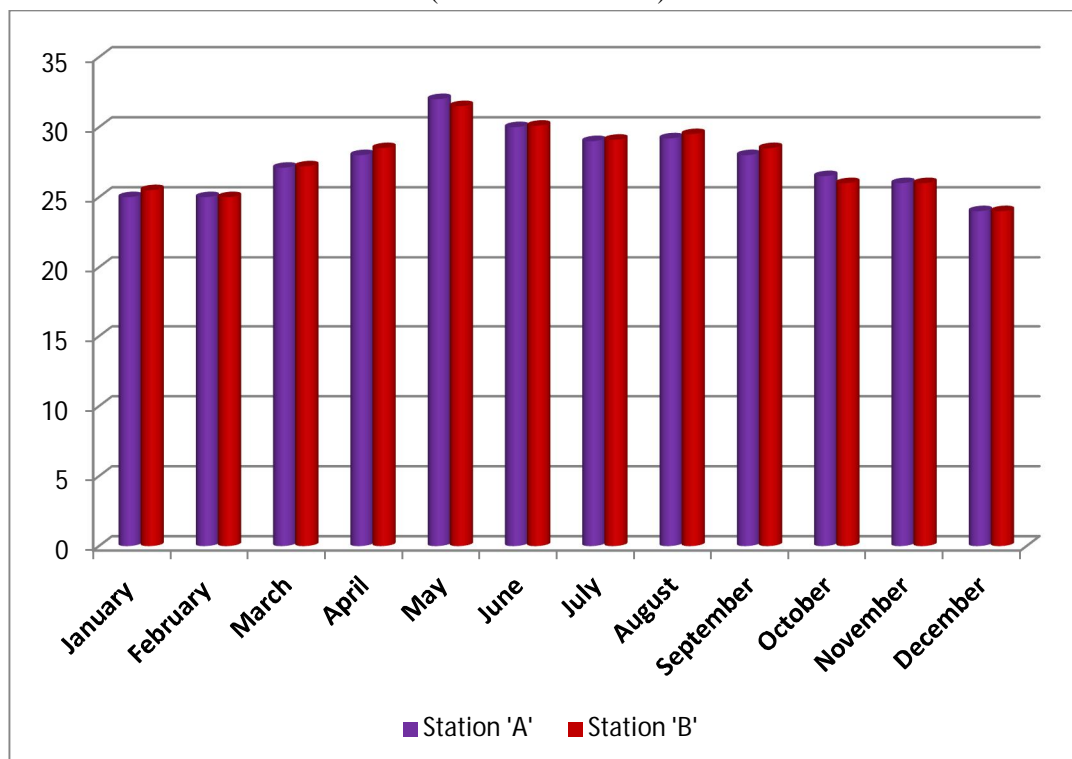


Figure 4. Monthly value of pH. of Majalgaon dam
(Jan-2016-Dec-2016)

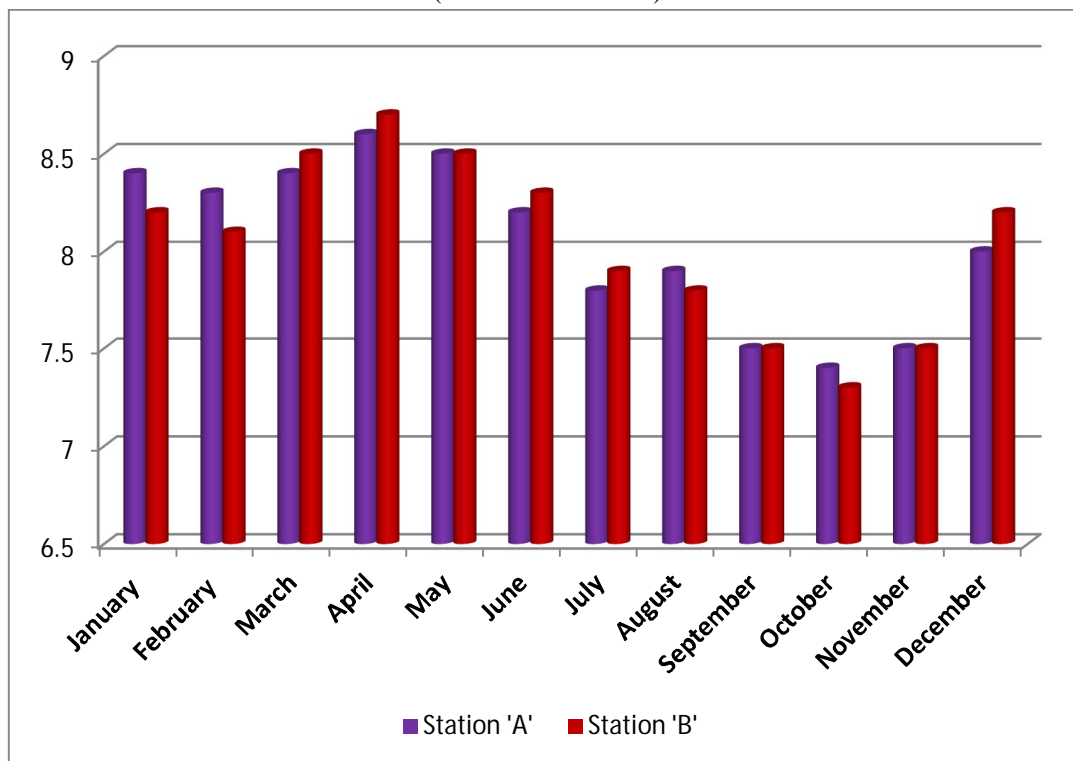


Figure 5. Monthly value of total hardness (mg/l) of Majalgaon dam
(Jan-2016 – Dec-2016)

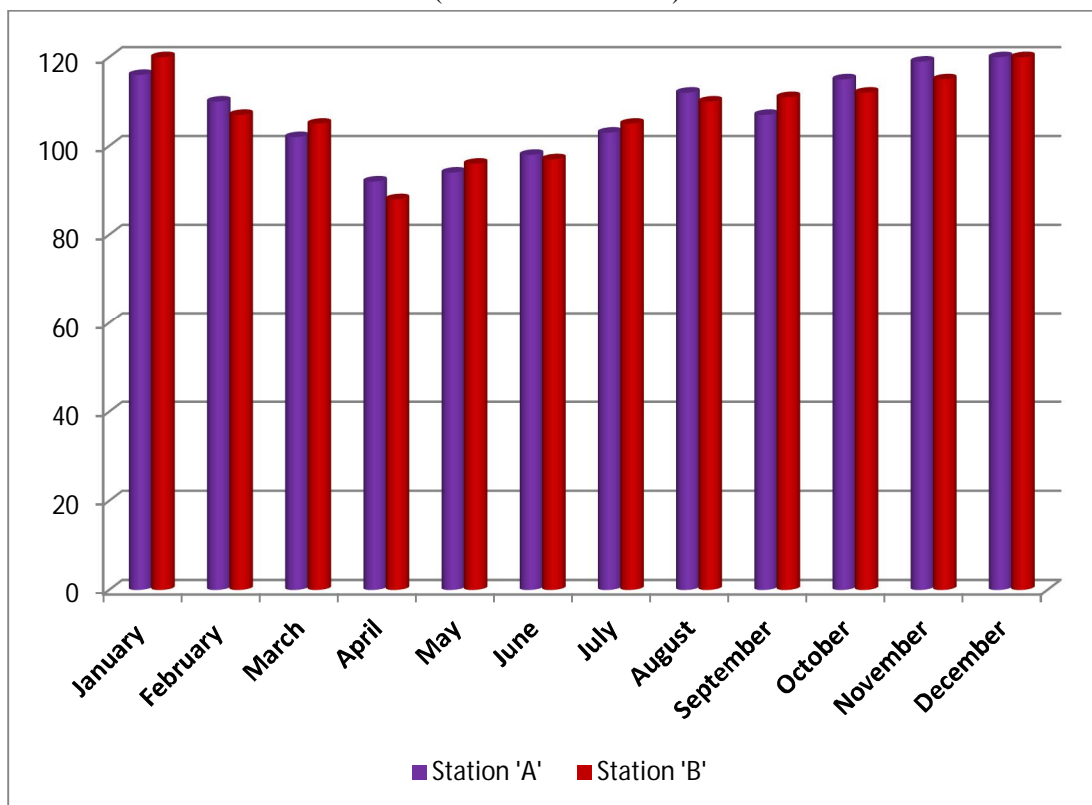


Figure 6 monthly value of total Chlorinity (mg/l) of Majalgaon dam
(Jan-2016 – Dec-2016)

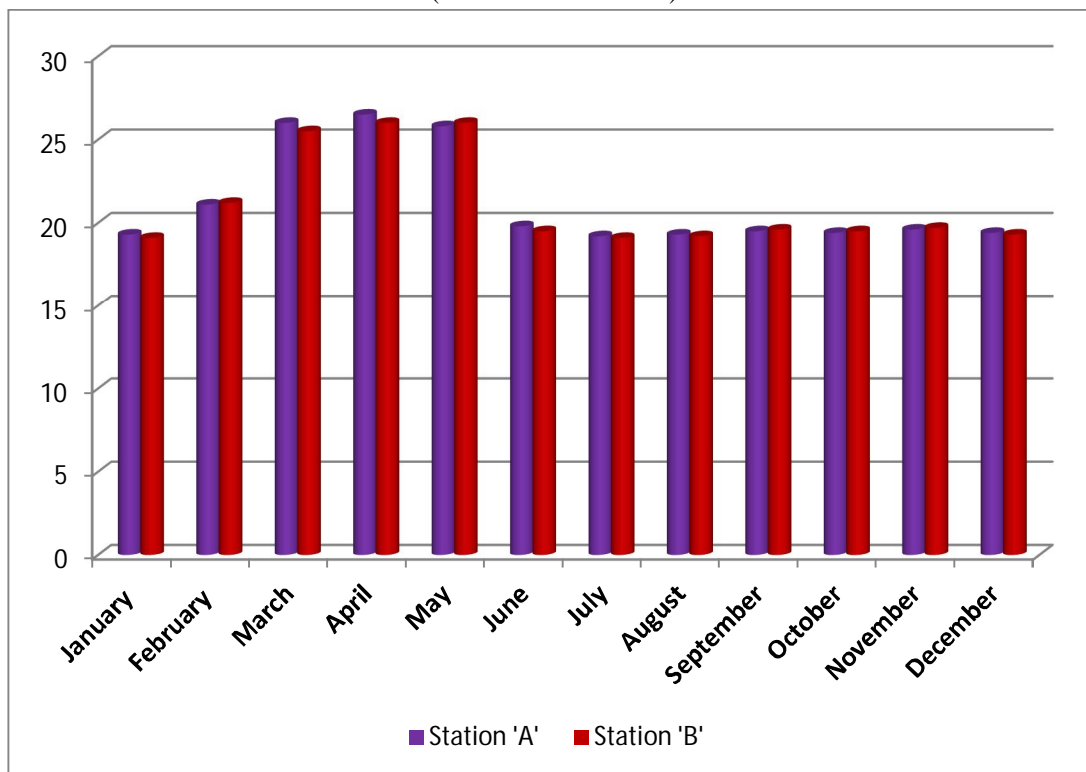


Figure 7. Monthly value of biological oxygen demand (mg/l) of Majalgaon dam (jan-2016 – Dec-2016)

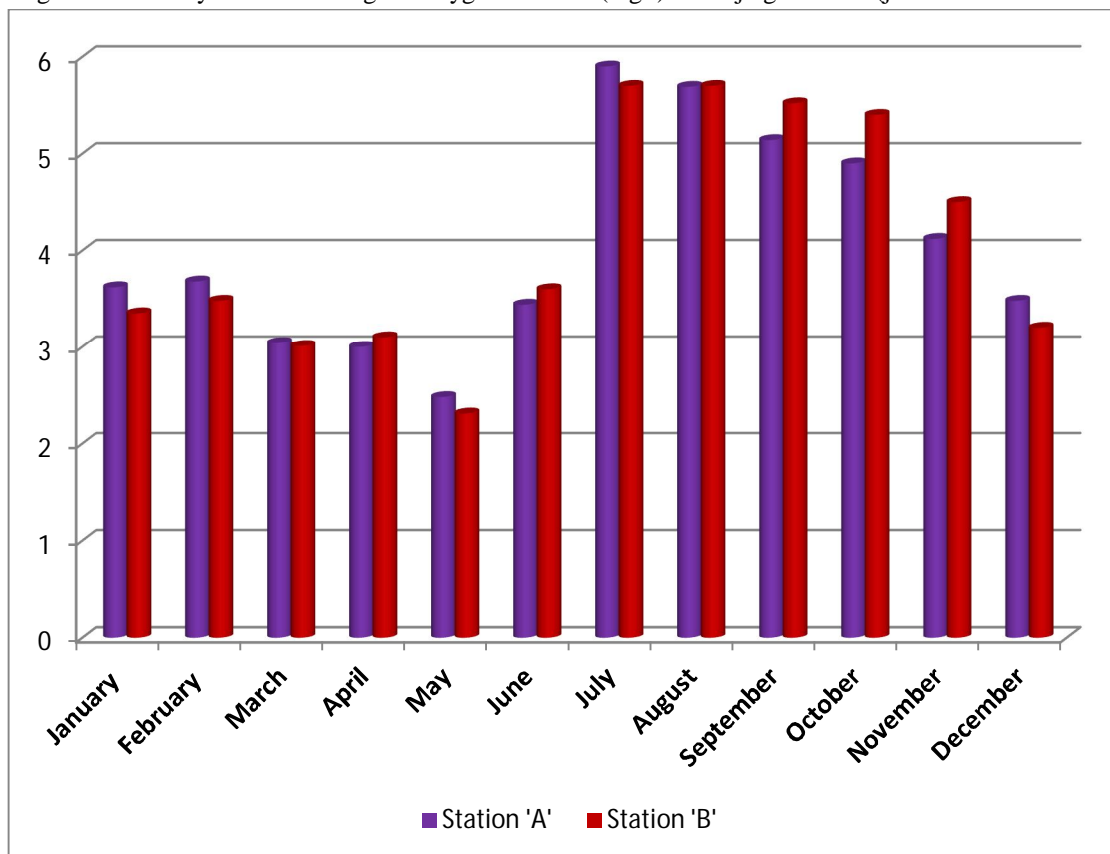


Figure 8. Monthly value of chemical oxygen demand (mg/l) of Majalgaon dam (jan-2016 – Dec-2016)

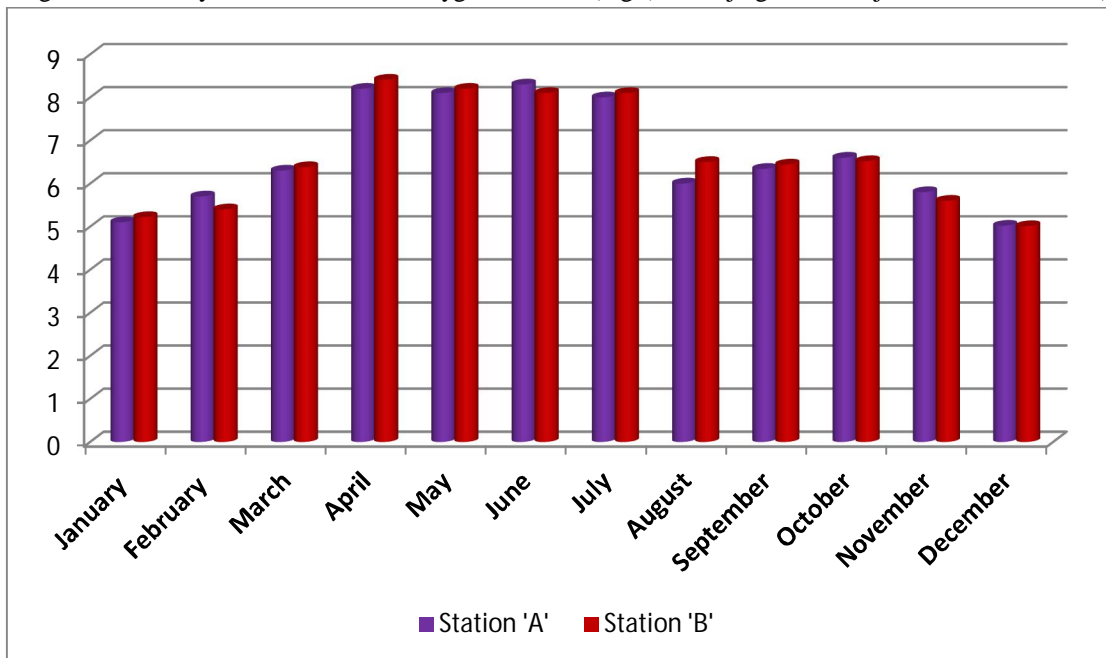


Figure 9. Monthly value of dissolved oxygen (mg/l) of Majalgaon dam (Jan-2016-Dec-2016)

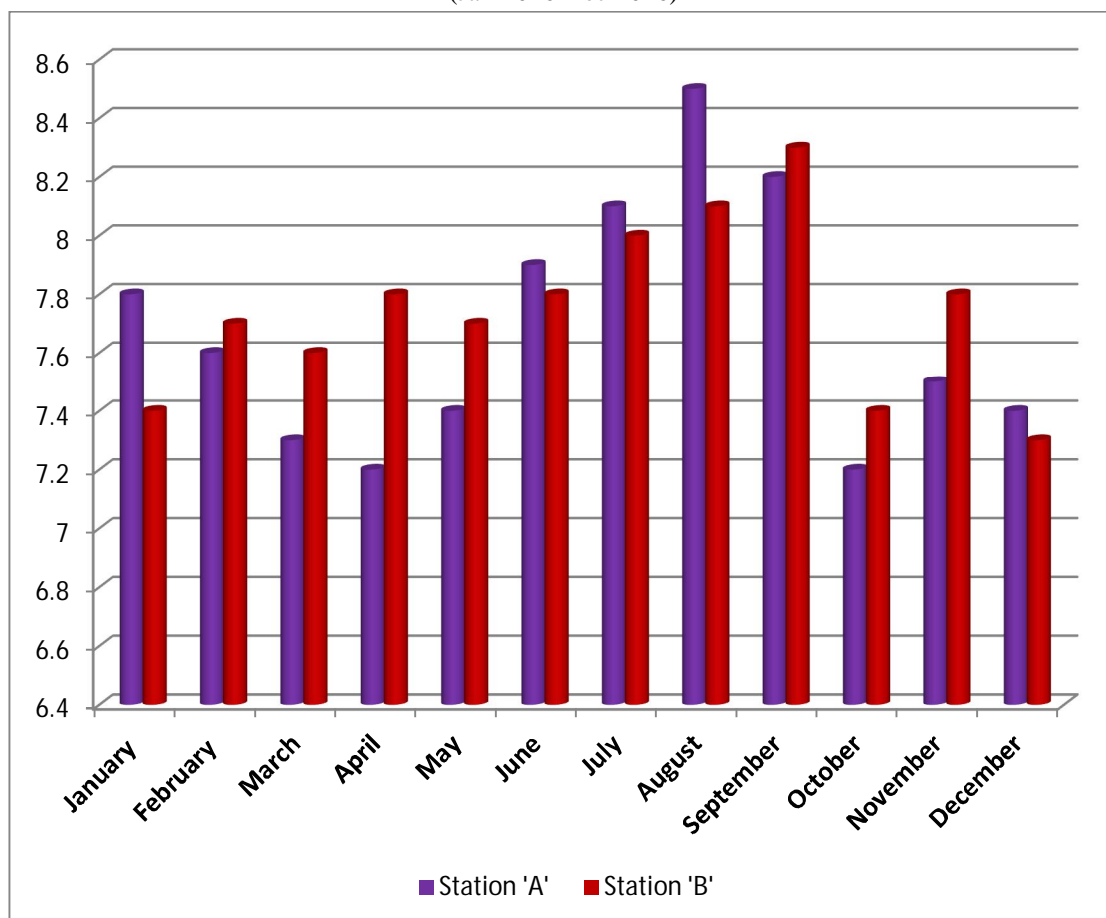
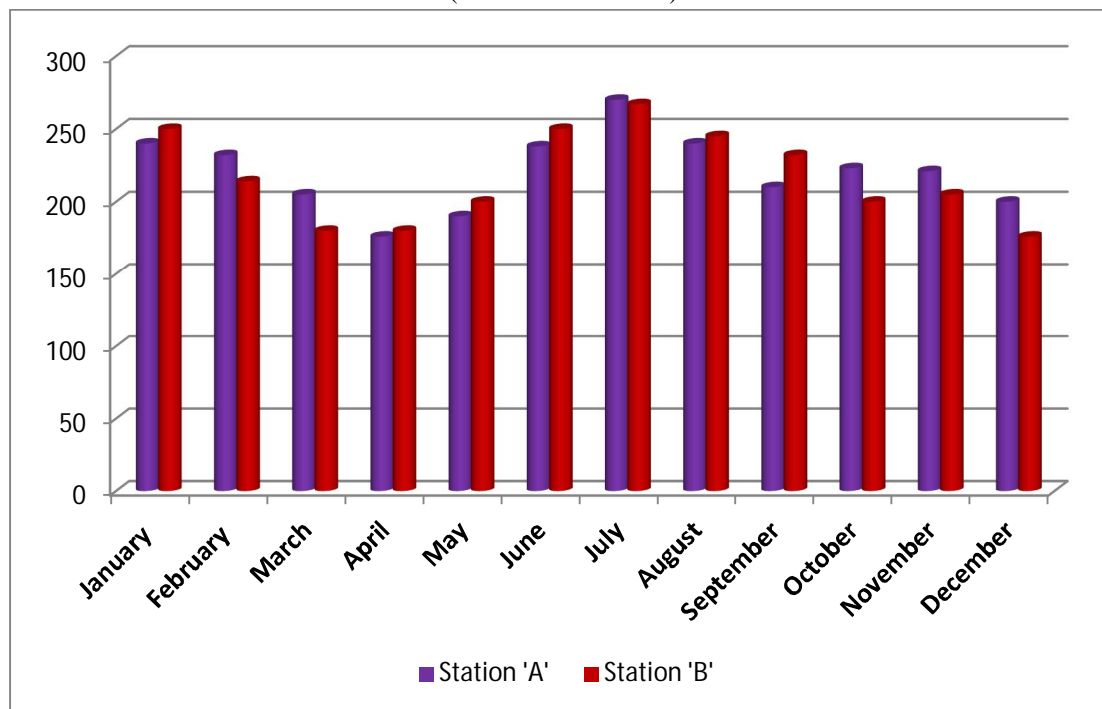


Figure 10. Monthly value of TDS (mg/l) of Majalgaon dam
(Jan-2016-Dec-2016)



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