

# Physico – Chemical characteristics of Adan reservoir of Washim district

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## Abstract

The present study deals with the physico-chemical characteristics of water of the Adan Reservoir, Washim District. Parameters like pH, Conductivity, Total Dissolve solids (TDS), Sulphates, Nitrates and Phosphates showed distinct variations in the lake. The pH in Adan Reservoir was found to be moderate.

**Keywords:** Physico-chemical parameters, Adan reservoir

## 1. Introduction

Water is not only essential to life but is the important natural source which is abundant in nature and cover about 2/3 rd of earth surface. However, only 1% of the water resource is available as fresh water (i.e surface water, rivers, lakes, streams and ground water) for human consumption and other activities. In India studies of physico-chemical characteristics of water have been carried out by various workers [1-3].

The Adan Reservoir is large size and constructed on Adan river near village Mansi, Taluka Karanja (Lad), Dist – Washim. It is situated at 77° 33' East Longitude and 20° 24'

North Latitude. The Adan reservoir is constructed to meet the demand of human being, irrigation for drinking purpose and for fish production.

## 2. Materials and methods

The water samples were collected from Adan reservoir during January 2014 to June 2014 for analyzing the various physico-chemical parameters. The samples were collected in plastic container in the morning hours and brought to the laboratory for further analysis. All standard methods of APHA [4] were used for physico-chemical analysis. pH, Conductivity, TDS were estimated digitally while Sulphates, Phosphates and Nitrates by spectrophotometrically.

## 3. Result and discussion

Adan Reservoir is rain fed perennial water body. The reservoir was slightly muddy due to deposition of surface runoff. The average range of variations in physicochemical factors at 4 sampling spots during January 2014 to June 2014 shown in table- 1.

**Table 1:** Range of Physico-chemical parameters of Adan Reservoir during six month January 2014 to June 2014

Spot Water Parameter	Spot 1	Spot 2	Spot 3	Spot 4
pH	6.68 to 7.90	7.13 to 7.62	7.19 to 7.52	7.19 to 7.49
Conductivity	302 to 357	310 to 333	309 to 338	292 to 335
TDS (mg/l)	214 to 250	222 to 310	218 to 237	222 to 236
Air Temperature	34.2 <sup>0</sup> to 36.8 <sup>0</sup>	40.1 <sup>0</sup> to 43.6 <sup>0</sup>	29.2 <sup>0</sup> to 31.8 <sup>0</sup>	27.1 <sup>0</sup> to 28.9 <sup>0</sup>
Water Temperature	20.2 <sup>0</sup> to 22.6 <sup>0</sup>	25.6 <sup>0</sup> to 27.1 <sup>0</sup>	20.1 <sup>0</sup> to 22.3 <sup>0</sup>	19.9 <sup>0</sup> to 21.1 <sup>0</sup>
Sulphates (mg/l)	0.008 to 0.034	0.028 to 0.152	0.006 to 0.031	0.009 to 0.490
Nitrates (mg/l)	0.010 to 0.101	0.021 to 0.083	0.017 to 0.056	0.019 to 0.061
Phosphates (mg/l)	0.294 to 0.306	0.073 to 0.322	0.280 to 0.308	0.298 to 0.331

Temperature is one of the important physical parameter for the growth of organisms. Atmospheric and water temperature play an important role in physico-chemical and physiological behavior of aquatic ecosystem [5] the variations in atmospheric and water values ranges from 19.9<sup>0</sup> to 21.1<sup>0</sup> and the water values ranges from 27.1<sup>0</sup> to 43.6<sup>0</sup>

pH values of water sample were observed in average during the study period. pH may be associated with increase photosynthesis, similar results were observed by Unni [6] Goldman and Horne [7] also discussed the fact that changes in pH values are generally governed by CO<sub>2</sub>, CO<sub>3</sub>, HCO<sub>3</sub>.

The conductivity of lake water is a measure of the capacity of substance or a solution to conduct electric flow. It depends upon dissolved solids [4]. The values of conductivity ranges from 292 to 357µs. Similar trends of conductivity was given by Pushpendra and Madhyasatha [8] while studying certain chemical parameters in soil water phases in a small pond along western India. Water has a large number of dissolved solid, which largely govern its physico-chemical properties

and in turn have indirect effect on the organism. Total dissolved solids ranges from 214 to 310. Such results have also been reported by Paka and Rao [9]. Nitrate is the most oxidized from the nitrogen and is an important plant nutrient. The values of nitrates ranges from 0.010 to 0.101 mg/l. respectively, was also noted by Bade *et.al.* [10] (2009) during analysis of physico-chemical parameters in Sai Reservoir, Latur District, Maharashtra. Phosphates is prime nutrient for the growth of plant next to the nitrogen and plays an important role in metabolism of both plants as well as animals. Phosphorous values range from 0.73mg./l to 0.331mg./l. in Adan reservoir. In nature water phosphorous ranges from 0.005mg/l. to 0.020 mg./l [11]. The physico-chemical parameters showed that the water from Adan Reservoir is of potable quality and is suitable for the commercial fish culture.

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