

# Hydrobiological Study of Lower Dudhna Dam, Wakdi, Dist. Parbhani (M.S.) India

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**Abstract-** Present paper deals with the study of Physico-chemical parameters of Lower dudhna water reservoir in Parbhani district of Maharashtra. Monthly variations in the physical and chemical parameters such as atmospheric temperature, water temperature, total dissolved solids, pH, dissolved oxygen, total hardness, total alkalinity, nitrate, were investigated for a period of one year (Feb 2021 to Jan 2022). All parameters were within permissible limits. The results revealed that the different months showed fluctuations in physico-chemical parameters.

**Keywords:** Physico-chemical Parameters, Lower Dudhna Dam, Monthly variation.

## INTRODUCTION:

The term "water quality" is used to describe the, physical, chemical and microbiological properties of water that determine its fitness for a specific use. Water is a unique substance. One of its unique characteristics is its excellent dissolving capability. As water moves through its cycle of rainfall, runoff, infiltration, impounding, use and evaporation (hydrological cycle) it comes into contact with a vast range of substances which may be dissolved by the water to a greater or lesser extent. The type and amount of these dissolved substances determine the properties (quality) of water. Lower Dudhna Dam is a water reservoir located on Dudhna River in Selu taluka of Parbhani District of Maharashtra State. It is situated between 18.45 to 19.10 North Latitude, 76.13 to 77.00 East Latitude and 357 m above sea level. The water from this dam is mainly used for the drinking and irrigation purpose in Parbhani and Jalna district of Maharashtra. Its storage capacity 242,200 million liters.

Analysis of quality of water is important to preserve and protect the natural ecosystem. To assess the quality of water, analysis of physico-chemical parameters of water is essential for the best usage like irrigation, drinking, bathing, industrial processing and fishing and so on. Water quality deals with the physical chemical and biological characteristics in relation to all other hydrological properties, (shinde et al., 2010). Natural and anthropogenic activities influence the quality of water including local climate, geology and irrigation practices, water regulates the earth's temperature (Ahamed, M and Krishnamurthy, R. 1990).

## MATERIAL AND METHODS:

A limnological survey of Lower Dudhna dam was carried out from Feb 2021- Jan 2022. For physico-chemical analysis water samples were collected from four sampling stations every month in the morning (between 8 to 10 a.m.) to study physico-chemical properties of water, water samples were collected in 5 liters plastic can, brought to laboratory and analyzed by standard methods. For dissolved oxygen, the water sample was taken in 300 ml capacity BOD bottles and fixed on the spot. The results were calculated as per standard formulas and methods APHA (1985), NEERI (1986), Kodarkar (1992).

## RESULTS AND DISCUSSION:

The physico-chemical parameters of water samples found in various months have been shown in **Table.01**.

Month	A. Temp	Water Temp	Hardness (mg/L)	TDS (mg/L)	Ph	DO (mg/L)	Total Alkalinity (mg/L)	NO <sub>3</sub> (mg/L)
Feb	33.0	24.2	135.0	271.15	7.51	6.55	217.0	1.17
March	35.0	24.8	136.0	422.55	7.60	6.40	228.0	1.25
April	37.5	28.1	138.0	432.90	7.65	6.02	258.0	1.18
May	38.5	31.0	140.0	440.66	7.62	5.75	238.0	1.17
June	31.0	28.5	147.0	342.20	7.54	5.64	247.0	1.52
July	26.0	26.2	154.0	466.28	7.50	6.64	232.0	4.68
Aug	26.4	25.0	148.0	500.24	7.60	7.65	252.0	5.12
Sept	26.5	24.9	138.0	432.30	7.63	8.10	182.0	4.10
Oct	27.5	23.1	129.0	338.10	7.35	8.73	190.0	0.04
Nov	26.5	21.2	132.0	310.28	7.16	9.12	189.0	0.05
Dec	25.5	19.2	133.0	238.30	7.24	10.12	201.0	0.06
Jan	27.0	20.6	134.0	208.18	7.21	10.43	211.0	0.05

**Atmospheric temperature**

The atmospheric temperature was found to be in the range between 25.5<sup>o</sup>C to 38.5<sup>o</sup>C. It was minimum during December and maximum in the month of May. It was higher during summer months and lower during winter months. Similar observations were recorded by Bade et.al. [3] in Sai reservoir, Latur.

**Water temperature**

Water temperature is an important factor which influences the chemical, biochemical and biological characteristics of water body. Water temperature of Lower Dudhna reservoir ranged between 19.2 <sup>o</sup>C to 31.0 <sup>o</sup>C. The minimum water temperature recorded in the winter season and maximum in the summer months. Similar results were reported by Jayabhaye et. al, (2008) and Salve et. al, (2008).

**Total hardness:**

The values of hardness ranged between 129.0 mg/L to 154.0mg/L. The maximum value (154.0mg/L.) was recorded in the month of July and minimum value (129.0 mg/L) in the month of October. Hujare (2008) reported the total hardness high during summer than monsoon and winter.

**Total dissolved solids**

Total dissolved solids means the amount of particles that are dissolved in water. The total dissolved solids fluctuated between 208.18 mg/L to 500.24 mg/L. Seasonal variations revealed that total dissolved solids values were maximum during summer and minimum during winter.

Lower values during winter may be due to settling of suspended particles and trapping of dissolved solids by organism.

**pH**

The pH of water ranged between 7.16 to 7.65. The minimum pH was recorded in the month of November and it was highest in the month of April. Bade et.al, (2009) and Jayabhaye et.al. (2008) reported similar observations.

**Dissolved Oxygen:**

Aquatic animals use dissolved oxygen for their respiration and metabolic processes. Alteration in dissolved oxygen may be due to production of oxygen by photosynthesis. The dissolved oxygen was recorded maximum during winter season and minimum in summer season. Maximum DO value of 10.43 mg/l was found to be highest in the month of January. Increased value observed due to high solubility of oxygen at low temperature. During summer season, depletion of DO in water is due to higher temperature and increased microbial activity, Deshmukh and Ambore (2006).

**Total alkalinity**

Alkalinity is the measure of the capacity of water that neutralizes the acids. In present study the total alkalinity ranged between 182 mg/L to 258 mg/L. Total alkalinity found minimum in monsoon and maximum in summer during the study

**Nitrate:**

Maximum nitrate values were recorded during monsoon season and minimum during winter season. Maximum nitrate values of 5.12 mg/l were recorded in the month of August. Higher values during monsoon season may be due to the use of chemical fertilizers in crop fields of catchment areas. Surface runoff during monsoon carries nitrates into the dam water. Karuthapandi et al., (2013) recorded similar results.

**Conclusion:**

A study of Physico-chemical parameters of Lower Dudhna water Dam in Parbhani district of Maharashtra was carried out by taking certain important parameters for a period of one year (Feb 2021 to Jan 2022). In present investigation it was found that all parameters were within permissible limits. This represents that the reservoir is non-polluted and can be used for agriculture, fish culture and domestic use.

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