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## STUDY ON PHYSICO-CHEMICAL PARAMETERS OF LIMBOTI DAM, TALUKA LOHA, DISTRICT NANDED, MAHARASHTRA, INDIA

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### ABSTRACT

The present study was conducted to assess the physico-chemical parameters of Limboti Dam Water of Loha Taluka in Nanded District Maharashtra, India, during the year June 2019 to May 2020. Analysis was performed on 05 different parameters. The monthly variation in the physical and chemical parameters such as Hydrogen ion concentration, water transparency, total hardness, calcium, magnesium were investigated. All the parameters were beyond the permissible limits. The result revealed that there were significant seasonal variations in some physico-chemical parameters and most of the parameters were in the normal range and indicated better quality of dam water. The under capacity of this dam is 3.5 T.M. The water of the dam drinking is supplied to the three talukas namely Kandhar, Loha and Ahmadpur.

**Keywords:** Limboti Dam, pH, Water Transparency, Total Hardness.

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### INTRODUCTION

Water is the main source of energy and governs the evolution on the earth. 71% of earth surface is covered by water, 96.5% of the world's water is sea water which is salty that is not be directly and industrial purposes. 1.7% in ground water, 1.7% in glaciers and the ice caps. Less than 1% water is present in ponds, lakes, rivers, dams etc., which is used by man for industrial, domestic and agricultural purposes. Water quality deals with the physical, chemical and biological characteristics in relation to all other hydrological properties. (Shinde et al. 2010) Water as extraordinary substance, exists in three states as gases, liquid proved important for survivability of life (Simpson et al, 2011). Maximum productivity depends on optimum level of physico-chemical parameters (Sadia et al, 2013). Changes in the water quality are reflected in the biotic community structure as shown by occurrence diversity and abundance pattern of species. Many researchers have done studies on physico-chemical and Biological Characters

of River and Dam Water. Simpson et al. (2011), Harney et al. (2012), Alka (2014), Meme et al. (2014). (Pawar 2018). The present study aims at making an assessment of the water quality of the Limboti Dam in Nanded District. In order to assess the suitability of its water for drinking use and agriculture use.

### MATERIAL AND METHODS

The water samples were collected for physico-chemical analysis from dam. At the regular intervals of one month a period of one year from June 2019 to May 2020. The samples are well mixed and stored in two litre plastic cans. Sample collection was usually completed during morning hours between 6:00 am to 9:00 am every for further Analysis. pH the water transparency, total hardness, calcium, magnesium, parameters were estimated in the laboratory. Standard methods as prescribed APHA (1992), Saxena (1990), were followed for examination of various physical and chemical parameters of water.

**RESULTS AND DISCUSSION**

The seasonal variations in physico-chemical parameters are given tables 1 and 2.

**Table 1. Physico-Chemical Parameters of Water Sample Collection from Four Sampling Station Limboti Dam during the year June 2019 to May 2020.**

Parameters	Hydrogen Ion Concentration				Water Transparency				Total Hardness			
	(pH)				(cm.)				(mg/l)			
Station	A	B	C	D	A	B	C	D	A	B	C	D
June	7.65	7.63	7.51	7.52	70.5	72.2	74.3	75.1	171	168	162	167
July	7.55	7.41	7.39	7.48	61.9	59.6	63.3	61.5	165	159	155	151
August	7.38	7.43	7.28	7.41	53.2	48.9	55.4	57.8	152	148	143	147
September	7.30	7.34	7.21	7.35	32.9	36.5	38.1	42.1	147	145	141	142
October	7.8	7.19	7.13	7.26	39.8	37.5	41.3	40.5	135	141	145	148
November	7.2	7.12	7.7	7.18	44.6	47.5	49.2	51.1	131	138	142	135
December	7.24	7.21	7.19	7.27	51.7	52.5	55.4	57.6	143	149	152	144
January	7.40	7.28	7.22	7.35	58.5	61.3	55.6	57.9	140	153	158	160
February	7.57	7.38	7.33	7.41	62.3	67.2	65.1	69.4	155	158	159	155
March	7.65	7.53	7.41	7.47	67.1	69.4	67.3	60.9	160	158	153	151
April	7.80	7.62	7.58	7.52	72.3	70.4	68.1	62.6	169	165	163	161
May	7.90	7.70	7.62	7.55	81.2	80.5	79.1	76.9	178	171	175	170

**Table 2. Physico-Chemical Parameters of Water Sample Collection from Four Sampling Station Limboti Dam during the year June 2019 to May 2020.**

Parameters	Calcium				Magnesium			
	(mg/l)				(mg/l)			
Station	A	B	C	D	A	B	C	D
<b>June</b>	92	98	93	90	148.55	144.08	139.30	145.01
<b>July</b>	69	87	83	88	143.28	137.77	134.74	129.52
<b>August</b>	85	81	80	84	131.26	128.23	123.48	126.50
<b>September</b>	72	78	81	83	129.43	125.96	121.23	121.74
<b>October</b>	68	71	73	77	118.40	123.67	127.18	129.21
<b>November</b>	61	63	65	62	116.11	122.62	126.14	119.87
<b>December</b>	65	68	64	61	127.14	132.40	136.38	129.11
<b>January</b>	71	73	76	75	132.67	135.18	139.45	135.48
<b>February</b>	77	79	74	76	136.21	138.72	140.94	136.45
<b>March</b>	83	85	81	87	139.74	137.26	133.23	129.77
<b>April</b>	91	88	92	93	146.79	143.52	140.55	138.30
<b>May</b>	99	97	94	96	153.84	147.33	152.06	146.57

**Hydrogen ion concentration (pH):** In 7.2 to 7.90. The high pH range was recorded present study. pH value was found between in summer and low range in winter. pH of

water is important for the biotic compound because most of the plant and animal species can survive a narrow range of pH from slightly acidic to slightly alkaline condition. Subhas N Chandra et al. (2004). Recorded the pH range between 7.2 to 7.8 in Purna River Parbhani District Maharashtra. The high value of pH is due to the deposition of sewage and agriculture waste. pH value is essential for the growth of aquatic flora. (Sirajudeen et al. 2013).

**Water Transparency:** In the present study ranged from 32.9 to 81.2 cm. The water transparency values were maximum in the season of summer and minimum in the season of monsoon. The water transparency depends on the micro-organisms present in water bodies and suspended organic and inorganic matter present in water. Bose (1956). Pointed out that transparency is one of the most 6 important factors governing the distribution of fishes as it directly influences the planktonic productivity.

**Total Hardness, Calcium and Magnesium:** The total hardness ranged from 131 to 178 mg/l. The calcium level varied from 61 to 99 mg/l. The magnesium level varied from 116.11 to 153.84 mg/l. The maximum values were during summer while minimum values were during winter. The total hardness range reported 95 to 147 mg/l. of majalgaon dam (Ingole, 2012). The hardness reported 148.33 ppm of yeldari dam (sahu et al. 2017). The calcium ranges between 59.43 mg/l. to 147 mg/l. of various water bodies of Marathwada Region (O.S. Chilgar and H.S. Jagtap 2018). The low concentration of magnesium (1.71 mg/l.) is present in Vishnupuri Dam Water. High concentration of magnesium causes nausea, muscular weakness and paralysis in human body when it reaches up to the level of about 400 mg/l. (Trivedy and Goel 1986). Magnesium is essential for chlorophyll bearing algae and plants. The magnesium range reported 4.86 to 18.2 mg/l. of Majalgaon Dam (Ingole, 2012).

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