IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, Dec 2022

ANALYSIS OF WATER QUALITY USING PHYSICO-CHEMICAL PARAMETERS OF CHULHARDOH LAKE IN TUMSAR TALUKA, BHANDARA DISTRICT, MAHARASHTRA, INDIA

Bhageshwari Arvind Thakre[1] , Sayeda Parveen Qureshi[2]

[1]Department of Botany R.T.M. Nagpur University Nagpur 440033 (M.S.) India

[2]P.G.Department of Botany J. M. Patel College Bhandara 441906 (M.S.) India

Corresponding author - **Bhageshwari Arvind Thakre**

Email: - bhageshwarithakre24@gmail.com

Abstract: - This paper present to study of the Physico-Chemical parameter of Chulhardoh Lake in Tumsar Taluka in Bhandara District Maharashtra. Monthly variation in Physico-Chemical Parameters. The Physical included Temperature, pH, Turbidity and Chemical Includes, Alkalinity, Hardness, Chloride, Phosphate. We Analyzed for Period of Pre Monsoon(April-May) Monsoon (July-August) Post Monson (Oct-Nov) in year 2022.All the Physico-Chemical Parameter for Pre Monsoon, and Post Monsoon, Season are with the maximum permissible limit. The result included the Lake is Non-Polluted and it can be used for Domestic and Irrigation Purpose.

Keyword: - ***Chulhardoh Lake, Physico - Chemical Parameter, Permissible limits, Irrigation Purpose.***

Introduction:

Water is wonder of nature. Water was useful to the people for drinking, cleaning animals and for Agriculture, plantation. " No life without water " is a common Saying depending upon the fact that water is the one of the life supporting activities. Water is most Important Component to the Ecosystem better Quality of water described by its Physical Chemical and Biological Characteristics (Muley, 2010). It is a fact that good water quality produces healthier human than one with poor Water Quality (Patil Shilpa G., 2012).Water is known to contain large number of Chemical elements, the interaction of Physical and chemical properties of water play Significant role in Composition , distribution and Abundance of aquatic community . (Sharma Riddhi, 2011)) In Todays Scenario, Unplanned urbanization, rapid industrialization, and indiscriminate use of chemicals are causing a heavy and varied pollution in aquatic environment leading to deterioration of water quality and depletion of aquatic fauna ((R.V. Bhagde, 2020). Water plays essential role in human life and its elements composition is important to life process as it provide all the essential nutrients to Organism. Water is natural resources and a basic human need .Water play essential role in human life. Although statistics, the WHO Report that approximately 36%of urban and 65% of rural

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, Dec 2022

Indians were without access to safe drinking water. (Undi Sai Nagendra Prasadu, 2020) The present work is carried out in vicinity of Tumsar area in Bhandara district in order to study the water quality. Tumsar Taluka is situated on North – Eastern Side of Maharashrta State and share the state border of Madhya Pradesh adjoining districts are Gondia on eastern side , on Northern side Bhalaghat district of Madhya Pradesh on western side Nagpur district. Tumsar it is Famous for lake.

Latitude and longitude 21.472356°-79.8175928° **Site for collection of water sample**

Fig:1 Satellite image of Chulhardoh lake with study site Latitude and longitude

Material Method:

Study area and its characteristics Chulhardoh Lake is the fresh water body in Tumsar Taluka built (Figure 1) for domestic and agricultural uses. During the rainy periods, fresh water also enters the lake as runoff.

Sampling and Analysis of water

The water samples were collected main Chulhardoh Lake in plastic bottles as possible to avoid unpredictable changes. Samples were collected from four different places (S1,S2,S3,S4.) from the Chulhardoh Lake .About 4 Water samples were collected in pre- Monsoon and post-monsoon seasons from selected side on lake. Sample was collected between 9.AM.- 11 AM From Sampling Site in pre –cleaned bottle,Sterilised Bottle Container of 1 lit. Capacity .Each side brought in Laboratory for analysis the Chemical Parameter. Water temp, Air temp, pH field, is recorded immediately on the spot. The parameter were analyzed by using standard procedure described in APHA (Rodger B.Baired, 2017)

The testing of samples was done according to the procedure prescribed by APHA. The water samples were collected and analyzed for different chemical, physical parameters and results were carefully studied and analyzed. The present study comprises of interpretation and analysis of water samples compare with the APHA recommended measurements. Various water quality parameters such

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, Dec 2022

Temperature, pH, Turbidity, Alkalinity, Hardness, Chloride, Phosphate were determined. Preservation, analysis, and interpretation are carried out in accordance APHA Method.

Results and Discussion

The water quality was analyzed by collecting samples from chulhardoh Lake. Sample S1 S2, S3, S4 was collected before and after the monsoon. The results obtained by the analysis of these samples are tabulated in table 2 and there comparison with the APHA and IS standards are tabulated in table1.

Temperature: The present study water temp was recorded 32ºC and 28ºC in pre and post respectively. The temperature is one of the important factors in aquatic environment since it regulate physic-chemicals well as biological activities (Rafiullah M.khan, 2012)

pH: The present Study pH range 6.8 to 7.10 in Both pre and post monsoon respectively . The values are found to be on the according to the APHA standards but and IS standards it will be permissible (A.R. Bhusari, 2014).

Turbidity: The turbidity recorded is 6.7 in pre monsoon and 6.8 in post monsoon. turbidity was higher which was because of rains bringing the sediment from the Adjoining areas.

Total Hardness

The hardness was found to be 68- 78.8 mg/L in pre –monsoon and 66. -76.8mg/L in post Monsoon it will be desirable limit of Hardness is 300 mg/L and it will be permissible.

Water hardness is usually due to the multivalent metal ions, which comes from minerals dissolved in the water Hardness in water is caused due to the presence of dissolved salts of calcium and magnesium. (U. G. Meshram, 2017) It was fluctuated between 68-70 mg/lit. range in pre monsoon and 76.8.mg/lit post monsoon.

Alkalinity

Alkalinity of water is described as the capacity of water to neutralize an acid. It is due to the presence of bicarbonates, carbonates and hydroxide ions in water. The alkalinity of the samples S_3 site maximum 95 and 80mg/L respectively which was found to be in post monsoon . Table2, Fig. 1 (Anima Upadhyay, 2015)

Chloride: The chloride concentration was used as an important parameter for the detection of contamination by sewage. In the present study the chloride was not found. People accustomed to higher chloride in water are subjected to laxative effects (Shahare, 2015)

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, Dec 2022

Phosphate: : In present study the value obtained were range 0.020-0.028 mg/L in pre-monsoon and 0.019-0.0.031mg/L in post-monsoon. According to IS phosphate is content in sample is less than permissible limit .Phosphates enter waterways from human and animal waste, phosphorus rich bedrock, laundry, cleaning, industrial effluents, and fertilizer runoff. (Bheemappa1, 2015)

Table 1 Water Quality Parameters and their ISI and APHA Standards

Sr. No	Parameters	IS10500-2012, APHA 2005,
1	Air Temp.(^{o}C)	---
2	Water Temp(^{o}C)	---
3	Total Hardness (mg/L)	300
4	Total Alkalinity (mg/L)	200
5	Turbidity(mg/L)	10
6	Phosphate(mg/L)	5
7	Chloride(mg/L)	600
8	pH	6.5 - 8.5

Table II

Pre- monsoon and Post monsoon variation in the physic-chemical parameter of lake.

S1, S2, S3, S4, Samples Collected From Chulhardoh lake

Sr. No.	Season	Parameter							
Site		Air Temp.	Water Temp.	Alkalinity	Hardness	Phosphate	pH	Turbidity	Chloride
S1	Pre (April-May)	32^{o}C	30^{o}C	90	68	0.025	6.76	7.10	Neg.
	Post. (Oct-Nov)	28^{o}C	28^{o}C	85	66	0.019	6.41	8	Neg.
S2	Pre (April-May)	32^{o}C	30^{o}C	95	70	0.020	7.20	6.90	Neg.
	Post. (Oct-Nov)	28^{o}C	28^{o}C	90	65	0.018	6.21	6.50	Neg.
S3	Pre (April-May)	32^{o}C	30^{o}C	90	78	0.025	7.10	6.80	Neg.
	Post. (Oct-Nov)	28^{o}C	28^{o}C	95	76.8	0.029	6,08	4.00	Neg.
S4	Pre (April-May)	32^{o}C	30^{o}C	92	68	0.028	6.80	6.70	Neg.
	Post. (Oct-Nov)	28^{o}C	28^{o}C	85	64	0.031	6.38	4.00	Neg.

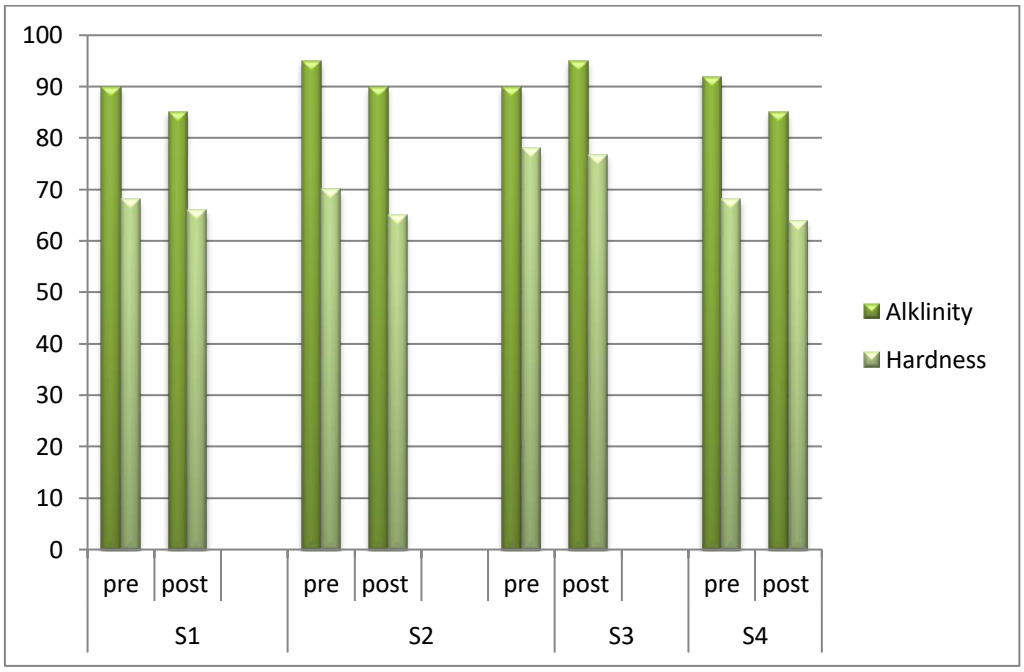

Fig2: Graph Showing Pre. and post Monsoon Variation in Alkalinity and Hardness

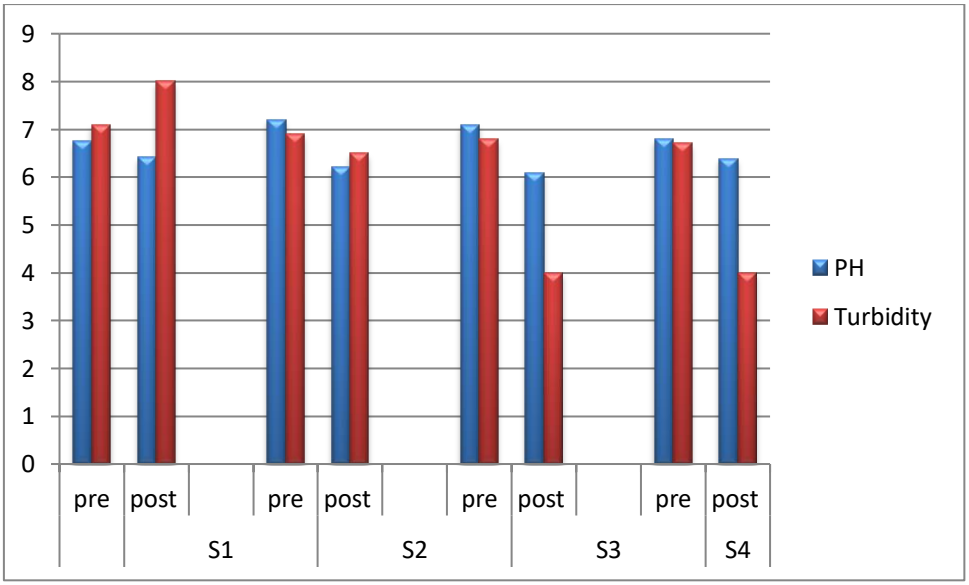

Fig3: Graph Showing Pre. and post Monsoon Variation in pH and Turbidity.

Conclusion:

The present study is Concluded that there the concentration of the investigated major ion like chloride, pH in a lake of different 4 site are within permissible limit .The present study shows that the Chulhardoh lake analysis result revealed that there was significant seasonal variation in some physicochemical parameters and most of the parameters were in the normal range and indicates better quality of water. The result indicates that the chulhardoh lake water is

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, Dec 2022

non-polluted and can be used for Domestic and Irrigation and Purposes. All the parameter is in a permissible limit.

References:

(1) A.R. Bhusari, M. R. (2014). QUALITY ASSESMENT OF WATER :A CASE STUDY OF TUMSAR AREA IN BHANDARA DISTRICT. *International Journal of Research in Bioscience , Agriculture and Technology* , 141-148.

(2) Anima Upadhyay, M. C. (2015). Pre- and Post-monsoon Study of PhysicoChemical Parameters of Ulsoor Lake Water of. *International Journal of Innovative Research in Science,,* : 2319 - 8753.

(3) Bheemappa1, K. (2015). Temporal Variation in Water Quality Parameters of Bandematta Hosakere Lake – Peri. *INTERNATIONAL JOURNALOF ADVANCED RESEARCH*, 1283-1291.

(4) Muley, S. M. (2010). ANALYSIS OF WATER QUALITY USING PHYSICO-CHEMICAL PARAMETERS TAMDALGE TANK IN KOLHAPUR DISTRICT MAHARASHTRA . *International journal of Advanceed Biotechnology and Research* , 115-119.

(5) Patil Shilpa G., C. S. (2012). Impact of Physicochemical Characterstics of shivaji university Lakes on on Phytoplankton Communities Kolhapur india . *Research Journal of Recent Sciences*, 56-60.

(6) R.V. Bhagde, S. P. (2020). A COMPARATIVE STUDY OF PHYSICO- CHEMICAL PARAMETERS OF THE FRESHWATER PONDS FROM SANGAMNER TALUKA OF AHMADNAGAR , MAHARASHTRA, INDIA . *International Journal of Biological Innovation*, 137-142.

(7) Rafiullah M.khan, M. J. (2012). PHYSICO-CHEMICAL ANALYSIS OF TRIVENI LAKE WATER OF AMRAVATI DISTRICT IN (MS) INDIA . *Bioscience Discovery* , 64-66.

(8) Rodger B.Baired, A. D. (2017). *Standaed methods for Examination of Water and Waste Water 23rd Edition.* American Public Heaith Association ,Street , NW Washington, DC 20001-3710.

(9) Shahare, P. C. (2015). Assessment of Physico-Chemical parameters of Chulband dam in. *INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY*, 2347 – 517X.

(10) Sharma Riddhi, S. V. (2011). Studies on limnlogical Characteristic, Planktonic Diversity and Fishes (Species) in Lake Pichhola, Udaipur, Rajasthan(india). *Universal Journal of Envirnomental Reseach and Technology* , 274-285.

(11) U. G. Meshram, R. B. (2017). Study on physico-chemical parameters of kurhada Lake at Pauni, Bhandara District Mharashtra. *INTERNATIONAL JOURNAL OF RESEARCH IN BIOSCIENCE AGRICULTURE AND TECHNOLOGY*, 899-904.

(12) Undi Sai Nagendra Prasadu, G. U. (2020). pre and Post- Monsoon Variations in physico Chemical analysis of Ground water of Rural Area in East Godavari District, Andhra Pradesh ,India . *Journal of Research in Applied Chemistry* , 39-49.