

“A STUDY OF PHYSICO CHEMICAL PARAMETER OF MALHARSAGAR DAM, NAZARE, DISTRICT PUNE, MAHARASHTRA”

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Abstract:

The paper deals with studying the Physico-chemical Parameters of the Malharsagar dam in Nazare, District Pune, Maharashtra. Monthly variations in the physical and chemical parameters such as Water Temperature, Transparency, Total Dissolved Solids(TDS), Turbidity, Electrical Conductivity, pH, Dissolved Oxygen (DO), and Total Hardness, Chlorides, Alkalinity, Phosphate, and Nitrates were investigated for a period of one year from 1st January 2017 to 31st December 2017. All the parameters were found within permissible limits. The result shows that the dam is non-polluted and used for domestic and agricultural purposes.

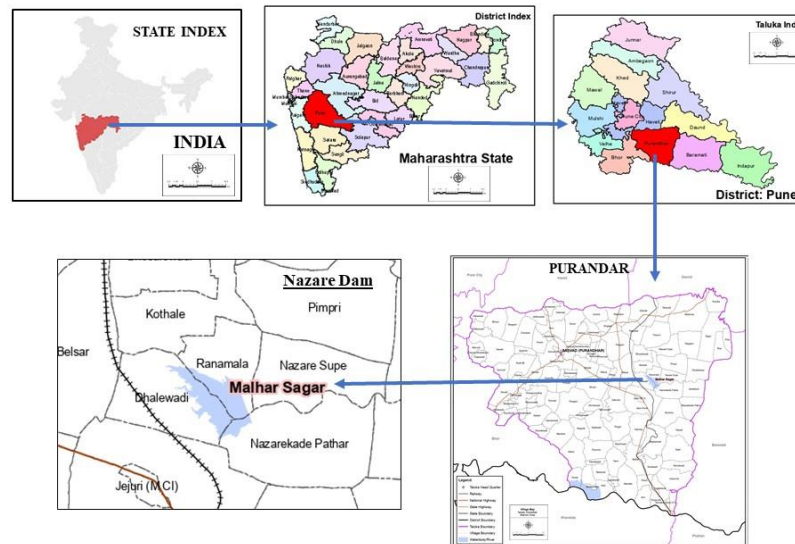
Index Terms: Alkalinity, Dissolved oxygen, Malharsagar, Total dissolved solid,

Introduction:

Water is one of the important basic components that every living being requires for their existence on the globe. Every human being has the right to get clean water. Water pollution is a global problem that affects the quality of drinking water and the health of humans, animals, and plants. It can be a result of many factors such as industrialization, the use of fertilizers in agriculture, and man-made activity, and natural occurrences such as flooding [1] The most common type of water pollution is sewage contamination. This happens when raw human waste from homes, businesses, and industry flows into rivers, lakes, or other sources of drinking water. Sewage can contain bacteria and disease-causing organisms that make people sick. Polluted water also contains chemicals from pesticides and fertilizers used in agriculture as well as heavy metals from mining operations. These substances pose risks to human health because they can cause cancer or lead to reproductive problems in humans. Therefore, it is necessary to check the Quality of Drinking water at regular intervals because people suffer from various waterborne diseases due to the use of Contaminated Drinking water. Pollution of water is checked by assessing the physiochemical parameter of water [2]. The Physicochemical analysis is a prime consideration to check the quality of water for the best use for Drinking, Agriculture, fisheries and Industry purpose.

Study Area:

In Present Study involves the Analysis of Water Quality in Terms of Physico-chemical Parameters of Malharsagar dam, Nazare Dist. Pune Maharashtra. It is Located in $18^{\circ} 17' 58.41''$ N Latitude and $74^{\circ} 11' 13.8''$ E longitude. The Area of the dam is about $3,890 \text{ km}^2$. This dam water is used for Domestic, Irrigation, and Industrial purpose.



Materials and Methods:

A water sample from Malharsagar dam is collected in Glass bottles from four different stations in the morning hours between 8.30 am to 10.30 am regularly for every month (Jan to Dec.). The water sample was immediately brought to Laboratory for various physicochemical tests. Parameters like Water Temperature, Transparency, and pH were recorded at the time of Sample Collection, by using a Thermometer, Secchi Disc, and Pocket Digital pH Meter respectively. Other parameters like dissolved oxygen, Total dissolved solids, turbidity, hardness, total alkalinity, Chlorides, Phosphate, and Nitrate were estimated in the Laboratory by using Standard Methods as Prescribed by APHA, AWWA, [3], Kodarkar [4], Trivedy and Goel [5].

Result and discussion:

Water temperature

In this present study, the water temperature is varied from 21°C to 28°C . The maximum temperature (28°C) was observed in summer in May and the Minimum temperature (22°C) was observed in winter in December. A similar study by Jayabhaye et al. 2005, and Salve and Hiware, 2006 [6,7], observed that during summer, the water temperature was high due to low water levels and clear atmosphere, and high temperature. Water temperature play important role in aquatic life.

Water Transparency

The transparency of water varies from 10 cm to 83 cm. Maximum transparency (83 cm) was recorded in the month of April and minimum transparency (10 cm) was recorded in July. Kadam, et al, reported that the absence of rain,

runoff, and flood water as well as the gradual settling of suspended particles during winter and summer, results in higher transparency.

pH

pH indicates the acidity and basicity of water. In the present investigation pH of water ranges from 7.1 to 8.9. the maximum pH (8.9) was recorded in the month of May and the minimum pH (7.1) in the month of October. This alkaline range indicates that water was alkaline in nature. It is also one of the important factors as most of the biochemical and chemical processes are influenced by pH.

Dissolved Oxygen (DO)

The dissolved oxygen value ranged from 5.56-13.26 mg/L. The maximum values (13.26 mg/l)) and the minimum values (5.26 mg/l) were recorded in the month of May and in the month of November respectively.

Total Dissolved Solid

The value of total dissolved solid ranges from 0.1 g/l to 2.5 g/l. The maximum value (2.5 g/l) was recorded in the month of July and the Minimum value (0.1 g/l) was recorded in the month of April. The maximum value of TDS was recorded in the Month of July due to heavy rainfall and flooding.

Turbidity

The turbidity of water ranged from 1.4 NTU to 15.23 NTU. The maximum value (15.2 NTU) was recorded in the month of February and the minimum value (1.4 NTU) in the month of October. The Maximum value of turbidity might be due to the presence of suspended particulate matter, human activities, and fewer water levels.

Electrical Conductivity

Electrical conductivity is an indicator of the salinity of the water sample.

In the present study, the electrical conductivity of the water sample was fluctuating from 677 mho/cm and 4227 mho/cm. The highest value of conductivity (4257 mho/cm) was found in the month of July and the lowest value 677 mho/cm) was found in the month of September.

Hardness

The hardness of water varies from 57 mg/l to 189 mg/l. The maximum value (189 mg/l)) and minimum values (57 mg/l) were recorded in the month of April and in the month of October respectively.

Alkalinity

The total Alkalinity of dam water is ranged from 109.10 mg/l to 210 mg/l. the maximum value (210 mg/l) was recorded in the month of March and the minimum value (109.10 mg/l) in the month of January.

Chloride

In the present study, the chloride concentration of water samples varied from 30.05 mg/l to 55.63 mg/l. the concentration of chloride was higher in the month of April and lower in the month of January.

Nitrates

In the present investigation, the range of nitrate content was 3.40 to 15.66mg/L. the highest nitrate value (15.66 mg/l) was observed in the month of July and the low value (3.40 mg/l) in the month of December.

Phosphate

Phosphate content in the water ranged from 0.14 to 13.20 mg/L. the maximum value (13.20 mg/l) was observed in the month of August and the minimum (0.14 mg/l) in the month of December. The more values of phosphate in the August months are mainly due to domestic sewage, and runoff agriculture areas.

Conclusion:

A study of Physico-chemical parameters of Malharsagar dam, Nazare Pune district was carried out by Considering important water quality parameters like temperature, pH, Electric conductivity, dissolved oxygen, total alkalinity, total hardness, chlorides, phosphate, nitrates, etc., from Jan to Dec. In the present investigation, All the parameters were found within permissible limits. The result shows that the dam is non-polluted and used for domestic and agricultural purposes.

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References:

1. Simpi B, Hiremath SM, Murthy KNS, Chandrashekarappa KN, Patel AN, et al. (2011) Analysis of Water Quality Using Physico-Chemical Parameters Hosahalli Tank in Shimoga District, Karnataka, India. Global Journal of Science Frontier Research 11: 31-34.
2. Wankhade V, Manwar N, Malu A, (2012) Evaluation of status of the ecosystem of Sawanga (Vithoba) Lake (Malkhed Talav), District Amravati, Maharashtra by assessment of Some Physicochemical Characteristics of water. International Journal of Scientific and Research Publications 2: 1-10.
3. APHA (1985): Standard Methods For Examination of Water and Wastewater, 20th Edition, American Public Health Association, Washington D. C.
4. Kodarkar M. S. (1992): Methodology for water analysis, Physico-chemical, Biological and Microbiological Indian
5. Trivedy, R. K. and Goel P. K. (1986): Chemical and biological methods for water pollution studies, Environmental Publication, Karad, Maharashtra.
6. Jayabhaye UM, Pentewar MS, Hiware CJ (2006) A study on physicochemical parameters of a minor reservoir, Sawana, Hingoli district, Maharashtra.
7. Salve BS, Hiware CJ (2006) Studies on water quality of Wanparkalpa reservoir, Nagapur, Near Parli Vajinath, Dist Beed, Marathwada region. J Aqua Bio 21: 113- 117.

8. Kadam, M. S. Pampatwar D. V. and Mali R. P. (2007): Seasonal variations in different physicochemical characteristics in Masoli reservoir of Parbhani district, Maharashtra, J. Aqua. Biol. 22(1): 110- 112.
9. Harney NV, Dhamani AA, Andrew RJ (2012) Physio-chemical status of three water bodies near Bhadrawati Town, Distt. Chandrapur, (M. S), India. Bionano Frontier. Eco Revolution, Colombo, Srilanka
10. WHO, (2008). Guideline for drinking water quality [electronic resource]; incorporating 1st and 2nd addenda vol.1 Recommendations, 3rd edn. WHO, Geneva, 515.
11. Rahmanian, N.; Ali, S.H.B.; Homayoonfard, M.; Ali, N.J.; Rehan, M.; Sadeh, Y.; Nizami, A.S. Analysis of physiochemical parameters to evaluate the drinking water quality in the State of Perak, Malaysia. J. Chem. 2015, 2015, 716125.
12. S. A. Manjare, S. A. Vhanalakar and D. V. Muley, Analysis of water quality using physico-chemical parameter tamdalge tak in Kolhapur district, Maharashtra, International Journal of Advanced Biotechnology and Research ISSN 0976-2612, Vol 1, Issue 2, Dec-2010, pp 115-119.

