Bulletin of Nexus
Multidisciplinary International Research Journal, Double-Blind Peer Reviewed, Open Access Journal
ISSN : 3065-7865 / Volume-2, Issue-8 August - 2025

Original Article

Evaluation of Biological Water Quality Parameters of Gundwal Dam, Tq. Mahur, Dist. Nanded"

Awadhut Achutrao Lande[1], Arvind Balasaheb Harkal[2]
[1] Department of Chemistry, Shri Renukadevi Arts, commerce & Science College Mahur, Dist. Nanded. Maharashtra
[2]Department of Zoology Shri Renukadevi Arts, commerce & Science College Mahur, Dist. Nanded. Maharashtra

Manuscript ID:
BN-2025-020842

ISSN: 3065-7865

Volume 2

Issue 8

August 2025

Pp217-220

Submitted: 19 July 2025

Revised: 28 July 2025

Accepted: 17 Aug 2025

Published: 31 Aug 2025

DOI:
10.5281/zenodo.17192308
DOI link:
https://doi.org/10.5281/zenodo.17192308

Abstract

The Nanded District's Gundwal Dam is an earth-fill dam located close to Mahur. It was far from 14 km Mahur. The Gundwal Dam is regarded as a source of drinking water for the town and for irrigating a variety of ecosystems. Goal of the project is to examine the physicochemical characteristics of water to ascertain its suitability for human consumption. The World Health Organization has compared. The main sources of water are used for cattle, irrigation, and household usage. These days, anthropogenic pressure, home sewage, industrial effluents, agricultural runoff, seasonal variations, and uncontrolled waste water discharge all contribute to the pollution of water. The study is crucial for determining the quality of the water. We are analyzing the following Water factors like that were examined, along with physicochemical parameters including pH, dissolved oxygen, alkalinity, TDS, conductivity, chlorides, phosphates, nitrates, and total hardness. Assess the water quality at the dam. Need the observed values of water samples.

Keywords: *Gundwal Dam, Physico-chemical Parameter, Seasonal Variation*

Introduction

Water is universal solvent and natural resource having number of vital component of human life as well as natural ecosystems. Physical, chemical, and biological factors all affects the wide range of chemical composition seen in natural water. Natural water bodies are a source of energy for living things and strength for plants as a result, the quality of the water also affects the health of aquatic life. Because it dissolves over 95 environmental components, it is referred to as a universal solvent. Water is essential to agriculture, industry, household needs, waste disposal, and other processes. Water plays an important role in the world economy. Approximately 70% of the fresh water used by humans goes to agriculture Baroni, L., Cenci, L., Tettamanti, M., Berati, M. (2007). The primary source of water is rain. The purpose of this study is to evaluate the reservoir's water quality and examine the socioeconomic effects that the impacted areas have to deal with. One of the main causes of surface and ground water pollution is now industrial and municipal solid waste. It was directly related to human health (Nagmani. C 2015). An essential component of human life is water. It is essential for the resistance of living things and industry. Since water makes up almost 70% of the globe, all living things on it depend on it for survival and growth (Balsane et al., 2015). Only 3% of the world's water reservoirs are fresh, with the remaining 97% being saline (Kamble et al., 2011).Both organic and inorganic substances dissolve in water, which is a universal solvent.

Study Area:

Gundwal is a village located in Mahur tehsil of Nanded district in Maharashtra, India. It is situated 14 km away from sub-district headquarter Mahur and 134km away from district headquarter Nanded.

Address for correspondence:
Awadhut Achutrao Lande, Department of Chemistry, Department of Zoology Shri Renukadevi Arts, commerce & Science College Mahur, Dist. Nanded. Maharashtra
Email: *awadhutlande@gmail.com*

How to cite this article:
Lande, A. A., & Harkal, A. B. (2025). Evaluation of Biological Water Quality Parameters of Gundwal Dam, Tq. Mahur, Dist. Nanded. Bulletion of Nexus, 2(8), 217–220. https://doi.org/10.5281/zenodo.17192308

Quick Response Code:

Website: https://bnir.us

Fig. photograph of Gundwal Dam Tq. Mahur, District. Nanded, Maharashtra, India.

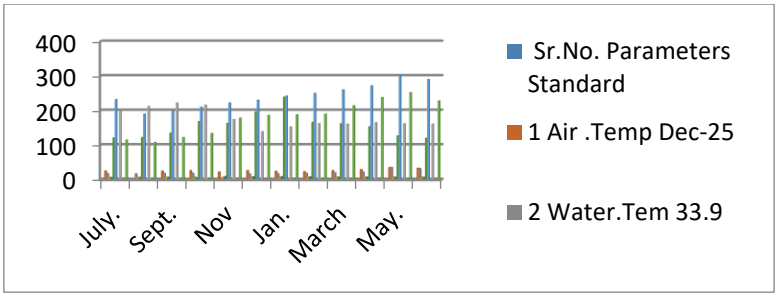
Materials and Methods: Throughout the course of the one-year investigation, from "July 2024 to June 2025," water samples were taken every month. Choose the sampling location. Clean plastic bottles were used to collect the samples. In the lab, samples were analysed for physicochemical properties. The following physical-chemical analyses were performed on water samples in the lab. Temperature of air, water, dissolved oxygen; alkalinity, TDS, conductivity, phosphates, nitrates, chlorides, and total hardness are all parameters. NEERI (2007) and APHA (1998) both recommended laboratory techniques for additional research.

Result and Discussion:

Eleven water quality measures were analysed, including conductivity, dissolved oxygen, alkalinity, TDS, air and water temperatures, pH, phosphates, nitrates, chlorides, and total hardness. The suggested standard approach was used to analyse the parameters. The difference in important characteristics among samples is displayed in Table1

Table 1: Physicochemical Parameters of Gundwal Dam for the Year (2024-2025).

Sr. No.	Parameters	WHO Standard	July.	Aug.	Sept.	Oct	Nov	Dec.	Jan.	Feb.	March	April.	May.	Jun.
1	Air. Temp	12-25	25.1	24.8.	25.2	26.3	22.3	26.4	24.2	23.20	26.20	29.25	35.1	33.1
2	Water.Tem	33.9	17.60	17.20	17.90	18.20	17.20.	17.00	17.10	18.20	20.15	22.50	35.2	32.1
3	PH	6.-8.	6.4	6.5	7.1	7.5	7.6	7.8	7.50	7.9	7.95	7.96	8.0	7.60
4	DO	>4mg/L	6.2	6.3	6.4	5.0	8.9	8.13	8.6	7.8	6.8	6.9	6.5	6.6
5	Alkinity	200mg/L	121	122	135	168	163	196	239	166	162	153	127	120
6	TDS	266mg/L	232	190	198	210	222	230	242	250	260	272	302	290
7	Conductivity	1000mS/cm	0.49	0.51	0.46	0.47	0.36	0.38	0.39	0.36	0.37	0.37	0.35	0.34
8	Chlorides	250mg/L	202	212	222	216	174	139	153	162	161	165	162	161
9	Phosphates	0.3 mg/L	3.43	3.73	3.52	3.48	2.92	2.12	2.74	2.83	2.84	2.76	2.67	2.66
10	Nitrates	10mg/L	4.52	4.47	4.39	4.45	4.38	2.89	3.88	3.77	3.72	3.72	3.67	3.53
11	Total Hardness	300mg/L	115	108	122	134	178	186	188	190	214	238	252	228



Physicochemical parameters Analysis:

Temperature In ^{0}C: I study this during my current inquiry in the Gundwal Dam. In May, the temperature peaked at 35.2 sdegrees Celsius, but in July, it dropped to 17.60 degrees Celsius.

Hydrogen Ion Concentration: This scale measures the concentration of H+ ions in water to quantify the degree of acidity and alkalinity. One significant environmental component that affects the biology and life cycle of biotic life is the pH of the water. Current research on the lower pus dam Water samples had PH values ranging from 6.0 to 8.1, which were greater than the WHO guideline. The maximum PH value was 8.1 in May 2024, and the minimum PH value was 6.4 in July 2024.

Dissolve oxygen: Since dissolved oxygen controls many biotic components' physiological and metabolic processes, it is a crucial metric in the evaluation of water quality. (Kulakarni DA, Liimbhar, and Bade BB). How polluted are water bodies based on dissolved oxygen readings? The Winkers technique is used for dissolved oxygen. The lower pus dam In December.2024, the DO reached its highest value of 8.13 mg/L, and in Augst 2025, it reached its lowest value of 6.3mg/L.

Alkinity: The alkalinity of a given water sample is determined by the quantity of acid needed to titrate the bases. The main bases found in natural water are believed to be bicarbonates, carbonates and hydroxides. When methyl orange indicator is added to water samples that contain bases, they turn yellow. Trivedy and Goel's (1986) standard method was used in the laboratory to determine the alkalinity of water samples. In the Gundwal Dam, the highest Alkalinity values were recorded in January 2024 at 239mg/L, while the lowest alkalinity was recorded in June 2025 at 120mg/L. Based on my current analysis, I discovered that the alkalinity was higher than what was allowed.

Total Dissolved Solids (TDS) :-

TDS values in the current study range from 100 mg/lit to 363 mg/lit. The water is unfit for human consumption. The degrading process is accelerated by higher concentrations, which also change the water's clarity and directly affect how much sunlight reaches the dam's bed. Total dissolved solids in the Gundwal dam ranged from a maximum of 302mg/L in may to a minimum of 190 mg/L in December 2024.

Conductivity:. Evaluates the water's electrical conductivity, which is affected by the dissolved ions present. I noticed that the current investigation of water body conductivity had a maximum value of 0.51 mS/cm in August 2024 and a minimum value of 0.35 mS/cm in May 2025.

Chloride: Water bodies can include chloride from a variety of causes, including human and natural activities. The water quality, infrastructure, and aquatic life may all be impacted by high chloride concentrations. Titrate with silver nitrate according to the standard test procedure. Water used for chloride investigation. The lowest reading was 139 mg/L in December 2025, while the highest was 222 mg/L in August. The chloride value, I found, was within the permissible range.

Phosphate : Phosphates can be found in home and industrial waste water, fertilizers and manure from agricultural runoff, and natural sources that contribute to phosphate pollution. Over phosphates can cause the eutrophication process, which is the growth of algae and the depletion of oxygen and aquatic life. Use the colorimetric approach in the lab. The current Gundwal dam study In August 2025, the highest phosphates value was 3.73 mg/L, while the Dec lowest was 2.12 mg/L.

Nitrates: The soil, water, waste water, agricultural runoff, and industrial processes all include nitrates. Effects of nitrates on the environment to much nitrate in water can cause eutrophication, which damages aquatic habitats. Elevated nitrate levels in soil can lead to decreased fertility and soil deterioration. In July 2024, the maximum nitrate level at Gundwal Dam was 4.52 mg/L. In December 2024, the lowest measurement was 2.89 mg/L.

Total Hardness:. Calcium carbonate content is used to quantify water hardness; soft water has a hardness of 0.60 mg/lit, hard water has a hardness of 61–120 mg/L, and extremely hard water has a hardness of more than 181 mg/L. There is a tendency for water hardness to rise over the summer.in the present investigation was the overall hardness highest values was 252mg/lit. The lowest value was 108 mg/L in Aug 2024, and the highest

was in May 2025. This parameter is inside the acceptable range.

CONCLUSION: In the present study of Gundwal dam water samples analysis of physicochemical parameter. In the current investigation, the majority of the parameters were determined to be within the prescribed limits and met WHO requirements. Only Alkinity, DO, Temperature and Tds was Slightly above the permitted level.

Acknowledgements

Author grateful and Thankful to our Principal Dr. Vilas Patil sir, Shri.Renukadev college Mahur, Tq. Mahur District.Nanded.

Financial support

Nil

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

References

1. Pawan M. Kotwad1, Dr. Ashok B. More, (2017) Water Quality Assessment of Manjra River Review. International journal of advance scientific research and engineering trendsVolume 2, Issue 2, september, ISSN (Online) 2456-0774.
2. Balsane V.K., Bansode R.D., Atre A.A, (2015) Environmental flow: Water quality Assessment of Mula river, International Journal of enhanced research in science Technology and engineering, Vol-4:44-49.
3. Bade BB, Kulakarni DA and Liimbhar AC,(2009) Physico-chemical Limnology of Sai Reservoirs in Latur district, Maharashtra, Ecology and Fisheries, 2 (2),83-90.
4. Kodarkar MS.(2006) Methodology for water analysis IAAB pub. No. 2, 3 rd Edn. Hydrabad. 5) APHA,(1985) Standard Methods for the examination of water and waste water, 16th Edi., APHA, WWAND WPCE, Washington.
5. Trivedy, R. K., and P. K. Goel, (1984). Chemical and Biological Methods for Water pollution Studies. Environmental publication, Karad. India.Nagamani C Physico-chemical analysis of water samples. International journal of scientific nd Engineering Research 2015,6: 2149
6. Dhawale P.G. and Ghyare B. P.,(2015) Assessment of Physico-Chemical Status of Water in Pus Dam of Pusad Tahsil, Journal of Natural Sciences Research, 5 (9).
7. Baroni, L., Cenci, L., Tettamanti, M., Berati, M. (2007). "Evaluating the environmental impact of various dietary patterns combined with different food production systems". *European Journal of Clinical Nutrition*. 61 (2): 279–286. doi:10.1038/sj.ejcn.1602522. ISSN 0954-3007. PMID 17035955.