VOLUME-7, ISSUE-5, MAY-2018 • PRINT ISSN No 2277 - 8160

Original Research Paper

Biological Science

# A STUDY ON PHYSICO-CHEMICAL PARAMETERS OF KELAVARAPALLY DAM OF TAMIL NADU

**Veena S S** — Lake management and Water Quality Research Unit, Department of Zoology, Jnana Bharathi Campus, Bangalore University, Bangalore-560056, India *Corresponding Author

**M. Ramachandra Mohan** — Lake management and Water Quality Research Unit, Department of Zoology, Jnana Bharathi Campus, Bangalore University, Bangalore-560056, India

**ABSTRACT** Present paper deals with the study of Physico-chemical parameters of Kelavarapally Dam , (Krishnagiri district, Tamil Nadu). Monthly variations in the physical and chemical parameters such as temperature, pH (6.2 to 7.8), Dissolved Oxygen (1.7-6.4 mg/L), Total alkalinity (182 to 390mg/L), Chlorides (55 to 215 mg/L), Phosphate (0.23 to 15.4mg/L) Fluoride (0.04-1.26 mg/L) ,Calsium (88.0-308 mg/L) etc ,were investigated. All the parameters were beyond the permissible limits.

**KEYWORDS** : Water; Physico-chemical parameters; Kelvarapally Dam

## Introduction

Water is one of the most important and abundant compounds of the ecosystem. All living organisms on the earth need water for their survival and growth. As of now ,Earth is the only planet having about 70 % of water. But due to increased human population, industrialization, use of fertilizers in the agriculture and man-made activity it is highly polluted with different harmful contaminants (Ramachandra Mohan 2018).Pollution of water is measured by assessing the physiochemical parameters of water (Ramachandra mohan et al 2012). Physico-chemical analysis is the prime consideration to assess the quality of water for its best utilization like drinking, irrigation, fisheries, and industrial purpose and helpful in understanding the complex processes, interaction between the climatic and biological processes in the water (Salve and Hiware 2006).

The objective of the present study was to assess the WATER QUALITY since the sewage water from Bangalore are percolate to down streem of Kelvarapally Dam, (Krishnagiri district, Tamil Nadu) by estimating the various physicochemical parameters like pH, Temperature, Total Dissolved solids, Total Alkalinity, Total Hardness, Phosphate, Nitrate, Turbidity, Fluoride, Chloride, Dissolved Oxygen, Iron and Conductivity and their ecosystem are essentioal Therefore the present work was proposed.

## Materials and Methods

### Study area

The study area is of Kelvarapally Dam, (Krishnagiri district, Tamil Nadu) which is located in krishnagiri, tamil nadu, india. The Latitude and Longitude of kelavarapalli dam is 12.7704 and 77.8757 respectively. 12.7704 Latitude and 77.8757. Study was conducted from September (2016)- December (2017). Water sample from the lake was collected every month. The Water samples were immediately brought to the Laboratory for the Estimation of various Physico- chemical parameters. The physical parameters such as Temperature of Air, Water and pH were recorded by using Thermometer and Digital pH Meter (Systronics) respectively. The transparency of water to light was measured by using Secchi disc. The chemical parameters of water such as Dissolved Oxygen, Total Alkalinity, Hardness, Chlorides, Sulphates and Total Dissolved Solids etc. were determined by standard methods in the laboratory as per the standard method APHA (2005).

| Month | Temp (0 c) | Ph | Cond. (µmhos/cm) | Turbity (mg/l) | Tds (mg/l) | Ca (mg/) | Chloride (mg/l) | Ta (mg/l) | Sulphate (mg/l) | Fluoride (mg/l) | Phospha te (mg/l) | Do (mg/) | Cod(mg/l ) | Bod(mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aug | 27.1 | 7.2 | 1492 | 9.8 | 988 | 241 | 212 | 284 | 25 | 0.05 | 3.8 | 6.04 | 36 | 5.8 |
| Sep | 27.4 | 7.1 | 1148 | 2.8 | 758 | 88 | 178 | 296 | 19.4 | 1.0 | 5.1 | 5.8 | 34 | 6.0 |
| Oct | 28.1 | 7.5 | 1158 | 3.0 | 753 | 168 | 181 | 304 | 22.2 | 1.26 | 6.0 | 6.3 | 24 | 6.0 |
| Nov | 26.8 | 7.1 | 1156 | 3.4 | 756 | 149 | 175 | 302 | 20.1 | 1.16 | 5.9 | 6.4 | 21 | 6.3 |
| Dec | 25.6 | 6.8 | 1328 | 0.4 | 846 | 176 | 180 | 324 | 30.4 | 0.74 | 14.8 | 5.6 | 34.0 | 4.4 |
| Jan | 24.9 | 7.1 | 1310 | 0.5 | 845 | 180 | 146 | 348 | 38 | 0.87 | 15.4 | 5.8 | 42.1 | 4.0 |
| Feb | 25.7 | 6.2 | 1306 | 12.8 | 843 | 286 | 198 | 268 | 20 | 0.04 | 5 | 1.44 | 158 | 44 |
| Mar | 28.4 | 6.7 | 1308 | 13.3 | 860 | 308 | 215 | 390 | 28 | 0.06 | 6 | 1.7 | 188 | 48 |
| April | 27.9 | 7.4 | 1467 | 15.6 | 965 | 244 | 165 | 315 | 27 | 0.9 | 4 | 4.8 | 48 | 8 |
| May | 29.3 | 7.2 | 1428 | 14.8 | 884 | 98 | 158 | 296 | 21 | 1.0 | 3 | 3.8 | 44 | 6.9 |
| June | 29.0 | 7.8 | 782 | 3.1 | 513 | 240 | 55 | 182 | 5.1 | 0.3 | 0.23 | 3.8 | 172 | 44 |
| July | 27.4 | 7.2 | 449 | 11.4 | 224 | 98 | 74 | 186 | 21.4 | 0.4 | 3.1 | 3.4 | 8.9 | 5.2 |
| Min | 24.9 | 6.2 | 449 | 0.4 | 224 | 88 | 55 | 182 | 5.1 | 0.04 | 0.23 | 1.7 | 8.9 | 4.0 |
| Max | 29.3 | 7.8 | 1492 | 15.6 | 988 | 308 | 215 | 390 | 38 | 1.26 | 15.4 | 6.4 | 188 | 6.9 |
| Mean | 27.3 | 7.1 | 1194 | 8.9 | 769 | 189.6 | 161.4 | 291.2 | 23.1 | 0.64 | 6.02 | 4.5 | 67.4 | 15.7 |

## Results and Discussion

The data on physico-chemical analysis of Kelvarapally Dam water has been given in Table No.1

### Physical parameters

**Temperature:** During the study period water temperature varied from 24.0°C±0.33.0C to 29°±0.560C. The maximum temperature (29°C) was observed during the month of January , 2016 and minimum temperature (24°C) was observed during the month of December, 2017. Jayabhaye et al., 2005 and Salve and Hiware, 2006 observed that during summer, water temperature was high due to low water level and clear atmosphere.

**Turbidity:** The turbidity ranged from 0.4-15.6 NTU units. The maximum value (15.6 NTU units) observed during the month of Dec, 2016 and minimum value (9.4 NT units) was observed during the month of September, 2017. Similar result was observed by Manjare et al., 2010 turbidity of water fluctuated from 0.41± 0.02 NTU to 3.51 ± 0.72 NTU.

**Total dissolved solids [TDS]:** During the present study, the TDS wavered from 224 mg/L to 988 mg/L. The higher value of total dissolved solids found in the month of Aug (988 mg/L) and lower value found during the month of July (224 mg/L). Alaka, 2014 reported that the amount of total dissolved solids detected from water sample at Borgaon was 347.16 mg/L to 738.0 mg/L.

**Electrical Conductivity [EC] :** The electrical conductivity in the water of the pond analyzed during the study period has been found to be fluctuating between 449 and 1492 mho/cm. Kashyap, (2016) analysed the Ramnai (Rewa Rural) drinking water for EC and reported that 180 mho/cm.

### Chemical parameters

**pH:** During the present investigation, the pH of the water sample ranged from 6.2 in the month of Feb , 2016 to 7.8 in the month of June, 2017. This range indicates that the water is alkaline in nature. Similar finding was observed by Joshi et al., 2009 pH of the Ganga River at Haridwar was slightly alkaline. It ranged from 7.06 to 8.35**Dissolved oxygen:** The Dissolved Oxygen value ranged between 1.7-6.4 mg/L. Lowest values were recorded during March 2016 . Meme et al.,( 2014) reported the range of Dissolved Oxygen was 6.02 to 7.01 mg/l at Oinyi River, Nigeria.

**Biological Oxygen Demand :** The Biological Oxygen Demand value ranged between4-69 mg/L. Lowest values were recorded during November 2016 .

**Chemical Oxygen Demand:** The Chemical oxygen Demand value ranged between 8.9-188 mg/L. Lowest values were recorded during November 2016 .

**Phosphate:** The phosphate value ranged between 0-23.-15.4 mg/L. Lowest values were recorded during November 2016 .

**Fluoride:** The fluoride value ranged between 0.04-1.26 mg/L. Lowest values were recorded during July 2016 .

**Total Alkalinity:** The Total Alkalinity value ranged between 182-390 mg/L. Lowest values were recorded during June 2016 .

**Chloride:** The Chloride value ranged between 55-215 mg/L. Lowest values were recorded during June 2016

## Conclusion

A study of Physico-chemical parameters of Kelvarapally Dam of ( Krishnagiri District, Tamil Nadu) was carried out by taking important parameters like Temperature, pH, Dissolved Oxygen, Total Alkalinity, Total Hardness, Chlorides, Phosphate, etc., for the period of August 2016 to July 2017. In the present investigation pH, Total Alkalinity, Total Hardness, Chloride etc., were beyond the permissible limit. Hence, Kelvarapally Dam water is considered as polluted water. The physico-chemical characteristics of Kelvarapally Dam water suggests that, it is harmful for pisciculture, irrigation and drinking purposes.

## Acknowledgment

The authors wish to thank U G C for providing Financial Assistance to carry out this research work.

## References

1. Simpi B, Hiremath S. M, Murthy K. N. S, Chandrashekarappa K. N, Patel A. N and E.T. Puttiah, 2011. Analysis of Water Quality Using Physico-Chemical Parameters Hosahalli Tank in Shimoga District, Karnataka, India. Global Journal of Science Frontier Research. 1(3): 31-34.
2. Wankhade V, Manwar N and A. Malu, 2012. Evaluation of status of 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(8):1-10.
3. Salve B. S and C. J. Hiware, 2006. Studies on water quality of Wanparkalpa reservoir, Nagapur, Near Parli Vaijinath, Dist Beed, Marathwada region, J Aqua. Bio. 21 (2): 113-117.
4. APHA, 2005. Standard methods of examination of water and waste water. American public health association. 19th ed. Inc. New York: 1170.
5. Jayabhaye, U. M.; Pentewar, M. S. And Hiware C. J, 2006: A study on physicochemical parameters of a minor reservoir, Sawana, Hingoli district, Maharashtra.
6. Joshi D. M, Kumar A and Agrawal N, 2009. Studies on physicochemical parameters to assess the water quality of river Ganga for drinking purpose in Haridwar district. Rasayan J. Chem. 2(1): 195-203.
7. Manjare S. A, Vhanalakar S. A and D. V. Muley, 2010. Water quality assessment of Vadgaon tank of Kolhapur (Maharashtra), with special reference to zooplankton. International Journal of Advanced Biotechnology and Research. 1(2): 91-95.
8. Harney N. V. Dhamani A. A and Andrew R. J, 2012. Phycio- cchemical status of three water bodies near Bhadrawati Town, Distt. Chandrapur, (M. S), India.Bionano Frontier. Eco Revolution, Colombo, Srilanka.
9. Lubal M. J, Sutar A.U and Pawar K.W. 2012. Studies on Physico-chemical aspects of Mhaswad water reservoir of Satara District (Maharashtra) India. IJPAES. 2(3): 12-15
10. Kashyap V. R, 2016. Physico-chemical analysis of various water samples of Rewa district (M.P.) India. International Journal of Applied Research. 2(1): 311-313.
11. Lende R. S and Yergi S. G, 2004. Physico-chemical parameters and zooplankton diversity of Phirange Kharbav lake, Thane, Maharahtra. J. Aqua. Biol. 19(1): 49-52.
12. Meme F.K, Arimoro F. O and F. O. Nwadukwe, 2014. Analyses of Physical and Chemical Parameters in Surface Waters nearby a Cement Factory in North Central, Nigeria. Journal of Environmental Protection. 5: 826-834.
13. Alaka P. A, 2014. An Assessment of Water Quality of Borgaon Reservoir in Sangli District of Maharashtra, India. International Research Journal of Environment Sciences. 3(5): 48-53.
14 Shannon, C. E. And Weiner, V. 1949. A mathematical Theory of Communication University Press, Illinois Urban 101-107