

Determination of Physico-chemical Parameters from Banshelki Dam, Udgir Dist. Latur (M.S.)

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Abstract

The present study was undertaken to study the physico-chemical parameters of water samples collected from Banshelki Dam. The physico-chemical parameters like temp, PH, total dissolved solids (TDS) turbidity, Dissolved oxygen (DO), total hardness was determined. The results were compared with standard prescribed by WHO (1975). It was found that the water sample were collected from June 2010 to May 2011. All samples showed physico-chemical parameters average the water quality standard and the quality of water is not bad and not it is useful for domestic purpose. But the human interference and the use of water for washing cattles the water become gets less polluted.

Keywords: Water Sample; Physico-Chemical Parameter; Banshelki Dam

1. Introduction

Water is most important factor of life, hence, it is known as universal solvent since it dissolved more than 95 components from the environment. The entire biotic components depends on water for their physiological process. We depend on water for irrigation, industry, domestic needs, disposal of waste etc. The main source of water is rainfall. Any change in the physical chemical and biological properties of water leads to great disturbance in the biotic component as well as disturb the equilibrium of the nature. It directly affects the food chain and the transfer of energy from one trophic level to other is disturbed. Heavy metals are toxic pollutants that severely limit the beneficial use of water for domestic and industrial application. The lakes have complex and fragile ecosystem as they do not have self learning ability and therefore readily accumulate pollutants. In the present study Banshelki Dam from Udgir city was selected which is located on Manmodi river. The purpose of selecting this lake was, it has no direct influx of water from any water bodies in the area. The annual rainfall is the only source of its water content.

2. Materials and Methods

For the present study the water samples were collected from the Dam for a period of one year from 2010 to 2011. The temp. was recorded at the time of sampling on the site using centigrade thermometer. The sample was collected every morning between 10.00 a.m. to 11.30 a.m. from the month of June 2010 upto May 2011 for physico-chemical examinations. The samples were collected in plastic canes of five liters capacity without any air bubbles. The samples were kept in refrigerator and stored for further assessment of physico-chemical parameters. Estimation is carried out in the laboratory by using standard methods. (2, 3, 5)

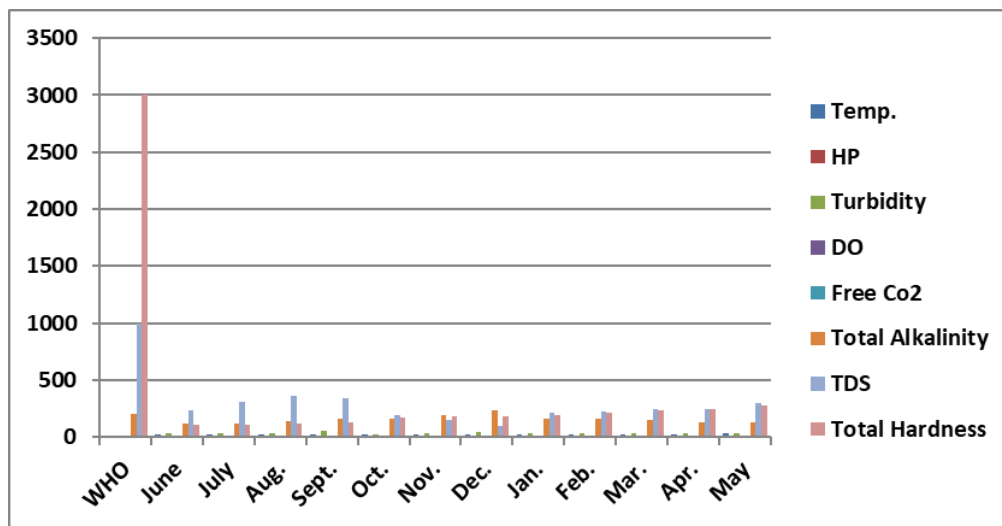
2.1. Physico-chemical Analysis

Analysis was carried out for various water quality parameters such as temp, PH, Total dissolved solids (TDS), Dissolved oxygen (Do), Free carbon dioxide (Co₂), total hardness, salinity, total alkalinity etc.

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Table 1 Physico-chemical Parameters of Banshelki Dam for the year (2010-2011)

Sr. No.	Parameters	WHO	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1	Temp.	-	26.4	26.9	25.1	26.8	23.2	26.2	25.6	22.2	25.5	24.6	28.0	30.0
2	HP	6.5 9.00	6.2	6.2	6.8	7.0	6.0	6.3	6.4	6.6	7.8	7.7	8.2	8.6
3	Turbidity	6.00 9.00	37	30	37	60	24	38	48	36	35	39	38	35
4	DO	>4	6.2	6.1	6.3	4.4	9.9	9.5	8.4	3.2	6.6	6.8	6.2	6.4
5	Free Co ₂	10	2.0	1.6	2.2	2.0	2.2	2.3	1.0	0.5	Nil	2.1	Nil	Nil
6	Total Alkalinity	200	120	122	135	166	162	194	240	166	162	150	125	130
7	TDS	1000	230	310	360	340	190	145	100	210	220	250	250	300
8	Total Hardness	3000	111	106	120	133	174	183	184	188	211	234	248	273

**Figure 1** Physico-chemical Parameters of Banshelki Dam for the year (2010-2011)

3. Results and Discussion

The physico-chemical parameters of the water sample were calculated and tabulated as below.

3.1. Temperature in °C

The measurement of temp. is one of the most primary factors, since it affects the chemistry and biology at all biotic factors. It plays an important role in the metabolic activities of the organism. The temp was ranging from 22.2°C to 30°C during the study period. The maximum temp. was recorded in the month of May and minimum in the month of January.

3.2. PH

It is the scale which measures the intensity of acidity and alkalinity of water with the measurement of the concentration of H⁺ ions. PH of water is an important environmental factor which affects the biology and the life cycle of the biotic life. The variation of PH directly affects the life processes of flora and fauna. The PH values of water samples varied between 6.0 to 8.6 and were found above the limit prescribed by WHO.

3.3. Dissolved Oxygen (DO)

Dissolved oxygen is an important parameter in water quality assessment as it regulates many metabolic and physiological process of biotic components. The amount of oxygen in the Dam depends on the extent of direct contact between water and air and on the circulation of water and on the amount produced and consumed by the biotic component of the Dam. The DO values indicate the degree of pollution in water bodies. The DO values varied from 3.2 to 9.9 mg/lit.

3.4. Free Carbon dioxide (CO₂)

Carbon dioxide presence in the water is the result of respiration of aquatic flora and fauna harboring the water body. CO₂ is extremely important in a minimum quantity for growth and development of flora. The CO₂ range from 10 mg/lit to 1 mg/lit. Free CO₂ in water form carbon acid, which after dissociation gives H⁺ ions. CO₂ varies between Nil to 2.3 mg/lit.

3.5. Total Alkalinity

Alkalinity of water ranges from 120 mg/lit to 240 mg/lit. Alkalinity can be defined as the capacity to neutralize a strong acid and it is due to the presence of salts like bicarbonate, carbonate and hydroxide compounds of calcium, sodium and potassium.

3.6. Total Hardness

Hardness of water is due to presence of bicarbonates ions. In the present study the total hardness ranges from 106 mg/lit to 273 mg/lit. which is in permissible limit by WHO.

3.7. Total Dissolved Solids (TDS)

TDS content ranges from 100 mg/lit to 360 mg/lit. The water is not suitable for drinking purpose. Higher concentration affects the clarity of water and directly affects the penetration of solar energy upto the bed of the Dam, thus promoting decaying process.

3.8. Turbidity

Turbidity is an important parameter which is depends upon suspended particles mixed in water bodies. The turbid water interferes with self-purification of stream by reducing photo-synthetic activity of aquatic plants. Turbid value ranges from 24cm to 60 cm.

4. Conclusion

The above study shows that all the parameters which were analyzed are permissible. Since there is no influx of sewage water, the water shows concentration of various salts below the average level which is extremely important factor and the water can be used for domestic purposes and for drinking by boiling and filtration method. If the human anthropological activities could be stopped as well as fishing activities could also be reduced, it would be a good source of drinking water.

References

- [1] Dwivedi P., Portable Water, Threats and Remedies, AURJ, 3 (1), 2000, 1-5.
- [2] APHA, Standard Methods for the examination of water and waste water, 16th Edi., APHA, AWWAND WPCE, Washington, 1985.
- [3] Trivedy RK and Goel PK, Chemical and Biological Methods for water pollution studies, Karad, 1986.
- [4] Anil KL, Sharma L and Arey NC, Physico-chemical characteristics and diatoms diversity of Jauahar lake-A wet land of Rajasthan, Sarovar, 5 (1), 2009, 8-14.
- [5] Bade BB, Kulakarni DA and Liimbhar AC, Physico-chemical Limnology of Sai Reservoirs in Latur district, Maharashtra, Ecology and Fisheries, 2 (2), 2009, 83-90.
- [6] Swarnalatha P and Narsing R. Interrelationship of Physico-chemical factors of pond, J. Environ. Biol., 18 (10), 1997, 67-72

- [7] Jayabhaye UM, Pentewar MS and Hiware CJ. A Study of Physico-Chemical Parameters of Minor Reservoir, Sawana, Hingoli District, Maharashtra, 2006.
- [8] ICMR, Manuals of standard of quality of drinking water, 3rd Ed., A special report of Indian Council of Medical Research, 1975
- [9] World Health Organization, Guidelines for drinking water quality, Recommendations, 2nd, Geneva WHO, 1993
- [10] Trivedy RK and Goel PK, Chemical and Biological methods for water pollution Studies, Environment Publication, Karad, 1986
- [11] Purandara BK, Varadrajan KN and Jayshree K, Impact of sewage on Ground water quality-A case study, Poll. Res. 22 (2), 2003, 189-197.
- [12] Reinna B and Nai B., Physico-chemical characterization of Couvery and Bhima river at the confluence point Kooduthari river, Ecol., Environ. And Cos., 10 (4), 2004-541-543
- [13] Shrinivasa RB and Venkateshwara P., Physico-chemical Analysis of Selected Groundwater Samples, Indian J., Environ. Prot., 20 (3), 2000, 161.
- [14] Moriam S and Gupta AB, Seasonal variation of Physico-chemical parameters of Hathli Stream in outer Himalayas, Poll.Res., 23 (2), 2004, 265-270.
- [15] Suriyanarayan S., Jayakumar D., Prashantidevi M. and Balusbramaniman, Monitoring of ground water and around waste paper based mill in Kanchipuram, UEP, 23 (9), 1033-1037.
- [16] Khabade SA, Mule and Sathe SS, Studies on Physico-chemical parameters of Lodhe reservoirs Tasgaon (M.S.) IJEP, 6(2), 2003, 301-304
- [17] Manna RK and Das AK, Diurnal variation in physico-chemical parameters of pond at Jammu, J., Eco., 11 (2), 2004, 339-341
- [18] Dubey GP, Status (Prior to the year 1980) of Hydrobiology, fisheries and Socio-economic conditions of fisherman in Narmada basin. Recent advances in fresh water biology, 2(9), 1997, 139-161.