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ANALYSIS OF WATER QUALITY IN KHARADKHED DAM WATER RESERVOIR USING PHYSICOCHEMICAL PARAMETERS

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ABSTRACT
The analysis of water will prove its portability as well as various activities performed in the reservoir. In natural waters, dissolved solids are composed mainly of carbonates, bicarbonates, chlorides, sulphates, phosphates and nitrates of calcium, magnesium, sodium, potassium, iron etc. In the polluted water, the concentration of other substances increases depending upon the type of pollution. Turbidity in natural water is caused by clay, silt, organic matter and other microscopic organism. The temperature at which a sample is collected and at which physico-chemical measurement are made important for data correlation and interpretation purposes e.g. Temperature reading are essential while performing tests such as colour, pH and specific conductance as well as for calculating parameters such as saturation stability indices, salinity and alkalinity. The major purpose of reservoir is to provide drinking water to growing town along with this certain water is also useful to irrigate the surrounding land. The studies are to find out temperature, turbidity and conductivity.

KEY WORDS: Aquatic organisms, carbonates, bicarbonates, chlorides, sulphates, temperature, conductivity.

INTRODUCTION
The science dealing with the physico-chemical, biological and geological study of fresh water is called limnology. The physico-chemical parameters of freshwater ecosystem have considerable effect on the aquatic life (Goldman and Horne, 1983; Boyd and Tucker, 1998). The water quality ultimately determine the survival and growth of cultured animals and plants (Dehadrai, 1992).

A large number of salts are found dissolved in natural waters. The common are carbonates, bicarbonates, chlorides, sulphates, phosphates and nitrates of calcium, magnesium, sodium potassium, iron and manganese etc. of their concentration becomes beyond the normal limit 500 mg/L. The water becomes polluted. A high content of dissolve solids elevated the density of water, influences Osmorequlation of fresh water for drinking irrigational and industrials purposes. Dissolved solids denoted the various types of mineral present in water in the dissolved from this may also include organic substances as in the case of polluted water and may also contribute to the total Dissolved load. Dissolved solids do not contain any gas and colloid.

Turbidity is actually the expression of optical property (Tyndall effect) in which the light is scattered by the suspended particles. Present in water, scattering of light is dependent upon the size, shape and refractive index of such particles. In turbid waters more light is scattered or reflected. The light penetrates only to shallow depths domestic waste may add great quantities of organic and some inorganic materials that contribute turbidity. Organic materials reaching rivers serve as food for bacteria and resultant bacterial growth and other microorganism produce additional turbidity. Inorganic nutrient such as nitrogen and phosphorous present in wastewater and agricultural runoff stimulate the growth of algae which also contribute to turbidity.

Water is clouds, fog, dew, rain, water is frost, show hail, a glacier, an iceberg water is part of every living thing water is the stuff of life itself. Water could exist on earth without life, but there would be no life without water. Life begins and evolved on the earth because of the presence of liquid water in large quantities. Life depends not only on the presence of water but also on its unique properties. Water has got several unique properties which make it suitable for existence of the life. Due to polar nature water has hydrogen bonding which is responsible for joining of water molecules together. Water is called a universal solvent as it dissolves more substances than any other liquid without undergoing any chemical change. Being an inert compound, it can transport various essential substances unchanged in living cells. It has got the properties of cohesion and

adhesion, which provide a high surface tension advantageous for the existence of many organism like algae, protozoa and some insect that live on the surface of water. The high specific of heat of water enables water bodies to resist much fluctuation of temperature than the land masses for this reason. The aquatic organisms are not adapted for wide range of temperature. The maximum density of water at 4°C prevents, the complete freezing of lakes in winter water has also get high latent heat of vaporization and fusion, which are also helpful to the organism in various way compared to many other countries India is fortunate in receiving copious amount of rainfall, being in fact the second wettest country in the world. In spite of this natural advantage with nature providing enough water every year to satisfy human needs. Unsuitable policies and bad practices have led to water scarcity. In order to minimize further deterioration in the position action must be taken to compound rainwater where it falls and make available for local domestic and irrigation needs. Sewage and contaminated water contains several different kinds of viruses like enter viruses, adenoviruses, reverses and hepatitis viruses. Rivers are the major sources of drinking water for people in the rural areas with these rivers getting increasingly polluted by city waste; the villagers may be left with nothing but contaminated water. This is already happening in various regions in India.

The physico-chemical analysis procedures that have been compiled in this collection of methods are based on experience which has shown that it is possible to work from these instructions without having to consult specialized literature. However literature reference is provided to supplement the analytical method described water analysis must supply information on the usability of the water, from the result of water analysis. The expert must be able to draw conclusions regarding direct application or the need for treatment plants.

MATERIALS AND METHOD

A thermometer having a quick response with 0.1°C division was employed to measure temperature. The mode of taking result was to immerse the thermometer directly in the water body for a period of time sufficient to permit constant reading temperature was recorded to the nearest 0.1°C. A conductivity of sample was determined with the help of digital conductometer. The cell constant was determined by placing N/10 KCl solution in the given conductivity cell. Sample was taken in a clean beaker and conductivity cell immersed in it and conductivity was measured. For TDS, 100ml of filtered sample was taken in a pre weighed evaporating dish on a water bath having temperature not more than 98°C. The residue was heated at 103-105°C for one hour and the final weight after cooling in a desicator was taken. The Turbidity was due to the presence of fine particles in the sample. This property was measured by means of digital nephelometer. The turbid sample was illuminated by means of light and the light scattered by the particles was measured in a direction at right angles to that of the incident light. The intensity of scattered light is proportional to the Turbidity. The Turbidity of sample was compared with that of standard Turbidity suspension.

Experimental

Table No. 1: Monthly mean values of temperature from different sites from December 2018 to November 2019.

Month	Site I	Site II	Site III
December 2018	24.0	24.0	24.0
January 2019	23.1	22.1	23.0
February 2019	26.2	26.1	26.1
March 2019	29.0	30.0	30.1
April 2019	32.2	32.0	32.0
May 2019	34.5	34.5	34.0
June 2019	35.1	35.2	35.0
July 2019	31.2	31.0	31.1
August 2019	30.2	31.0	31.0
September 2019	29.2	29.0	29.0
October 2019	31.3	30.4	30.0
November 2019	26.2	26.2	26.0

Table No. 2: Monthly mean values of conductivity (µs/cm) from December 2018 to November 2019.

Month	Site I	Site II	Site III
December 2018	410	450	400
January 2019	500	480	410
February 2019	500	510	560
March 2019	610	510	575
April 2019	700	690	620
May 2019	740	660	690
June 2019	770	690	780
July 2019	610	580	700

August 2019	340	290	380
September 2019	320	301	340
October 2019	370	350	370
November 2019	385	375	375

Table No. 3: Monthly mean values of Turbidity December 2018 to November 2019.

Month	Site I	Site II	Site III
December 2018	195	98	96
January 2019	102	95	60
February 2019	62	67	65
March 2019	77	77	70
April 2019	177	180	167
May 2019	163	167	165
June 2019	184	182	190
July 2019	252	227	235
August 2019	232	242	240
September 2019	362	362	365
October 2019	293	323	350
November 2019	191	180	175

RESULT AND DISCUSSION

Measurement of temperature is an important parameter required to get an idea of self purification of reservoir and control of treatment plant. A rise in temperature of water leads to the speeding up of the chemical reactions in water, reduces the solubility of gases and amplifies of tastes and odour. Water in the temperature range of 7°C to 11°C has a pleasant taste and is refreshing at higher temperature with less dissolved gases, the water becomes tasteless at elevated temperatures. Metabolic activity of the organism increases, requiring more oxygen but at the same time the solubility of oxygen decreases time. The solubility of oxygen decreases.

Conductivity is the measure of capacity of a substance or solution to conduct electric current. Conductivity is the reciprocal of the resistance. As most of the salts in the water present in ionic forms capable of conducting current. Therefore conductivity is a good and rapid measure of total dissolved solids. Conductivity of distilled water ranges between 1 to 5 μ mho. But the presence of salts and contamination with waste increase the conductivity of water consequently a sudden rise in conductivity in the water will indicate addition of some pollutant to it conductivity is highly dependent upon the temperature and therefore is reported normally at 25°C to maintain the comparability of the data from various sources. However, the conductivity is an important criteria in determining the suit ability of water and waste water for irrigation waters having conductivity more than 20 m mho have not been found suitable for irrigation.

So from present study the maximum conductivity recorded was 780 μscm^{-1} in the month of June and minimum value of 290 μscm^{-1} in the month of August. It was observed that the higher value of conductivity in summer and onset of rainy season. It was seen that upstream the conductivity goes up during February to May which are post monsoon months of increasing ambient temperature with the onset of Southeast monsoon during late may the electrical conductivity falls sharply as rain water dilutes the salt content of the reservoir in January to March.

CONCLUSION

The present investigation was carried out from Dec. 2018 to Nov. 2019. In different sites of Karadkhed reservoir the monthly mean values are given in table no.1. Site I showed the range of temperature from 23.1 to 35.1°C. The maximum temperature of 35.1°C was noted in June while. The minimum was noted as 23.1°C in January. The maximum temperature recorded was 35.2°C in the month of June at site II and minimum of 22.1°C in the month of January. Site III was characterized with highest temperature of 35°C in June where as the lowest of 23.0°C was observed in January.

Site I showed a range of conductivity from 320 to 770 μscm^{-1}. The maximum conductivity of 770 μscm^{-1} in the month of June while the minimum noted was 320 μscm^{-1} in September. The maximum conductivity recorded was 690 μscm^{-1}. in the month of April and June and minimum of 290μscm^{-1} in the month of August at site (II). Site III was characterized with the highest conductivity of 780μscm^{-1} in the month of June where as lowest of 340μscm^{-1} in September.

Turbidity in water is caused by the substance not present in the form of true solution. The true solution has a particle size of less than 10^{-9}m. Any substance having more than this size will produce turbidity. Turbidity of water is actually the expression of optical property (Tyndall effect) in which the light in scattered by the particle present in the water.

The present investigation was under taken to access the physico-chemical parameter of water form karadkhed reservoir which is used for drinking purpose as well as

irrigation the study was conducted during December 2018 to November 2019. Three sampling stations were taken. In order to study the physico-chemical parameter like Temperature, Conductivity and Turbidity.

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REFERENCES

1. A.Findley, Practical Physical Chemistry.
2. Chatwal Anand, Instrumental Methods of Chemical Analysis.
3. Chauhan Anil, Effect of distillery effluent of river Wainganga. Indian Journal of Health, 1991; 33: 203-207.
4. Coarse Manual, Water and waste water analysis NEERT, Nagpur, India, 1979; 134.
5. Coroni, Environmental management; 29 July 1999.
6. Das R.L. and B.Behera, Experimental Chemistry.
7. Das S.M, High pollution in lake Nainital (U.P.) as evidences by biological indicators Sci., 1978; 44: 236-237.
8. Donald J. Pietrzyk and Clyde W.Frank, Analytical Chemistry.
9. Gill S.K., Sahota S.K., Sahota G.P. and Sahota H.S, Physico-Chemical parameter examination of river sutley, IndianJournal of environmental protection, 1993; 13(3): 171-175.
10. Golter Man H.L., Glymo, R.S. and Ohonstand, M.A.M, Methods for physical and chemical analysis of fresh water IBP hand book No.8, Blackwell Scientific Publication.
11. Kabadi S. N, Ph.D. Thesis; S.R.T. M.University, Nanded. 2002.
12. Khopkar S.M., Basic concept of analytical Chemistry.
13. Klein D, River pollution- I chemical analysis batter works scientific publication London U.K. 1959.
14. Klidesia V.P, Water pollution, Pragati prakashan meerut; India. 1980.
15. Kulkarni P.R, Technological mission and drinking water quality in India In; 22nd annual convention IWWA, 1990; 28-35.