Quality Analysis of Surface Water Using Physico-Chemical Parameters in Kandulur Water Pond, Kandulur, Prakasam(Dist.), Andhra Pradesh

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Abstract: The present study involved in the analysis of physico-chemical parameters of surface water collected from Kandulur water pond near Ongole in Prakasam district, Andhra Pradesh. The water stored in this pond is coming from Nagarjuna Sagar reservoir through surface canal. The quality of the water in the pond was evaluated by analyzing the various physical and chemical parameters such as pH, Turbidity, Electrical conductivity, Alkalinity, Hardness, Total solids, Chlorides, DO, Iron and Manganese in the month of March, 2017. All parameters were within the permissible limits. The results indicate that water entered into the pond is safe for drinking.
Keywords: Kandulur water pond, Nagarjuna Sagar reservoir, Physico-chemical parameters, Turbidity, IS10500:2012

I. INTRODUCTION

Water is one of the most important substances on the earth. Each and every living organism required water to survive. Apart from drinking, human beings have many uses of water for their survival. The water resources are getting not suitable for drinking due to its natural characteristics, pollution and depletion of aquatic biota. Therefore it is necessary that the quality of water should be checked and analyzed because due to usage of contaminated water, human beings suffer from various kinds of water borne diseases.

The present study involves in the analysis of water quality by checking its different physical and chemical parameters of Kandulur Pond near Ongole, Prakasam District, Andhra Pradesh. It is located in 15.2197^0N latitude and $79.9.25^0$E longitude. This pond occupies an area of $1.5km^2$. This pond is basically for drinking and agriculture. The water to this pond is coming from Nagarjuna Sagar reservoir through surface open canal by travelling distance of 190 km. Basically the study area is too hot in summer and every year highly affected by draught.

II. EXPERIMENTAL METHODOLOGY

2.1 Collection of sample:

For the analysis of physic-chemical characteristics of water, two stations were chosen for sample collection from the pond. On 3rd March, 2017, the samples were collected in polythene bottles at 11.30AM. At the time of collection the temperature was measured by using the thermometer.

2.2 Analysis at laboratory:

The collected samples of water were immediately brought to Environmental Engineering lab at QISIT, Ongole for the estimation of different physical and chemical parameters like pH, Turbidity, Electrical conductivity, Alkalinity, Hardness, Total solids, Chlorides, DO, COD and BOD. Every parameter has been evaluated in the laboratory by using Indian Standard procedures.

III. RESULTS AND DISCUSSIONS

The below table shows the average values of various Physico-chemical parameters of the tested sample at laboratory.

S.No.	Name of the Parameter	Mean Value
1	Temperature	24^0C
2	Electrical Conductivity	699 µmhos/cm
3	pH	7.88
4	Alkalinity	150mg/lt.
5	Hardness	100mg'lt.
6	Chlorides	106mg/lt.
7	Dissolved Oxygen	20.88mg/lt.
8	COD	265mg/lt.
9	Total Solids	500mg/lt.
10	BOD	45mg/lt.
11	Turbidity	11.61NTU

3.1 Water temperature:

Generally the weather of the study area is slightly hot and the study is also conducted in summer. The temperature of water was found out as 24^0C. It is normal temperature and suitable for drinking.

3.2 Electrical Conductivity:

Many surface water sources such as streams, rivers, lakes and ponds possess an Electrical Conductivity of 200 to 2000 µmhos/cm. For our study area, the collected sample had 699 µmhos/cm. As per IS10050:2004 and WHO standards this water suitable for drinking.

3.3 pH:

The present sample contains pH as 7.88. According to IS10500:2012 and WHO, water for drinking should have pH between 6.5 and 8.5. Hence it is suitable for drinking.

3.4 Alkalinity:

Excess alkalinity gives better taste to water. However some alkalinity is required in drinking water to neutralize the acids such as lactic acid and citric acid produced in the body. As per IS10050:2012 water having an alkalinity less than 200 mg/lt. as $CaCO_3$ is desirable for drinking. Hence our present study area having the alkalinity within the permissible limit and it is suitable for drinking purpose.

3.5 Hardness:

Usually surface waters are soft to moderately hard. As per IS10050:2012, the desirable limit for hardness in drinking water is 300 mg/lt. as $CaCO_3$ In the present study sample of water, the hardness is 100 mg/lt. Hence it is suitable for drinking.

3.6 Chlorides:

As per IS10500:2012 the permissible limit for the chlorides content in drinking water is 200 mg/lt and as per WHO it is 250 mg/lt. For our present tested sample the chlorides content dissolved about 106 mg/lt and being within the permissible limit.

3.7 dissolved oxygen:

According to IS10500:2012 and WHO standards, the water contain the amount of Dissolved Oxygen about 4 to 8 mg/lt is suitable for drinking. Now our present study area's water having the dissolved oxygen as 7.33 mg/lt. Hence it is suitable for drinking and agricultural purposes.

3.8 Total Solids:

The determination of total solids is used to assess the suitability of potential supply of water for various uses. The pH stabilization also depends upon the total solids present in the water. Our present sample having the amount of total solids is 500 mg/lt. Hence the water of the study area is suitable for drinking purpose.

3.9 Turbidity:

Turbidity is the property of water due to which it can show some resistance to passage of light or light rays through it. It is due to the presence of dust particles and suspended matter. As per IS10500:2012 and WHO's recommendations, the present study area's water is suitable for drinking and also can be supplied to agricultural lands.

3.10 Iron and Manganese:

As per IS10500:2012 and WHO recommendations, the desirable standards for iron and manganese in drinking water are 0.3 mg/lt and 0.1 mg/lt respectively. Hence our present study area's water is suitable for drinking purpose.

IV. CONCLUSION

All the physical and chemical parameters of sample of water from the Kandulur water pond are within the desirable limits except in the sense of turbidiy. Turbidity is also slightly exceeds the value. So I recommend that this water is safe for drinking purpose.

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