Studies of Physico-Chemical Parameters to Access the Water Quality of Sonhira Lake (Chinchani) For Agricultural Farming Purpose in Kadegaon Tehsil (Sangli District)

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Abstract*— The present study was carried out with the aim to assess of water quality using physico-chemical parameters of Sonhira Lake, such as (temperature, pH, EC, TDS, Calcium, Magnesium, Sodium, Potassium, Carbonate, Chloride, Sulphate of water samples from different sampling points. Comparatively study three villages interpoint distance is 2 to 6 km. it was observed that the water in sonhira lake is better quality. Sonhira Lake receives the small amount of pollution from the surroundings. The results revealed that the average pH value was analyzed as 7.5, Electrical conductivity was 0.52 mhos/cm, parameters include total solids 259 ppm, chlorides was 0.92 ppm, sodium was 1.27ppm, potassium was 0.054ppm, sulphates was 0.92ppm in of sonhira lake water. It was observed that water in Chinchani, Sonkire and Sonsal are better quality. The general classification scheme along with concentration ranges defined in these classes will be of immense use for determining the surface water quality status with reference to specific individual parameter. The result obtained from the present study shall be useful of water quality of Sonhira Lake is better use to Agricultural Farming.

Indexed Terms*— Agricultural water, physico-chemical parameters, Water Quality Test, Description, Instruments/method

I. INTRODUCTION

Water is a substance composed of the chemical elements hydrogen and oxygen and existing gaseous, liquids, and solid states. It is one of the most plentiful and essential of compounds. It has the important ability to dissolve many other substances. It is important to all living organisms, human health, food production and economic development. Water is a critical input for agricultural production and plays an important role in food security. Lakes and surface water reservoirs are the planets most important freshwater resources and provide in numerable benefits. They are used for domestic and irrigation purposes and provide ecosystems for aquatic life especially fish. The physico-chemical parameters are very essential and important to test the water, before it is used for drinking, domestic, agricultural or industrial purpose. The physic-chemical parameters is very important to get exact idea about the quality of water and then we compare the obtained results with standards values.

Farm water, also known as agricultural water, is water committed for use in the production of food and fiber and collecting for further resources. Water is one of the most fundamental parts of the global economy. In areas without healthy water resources or sanitation services, economic growth cannot be sustained. It is therefore necessary that water quality investigation or assessment can be done to find out whether the available water from the termed reliable sources is safe for drinking and other uses.

Improving water use efficiency of irrigation systems may also reduce negative environmental impacts. Lining canal systems reduces conveyance losses in surface water-based irrigation systems. The proportion of fresh water on earth's surface is only 2.5% of which only 1% is accessible for use. In this context, lakes are one of the most important water resources and have been used as a source of water supply for human consumption and in general accounts for about 0.3% of the total surface water body sources. As such, the conditions of lakes have been in constant deterioration due to increased anthropogenic

activities surrounding them. In principle, the quality of lake water (or other surface sources) is evaluated using various physico-chemical and biological parameters selected on the designated best use of water body (Lake) for various purpose. The determination of existing properties helps in determination of future trends of such pollutants and thereby the quality of the lake water in future scenario. Different modeling techniques are used for prediction of futuristic changes in lake water quality including watersheds models, ground water models and lake models.

II. SAMPLE COLLECTION

The present study was carried out for Sonhira Lake, located in Chinchani (Ambak) village. the water sample were collected in the polythene bottles. The samples were collected from Sonhira Lake (three polluted site) chinchani, sonkire, sonsal.

III. MATERIAL AND METHODS

The water samples were collected from three Different places in the Morning Hours between 9 to 11 am, to collect water samples in cleaned and rinsed plastic containers of one – liter capacity were used. For Lake water samples collected to the closed bottles was dipped in the lake at the depth of 0.7 to 0.9 m, and then a bottle was opened inside and was closed again to bring it out at the surface.

The Water samples were immediately brought in to Laboratory for the Estimation of various Physico-chemical Parameters like Water Temperature, pH were recorded by using Thermometer and Digital pH meter. (Systronics). Specific conductivities were measured by using digital conductivity meter. The TDS values were measured by using TDS meter. While other parameters such as Hardness, Sodium and Potassium by Flame Photometry. Magnesium, Calcium, Sulphates, Chlorides, bicarbonates were estimated in the laboratory by using Standard laboratory methods. Present study involve the physico-chemical parameters to asses the water quality from Sonhira Lake

Table No. 1. (Water Quality Test, Description, Instruments/method)

Water quality test	Description	Instrument/method
pH	The major of acidity (hydronium ion , H+) in the water.	pH meter
Turbidity	Turbidity in water is the reduction of transparency.	Turbidity meter
TDS	The measure of the amount of particulate solids that are in the water.	TDS meter
Calcium	Measurement of Calcium amount in water.	Titrimetric method
Magnesium	Measurement of Magnesium amount in water	Titrimetric method
Sodium	Measurement of Sodium amount in water.	Titrimetric method
Potassium	Measurement of Potassium amount in water.	Titrimetric method
Carbonate	Measurement of Sodium amount in water.	Titrimetric method
Bicarbonate	Measurement of Sodium amount in water.	Titrimetric method
Chloride	Measurement of Chloride amount in water.	Titrimetric method
Sulphate	Measurement of Sulphate in water.	Titrimetric method

Figure No. 1. Collection Site Map.

Collection Site:

Figure No. 2. Chinchani

Figure No. 3. Sonkire

Figure No. 4. Sonsal

IV. RESULTS & DISCUSSION

The result obtained from analysis of Sonhira Lake are shown in table. No. 2. The results indicates that the quality of water for Agricultural Purpose are good.

pH generally in India many small confined water pockets particularly, are alkaline in nature. Alkalinity consist primarily of Carbonate, bicarbonate, phosphate, borate, orthosilicate, sulfides, and organic acids. pH level of the water in Lakes is important to plant and animals life. pH range found to be 7.5 to 7.7 Alkaline in nature.

Electrical Conductivity (EC) of water is its ability to conduct an electric current. Salts or other chemicals that dissolves in water can break down into positively and negatively charged ions. These free ions in the water conduct electricity, major positively ions that affect the conductivity of water are sodium, calcium, potassium and magnesium. Major negatively charged ions are chloride, sulphate, carbonate and bicarbonate. Nitrates and phosphates are minor contributors to conductivity. Electrical Conductivity values are found to be lower.

The total hardness of water is defined as the sum of calcium and magnesium concentration. Hardness of water is not a specific constituents but is a variable and complex of cations and anions. The total hardness recorded in the water of Sonhira lake Nil.

Calcium is most abundant ions in freshwater and is important in shell construction, bone building and plant precipitation of lime. The amount of calcium in the water of Sonhira lakes ranges 3.2 in Chinchani region, 3.1 in Sonkire region and 3.1 in Sonsal region.

Magnesium is considerable amount to influence water quality. The amount of magnesium in the water of Sonhira Lake, three regions are same 2 ppm.

Sodium is the monovalent cation commonly present in water. This ion does not produce hardness to water. Sodium is a natural constituents of raw water, but its concentration is increased by pollutional sources such as rock salt, precipitation runoff, soapy solution and detergents. The amount of sodium recorded in the water of Sonhira Lake is 1.26-1.27 ppm.

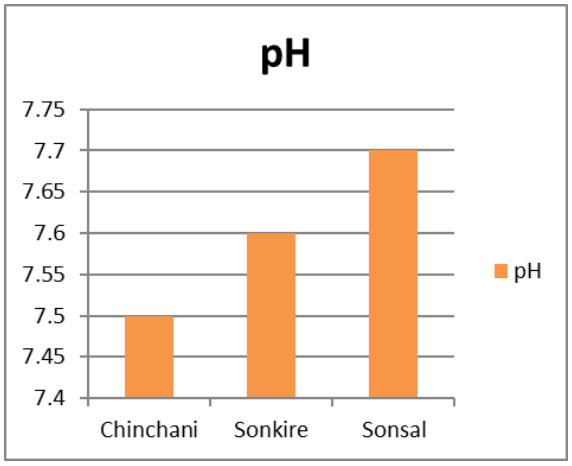
Chlorides are important inorganic anions which contain varying concentrations in natural waters. The greater source of chloride in lake water is disposal of sewage and industrial waste, chloride can be considered as one of the basic parameters of classifying lakes polluted by sewage into different categories. The amount of chloride in the water of Sonhira Lake ranges are 4.2 to 4.5 ppm.

Sulphate is second to bicarbonate as the major anion in hard water reservoirs. more important to plant growth and Sulphate value found very low proportion is 0.92 ppm.

Table No. 2 : Physico-chemical analysis of water from collection sites.

Sr. No.	Parameters	Chinchani	Sonkire	Sonsal
1	pH	7.50	7.60	7.70
2	Electrical Conductivity in mhos/cm	0.52	0.51	0.51
3	Total Dissolved Solids in ppm	259	257	258
4	Hardness	0	0	0
5	Calcium in ppm	3.2	3.1	3.1
6	Magnesium in ppm	2	2	2
7	Sodium in ppm	1.27	1.26	1.26
8	Potassium in ppm	0.054	0.052	0.053
9	Carbonate in ppm	0	0	0
10	Bicarbonate in ppm	1.6	1.4	1.3
11	Chloride in ppm	4.5	4.2	4.4
12	Sulphate in ppm	0.92	0.90	0.90
13	Sodium Stabilization ratio	0.62	0.60	0.59

Figure No. 5



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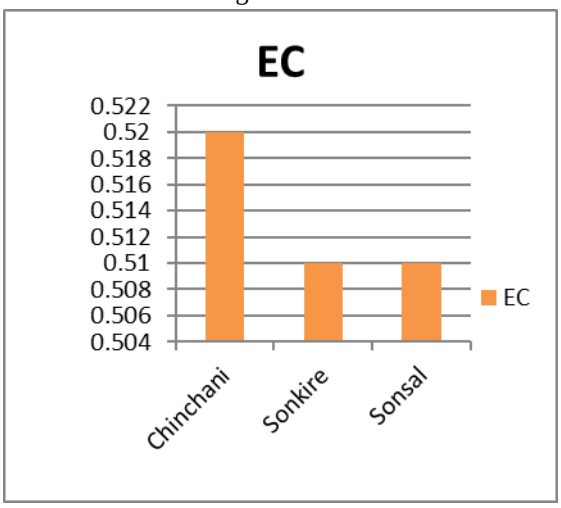

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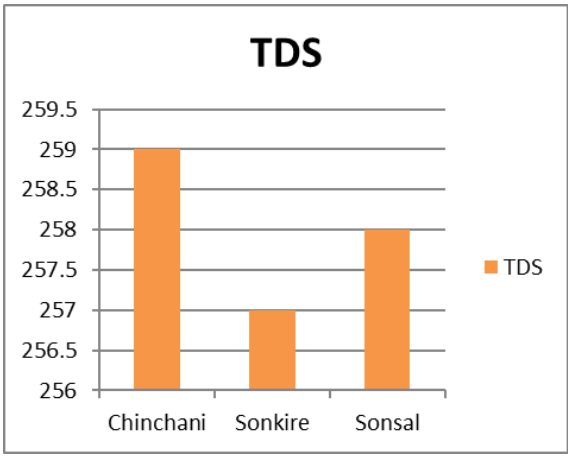

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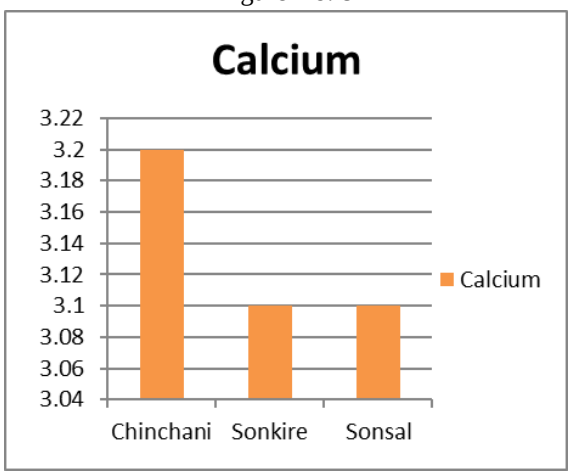

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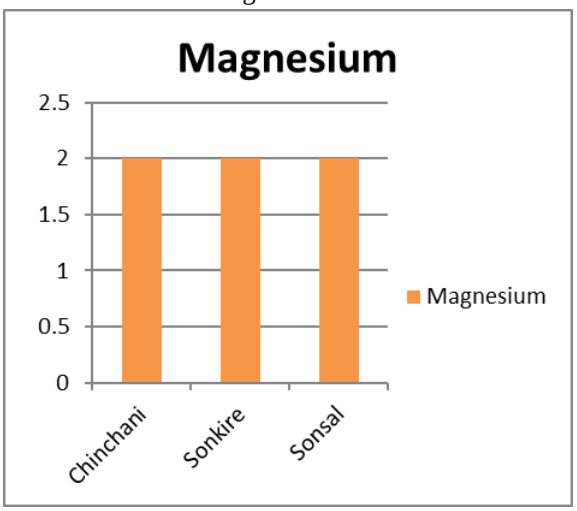

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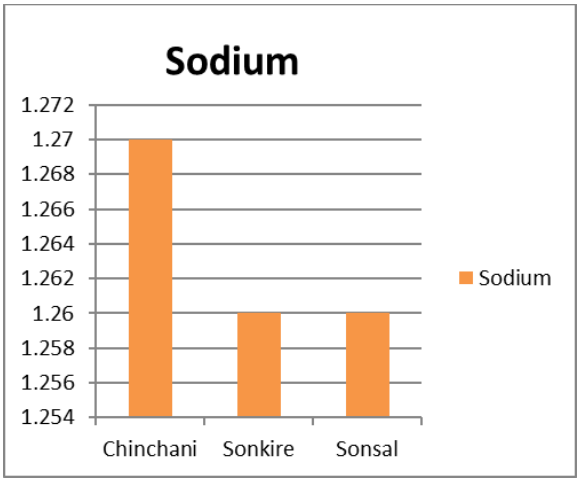

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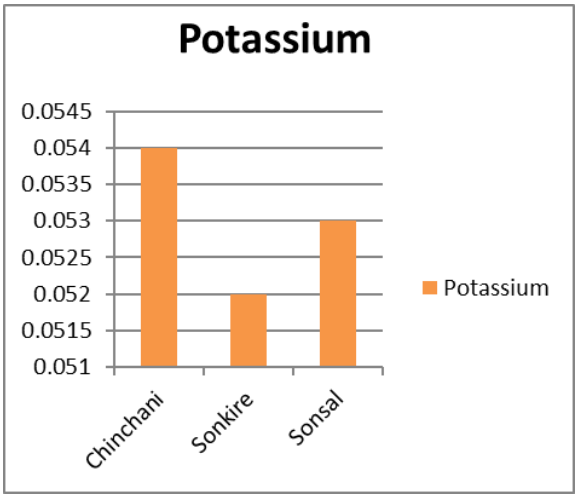

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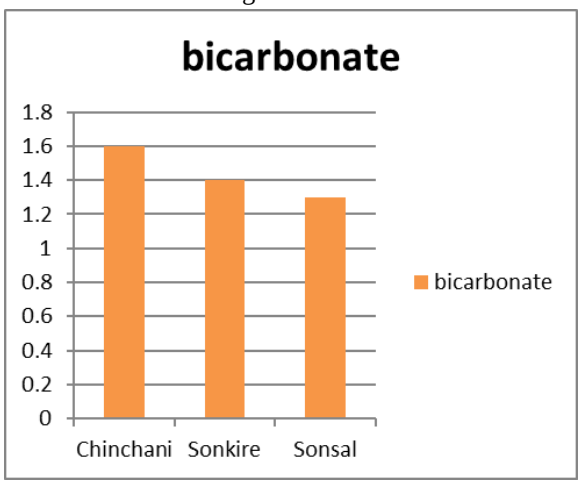

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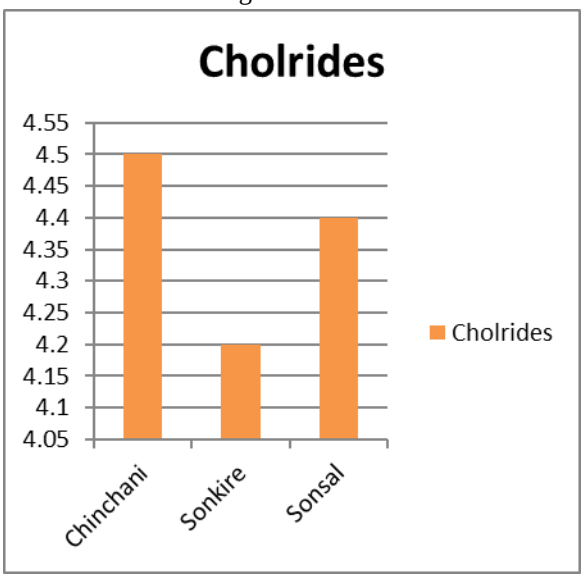

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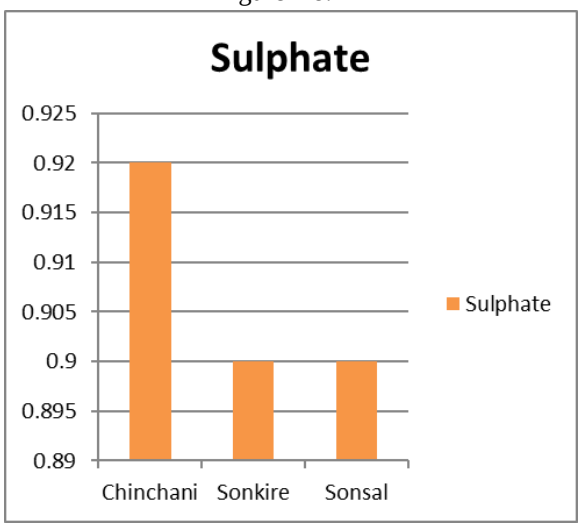

V. CONCLUSION

The result obtained during study was compared with standards and it was found that minimum number of parameters in Sonhira Lake. The pH values are nearly alkaline in nature therefore suitable for Agricultural Farming. This result shows that the Sonhira Lake receives the small amount of pollution from the surroundings. And water of lake found small quantity of content. It is not hazardous to farm. The results suggested that the water in the lake was not polluted and is good for agricultural purposes.

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[24] Remediation of water quality problems caused by rain-fed agriculture through reforestation/afforestation and agricultural land management (e.g., perennial versus annual crops) will decrease water quantity.

[25] Remediation of water quantity and quality problems associated with irrigated agriculture can be achieved through inter basin transfers, conjunctive use of surface water and groundwater, and improved irrigation water use efficiency.

[26] Long time lags between land use change and water resource impacts need to be considered in determining when full-scale impacts of a land use change will be realized and in setting up remediation programs.

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