

WATER QUALITY ANALYSIS IN VELACHERY LAKE, CHENNAI

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Abstract:

Water quality analysis deals with the Physico – chemical Parameters of Wet land in any particular area. Monthly Changes in Physical and Chemical Parameters such as Water Temperature, Turbidity, Total Dissolved Solids, pH, Dissolved Oxygen, Free Carbon dioxide and Total Hardness, Chlorides, Alkalinity, Phosphate and Nitrates are analyzed for a periods of desired duration.

Keywords:

Velachery lake, deterioration, quality test.

1. INTRODUCTION

1.1 VELACHERY LAKE

Velachery lake, is one of the lakes inside Chennai, in the Indian state of Tamil Nadu, with a good stock of water all through the year. Since Velachery is a low-lying area, the monsoon rain water from the neighbouring areas are drained into this lake.

1.2 CONTAMINATED VELACHERY LAKE

There are about 2,000 families living in the southern bund. Even though some have toilets in the backyard, they conveniently direct the pipelines to the lake, causing extensive damage to the waterbody. The government's efforts to relocate the encroachers has not yielded satisfactory results.

1.2.1 PROTECTION EFFORTS

The ambitious programme of the corporation was conceived three years ago. The local body had even engaged a consultant, shortlisted by experts from Anna University, Public Works Department and the agriculture department. The consultant gave a detailed plan in October last on how to beautify the lake. This included removal of encroachments in Gandhi Nagar and Ambedkar Nagar, fencing of the entire waterbody, provision of three decks for walking, viewing and fishing and a boating jetty. The consultant also suggested plantation of African grass, reed and bamboo along the middle deck and flowering plants and trees like bottlebrush, bougainvillea, royal palms and areca nut betel palms along the upper deck.

2. LITERATURE SURVEY

The study of different types of lakes and its qualities was studied. This study flashes out the different results and the comparisons of those values with all the water quality standards. Few point sources and non point sources were investigated. As the result, all the values were mostly of under or above the good qualities. Still few of them were quite ok at its level.

3. MATERIAL AND METHODS

3.1 STUDY AREA

Velachery is a residential area in South Chennai, a metropolitan city in Tamil Nadu, India. The growth of Velachery during the last decade can be cited due to the growth of the IT sector in south Chennai. It acts as an important hub connecting the rapidly growing business class Information Technology corridor popularly called OMR; the

more mature and well connected GST road and the Central Business Districts of the city, which has more relevance to the history of Chennai. Velachery as a whole draws a perfect balance between Old and New Chennai and is a phenomenon in terms of growth and development.

3.2 LOCATION OF SEDIMENTS SAMPLES

The samples were collected during the month of December 2017 at the surface of the Velachery lake. Nearly 6 samples were collected at the different points and the intervals, then taken to the laboratory.

3.3 METHODOLOGY

The samples are collected in the well washed bottles. Then they are transported to the laboratory and kept in the normal temperature. Proceeding further, different types of water quality tests are done.

3.3.1 pH, Electrical conductivity

pH indicates the hydrogen ion concentration in water and it ranges from 0-14 where as 7 is neutral, less than 7 is acidic and more than 7 is basic. Then there comes the electrical conductivity which is the measurement of the water's ability to conduct the electricity.

3.3.2 Total hardness

Hardness of water is an aesthetic quality of water and is caused by carbonates, bicarbonates, sulphates and chlorides of calcium and magnesium. It prevents the lather formation with soap and increases the boiling point of water. The maximum permissible limit of total hardness for drinking purpose is 300 mg/L. Hardness more than 300 mg/L may cause heart and kidney problems. The total hardness in surface water samples collected from the study area ranged from 100-850 mg/L. In the present study the hardness were above the permitted limit

3.3.4 Chloride

The chloride ions occur in natural water in fairly low concentration, usually <100mg/l unless the

water is brackish or saline. The distribution of chloride ion concentration individually reflects the water interaction with rocks, permeability variations of aquifer and inters transmissivity of rock. Based on ISI standard, chloride concentration is classified <100ppm as good zone suitable for drinking. Moderate surface water suitable zone is categorized under the class of 100-250ppm. Above 250ppm zones were classified as poor surface water suitable zones.

3.3.5 Alkalinity

Alkalinity is a measure of ability of water to neutralize the acids. Determination of alkalinity OH^- , CO_3^{2-} and HCO_3^- can be estimated separately by titration against standard acid using phenolphthalein and methyl orange as indicators. Capacity of water to resist the pH that would make the water more acidic.

3.3.6 phosphorous

Phosphorus occurs in natural waters and in waste waters almost solely as phosphate. These are classified as ortho phosphate, condensed phosphate (pyro-meta), and other (poly phosphates), and organically bound phosphates. They occur in solutions in particles or detritus, or in the bodies of aquatic organisms.

3.3.7 Sodium

Sodium (Na) (from Latin natrium) and atomic number 11. Sodium is a common element, the sixth most abundant, and present to some extent in most natural waters. Concentrations vary from negligible in freshwater to considerable in seawater and brackish water. The permeability of agricultural soil is harmed by a high ratio of sodium ions to total cations. Sodium concentrations higher than a few milligrams per liter are undesirable in feed water for high-pressure boilers. When compounded with certain anions (e.g. chloride), sodium imparts a salty taste to drinking water and, if the concentration is sufficiently high, consumers may not be willing to drink it. Sodium concentrations can be determined by flame photometry.

4. RESULT & DISCUSSION

S.NO	LOCATION	pH	EC	TH	Ca	Cl	ALK	P	Na	SiO ₂
1	P-1	8.1	945.2	5.1	510	142	5.2	3.5	1.64	3.94
2	P-2	8.17	940.5	28.5	690	139.16	8.4	6.8	1.43	1.61
3	P-3	6.45	916.5	33.8	530	136.32	8.4	10	1.08	-1.61
4	P-4	8.05	922.4	10.6	550	144.84	12.2	12.6	0.81	-0.17
5	P-5	8.13	921.9	16.4	580	136.32	10.6	16	0.61	31.67
6	P-6	8.07	911.2	22.1	570	150.52	7.6	18.7	1.09	-0.17

Table 1:Velachery Lake values

TEST	pH values	EC values	Ppm of TH	Ppm of Ca	Chloride values	Alkalinity values	Phosphorus values
Std values	6.5-8.5	100-2000 micro Siemens	300-600	75-200	98-106mmol /lit	200-600 mg/lit	Less than 0.1ppm
Avg of pa sample	8.5	968.6	1438	558.9	134.67	7.25	8.7
Comparison of both values	Std values= sample value	Std values <sample values	Std values <sample values	Stdvalues =sample values	Std values <sample values	Stdvalues >sample values	Std values <sample values

Table 2: Comparison of the standard values and the sample values

5. CONCLUSION

This paper shows the results of quality of water with different metrics. At the end all the

parameters are not upto the level of WHO standards.

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