



Analysis of Temple Pond Water in Ayyankarkulam, Kanchipuram

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Abstract : The present study was analyzing the water quality of sanjeevi rayar temple and kailasanathar temple pond water in Ayyangarkulam. During the study period various physico chemical parameters P^H , Electrical conductivity, colour, Total alkalinity, calcium, sodium, chloride, sulphate, phosphate, Dissolved oxygen, TDS, BOD were tested and analyzed. The investigation shows both temple ponds are polluted due to its anthropogenic activities. The water quality index value is greater than 100. So the temple pond water can not be used directly for drinking purpose without treatment.

Keywords: Temple Pond Water, Ayyankarkulam, Kanchipuram.

Introduction:

Fresh water has become a scarce commodity due to over exploitation and pollution of water. Ecosystem having a small areal extent can also play a major role in global ecological processes. The areal extent of continental water is dominated by ponds and small lakes⁵. Increasing population and its necessities have lead to the deterioration of surface and subsurface water⁶

Temple tanks are located in the very center of the village and are the repository of age old rituals⁴. The important ponds are very often used for religious activities⁷. The people take holy dip in the temple tank³ water, leave products used in worshipping, washing of temple idols and utensils for temple rituals. This leads to significant alteration in the water quality². Physico chemical⁶ studies on temple ponds were made in India¹. Now a day many of the tanks were in dry condition due to various activities of public and also due to nature climatic changes. Constructing a new building in and around the temples it takes more water so peoples making bore holes this will cause the lowering of water table. Next problem in the catchment areas the inlet of water way was completely arrested. The above activities produce the temple tank in less water level or dry condition.

Study Area:

Kancheepuram is the historical and ancient city. Kanchipuram majorly rolled by Pallavas, Temples in kanchipuram having architectural beauty. It is a great historical and religious importance city greatly visited by foreign tourists. Kancheepuram is located in south west direction at a distance of 76km from Chennai.

Kanchipuram having an holy river Vegavathi, and a tributary of the river Pallar. Ayyangarkulam is located 4km from kanchipuram. This village has two main temples one is old legendary temple named Sri Sanjeevi Rayar temple and kailasanathar temple.

Sample Collection

Water samples were collected at the month of February 2015. Water samples were collected from the two ponds for the analysis of physico-chemical parameters. Samples were collected in plastic containers previously cleaned by distilled water. The samples were labeled and transported to the laboratory.

Table:1 Physico-chemical parameter values

| Sl.No | Parameters | Sanjeevi Rayar Temple | Kailasanathar temple. | Class A Standard value |
|-------|-------------------------|-----------------------|-----------------------|------------------------|
| 1. | PH | 7.43 | 7.4 | 8.5 |
| 2. | Electrical Conductivity | 850 | 745 | --- |
| 3. | Colour | Colourless | Colourless | |
| 4. | Chloride (mg/L) | 170 | 150 | 250 |
| 5. | Sulphate (mg/L) | 93 | 96 | 400 |
| 6. | Magnesium (mg/L) | 20 | 33 | 100 |
| 7. | Calcium (mg/L) | 46 | 56 | 200 |
| 8. | Total Hardness | 206 | 275 | 300 |
| 9. | Phosphate (mg/L) | 6.3 | 5.3 | --- |
| 10. | Dissolved oxygen (mg/L) | 6.9 | 5.2 | 6 |
| 11. | TDS (mg/L) | 610 | 586 | 500 |
| 12. | BOD (mg/L) | Nil | Nil | 2 |
| 13. | Total Coliform Count | 550 | 500 | 50 |

Result and Discussions:

Table 1 shows the Physico-chemical parameter values from the results the following are the discussions. The pH values were found greater than 7 it shows the pond water is in somewhat alkaline nature. The greater value of pH changes the biological processes and biochemical reactions in pond water. The Conductivity of water is precious by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, etc. The chloride values were ranging between 170,150 mg/L in 1 pond water samples, which was found within the permissible limit for class A std. Hardness values were 206 mg/L and 276 mg/L, which was found within permissible limit of irrigation standard. The values of DO, BOD and TDS varied from 3.2 mg/L to 5.6 mg/L, 1 mg/L to 2.5mg/L and 1290 mg/L to 2340 mg/L respectively. The maximum value of DO was 6.9 mg/L in and the minimum value of 5.2 mg/L. Dissolved oxygen is an significant parameter in water quality calculation and reproduces the physical and biological processes of aquatic life. Biochemical Oxygen Demand depends on temperature, extent of biological activities. TDS value is increased mostly by sewage waste, soap and detergent. Total Coliform Count value is greater than permissible limit due to water pollution caused by fecal corruption. It is a serious problem due to the potential for contracting diseases from pathogens. The presence of pathogens is determined with indirect signal by testing for an indicator organism such as coliform bacteria.

Water Quality Index

WQI represents the quality of water.

$$WQI = \frac{\sum q_n W_n}{\sum W_n}$$

Water Quality Index was calculated by grouping the quality rating with the unit weight.

The weighted arithmetic index method has been used for the calculation of W.Q.I.

Sub index (qn) was calculated using the following expression-

$$Q_n = 100 \times \frac{[V_n - V_o]}{[S_n - V_o]}$$

Where, qn = Quality rating for the nth water quality parameter.

V_n = Estimated value of the nth parameter at a given sampling station.

S_n = Standard permissible value of the nth parameter.

V_o = Ideal value of nth parameter in a pure water.

Unit weight was calculated by a value inversely proportional to the recommended standard values S_n of the corresponding parameters.

Where, W_n = Unit weight for the nth parameter. S_n = Standard value for nth parameter.

Table: 2 Calculation of Water Quality Index

| | | P1 | | | P2 | |
|-----|-----------|--------|----------|----------|----------|----------|
| | Std Value | Wi | Qi | WiQi | Qi | WiQi |
| PH | 8.5 | 0.3553 | 29.33 | 10.42095 | 26.67 | 9.475851 |
| DO | 6 | 0.5034 | 89.53488 | 45.07186 | 109.3023 | 55.02279 |
| TDS | 500 | 0.006 | 122 | 0.732 | 117.2 | 0.7032 |
| CL | 250 | 0.0121 | 68 | 0.8228 | 60 | 0.726 |
| So4 | 400 | 0.0076 | 23.25 | 0.1767 | 24 | 0.1824 |
| TH | 300 | 0.0101 | 31 | 0.3131 | 32 | 0.3232 |
| Ca | 200 | 0.0151 | 23 | 0.3473 | 28 | 0.4228 |
| Mg | 100 | 0.0302 | 20 | 0.604 | 33 | 0.9966 |
| TCC | 50 | 0.0623 | 1100 | 68.53 | 1000 | 62.3 |
| | | | | 127.0187 | | 130.1528 |

Result and Discussions:

Table 2 shows the WQI values. The calculated WQI value for Sanjeevi Rayar temple was 127.0187 and kailasanathar temple was 130.0528. The values are greater than 100 so it is not used for drinking purpose directly. According to class A standards it shows with proper conventional treatment it can be used for drinking purpose.

Conclusion

Results of physico-chemical parameters of various ponds at Ayyangarkulam as studied in the present investigation clearly shows that the water is not good for human consumption and also stressed for their life. So there is an immediate need of renewal, improvement and proper management of these secret water bodies for the human and environment.

Remedies and Measures

It is a need of alertness among the local people to maintain the ponds at quality and purity levels. The rainwater helps in diluting the pollutants, awareness practices such as planting trees around ponds, regularly recharging during summer period, removal of sediments from the bottom of pond, removal of floating debris from the pond surface, diversion of sewage discharge to proper disposal site.

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