

# Assessment of Physico-chemical parameters of selected reservoir of Wanaparthy District, Telangana

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### ABSTRACT

The present study aims to evaluate the physico-chemical profile of GhanaSamudram reservoir, Wanaparthy was done during period of Jan-2024 to Dec-2024. Reservoir water is a source for ground water recharge and main source for agriculture purpose. The water analysis was carried out for the parameters like temperature, pH, Dissolved Oxygen, Carbon dioxide, Phosphate and Nitrate etc., the study report discusses about the analysis of lake water quality.

Key words: Freshwater Ecology, Water Quality and Telangana

### **INTRODUCTION**

Water is mother of life and key component of any ecosystem. Recent developments, rapid urbanization, extensive use of chemical fertilizers in the agro sector, industrialization are causing high degree of damage to aquatic ecosystems (Rajashekhar et al., 2009). The life of all aquatic biota directly or indirectly depends on status of water quality. (Sayeshware, 2010).

Generally, the quality of water is fluctuated by various factors such as, rainfall, erosion, hydrological features, and industrial and agricultural activities, control the quality of surface water. Water quality study offers the current statistics about the suitability of water for selected uses and to improve existing state. In the present scenario, the aquatic ecosystem are highly vulnerable due to domestic sewage, industrial effluents and agricultural runoff (Fatima et al., 2011; Reshma et al., 2015).

Studies on pollution index and quality of water of various freshwater resources have been conducted by some researchers. Evaluation of physic-chemical profile of freshwater is crucial to determine the water quality. The Inappropriate water management may leads to eutrophication of ecosystem and significant harm to the freshwater resources (Loucif et al., 2020). Water quality can be maintained by reducing pollution by timely monitoring and appropriate management of water bodies (Weerasinghe and Handapangoda, 2019). Therefore the conservation of water bodies and its monitoring is very important (PriyankaYadavet al., 2013).

# **MATERIALS METHODS**

#### Study area

Ghana Samudram reservoir is situated in KhillaGhanpur is a historic place equidistant, 25 km, from Mahabubnagar and Wanaparthy towns of Telangana state. It is 111 kilo meters away

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from Hyderabad city. which falls under 16.5748° N Latitude, 78.0511° E Longitude: and it is 421 m above Mean Sea Level.

Present study was carried out during Jan-2024 to December2024 and the water samples were collected between 7.00 am to 9.00am and were brought to the laboratory carefully for further analysis parameters such as Atmospheric temperature, water temperature, pH, DO, CO<sub>2</sub>phosphate and Nitrate etc., were analysed according to APHA (1998).

#### **RESULTS AND DISCUSSION**

Atmosphere, water temperature play an important role regulate the growth and development ofmany aquatic creatures. Excess volume of nutrients, high temperature cause to the eutrophication. The high atmospheric water temperature was observed in the months of May and June and lowestvalues were recorded in the month of January and December. The temperature exhibited positive correlation with phosphate and other variables.

pHis one of the key factor in all the aquatic ecosystems and support the survival of flora and fauna. The aquatic organisms are adapted to typical pH and don't withstand abrupt fluctuations. The present study reveals that, pH ranges from 7.6 to 8.23 and the water body exhibited alkaline trend during study period. Similar results were reported by Rajashekhar et al., () khan et al. (2005). The high pH was during summer season is associated with photosynthetic activity of autotrophs. The pH exhibited positive correlation with temperature and other variables.

Dissolved Oxygen is very important parameter of aquatic ecosystem and is an index of biochemical process along with physical process of water body. The Dissolved oxygen content in present investigation 6.2 mg/l to 10.2 mg/l. The maximum value of Dissolved Oxygen was noticed in summer seasons. similar results were reported by Devidas (2006) and lokhande (2009). The dissolved oxygen exhibited positive correlation with phosphate and other variables.

The high value of phosphate 0.04mg/l was recorded in the month of May and minimum 0.086mg/l in the month of September, low value of phosphate concentration during summer season may be attributed to high rate of utilization of phosphate content. In the present study nitrate 0.01 mg/l was recorded in the month of July and minimum 0.06 mg/l in the month of March. Similar studies were reported by Reddy et al. (2009). The phosphate exhibited positive correlation with temperature and other variables.

#### **CONCLUSION**

The physic-chemical properties of Ghana Samudram tank water body reveals that the all parameters of water quality are within the permissible limits . All the physical and chemical variables are exhibited seasonal variations and oscillations. The nutrient status of the reservoir indicate that, oligotrpophic condition. Which support the high biodiversity and also suitable for sustainable fisheries.

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| Months | At <sup>0</sup> C | WT <sup>0</sup> C | рН    | DO   | CO <sub>2</sub> | PO <sub>4</sub> | N-N   |
|--------|-------------------|-------------------|-------|------|-----------------|-----------------|-------|
| Jan-24 | 27.5              | 23.3              | 7.89  | 6.2  | 9.9             | 0.06            | 0.009 |
| Feb    | 29.3              | 25.2              | 7.99  | 6.5  | 8.8             | 0.05            | 0.008 |
| March  | 29.8              | 25.3              | 8     | 6.8  | 9.9             | 0.06            | 0.006 |
| April  | 33.5              | 25.2              | 8.1   | 7.2  | 6.6             | 0.05            | 0.007 |
| May    | 36.4              | 26.2              | 8.12. | 8.8. | 3.3             | 0.04            | 0.009 |
| June   | 28.2              | 27                | 8.21. | 8.9  | 4.4             | 0.05            | 0.009 |
| July   | 29.9              | 25                | 8.2   | 10.2 | 5.5             | 0.07            | 0.01  |
| August | 28.5              | 26.4              | 8.12  | 9.2  | 6.6             | 0.06            | 0.012 |
| Sept   | 27.3              | 24.4.             | 8.23  | 9.4  | 4.4             | 0.08            | 0.009 |
| Oct    | 28.3.             | 23.3              | 7.81  | 8.7  | 5.5             | 0.08            | 0.008 |
| Nov    | 28.3              | 24.2              | 7.6   | 8.9  | 6.6             | 0.07            | 0.009 |
| Dec    | 27.9              | 23.1              | 7.9   | 8.1  | 6.6             | 0.05            | 0.01  |

Table 1: Physico-Chemical parameters of Ghana Samudram reservoir.

| Table 2:  | Correlation-coefficient | between | physico-chemical | parameters | of | Ghana | Samudram |
|-----------|-------------------------|---------|------------------|------------|----|-------|----------|
| reservoir |                         |         |                  |            |    |       |          |

| Parameters          | Atmospheric<br>temp | Water<br>temp | рН         | Dissolved<br>Oxygen | Carbon<br>dioxide | Phosphate | Nitrate |
|---------------------|---------------------|---------------|------------|---------------------|-------------------|-----------|---------|
| Atmospheric<br>temp | 1                   | .733**        | .421       | 176                 | 290               | 587*      | 077     |
| Water temp          |                     | 1             | $.548^{*}$ | 150                 | 391               | 352       | .114    |
| pН                  |                     |               | 1          | .255                | 193               | 004       | .144    |
| Dissolved<br>Oxygen |                     |               |            | 1                   | .070              | .652*     | .242    |
| Carbon dioxide      |                     |               |            |                     | 1                 | 037       | 345     |
| Phosphate           |                     |               |            |                     |                   | 1         | .047    |
| Nitrate             |                     |               |            |                     |                   |           | 1       |

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