

# Study of Physico Chemical Characteristics of Chandrampalli Reservoir

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## I. Introduction

Freshwater ecosystems have been used for the investigation of factors controlling the abundance and distribution of aquatic organisms (Esenowo and Ugwumba, 2010). It is well established that the productivity of a reservoir depends on its ecological conditions and by monitoring the water quality; productivity can be increased to obtain msustainable yield of aquatic biota (Mustapha, 2011 Usman, 2016)..

Maintenance of healthy aquatic environment and production of sufficient foods in reservoir are primarily linked with successful reservoir culture operations. To keep the aquatic habitat favourable for existence of living organisms, physical and chemical factors like temperature, turbidity, pH, odour, dissolved gases, salts nutrients etc..

Research findings indicate that application and heavy doses of fertilizers pollute ground water through leaching of nitrate from nitrogenous fertilizers and of cadmium from single super phosphate and of fluoride from rock phosphates.

### 1.1 Aims and Objectives of the Study:

The present study is an attempt to understand the river water quality of Kagina River. The main objectives of the current study are as following.

1. To find out the physical & chemical characteristics of water samples collected from different sources.
2. To determine the Co-relation Co-coefficients and Regression analysis
3. To find the Water Quality Index (WQI)
4. To find out the factors affecting the quality of water by carrying out Factor Analysis (FA).
5. The main objective of this work is to know the present river water quality whether it is used for potable purpose.

## II. 2. Materials And Methods

### 2.1 Study area

The Chandrampalli dam is constructed across river bhima the dam is located in Chandrampalli village of Chincholi taluka under the Gulbarga District of Karnataka since it is responsible for the irrigation of several villages in Chincholi taluka.

The dam was constructed in the year 1973 and has 6 spillway gates each having a size of 9.14 x 5.64 m the release gates are located at the southern end of the dam has capacity to store water up to 493.6 ft the maximum water level (MWL) of the dam is 496.21 meters the has a gross storage capacity of 34.19 mcm. The live storage capacity is 31.4 mcm. The dam has a height of 28.65 meters of above dam has a height of 28.65 meters above foundation and the length of the dam is 926.54 meters

### Quick facts

<b>Built on</b>	<b>River bhima</b>
Type	Earthen dam with left bank spillway
Length	926.54 meters
Height	28.65 meters above the foundation
Full reservoir level (FRL)	493.16 feet
Maximum water (MWL)	496.21 meter
Number of gates	6
Projects	Irrigation project

### III. Sampling Techniques And Preservation

Sampling is the first of a series of steps leading to the generation of water quality data and is an exceedingly important one. Care must always be taken to ensure obtaining a sample that is truly representative. Further the integrity of the sample is not representative of the system sampled or if the sample has changed in chemical composition between sampling and analysis, all care taken to provide an accurate analysis will be lost.

#### 3.1 Precautions

1. The water has been collected in bottles, especially of white color, having well fitted stoppers or screw caps.
2. Bottles having holding capacity of about one liter of water are necessary for the chemical analysis.
3. Bottle has been thoroughly cleaned, filled thrice with water and emptied before collecting the sample.
4. After collecting the sample, the stopper of the bottle have been well secured and the bottles containing samples of water have been labeled stating the date and time of collection.

### IV. Results And Discussions

#### 4.1 Chandrampalli Reservoir Water:

For Sampling purpose we have selected as 3 points and collected 12-Bottles from every point around embankment of the Reservoir and totally 36 Bottles are collected For this Reservoir we have stated 'S' as sample code. We have analysed 12 samples from each sampling points. This description of sampling is given in Table below.

**Table 4.1: Sampling points**

Sl.No	Location	No of samples taken	Sample Code
1	Sample 1	12	S1
2	Sample 2	12	S2
3	Sample 3	12	S3

#### 4.2: Characteristics Of Reservoir Water At Sampling Points 1

Water samples collected from 12 sampling points and they are analyzed for the Following parameters and the results of the Second sample are tabulated in the table and the diagram showing the variation of different parameters are represented in Table 4.2.1

##### 4.2.1 pH (Hydrogen Ion Concentration):

The determination of the pH facilitates the broad and quick evaluation of the acidic/alkaline nature of water. The pH in study area ranges from 7.1to 8.2. The mean value of pH is 7.65 and the standard deviation value is 0.342 coefficient of variation value is 0.447. The bar diagram showing the pH variations in the days is as shown in Figure 4.2.1

##### 4.2.2 Alkalinity:

The Alkalinity concentration in the Reservoir water varying from a minimum value of 116.2 mg/L to a maximum value 184.4mg/L, the mean value is 150.3mg/L and the and the standard deviation value is 18.30. And the coefficient of variation value is 0.121 and bar diagram showing the concentration variations are shown in Figure 4.2,2

##### 4.2.3 Dissolved Oxygen:

The dissolved oxygen concentration in the Reservoir water varying from minimum value of 8.2mg/L to a maximum value of 8.8mg/L, the mean value is 8.5mg/L and the standard deviation value is 0.209. And the coefficient of variation value is 0.024 and bar diagram showing the concentration variations are shown in Figure 4.2.3

##### 4.2.4 Total Dissolved Solids:

The total dissolved solids in Reservoir water under the study area has been found that it varies from minimum value of 553.2mg/L and maximum values of 578.2mg/L. The mean value is 565.7mg/L and the standard deviation is 8,957. And the coefficient of variation value is 0.015 the bar diagram showing the Concentrations variations in the days is as shown in Figure 4.2.4

##### 4.2.5 Total Hardness:

The total hardness of the Reservoir water ranges from a minimum value of 58.1 mg/L and the maximum value of 92.2 mg/L, the mean value being 75.15 mg/L and the standard deviation is 9.153. And the coefficient of variation value is 0.121 the bar diagram showing the concentration variations in the days is as shown in Figure 4.2.5

4.2.6 Calcium Hardness: The Calcium Hardness of the Reservoir water ranges from a minimum value of 35mg/L, the maximum value of 65.6 mg/L, The mean value being 50.3 and standard deviation value is 7,383. And the coefficient of variation value is 0.146.

4.2.7 Magnesium Hardness: The Magnesium Hardness of the Reservoir water ranges from a minimum value of 21.2 mg/L, the maximum value of 35 mg/L, The mean value being 28.1 and standard deviation value is 3.935. And the coefficient of variation value is 0.140.

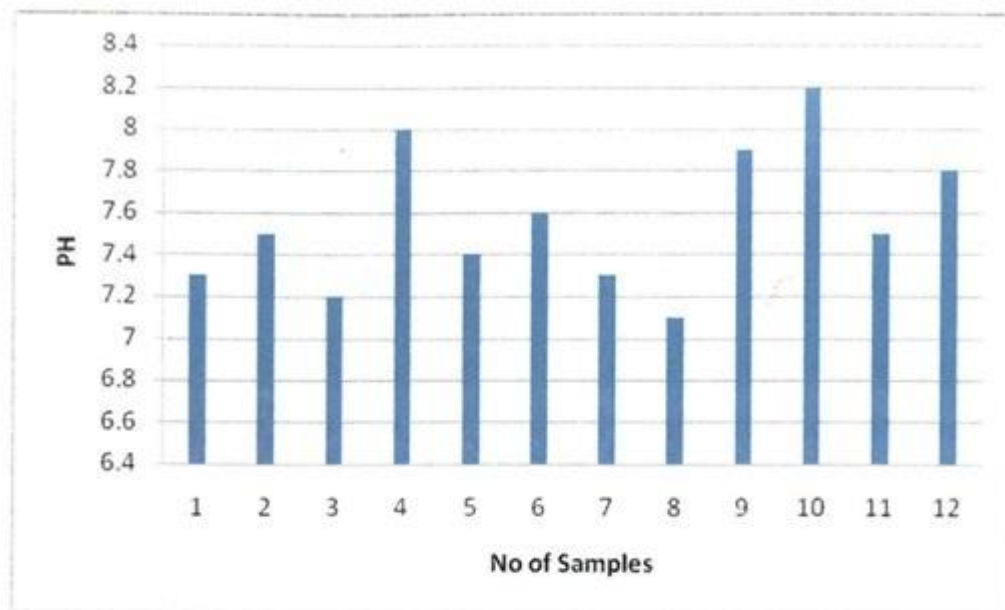


Figure 4.2.1: Showing the variation of pH at all the days

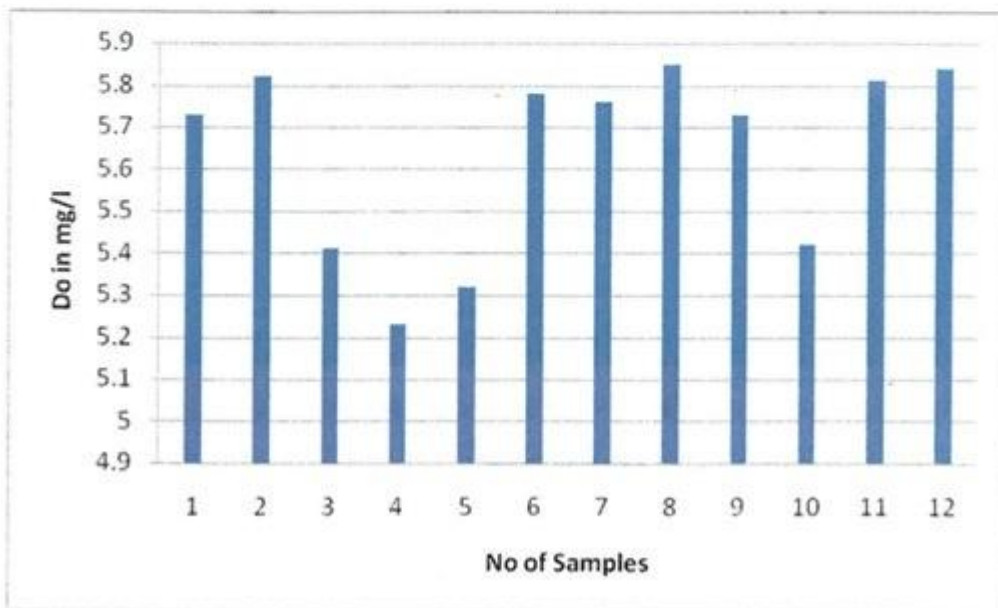


Figure 4.2.2: Showing the variation of DO at all the days

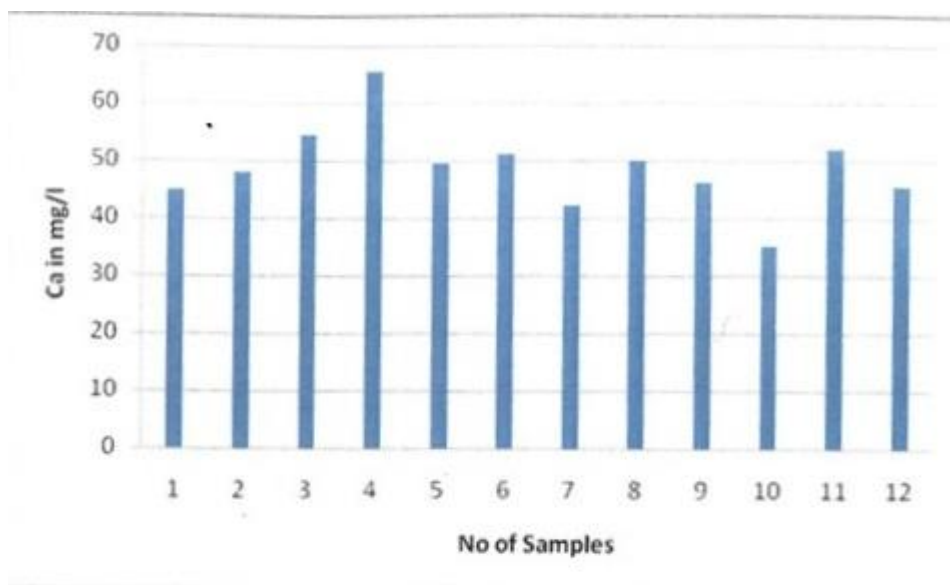


Figure 4.2.3: Showing the variation of Ca at all the days

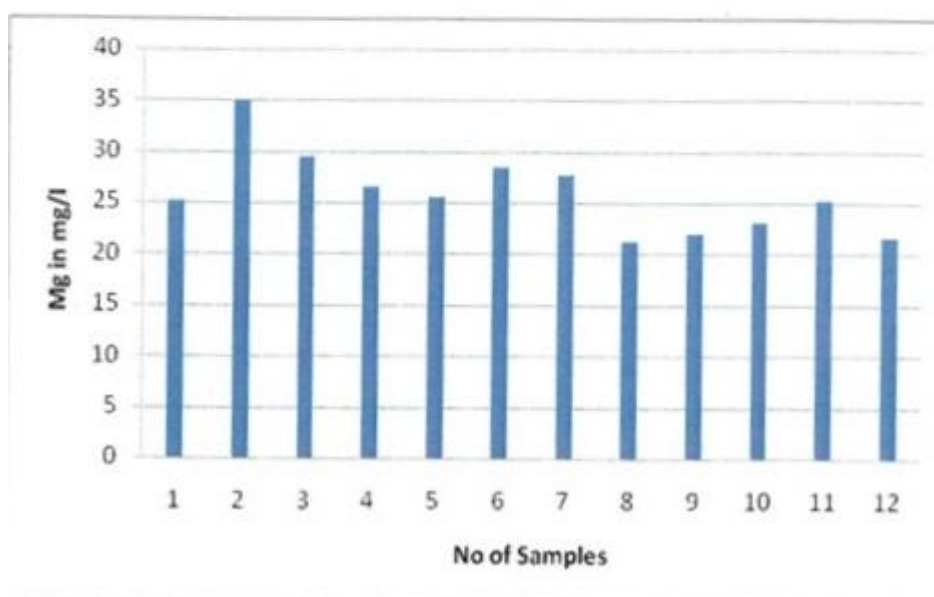


Figure 4.2.4: Showing the variation of Mg at all the days

## V. Conclusions

After the careful study of analysis interpretation and discussion of the numerical data following conclusion have been drawn for the Chandrampalli Reservoir water characteristics of Chandrampalli village.

1. The pH in Chandrampalli Reservoir water is between 7.1 to 8.2.
2. The DO in Chandrampalli Reservoir water is between 7.5 to 8.8.
3. Factor analysis has all sampling points has shown that DO is Normal in water as wash water from water treatment units is fed along with fresh water.
4. Factor analysis for sampling points shown that NO<sub>3</sub>& SO<sub>4</sub> is present in the water is good quality of Chandrampalli Reservoir water.
5. The Physico-chemical characteristics of water of Chandrampalli Reservoir are very good & It is fit for Drinking.
6. The Physico-chemical characteristics of Chandrampalli Reservoir water at different sampling points were analyzed and found all the values are within the permissible limits.

### **Acknowledgement**

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