



PHYSICO CHEMICAL PARAMETER OF VISHNUPURI DAM OF NANDED IN DIFFERENT SEASONS

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ABSTRACT

India is one of the developing countries with a serious problem of water pollution. Most industries discharge their effluents without proper treatment at nearby water bodies which are detrimental to water quality. Safe portable water is absolutely essential for a healthy life. The selected study area was Vishnupuri Reservoir of Nanded. Vishnupuri Reservoir is an important source of water supply to Nanded city. The catchment area of this reservoir is 608 km². The city meets the drinking water needs of about 65 percent of the population. Apart from this, the dam also provides irrigation purposes in and around Nanded city. Attempts were made to study and analyse the physical properties of water.

KEYWORDS: developing countries , serious problem , water pollution .

INTRODUCTION

Vishnupuri Dam selected study area of Nanded city about 25 km from Nanded city. Vishnupuri Dam is a large china dam at a distance of 1000 feet from Nanded in the distance and near Vishnupuri village in Nanded district. Reservoir water is water flowing through the forest. Before the reservoir was built, the submerged part was part of the forest and so many trees were submerged in the reservoir. The dam is used to supply drinking water to the city of Nanded. Apart from this, the dam also serves the purpose of irrigation in and around Nanded city, when the water level in Vishnupuri Dam rises to 462 meters, its water is released.

MATERIAL AND METHOD:

Selected study area at Vishnupuri Dam, Nanded. Water samples were analyzed for 11 parameters such as temperature, turbidity, pH, total alkalinity, chloride, total hardness, calcium hardness, magnesium hardness, iron, manganese and sulphate. Sample preparation and physiochemical examination were performed according to standardized methods. The results were carefully studied and analysed and compared with WHO standards and BIS standards in a specific context of alcohol eligibility.



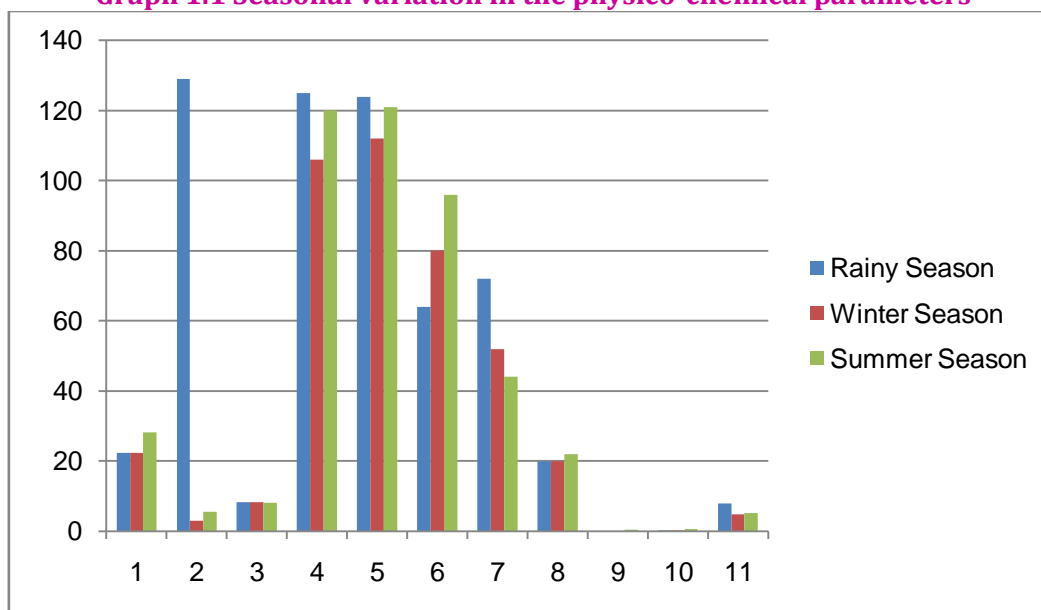
- The water temperature in the field was recorded with a sensitive mercury thermometer.
- The pH of the samples was determined using a digital pH meter.
- Turbidity Nefello - was determined by the turbidity meter.

- Total hardness, calcium hardness, and magnesium hardness were determined titrimetrically using the EDTA method.
- Total alkalinity was determined by titratometric method.
- Chlorides were determined by the argentometry method of sealing (APAA 1995).
- Iron, manganese and sulphate were spectro photometrically determined.

Table 1.1 Seasonal Study of Physico-Chemical Parameters of Vishnupuri Dam

Sr. No	Parameter	WHO Standard	BIS Standard	Rainy Season	Winter Season	Summer Season
1.	Temperature	-	-	22.3	22.3	28.1
2.	Turbidity	5	10	129	2.9	5.5
3.	pH	8-9.5	7.5-9.5	8.20	8.34	8.12
4.	Total alkaline	200	600	125	106	120
5.	Total hardness	100	600	124	112	121
6.	Ca hardness	80	210	64	80	96
7.	Mg hardness	80	80	72	52	44
8.	Chlorides	250	10000	20	20	22
9.	Iron	1.5	1.5	-	0.04	0.29
10.	Manganese	0.5	0.5	0.24	0.15	0.50
11.	Sulphate	250	450	7.8	4.8	5.2

Graph 1.1 Seasonal variation in the physico-chemical parameters



RESULT AND DISCUSSION:

The findings and results of the analysis of various physico-chemical parameters of water of Vishnupuri Dam are summarized in Table 1.1 and also graphic analysis is done. The data showed that there were many changes in physiochemical parameters from season to season. The various physico-chemical properties of the water samples studied with the WHO (1984)) and BIS (1998) standards have been compared. These parameters are discussed below:

1. **Temperature:** The maximum water temperature recorded in summer was 28.1 degrees Celsius. Changes in water temperature may be due to differences in collection time and seasonal effects.

Temperature regulates the behavioural characteristics of organisms, the solubility of gases and the salinity in water. The temperature of any other element does not have such an effect.

2. **Turbidity:** The amount of suspended substance in water can be calculated by collecting solids or by evaluating the relative light diffusion of the suspension. Increased opacity is caused by increased sedimentation which has a negative effect on most aquatic organisms. Both fruit production and fish reproduction and feeding can be reduced, and organs such as shellfish can be reduced to silt and eventually die in more muddy water. The maximum value of disability was observed during the rainy season (129 NTU) which is much higher than the licensing limit prescribed by the WHO. Water cannot be safe from a health point of view because in such a situation it is very difficult to observe the minimum desirable limit of chlorine in the water.
3. **Concentration of Hydrogen Ion pH:** The pH is a unit that expresses the strength of a solution based on its acidic or basic properties. Aquatic organisms can only operate within a certain range of pH and may be forced to relocate when the surrounding water changes. Pollution from fossil fuels increases the amount of sulphur and nitrogen oxides entering the water, which increases the overall acidity. The WHO has recommended a maximum allowable limit of pH from 7.5 to 9.5. Correction of pH after water treatment can reduce the problems of rust and infiltration. The pH regulates many nutrient chemical conditions, including dissolved oxygen, phosphate, nitrate, and so on. It regulates most biological processes and biochemical reactions. PH 8.34. It is found in the range of in i.e. 8.12 its pH value is in the desirable and appropriate range.
4. **Total Alkaline:** Water salinity is the ability to neutralize acids. The maximum salinity was recorded at 125 ppm during the rainy season. BIS has set an optimal level of salinity in drinking water to be 200 ppm where in the absence of an alternative source its value has been set at 600 ppm. Alkalinity fluctuates with the fluctuations in pollution load.
5. **Total Hardness:** The maximum hardness was recorded at 124 ppm in the rainy season and the minimum value was recorded at 112 ppm in the winter. Water hardness is not a pollutant factor but a water quality indicator. Hardness is an important parameter to reduce the toxic effects of toxic components. It is within the desired limits. BIS has set a desirable limit and allowable limit of total stiffness in the absence of an alternative source 600 mg / L.
6. **Calcium Hardness:** Its value is found in the range of 64 mg / l to 96 mg / l and is within the permissible limits set by the WHO.
7. **Magnesium Hardness:** Its values were found in the range of 44 mg / l to 72 mg / L. It has value within the permissible limits set by the WHO.
8. **Chloride:** Chloride occurs in large quantities in all natural waters. The chloride content usually increases as the mineral content increases. The current study found levels of chloride at 20-22 ppm.
9. **Iron:** Its value was found in the range of 0.04 mg / l to 0.29 mg / l. This is within the permissible limits set by the WHO.
10. **Manganese Hardness:** Manganese is an essential element that does not occur naturally in the form of metals but is found in the form of salts and minerals. Its deficiency leads to bone deformities and reproductive dysfunction. The maximum concentration of manganese during the summer season was recorded at 0.50 ppm and the minimum value of rainfall was recorded at 0.25 ppm, which is within the permissible limits set by the WHO.
11. **Sulphate:** It usually occurs in natural waters. The presence of sodium sulphate and magnesium sulphate in drinking water beyond permissible limits can cause cathartic action. Sulphate values ranged from 5.2 mg/l to 7.8 mg/l. Its value is much lower than the license limit set by the WHO.

CONCLUSION:

The results show that temperature, pH, total alkalinity, chloride, total hardness, calcium hardness, magnesium hardness, iron, sulphate, manganese, are found within permissible limits according to WHO standards and BIS standards. There is not much difference in the values of different parameters in different inputs, except for the date which has a very high value in the rainy season. The analysis shows that the water of Vishnupuri reservoir is moderately soft with moderate alkalinity. Observing the

results of different seasons, it can also be concluded that the parameters taken for the study of water quality are below the pollution level and can be used for various purposes like domestic, agricultural, industrial etc. The overall water quality is better than the Vishnupuri reservoir surrounded by dense forest. Water quality parameters in Vishnupuri reservoir show its good qualities.

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