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"STUDY OF PHYSICO-CHEMICAL PARAMETERS OF WAKI DAM WITH RESPECT TO ITS DRINKING WATER QUALITY"

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ABSTRACT-
Present investigation was carried out for study of Physico-chemical parameters Waki dam water with respect to its drinking water quality which involved analysis of water samples collected from different sites of Waki Dam. The physico chemical parameters such as Temperature, pH, TDS, Chlorides, Phosphates, Nitrates, Biological Oxygen Demand, Dissolved Oxygen, Carbonates were analysed to know the present status of the dam water during the period of one year study from June 2020 to May 2021. It is observed that dam water is better source for irrigation and drinking purpose.
Keywords: Wilson dam, Physico-chemical parameters, drinking water etc.

INTRODUCTION

Water is most essential substance available on the earth. Our biosphere consists of 71% of water coverage. Out of available water source on earth 97.4% is sea water. While freshwater environment occupies only 2.6% of which 1.98% is found in frozen form in ice caps and glaciers. It means only 0.62% water form lakes; streams and rivers are available for welfare of society. With rapid increase in population the demand of irrigation natural resources and industrial consumption has increased considerably. This puts tremendous pressure on the limited fresh water resources. Uncontrolled disposals of urban waste, industrial and agricultural waste contaminated the surface and ground water. Ultimately most of the fresh water bodies were polluted.

Waki Dam is a minor irrigation dam. The water in Waki dam is used for irrigation, drinking, fish culture and domestic purposes. The present investigation deals with the study Physico-chemical parameters of Waki-dam water. Waki Dam is located at western part of the Ahmednagar district in Maharashtra. It builds across the river Krishnawanti near the village Waki. During the present study analysis of water of Waki dam has been carried out in one year (June 2020-May 2021) Five sampling sites were selected for collection of water samples

The Waki dam is one of the minor irrigation projects of Maharashtra and one of the most important aquatic reservoirs from Akole tehsil in Ahmednagar district (Western ghat) situated at 19°34'11"N 73°46'4"E The dam is built across a river Krushnavanti. The main purpose of Waki dam is irrigation, drinking, fish culture and domestic use. The height of the dam above its lowest foundation is 51.87 m (170.2 ft.) while the length is 869 m (2,851 ft.). The volume content is 4,582 km (1,099 cu mi) and

gross storage capacity is 53,730.00 km (12,890.51 cu mi). Water is a unique component of nature and plays important role in human life. Therefore, it is necessary that the quality of drinking water should be checked. The quality of water is described by its physico chemical characteristics and the types of planktons present in water.

MATERIALS AND METHODS –

Five sampling stations of Waki dam were selected for the collection of water sample during the one-year study

Station - S1.
Station - S2
Station - S3
Station - S4
Station - S5

COLLECTION OF WATER SAMPLE: -

The water samples for physico-chemical parameters were collected from five different stations in the morning hours between 9 am to 11 am clean plastic cans of 2-liter capacity and brought to the laboratory for every month. The as parameters such Temperature, pH, TDS, Chlorides, Sulphates, Phosphates, Nitrates, Biological Oxygen Demand, Dissolved Oxygen, Carbonates were analyzed by using standards different methods A.P.H.A. (1985) and Trivedi and Goel (1986). For DO and BOD estimation water samples were collected in 250 ml BOD bottles and fixed at sampling sites.

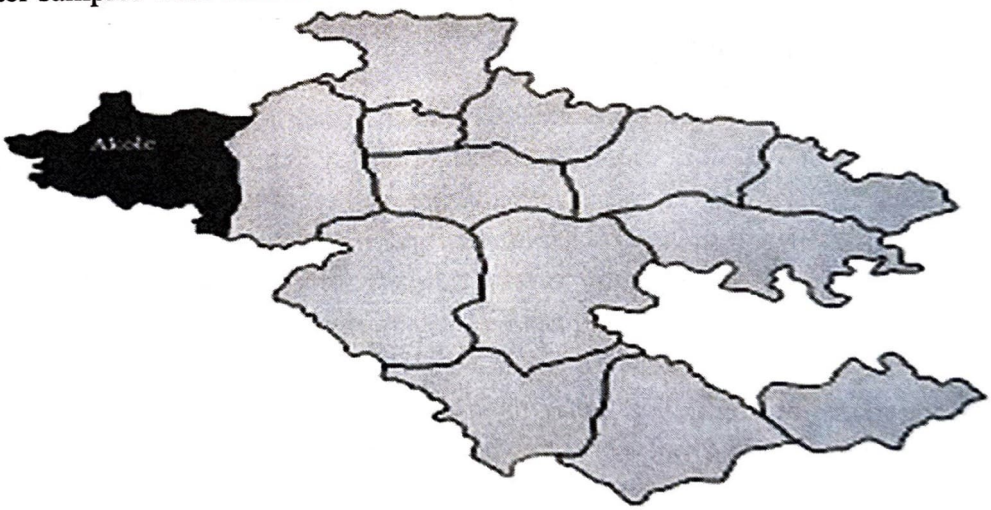


Plate-1: Showing Akole taluka in Ahmednagar District

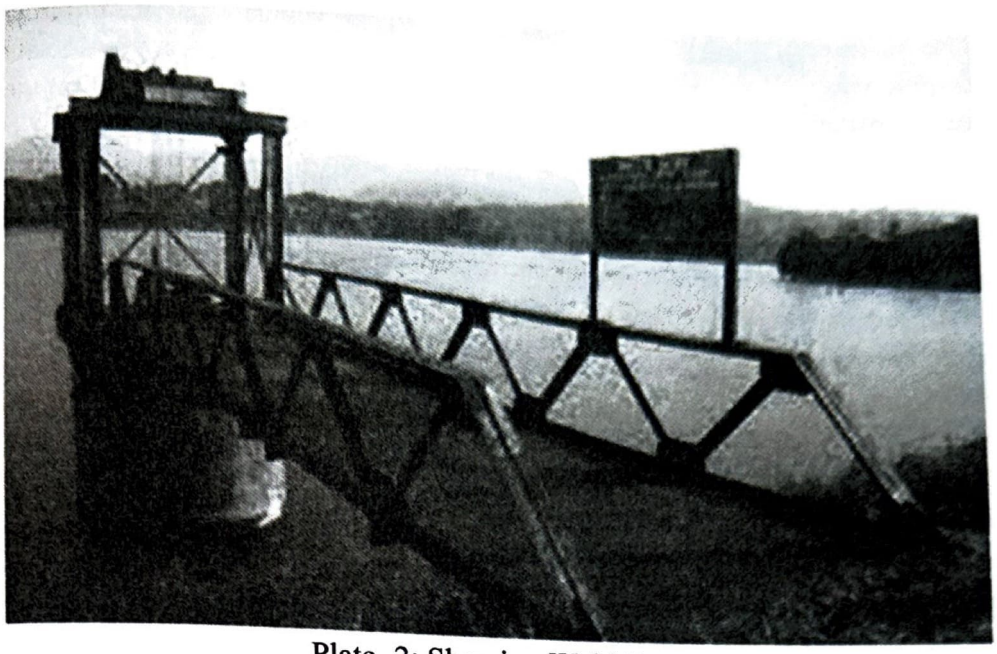


Plate- 2: Showing Waki Dam

RESULT AND DISCUSSION:

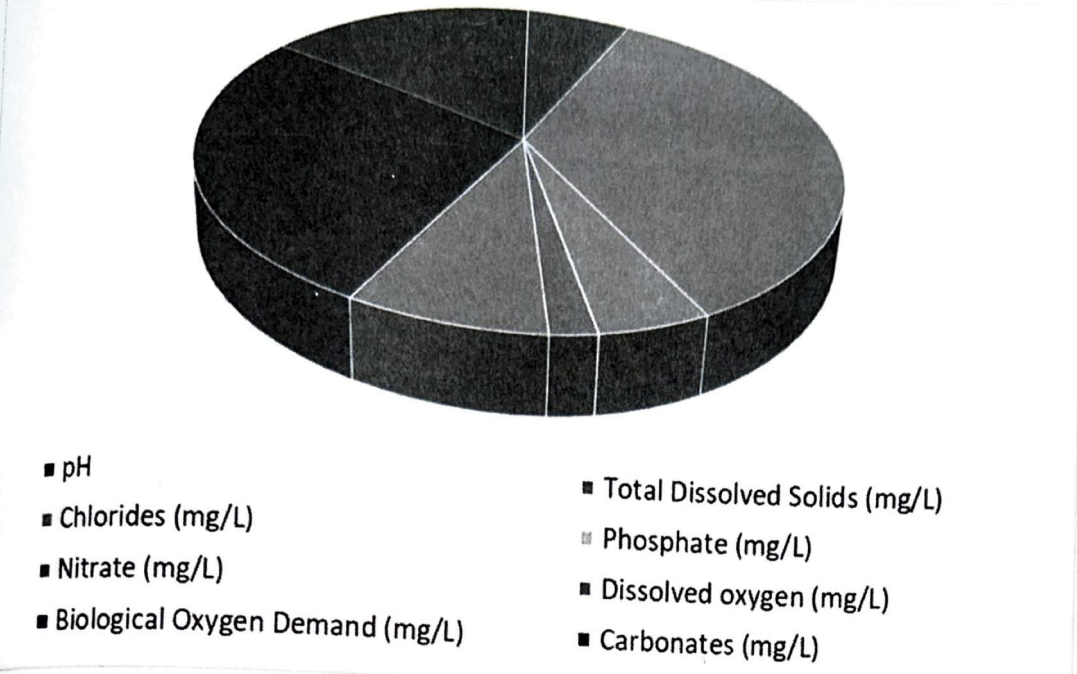
1. Water Temperature: The water temperature at five sampling stations of Waki Dam was varied from 15.1°C to 26.6°C during the present investigation from June 2020 to May 2021. Maximum temperature was recorded at site S4 and maximum temperature at site S2 These temperature values were high in summer season and low in winter season and moderate in monsoon season.
2. pH: - The pH value was ranged between 6.50 to 7.80. Maximum pH value 7.80 in May 2020 at station S1. Minimum pH value 6.45 in Aug. 2020 at station S1 was recorded. The lowest pH value may be due to reduction of solar ray's penetration during the monsoon months and most of the biological processes and biological reactions are pH dependent and present pH values are suitable for aquatic organisms.
3. Total Dissolved Solids (TDS): - The highest value of TDS 355 mg/L in April 2021 at site S3 and lowest value 38 mg/L in January 2021 year was recorded at site and S5. Therefore, a limit of 500 mg/L of TDS has been prescribed for drinking water by WHO (1984) as well as the Indian standard.
4. Chlorides: In the present investigation the chloride concentration was 5.3- 41.42 mg/L in year 2020 -2021. The maximum chloride is recorded in summer and minimum recorded in monsoon. The increased quantity of chlorides in study area indicates the sewage pollution in this region. Zafar (1966) and Venkateshwarulu (1969) as also make similar observation. High concentration of chlorine may be due to accumulation at excess chlorides in Waki dam.
5. Phosphate: - Highest value was 0.22 mg/L observed in September 2020 at S4 and lowest value was 0.021 in August 2020 at S3. The presence of phosphate in Water is due to detergents, fertilizers and biological processes (Trivedi and Goel 1986).

6. Nitrate: - The maximum value of nitrate was 2.18 mg/L in August 2020 at sampling site S5. The lowest value was 0.01 mg/L in November 2021 at Sl and S4. Highest nitrate values were found during the monsoon (June to September 2020) at all sites similar observation were made by Pandey et al. (1991) Tambe and Tapale (2020), Patil (2000). Higher values may be due to increase human activities.
7. Dissolved oxygen (DO) - Maximum D.O. obtained 8.91 mg/L was noted in Sep. 2020 at site S1. Minimum D.O. 3.0 in April 2021 at site S1. In the present investigation the dissolved oxygen. Observed seasonal fluctuations. The dissolved oxygen maximum in beginning of winter season and minimum in summer season are observed.
8. Biological Oxygen Demand (BOD):
   The Maximum value 29.0 mg/L was noted in May 2020 at study site S1 Minimum BOD 6.2 in April 2021 at site S5. This result shows that the reservoir was not so polluted due pollutants. Sewage influent discharged water show maximum BOD
9. Carbonates: - The maximum value of carbonate is recorded 16.80nmg/L in February 2020 at site S2 and minimum recorded 0.20 at site S4 in July 2020. The value was uniformly very low. Monsoon seasons, which is in accordance with the work of Cynthia (1980) and Kodarker et.al (1994)

Table No.-1 Value of Physicochemical parameters at Study sites

Sr.No.	Parameters	Max	Site	Min	Site
1	Water Temperature (°C)	26.6 °C	S4	15.1 °C	S2
2	pH	6.50	S1	7.80	S1
3	Total Dissolved Solids (mg/L)	38	S3	355	S5
4	Chlorides (mg/L)	5.3	S2	41.42	S4
5	Phosphate (mg/L)	0.021	S4	0.22	S3
6	Nitrate (mg/L)	2.18	S5	0.01	S4
7	Dissolved oxygen (mg/L)	8.91	S1	3.00	S1
8	Biological Oxygen Demand (mg/L)	29.0	S1	6.2	S5
9	Carbonates (mg/L)	16.80	S2	0.20	S4

Plate 3:- Graphical representation of all parameters



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