



# QUALITY ASSESSMENT OF PHYSICO- CHEMICAL PARAMETERS OF WATER, NEAR SUDHA DAM BHOKAR, NANDED, MAHARASHTRA

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## ABSTRACT

Rainfall, the main sources of surface water; includes water reservoirs, rivers, ponds, lakes and streams. Current work and research, metal occurrence and distribution of Sudha Dam has been going on for about two years i.e., January 2017 to December 2018. Sudha Dam surrounded by hilly region, different types of dense vegetation and agricultural land, different types of land forms. The surface runoff contains various organic elements that enter the Sudha dam itself. The source of pollution is agricultural activity, soil erosion and exposed geology of the surrounding region. Its experimental analysis was performed by their respective standard widely applicable methods. While conducting preliminary observation, it was found that water samples from Sudha Bhokar taluka dam and conduct seasonal survey of quality assessment of Physico-chemical parameters of water, near Sudha dam Bhokar. Selected sampling water parameters to carry out this research work, the results are shown on the respected plates, the result, etc.

**Key words:** Sudha River, Pollution, Water quality analysis, Biological Oxygen Demand, Chemical Oxygen Demand, Dissolved Oxygen

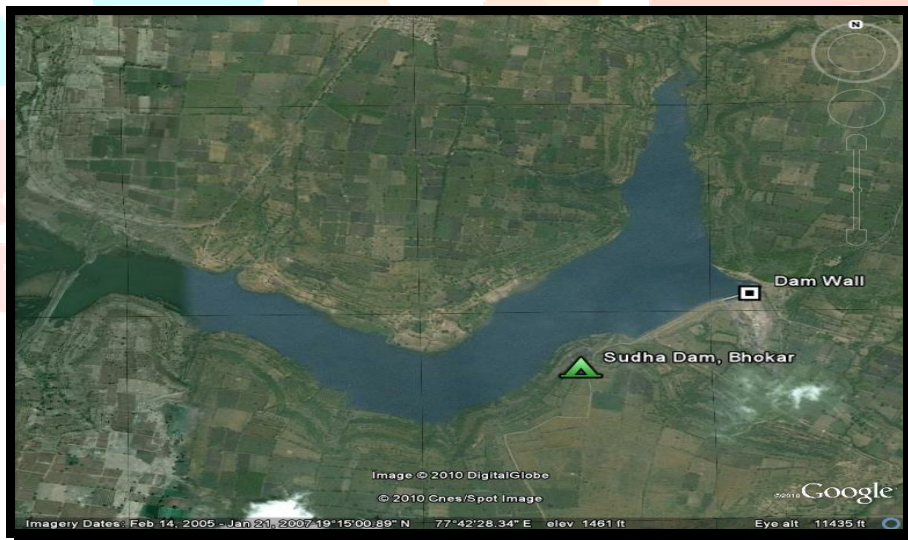
## I. INTRODUCTION

The proper monitoring and the control of river water pollution studies must be undertaken with systematic planning, management and expertise. Most of the rivers of India have received greater attention during recent years because of the sever pollution. The rivers are being polluted by the heavy discharge of municipal and industrial waste. Water is the most important natural resource in the world since without its life cannot exist and most industries could not operate. Although human life can exist for many days without food, the absence of water for only a few days has fatal consequences.

The presence of a safe and reliable source of water is thus an essential prerequisite for the establishment of a stable community. In the absence of such a source a nomadic life style becomes necessary and communities must move from one area to another as demands for water exceed its availability. The importance of water as a natural resource which requires careful management and conservation must be universally recognized. Although nature often has great ability to recover from environmental damage, the growing demands on water resources necessitate the professional application of fundamental knowledge about the water cycle to ensure the maintenance of quality and quantity. (Tebbutt,1992).

### 1.1 Study Area

Sudha dam constructed on Sudha River at Renapur village inside the Bhokar taluka having district Nanded of Maharashtra state has been decided on for carrying out these studies paintings. The density of flora across the dam is thick and the soil is black, barely rocky, and every now and then red. its miles situated inside the northern a part of the Nanded district. Bhokar is the Tehsil area within the Nanded district of Maharashtra, the Sudha reservoir become constructed earlier and its miles on the manner to Kinwat road and at Bhokar towards the eastern. The reservoir is situated at 190 15' range and 730 43' longitude. The catchment area of the reservoir is about a hundred and five Sixty-seven sq. km.



**Figure 1:** Google Image of Sudha dam in Bhokar, Nanded

## II. RESEARCH METHODOLOGY

The present data has been collected on physico-Chemical parameters and biological parameters monthly for the period of one year. In this period human activities were also noted. The samples were collected during day time once in a month, from March 2017 to February 2018. Eighteen water samples were collected from Godavari River at different locations. Water samples were collected in clean non-reactive plastic containers. For Dissolved Oxygen (DO) and Biochemical Oxygen Demand (BOD), the samples were collected in glass Stoppard bottles very carefully in order to avoid contact of the sample with air.

The bottles were completely filled with water. For bacteriological analysis, samples of water were collected in pre-sterilized glass bottles and preserved at 4°C. The water temperature was recorded at the site using a sensitive mercury thermometer and pH was measured in-situ using pH meter. The DO, BOD, COD and MPN were analyzed and Planktons were identified in the laboratory using standard methods of APHA (1989) and Trivedy and Goel (1986).

## III. RESULT AND DISCUSSION

The entire data has been collected from the study area for the selected three sites continuous for the period of two years i.e., January 2017 to December 2018. Information collected and segregated for different seasons to reach to a particular conclusion. After analysis of this data using various physico-chemical methods following results have been obtained during research work.

The present work was on three different sampling sites which were selected at Sudha dam as S1, S2 and S3 where sampling site S1 showed lower concentration of selected parameters observed during the study period. However, each day the runoff contains a lower concentration of essentials compared to sampling site S2. Because flowing water has a high concentration of dissolved oxygen compared to water stored in a dam.

Sampling site S2, essentials are deposited, due to which a slight increase in the level of all oxygen level was observed. Oxygen present in running water interact with organic matter and settle, resulting in high concentrations in stored water. An important part of these oxygen were activities circulating in the aquatic ecosystem, especially plankton.

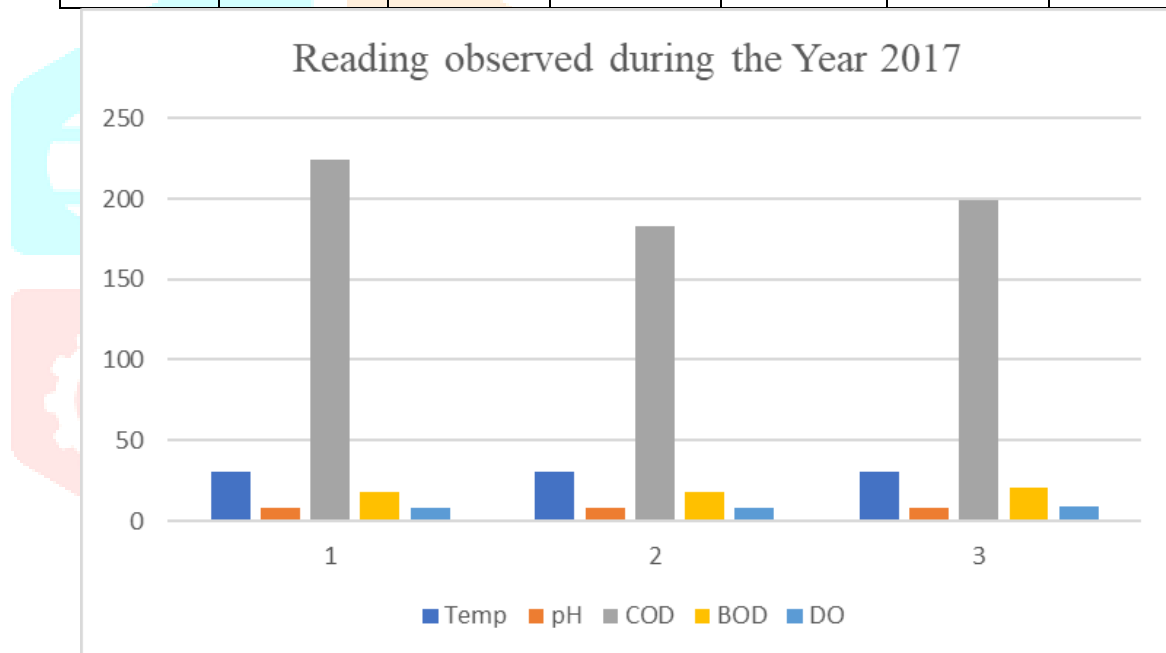
The highest pH level was found in the month of September 2017. The minimum pH concentration was recorded in the month of May 2018. In this research, it was observed that pH is less alkaline in monsoon season which becomes slightly alkaline in summer and less alkaline in winter season. In general, this can be attributed to the high growth of algae that use CO<sub>2</sub> through photosynthetic activity and decomposition of organic matter. Water temperature is an extremely important ecological parameter.

Temperature has a major effect on aquatic organisms with regard to the occurrence and level of activity of organisms. In general, an increase in water temperature leads to greater biological activity and faster growth. All aquatic organisms have a preferred temperature at which they can survive and reproduce

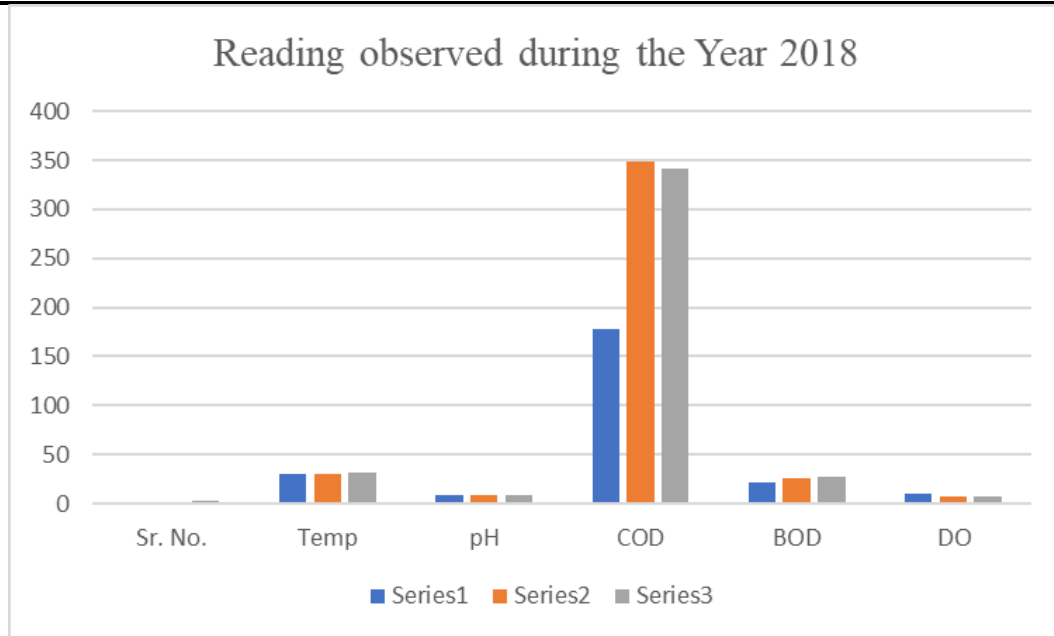
optimally. The highest temperature was found in the months of April and May 2017. The lowest level was observed in the month of November 2018.

**Table 4.1:** Data on Physico-chemical and characteristics in Average for the selected three sampling sites during the period of two years (2017-2018)

Sr. No.	Temp	pH	COD	BOD	DO	Year
1	30.63	8.02	224.00	18.33	8.33	2017
2	30.56	8.07	183.00	18.28	8.49	2017
3	30.43	8.22	199.00	20.63	8.83	2017
4	30.86	8.02	178.00	20.83	9.44	2018
5	30.85	7.94	349.00	25.65	7.12	2018
6	31.11	8.14	342.00	26.80	7.59	2018



**Fig. 4.1.:** Average Seasonal Physico-chemical data for Sudha River water during the year 2017



**Fig. 4.2.:** Average Seasonal Physico-chemical data for Sudha River water during the Year 2018

The temperature of the Sudha River varies from 20.81 to 32.17° C being maximum in the summer and minimum in winter season. Temperature increases in summer season which can be attributed to microbial activities in this season and minimum in the winter According to Khan *et. al.*, (2005) temperature has a considerable influence on the biological process in the water. Narrow annual variation in water temperature indicates its thermostatic characteristics.

The variations in the values of temperature and river flow were due to seasonal changes Sangu, and Sharma, (1985). The pH was found to be varying from 7.06 to 9.09 being maximum in the winter season because the sewage water flows from city and minimum in the rainy season. According to Mohammad Musaddiq and Fokmare (1999) & Juned *et al.*, (2018) the higher values of pH can be attributed to high growth rate of algal population which utilized CO<sub>2</sub> through photosynthetic activity. The Chemical Oxygen Demand of the Sudha River water varies from 156.00 to 666.00 mg/l being maximum in the rainy and minimum in winter season. The increase trend of BOD and COD values clearly indicates that the river water becomes highly polluted with increase of effluents, and the water quality shows improvement after the onset of monsoon (Singh and Shrivastva 1995).

The Dissolve Oxygen of the Sudha River water varies from 4.58 to 12.85 mg/l being maximum in the winter and minimum in rainy season. According to Sangu and Sharma (1985), Yannawar V.B. and Bhosle A.B., & Yannawar *et al.*, (2013) the minimum DO (4.5 mg/l) was noted in summer due to higher temperature and active utilization of DO in bacterial decomposition of organic matter. The high value in winter was due to low water temperature and release of appreciable amount of O<sub>2</sub> by algal flora of the river. The Lower DO in summer may be due to higher temperature and low solubility of oxygen in water. The present investigation of the Godavari River water also shows similar relationship of DO.

The Biochemical Oxygen Demand of the Godavari River water varies from 12.97 to 34.30 mg/l being maximum in the summer and minimum in winter season. The increased trend of BOD and COD values clearly indicates that the river water becomes highly polluted with increase of effluents, and the water quality shows improvement after the onset of monsoon (Singh and Shrivastva 1995).

#### IV. CONCLUSIONS

The Rainfall, the chief sources for the surface waters; it includes dams, rivers, ponds, lakes, and streams water body. The present work and the investigated, occurrence and distribution of pollution of Sudha dam were carried out for about two years i.e., January 2017 to December 2018. All investigated water parameters pH, Temperature, Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and lastly Biological Oxygen Demand (BOD) are within the permissible limits of BSI and WHO except the one sampling site for the chemical oxygen demand (COD) etc. There is some of the domestic as well as agriculture practices are noticed where the chemical oxygen demand (COD) is recorded comparatively more.

**Declaration:** The authors of this manuscript do not oppose the interest.

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