



## ASSESSMENT OF WATER QUALITY OF SONALA DAM, DIST. WASHIM, MAHARASHTRA

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### Abstract:-

Sonala dam is constructed in the basin of River Adan, a tributary of River Godavari. The paper deals with the estimation of current status of physico – chemical characteristics of the dam water. To assess the potability of dam water, hydro-biological study was undertaken from February 2012 to January 2013. The water was analyzed for various important water quality parameters like temperature, PH, conductivity, total dissolved solids, turbidity, carbon dioxide, dissolved oxygen and Biochemical oxygen demand. The observations revealed that the physico – chemical parameters of the water were within the permissible limits and can be safely used for domestic, irrigation and pisciculture.

**Keywords:-** Sonala dam, water quality, physico - chemical parameters, dissolved oxygen.

### Introduction:-

Water is an indispensable substance for sustaining excellent quality of life in an ecosystem. Enormous number of natural and man made water bodies are found in India. These water bodies are mainly used for drinking and agricultural purposes. The quality of water bodies has deteriorated recently due to rapid urbanization and modern agricultural practices. Lakes are considered to be the most fragile ecosystem, as they have very little self purification capacity and tend to accumulate pollutants.

To preserve and protect the natural ecosystem, analysis of water quality is very important. The present work is aimed to assess the quality of water of Sonala dam, Dist. Washim, Maharashtra, mainly to measure the pollution status of the dam.

### Materials and Methods

#### Study Area:

The study area of dam is located at 77<sup>o</sup>, 12', 30" Longitude and Latitude of 20<sup>o</sup>, 19', 00" in Sonala village of Washim district in Maharashtra (India). It is an earthen dam with 19.20 meter maximum height and 446.90 hectares of submergence with 132.50 square kilometer of catchment area. The reservoir is constructed in the Basin of Adan River, a tributary of Godavari River. In the view of human activities, six sampling stations have been selected around the dam.

#### Collection of Samples:-

The acquisition of meaningful data demands correct sampling and preservation procedures. Water samples were collected from the selected sites throughout the year from Feb 2012 – Jan 2013. Samples were collected periodically at the

first week of every month during morning hours between 8.30 am to 10.30 am. The samples were collected in acid washed five liter plastic container. The samples for BOD analysis were collected in separate 300ml BOD bottles and oxygen was fixed immediately.

#### Physico -chemical Analysis:-

The analysis of certain parameters such as, Temperature, pH, Conductivity, Total dissolved solids and Dissolved oxygen was done in the field by using portable water analysis kit. Analysis of water for turbidity, carbon dioxide and Biochemical oxygen demand was estimated by the laboratory techniques given by NEERI (1984) and APHA (1985).

### Results and discussion:-

The data harvested during the present study is given in Table No.-1.

#### Temperature:-

Water temperature recorded during the study period ranged from 19.18<sup>o</sup>C in the month of December to 30.37 <sup>o</sup>C in the month of May. It showed higher temperature in summer and relatively lowers in winter. Jayabhaye et.al (2006), Salve and Hiware (2008), recorded similar findings. The increased temperature during summer is due to the common effect of intensity of solar radiations, low water level and clear atmosphere. Decreased values of temperature during winter are due to low ambient temperature variation in temperature of dam water throughout the year is illustrated in Figure No. 1.

#### Conductivity:-

Conductivity is a measure of total ions and a numerical expression of its ability to carry an electric current. The ionic strengths of a sample depend on temperature, ionic mobility and ionic

valences. The electric conductivity ranged from 638.82  $\mu\text{mhos/cm}$  to 409.49  $\mu\text{mhos/cm}$ . It was observed maximum in the month of May and minimum in the month of October. Pollution status and tropic levels of the aquatic body is greatly influenced by high level of conductivity (Anitha, 2002). In the present investigation, maximum conductivity was reported in summer season and minimum during winter. Chandrashekhar and Kodarkar, (1996) reported similar observations in Saroornagar Lake in Hyderabad. Variation in conductivity of dam water throughout the year is illustrated in Figure No. 2.

**Turbidity:-**

Turbidity is inversely proportional to transparency. Turbidity is due to suspended inorganic and organic matter. The turbidity of water fluctuated from 11.56 NTU in the month of December to 34.52 in the month of May. Maximum value during summer is due to human activities, decrease in water level and presence of suspended particulate matter. Variation in the turbidity of dam water throughout the year is illustrated in figure no. 3.

**Total dissolved Solids:-**

The highest TDS value was recorded to be 670.84 mg/l in the month of July and lowest TDS value was recorded to be 158.16 mg/l in the month of December. In the present investigation the highest value of TDS during rainy season was mainly due to surface runoff, precipitation and decaying matter from catchment areas. (K. S. Raut, 2011). Salve and Hiware, (2006) reported low TDS value in winter season and maximum value in Monsoon due to addition of solids from surface runoff in Wanprakalpa, Nagapur (M.S.). Variation in TDS of dam water throughout the year is illustrated in Figure no.4.

**PH :-**

Hydrogen ion concentration is considered as an important ecological factor, which is the result of interaction of various substances in water and in numerous biological phenomenon. Bobdey A. D. et. al. pH value fluctuated from 8.1 to 6.8 during the study period. The highest value recorded was 8.1 in the month of January and lowest value recorded was 6.8 in the month

of July. Variation in the PH of dam water throughout the year is illustrated in the Figure No. 5.

**Free Carbon dioxide:-**

The value of free carbon dioxide ranged from 10.6 mg/l to 44.8 mg/l. The maximum value was recorded in the month of May and minimum value in the month of September. Variation in the free carbon dioxide of dam water throughout the year is illustrated in Figure No. 6.

**Dissolved Oxygen:-**

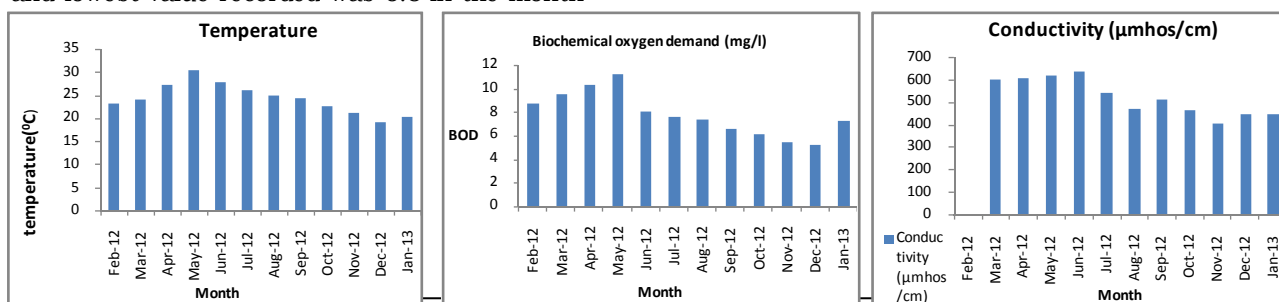
Dissolved oxygen content of dam water varied between 5.11 mg/l to 10.6 mg/l. The lower values of dissolved oxygen are the sign of organic pollution in the dam water, (Nair et. al., 1988). Low DO in summer is due to solubility of gases at high temperature (Hynes, 1978). This also consumed more oxygen, for the oxidation of organic contents (Sharma et. al., 1981). High value of DO during winter might be due to high solubility of oxygen at low temperature (Verma and Sarita Rani, 1984). Variation in dissolved oxygen of dam water throughout the year is illustrated in Figure No. 7.

**Biochemical oxygen demand :-**

BOD is found to be more sensitive test for organic pollution. BOD values fluctuated from 5.20 mg/l to 12.52 mg/l. Low value of BOD was recorded in the month of December and high value in the month of May. High values indicate presence of more oxidizable organic matter in water. Variation in BOD of dam water throughout the year is illustrated in Figure No. 8.

**Conclusion:-**

The data harvested during the present study of physico-chemical characteristics and quality of water in Sonala dam, Dist. Washim, Maharashtra revealed that the physico-chemical parameters are showed variations during the change in seasonal environmental conditions in spite of the variations due to addition of pollutants by human activities at given time. The quantity of dam water itself is seen capable to stabilize the most of organic pollutants on some extent.



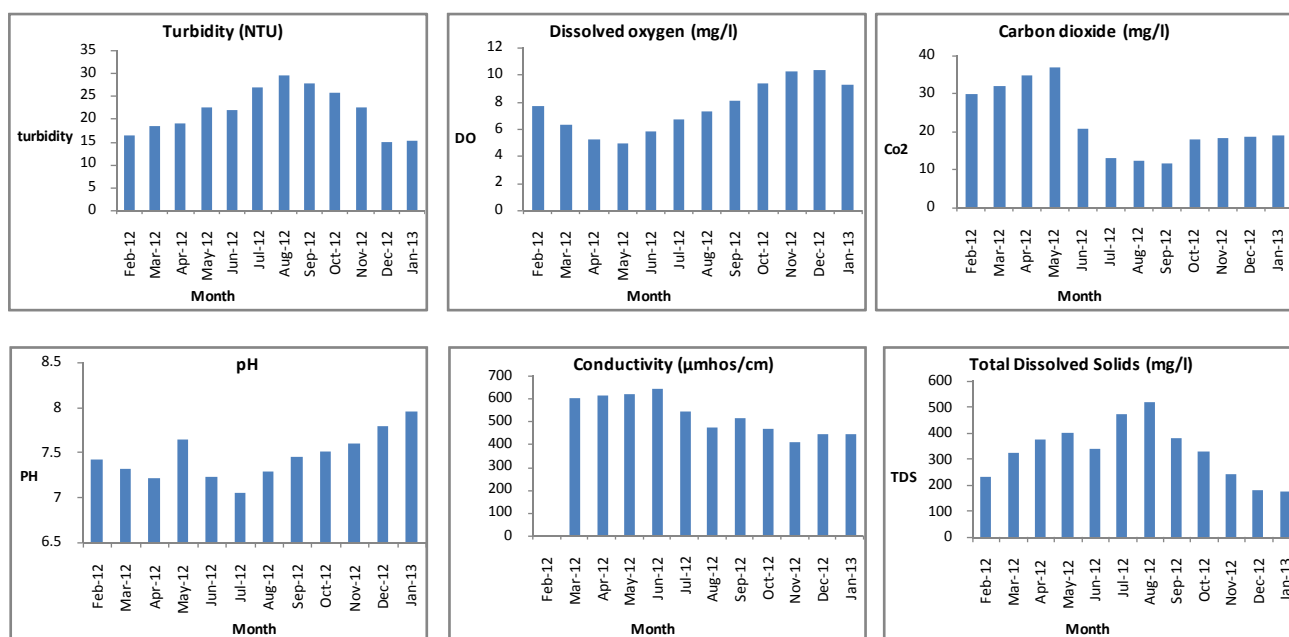


Fig 1:- Variation of various parameter in Sonala Dam, Dist. Akola, M.S. India. During study period.

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