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Assessment of Water Quality Using Physico-Chemical Parameter from Lower Pus Dam Tahsil Mahagaon Dist- Yavtmal

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ABSTRACT

Water is one of the most important of all natural resources known on earth. It is important to all living things. The safety of drinking water is important for the health. The safety of drinking water is affected by various contaminants which included chemical and microbiological. Such contaminants cause serious health problems. Due to these contaminants quality of the Drinking Water becomes poor. Sometimes such poor quality water causes many diseases in the humans so that quality of the water must be tested for both the chemical as well as for the microbial contaminants. This study was aimed to estimate current status of physico-chemical characteristic of Lower pus dam tahsil Mahagaon Dist.Yavtmal , Maharashtra. During the study it was found that maximum number of physical and chemical parameter were within the desirable limit, as suggested by WHO.

Keywords: Physico-chemical parameters,TDS,Lower Pus Dam.

I. INTRODUCTION

Increases in use of chemical fertilizer and pesticides in agriculture are due to industrialization which causes various aquatic environmental pollution and lead to depletion of water quality. It is the fact that most of the rural, towns and cities do not have access to safe drinking water despite investment from governing bodies and private organization in an effort to reduce pollution load and enhance quality of water[1-2]. The assessment of water quality parameters in and around Yavatmal district has not been undertaken previously. However there is also no systematic study on the overall quality of water in this region has so far been undertaken that would provide a qualitative and quantitative results indicating the suitability of water for human consumption & Agricultural purpose[3-4]. Water is one of the most important of all natural resources known on earth. It is important to all living organisms, ecological systems, human health, food production and economic development. The safety of drinking water is important for the health. The safety of drinking water is affected by various contaminants which included chemical and microbiological. Such contaminants cause serious health problems. Due to these contaminants quality of drinking water becomes poor. Sometimes such poor quality

water causes many diseases in the humans, so that quality of water must be tested for both the chemical as well as for the microbial contaminants[5]. Present study is focused on as such as dam of Mahagaon tahsil Yavatmal District, i.e. Lower pus dam Weni (Bk).The parameters studied are temperature, pH, alkalinity,total hardness, COD,TDS,DO,metals & conductivity.

II. MATERIALS AND METHODS

Study area:

Lower Pus Project ,(also called as Weni Project,) and Dam's Official Designation is "Lower Pus , D -0 2869" . Locally also known as " Weni Lake" / " Weni Talav" . Lower Pus Dam was constructed as part of irrigation projects by Government of Maharashtra in the year 1983 . Nearest city to dam is Mahagaon and the Dam is situated in Mahagaon Taluka of Yavatmal District of Maharashtra . It is built on and impounds Pus River ,. The dam is an Earth-fill Gravity Dam . Purpose of the dam is for irrigation .The length of The dam is divided in two portions by the Spillway , Left and Right . The length of the dam, including the spillway is 3346 m (10977.69 Feet) Left section is approximately 2500 m (8202.1 Feet) + Right section of approximately 650 m (2132.55 Feet) . While the height of the dam above lowest foundation is 28.0 m (91.86 Feet) . The Dam has a Spillway of Ogee type . Length of the spillway is 147 m (482.28 Feet).The Spillway has 10 Radial Type of spillway gates . Dam's catchment area is 128.2 Thousand Hectors. Maximum / Gross storage capacity is 81.16 MCM. Live storage capacity is 59.16 MCM. Now a days almost all the water bodies make for good picnic spots. Pus lake is also a popular Tourist attraction for its scenic beauty.

Figure 1: Map of the study area showing the different sampling stations.

Collection of sample:-

In order to determine the water quality index two stations were chosen for sample collection form the Reservoir during September (2021) in the first week . Water samples were collected in clean and dry

polyethene bottles of one litre capacity. We have collected two samples from different places. All the water samples, after measuring temperature on spot, were Immediately transported to the laboratory for analysis and stored in cool place away from light. In the present investigation we have studied the following parameters such as Temperature, pH, Alkalinity, Chloride, Total hardness, Total dissolved solids, Dissolved oxygen, and Chemical oxygen demand to study the quality of water. Standard methods were used for the Analysis of samples. Temperature was taken on spot while collected the sample. pH meter, make was used for determination of pH. Determination of chloride was done by a Mohr's method. The total hardness was determined titrimetrically by EDTA method. Alkalinity of water sample was estimated by titrating with standard sulphuric acid solution. Determination of total dissolved solids (TDS) was done gravimetric method. The Winkler method was adopted for determination of Dissolved Oxygen. Magnesium Measurment of Magnesium amount in water by Titrimetric method, Barium Measurment of barium amount in water Titrimetric method, Calcium Measurment of Calcium amount in water Titrimetric method.

III. RESULT & DISCUSSION

Report of lower pus dam analysis of water samples in September (2021).

Sr. No.	Parameter	Site1	Site2
1	Temperature °C	27.2°C	27.8°C
2	pH	7.3	7.4
3	Alkalinity mg/L	180	186
4	Electrical Conductivity (E.C.)mho/cm	850	840
5	Dissolved Oxygen (DO) mg/L	5.8	5.5
6	Total Hardness mg/L	188	192
7	Chemical Oxygen Demand (COD)mg/L	10	10.4
8	Chloride mg/L	78	74
9	TDS mg/L	380	385
10	Barium (ppm)	31	30
11	Calcium (ppm)	6	6.2
12	Magnesium (ppm)	3.5	3

pH

The pH of water is a measure of acidity or alkalinity. The pH is a logarithmic scale based on a measure of the free hydrogen ions in the water. The scale runs from 0 to 14, where 7 is considered neutral, 0 to 7 is acidic and 7 to 14 is alkaline. Because pH can be affected by dissolved minerals and chemicals, it is an important indicator of the change in water chemistry.

[1] . Total Dissolved Solids (TDS)

High concentrations of TDS may affect taste adversely and deteriorate plumbing and appliances. The EPA recommends that water containing more than 500 mg/l of dissolved solids not be used if other less mineralized supplies are available. However, water containing more than 500 mg/l of TDS is not dangerous to drink. Exclusive of most treated public water supplies, the Missouri River, a few freshwater lakes and scattered wells, very few water supplies in North Dakota contain less than the recommended 500mg/L concentration of total

dissolved solids. Many households in the state use drinking water supplies with concentrations up to 2,000 mg/l and greater. Treatment for household use is reverse osmosis.

[2] . Total Hardness

Hardness is the property that makes water form an insoluble curd with soap and primarily is due to the presence of calcium and magnesium. Very hard waters have no known adverse health effects and may be more palatable than soft waters. Hard water is primarily of concern because it requires more soap for effective cleaning; forms scum and curd; causes yellowing of fabrics; toughens vegetables cooked in the water; and forms scale in boilers, water heaters, pipes and cooking utensils. The hardness of high-quality water should not exceed 270 mg/l.

[3] . Calcium and Magnesium

Calcium and magnesium are the main contributors to water hardness. When water is heated, calcium breaks down and precipitates out of the solution, forming scale. Maximum limits have not been established for calcium. Magnesium concentrations greater than 125 ppm may have a laxative effect on some people. Magnesium levels can be controlled through distillation.

[4] . Chloride

High concentrations of chloride ions can cause water to have an objectionable salty taste and corrode hot-water plumbing systems. High-chloride waters have a laxative effect for some people. An upper limit of 250 mg/l has been set for chloride ions, although noticing the taste at this level is difficult, and even higher concentrations do not appear to cause adverse health effects. An increase in the normal chloride content of water may indicate possible pollution from human sewage, animal manure or industrial wastes.

IV. CONCLUSION

An evaluation of quality of water, report of observation table. It is clearly indicate that the dam water having all physicochemical parameters fall within tolerable limit for drinking purposes but after some purification process.

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