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Study on Assessment of Water Quality of Masoli Dam Nearby the Gangakhed

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***ABSTRACT**: As ground water is more valuable than surface water it is necessary to check the water quality parameters at regular interval of time viz. pH, TDS, alkalinity, turbidity, nitrates, chlorides phosphates, BOD,COD, DO, minerals, salts. Present research paper focus on review of different research papers related to physico-chemical analysis of water from different sources used for drinking purpose. The present study was aimed at assessing the ground water quality characteristics of Masoli dam near by the Gangakhed, Tal-Gangakhed, District Parbhani, Maharashtra. A comprehensive physico-chemical analysis was conducted after the groundwater samples were collected from different sampling locations. The physico-chemical parameters such as pH, TDS, Total hardness, Chlorides, turbidity and alkalinity were analyzed to observe the current status of the ground water quality.*
***KEYWORDS**: Assessment, Masoli dam, water, Physico-chemical, P^H, DO, BOD.*

I. INTRODUCTION:

Water resources have played critical and vital role throughout history in the growth and continue to be a factor of importance in the economic growth of all the contemporary societies. In societies like our India with developing economics, the optimum development, efficient utilization and effective management of their water resources should be the dominant strategy for economic growth, but in recent year scientific management and use of this resources for various purpose almost invariably has created undesirable problems in its wake, water logging and salinity in the case of agriculture use and environment pollution of various limits as a result of mining, industries and municipal use. Considering the above aspects of groundwater contamination, the present study was undertaken to investigate study of assessment of water quality of Masoli dam nearby the Gangakhed, District-Parbhani, Maharashtra. It thus, becomes an important factor for the assessment and management of ground water. Thus, in this research work an attempt has been made to assess the physical and chemical parameters of groundwater like pH, DO, BOD, TDS, Calcium, Manganese and Zinc. The analyzed data were compared with standard values recommended by BIS. [1,2]

Study Area

The Masoli dam is medium size reservoir constructed near small village name as an Isad nearby the Gangakhed. The Masoli dam is constructed in the year 1981 by the Government of Maharashtra the height of dam is 24.84 meter and length is 1086 meters.

II. IMPORTANCE OF WATER:

Human's basic drinking water for sustaining life and social prosperity. Water is one of the most important elements on Earth. All plants and animal require water for their existence. If there was no water, there would be no life on ground. Apart from drinking it to survive, people have many other uses for water. Massive quantities of water are required for drinking, cooking, Industrial and commercial uses, and to support agriculture. Water Supplies continue to decrease because of resource reduction and pollution, whilst demand is increasing fast because of industrialization, population growth, mechanization and urbanization. This situation is mainly acute in the drier regions of the world where water shortage and related increases in water pollution, bound social and economic development and are linked closely to the occurrence of poverty, hunger and disease. Both anthropogenic pressures and natural processes account for degradation in ground water and surface water.[3,4]

III. Sample collection:

The water samples were collected from four Sampling stations from Upstream (least disturbed site) to Downstream (most disturbed site). High density polyethylene (HDPE) bottles were used to collect one liter water samples from each sampling station. Bottles were autoclaved and cleaned with diluted HNO_3 and double distilled water before sampling. These bottles were also washed with pure distilled water before being analyzed. The samples were evaluated for chemical and physical characteristics in the Department of Chemistry by using standard APHA methods. The samples were kept in sampling kits at 4°C and brought to the lab for analysis within three hours.[5]

IV. Methodology :

Water samples were collected from five various sample stations (Table 1). Samples were collected in clean polythene bottles in the month last week of August 2025. After proper labeling, the samples were taken to the laboratory to be analyzed further for physicochemical characteristics. The sample was collected and preserved using standard techniques (American Public Health Association, 2005) and BSI (1991). Digital equipment was used to test physio-chemical variables like as pH, Dissolved oxygen, Chemical oxygen demand, Calcium, Manganese and Zinc were all measured according to the APHA (American Public Health Association) 2005 standard analytical techniques. The spring water quality data were interpolated and generated the water quality map in spatial form using kriging method in Arc GIS software. Kriging derives from regionalized parameter theory. It expresses spatial attribute variation as a variogram and reduces estimated prediction errors.[6,7]

V. RESULTS AND DISCUSSION:

An attempt has been made in this study to describe and analyzed the spring characteristics accessible in and around the major town and their surrounding areas in Masoli Dam. The average value of the physico-chemical analysis of spring water is shown in Table 1.

pH (Potential of Hydrogen)

The pH scale runs from 0 to 14, and it is an important factor in determining the health of bodies of water. In current study, the pH readings fluctuate between 6.50 to 7.30. Where the minimum pH value was recorded at site 5, 7.0 and the maximum at site 4, 7.20. The result of the pH experiment was matched with the observation. As a result, the spring waters are slightly acidic and slightly basic at different sampling stations. The spring water pH is affected by soil composition and bedrock of the surrounding topography. The water organism adopted their life in a specific pH.

DO (Dissolved Oxygen)

Plant photosynthesis raises DO, while chemical oxygen oxidation, nitrification, and plant transpiration reduce it. Temperature and salinity are two factors that influence DO. The presence of dissolved oxygen in aquatic ecosystem is an essential indicator of good water quality for determining the viability of aquatic life. Dissolved oxygen concentrations ranged between 2.06 mg/l to 3.15 mg/l. Where minimum DO was showing at site 4, 2.06 mg/l and at site 2, 3.15 mg/l showing maximum DO concentration of spring.

BOD (Biological Oxygen Demand)

The term "Biological Oxygen Demand," refers to the amount of oxygen that is typically required to breakdown organic matter found in the water .The BOD values can be fluctuating due to variation in water temperature, as well as rise in photosynthetic activity in a water ecosystem. Organic pollution in the water is indicated by a high BOD level. The BOD observation varies from a 0.30 mg/l to 1.45 mg/ l. The minimum BOD recorded at site 3, 0.30 mg/l and maximum at site 4, 1.45 mg/l . According to WHO standards, the current results show good water quality in all springs on the basis of BOD concentration.

TDS (Total Dissolved Solid)

Total dissolved solids, which includes dissolved salts, minerals, and even certain organic substances. The TDS are determined by the residue that is left behind after evaporation of the filtered sample, and the data is reported in mg/l. T.D.S. concentrations of the springs vary between 9.60 mg/ l to 14.55 mg/l. The minimum TDS observed at site 4, 9.6 mg/l and maximum TDS observed at Near site 3, 14.55 mg/l. If there is a significant concentration of TDS in water, then the pH of the water is probably going to be alkaline

Ca (Calcium)

The abundance of gypsum rocks is responsible for the high percentage of calcium ions. Plant tissues contain calcium ions, which play a role in a variety of cellular processes. The value of the calcium very between

34.15 mg/l to 186.90 mg/l .Minimum value of calcium was recorded at site 2, 32.46 mg/l and maximum value of calcium was recorded at near site 3, 178.25 mg/l. The calcium ion concentration of all spring water complies with the BIS standard of drinking water for calcium concentration.

Mn (Manganese)

Mn is a transition metal which is found in large amounts in the crust of the earth. It can be found in both surface water and aquifer. Manganese in water can also come from human activities like mining activity, industrial waste, and the percolation process of waste from landfills. In this study, the manganese value deviated between 0.01 mg/l to 0.45mg/l. The minimum manganese reading recorded at site 5, 0.01 mg/l and maximum site 5, 0.45 mg/l. The spring water of all sites is following the BIS standard of drinking water for manganese concentration.

Zn (Zinc)

Zinc is commonly found in all water bodies, and its concentration may vary widely in nature. Humans need limited amounts of Zn, and most of it comes from food and drinking water. The zinc concentration varied between 0.01 mg/l to 0.05 mg/l. The lowest value of zinc was recorded at site 2, 0.01 mg/l and highest value was recorded at site 3, 0.05 mg/l. Most zinc enters water through Zn-containing soil erosion.

Table 1- Detailed Physico-chemical characteristics of spring water

Sampling Sites	PH	D.O. (mg/I)	B.O.D. (mg/I)	T.D.S. (mg/I)	Ca (mg/I)	Mn (mg/I)	Zinc (mg/I)
S1	6.80	3.01	0.68	9.97	100.11	0.12	0.03
S2	7.00	3.18	0.70	11.59	32.46	0.45	0.01
S3	7.10	3.12	0.30	14.55	178.25	0.10	0.05
S4	7.20	2.06	1.45	9.6	124.01	0.06	0.03
S5	7.00	2.34	1.00	12.62	307.90	0.01	0.01
*WHO Specification	6.5-8.5	-	0.75	75	75	0.1	5
Permissible limits (BIS and WHO)	No relaxation	-	1.5	2000	200	0.30	15.0

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