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Limnological Studies on Datuni Dam of district Dewas (M.P.)

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Abstract - The limnological studies of Datuni dam kannoddistrict Dewas (M.P.) has been studies. The study of Physico-Chemical parameters was seasonally carried out of two years 2022-2023. Four sampling stations were selected at Datuni dam.The water samples werecollected analyzed as per standard methods of APHA(2005). Obtained results were compared with standard values laid down by various agencies BIS(1991) and WHO (1992). The study was conducted based on their water resources,using phytoplankton and Zooplanktons communities and origin of population such as utilization by human and animals. The present study was PH, Total hardness, TDS, BOD, COD, phosphate, Nitrogen ad Sulphate etc.
Keywords - Limnological, Physico-chemical, Parameters.

Introduction - Water is on important coustient of all living organisms and basic needs of human beings. Water is one of the most precious natural resources and is essential for everything on our planet to grow and prosper (Buragohain et al. 2007). Lake and dam always have been the most important fresh water resources and most development activities are still development upon them. The physico-chemical factors are very important role of environment. The principles physical and chemical condition operative in natural waters make up the basic plate from through various combination. WHO and BIS has been given a setup guideline values for drinking water quality WHO (2004). A systematicinvestigation has been carried out to study the Datuni dam waterquality and Physico-chemical characteristics. The Parameter namely TDS, Total hardness, BOD, COD, pH, Nitrogen and Sulphate were compared with the WHO and BIS standard of drinking water quality of India. The quality of water samples under study, were above the desirable limit but within the tolerance level. The study alsoincludesPhysico-chemical parameters and significant values of the observed than discussedin this paper and various suggestions to improve the water quality in this dam.

Study Area: The dam of Datuni constructed on riverdatuni. With a catchment area about 181.61 sq.km. The key features of the project are 1290 m length of dam at top 660 long earthen dam on left flank and 630 m long on right flank. The dam envisages irrigation over on area of 7235 ha. The water samples were collected from 4-different sampling stations. Water samples were collected in plastic bottles seasonally during 2022-2023. The Physico-chemical parameters were analyzed as per the standard method APHA (2005) and Trivedi and Goel (1986).

Results and discussion: The Physico-chemical parameters of selected four stations in the Datunidam Reve bean given in the table no one and two.

pH: The pH indicates the intensities of acidity and alkalinity. The pH values were found minimum in rainy season and maximum in the summer seasonbecause of the due to utilization of bi-carbonates and carbonates buffer system due to evaporation of water. The pH value of all water samples were found to be higher than that of the standard permissible limit BIS (1991) &WHO (1992).

TDS: Total dissolved solids in on indication of the degree of dissolved substance in the water bodies.The TDS in water are composed mainly of carbonates, bi-carbonates,chlorides,phosphates,Nitrates of calcium, magnesium,sodium, potassium organic matter, salts and other particles. The BIS standard for TDS is proposed are 500 mg/li. The TDS valueswere found minimumin rainy season and maximum in the summer season. The TDS values of all water samples were found to be lower than the desirable limit of 500 mg/lit.

Total hardness: It is a major of variable complex mixture of onion cations in dam, reservoir the principal cations which important hardness are calcium and magnesium. The Total hardness values were found minimum in rainyseason and maximum in the summer season. It is in agreement with the study of (Jain et. al. 1997).

BOD: The Biological oxygen demand of water indicator of organic pollution. The BOD values were found minimum in the winter season and maximum in the summer season.

The reason of BOD in water body may by that in summer season several microbes present in the water bodies accelerated their metabolic activities with concentrated amount of organic matter in the form of domestic wastes discharge in to water bodies. BOD values of all water samples under the desirable permissible limit of BIS and WHO.

COD: The chemical oxygen demand is a measure of the oxygen equivalent of the organic matter in water. The COD values of water found minimum in the summer season and maximum in the winter seasons. COD values of all water samples under the permissible limits. It means does not receive any pollution bearing substances.

Nitrates : Nitrates are the highest organized from of nitrogen and in water its important source in "Biological oxidation in nitrogenous organic matter. Nitrate content in all the water samples were found to be less than the standard permissible limit of BIS and WHO.

Phosphate : Phosphate is one of the most important nutrients in aquatic ecosystem. The amount of phosphate was found minimum in the winter season and maximum in the summer season. The phosphate values were found to be less than the standard permissible limit of BIS and WHO.

Sulphate: The sulphate vales were recorded minimum in summer season and maximum in the winter season. Sulphate in all the water samples found below BIS limit of 200 mg/lit. The sulphate values of dam water samples were also within the permissible limit of BIS.

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Table: 1 (see in next page)

Table: 2 (see in next page)

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Table: 1 Seasonal Variation in Physico-chemical Parameters of Datuni Dam During-2022

S.	Parameters	Station-I			Station-II			Station-III			Station-IV		
		R	W	S	R	W	S	R	W	S	R	W	S
1	pH	7.00	7.05	7.06	7.01	7.06	7.07	7.02	7.04	7.07	7.01	7.03	7.08
2	Total hardness	105	120	132	103	12	130	106	126	133	104	130	135
3	TDS	312	339	331	310	340	333	318	338	330	320	337	332
4	BOD	2.09	2.08	4.04	2.12	2.10	4.08	3.00	2.09	4.06	3.02	2.11	4.05
5	COD	10.02	9.02	11.07	10.06	9.07	11.08	10.07	9.06	11.02	10.05	9.05	11.01
6	Phosphate	2.12	2.06	3.06	2.15	2.08	3.02	2.10	2.09	3.05	2.09	2.07	3.03
7	Nitrate	1.92	2.02	1.90	1.94	2.00	1.98	1.93	2.01	1.92	1.93	2.03	1.93
8	Sulphate	46	58	48	45	58	49	47	56	52	48	54	54

Note - All parameters mg/lit.

Table:2 Seasonal Variation in Physico-chemical Parameters of Datuni Dam During-2023

S.	Parameters	Station-I			Station-II			Station-III			Station-IV		
		R	W	S	R	W	S	R	W	S	R	W	S
1	pH	7.01	7.06	7.07	7.01	7.05	7.08	7.04	7.05	7.07	7.02	7.03	7.07
2	Total hardness	106	121	133	103	124	130	105	125	132	104	129	134
3	TDS	311	338	332	311	339	332	317	337	331	319	336	332
4	BOD	2.08	2.07	4.00	2.13	2.09	4.04	3.01	2.09	4.05	3.01	2.12	4.04
5	COD	10.01	9.01	11.08	10.05	9.06	11.08	10.06	9.08	11.03	10.06	9.06	10.08
6	Phosphate	2.13	2.07	3.08	2.14	2.09	3.01	2.12	2.08	3.06	2.08	2.07	3.04
7	Nitrate	1.93	2.21	1.91	1.93	2.02	1.98	1.93	2.02	1.92	1.94	2.02	1.96
8	Sulphate	45	56	48	44	57	47	46	55	53	48	55	53

Note - All parameters mg/lit.

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