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"ASSESSMENT OF WATER QUALITY OF SUKATA RIVER AT KHANDWA DISTRICT (M.P.)"

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ABSTRACT

Water is very much stressed with the rapidly increasing population, climate change and water pollution that increases domestic, agricultural and industrial needs. This paper presents the results of chemical characteristics for example total dissolved solids, turbidity, alkalinity, dissolved oxygen, pH, chloride, sulphate, hardness, It was observed that Sukta River at Nimad region was suitable for drinking water.

KEYWORDS: *Chemical characteristics, Water, Sukta River and Nimad region.*

INTRODUCTION

Rivers are one of the major sources of freshwater for human beings for providing water for irrigation, industrial, and daily needs (Meybeck, 1976; Ridoutt & Pfister, 2010; Sunil, Somashekar, & Nagaraja, 2010). The transfer of sediments, pollutants, debris, and other substances from one place to another place is also carried out by the current of a river systems (Lal, 1977; Padmalal & Maya, 2014). Rivers are also responsible for maintaining or recharging the groundwater aquifers (Ghalib & Sogut, 2014). However, water chemistry of the riverine ecosystem depends upon various lithological characteristics, evaporation process, habitat ecological parameters, and weathering of rocks from place to place (Ghalib, 2017). Nowadays, rivers are under enormous load due to anthropogenic activities like sewage waste discharged, industrial activity, riverbed mining activity, water quality of the river has deteriorated appreciably which has affected the aquatic life as well as human life (Aswal, Singh, Kamboj, & Singh, 2016; Jindal & Sharma, 2010; Kamboj, Kamboj & Sharma, 2017; Sreebha & Padmalal, 2011). Amongst the above, riverbed mining has become a major threat to the aquatic habitats and health of the related flora and fauna (Soucek, Cherry & Zipper, 2003). Riverbed mining is the extraction process of sediments from the bottom of instream and floodplain area of the river (Kamboj et al., 2017; Sreebha & Padmalal, 2011). The aquatic diversity is negatively affected by the riverbed mining practice as it removes the significant nutrients from the rivers. This hampers the thriving organisms leading to the disturbance of the river ecosystems (Bruns, 2005). The quality of river water changes severely when the riverbed mining practice is conducted on the instream which promotes temporary turbidity and create the disturbance in other related parameters (Peck Yen & Rohasliney, 2013).

Sukta River is a tributary on left Bank of Narmada near village Dongar in Khandwa district. Khandwa lies in the region which includes the lower Valley of the Narmada River. Bhagwant Sagar Project is constructed on Sukta River. Total water supply to the town, 61% water comes from Bhagwan

Sagar project and 31% from the ground water sources and rest comes from the Nagchun Dam. In term of water availability in Khandwa water is available throughout the year through Sukta River.

Materials and Methods:

Locations of sampling Sites:

Sukta dam is located in 10 km away from Khandwa city. Khandwa district lies between $21^0$5" to $22^0$9"N latitude $78^0$1" to$79^0$49"E longitude. The Narmada forms part of the northern boundary of the district, and the Satpura Range form the southern boundary of the district. Burhanpur District, to the south. Betul and Harda districts lie to the east, Dewas District to the north, and Khargone District to the west. For monitoring the chemical characteristics of Sukta River water at Khandwa district, two sampling site were selected. They are referred S_1 and S_2. S_1 was located near Sukta Dam and S_2 site was located in 1km away from Sukta dam.

Water samples were collected from all the selected two sampling sites (S_1–S2) once in a month by grab sampling method from october 2020 to december 2021. A total of eight samplings was performed during the study period. The water samples were collected in the polyethylene bottles at the depth of 15–20 cm below the surface water. A total of eleven physicochemical parameters were being analyzed in the laboratory for assessing the surface water quality. The Water Temperature, pH, and TDS, Alkalinity, Hardness, DO & COD,Turbidity (ntu), Chloride, Appearance, were analyzed in the laboratory following the standard methods (APHA, 2012; Trivedy & Goel, 1986). The measurement of all the parameters was done in triplicate and the mean value was presented in the table. For this study, the monthly data of water sample was formulated into data.

Results and Discussion:

The information regarding water quality of the river is vital for maintaining and survival the aquatic life. Humans, in some way or the other, depending on the river for fulfilling their daily needs. For keeping this way of view, the present study was undertaken for assessing the water quality of the River Sukta. In the current study, eleven physicochemical parameters were analyzed. The data showing the seasonal variation in water quality at a different location (S_1–S_2) of River Sukta was tabulated in Table - 1.

In the present investigation, the range of dissolved oxygen during 4 months was found to be high. Observations with the permissible limits (WHO 1982) it is noted that the Sukta River water at Nimar region in Khandwa district is permissible for drinking and even survival of aquatic life. To Summarize, the studies indicate that the Sukta River water quality is in permissible limit due to high level DO value similarly it was observed that the ionic concentration like chloride and sulphate are in permissible limit.

Table – 1 : The Result of Chemical Characterstics mg/l

S. NO.	PARAMETERS	MONTHS							
		OCTOBER		NOVEMBER		DECEMBER		JANUARY	
		S_1	S_2	S_1	S_2	S_1	S_2	S_1	S_2
1	APPEARANCE	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
2	TEMPERATURE ˚C	14	12.2	11.3	11.7	11.1	11.09	10.2	10.7
3	TURBIDITY(NTU)	3.00	2.70	2.65	2.55	2.10	2.12	2.00	2.00
4	pH	6.8	6.9	6.8	6.8	7.1	7.3	7.2	7.1
5	HARDNESS	101	100	99	102	102	101	103	102
6	CHLORIDE	79.1	79.5	78.3	79.2	77.9	79.1	78.8	77.9
7	SULPHATE	150.8	152.1	151	150.1	152.3	151.2	147.1	148.2
8	ALKALINITY	110.2	111.3	111.1	110.9	113.9	112.3	109.3	108.2
9	DO	3.45	3.43	3.61	3.62	3.68	3.66	3.47	3.45
10	COD	30.9	35.1	32.2	32.8	33.2	34.8	30.9	31.1
11	TDS	147.5	146.6	143.1	143.2	140	140.6	130.2	133

(S_1: Station Site - I , S_2: Station Site – II)

CONCLUSION:

The present study investigates the assessment of water quality of the Sukta River at district Khandawa. The study revealed that water quality of Sukta River was found not suitable for drinking purpose in monsoon season, it can be suitable for irrigation purpose. In summer and winter season, water quality of Sukta River found to be suitable for irrigation as well as drinking purpose. The outcome of the present study need careful monitoring of the environmental aspects of a watershed specially in active area due to potential environmental risk.

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