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WATER QUALITY ASSESSMENT OF THE DALSAGAR LAKE AT SEONI (M.P.)

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Abstract:-Various physico-chemical characteristics of river Dalsagarlake flowing in district Seoni were studied in the summer, rainy & winter seasons. Ecological parameters like dissolved oxygen, Biochemical oxygen demand, temperature, PH, nitrate, phosphate etc. were analyzed and compared with standard permissible limits to assess the best designated use of the lake water for various purposes

Keywords:Physico-chemical, Assessment.

INTRODUCTION

The Dalsagar Lake in district Seoni. It is situated 22.08°N 79.53°E. It has an average elevation of 611 metres (2004 feet). The city is 2,043 ft. above sea-level, half-way between Nagpur and Jabalpur. It is bordered by Jabalpur, Narsinghpur and Mandla districts to the north, Balaghat to the east and Chhindwara to the west and the shares its southern boundary with Nagpur (Maharashtra). National Highway No. 7 connects the Kanyakumari-Banaras passes through the district from north to south. Fair weather roads connect the major towns in the district. The narrow-gauge Chhindwara-Nainpur Central Railway passes through Seoni connecting Jabalpur, Nagpur, Chhindwara, Balaghat, Katangi, Keolari and Nainpur. Prateet. Dalsagar Lake is polluted near many anthropogenic activity on its bank. The problems of pollution at many other place, is due to sewage inflow, animal carcasses, plastic bags etc. Lake has always been the most important fresh water resources along the banks of which our ancient civilizations have flourished and most developmental activities are still dependent upon them. Lake water has multiple uses in every field of development like agriculture, aquaculture etc. The growing problem of degradation of our surface water ecosystem has necessitated our monitoring of water quality for various rivers all over the country to evaluate their production capacity, utility potential and to plan restorative measures. In any system where organic matter is present, the organic matter can be broken down to inorganic matter by the action of microbes, oxygen is utilized during the biodegradation process. It has been found that the rate of biodegradation of the organic matter at any given time is proportional to the amount of organic matter and also the microbial population present in the system at the time (Ademoroti, 1982). Dissolved oxygen is the amount of oxygen in the gaseous form present in water available for aerobic organisms to carry out their life processes. A well balanced warm water where fish can thrive requires a dissolved oxygen level of not less than 5 mg/l. The dissolved oxygen in highly polluted waste water is used up by microorganisms (Ademoroti, 1996). The parameter used as a measure of the amount of oxygen required by microorganisms "Biochemical Oxygen Demand (B.O.D). The B.O.D. is an empirical biological test

in which the water condition such as temperature, oxygen concentration of type of bacteria plays a decisive role. These and other factors cause the reproducibility to be much less than that of pure chemical test. These parameters also measure the strength of any given waste water (Ademoroti, 1984). In spite of the disadvantage, the B.O.D. is of special importance in the assessment of pollution in waste water. High dissolved oxygen is an indication of a high state of purity of water and low dissolved oxygen is an indication of pollution. The present paper deals with a physico-chemical assessment of the Dalsagar Lake.

MATERIALS AND METHODS

The three study sites namely Samp. St.A, Samp.St. B and Samp. St. C were chosen for the purpose of the study, Lake water samples were collected at each station during every month. All the samples were collected from midstream at depth of 10 to 15 cm. from surface. Estimation of temperature, PH, D.O. and alkalinity were done at the site immediately after the collection of the sample. 2.5 liters samples collected from each site were brought back to the laboratory for the estimation of other parameters such as B.O.D., nitrate phosphate etc. All samples were analyzed as described in the standard methods for the examination of water and waste water and standard methods for water and effluent analysis (APHA, 1992).



Dalsagar Lake Seoni (M.P.)

RESULTS AND DISCUSSION

The physico-chemical analysis shows in Table: 1 that the Rapti water remained alkaline throughout the study period. Sampling site A showed lower values of D.O. and high values of B.O.D. Acidity values were low. The results indicate that Dalsagar lake water was found to be rich in nitrate and phosphate. In the rainy season, the low values of alkalinity and phosphate were observed. Temperature is high in the month of June and minimum in January. However, the value of alkalinity varied as compared to other physico-chemical parameters. Acidity value was maximum at Sampling St.C. The dissolved oxygen concentration was found to be minimum in the month of June at Sampling St. A. Low dissolved oxygen content as noticed in summer may be due to high atmospheric temperature and low flow rate and dissolved volume of water, which the disposal of waste water and sewage remains, virtually the same (Tiwari, 1983). However, the lower value of D.O. at Sampling St. A may be due to discharge of huge quantity of domestic sewage at these sampling sites.

Table 1 Seasonal Variation in Physico-chemical properties of Dal Sagar Lake Seoni water at different study sites 2013-2014*

Study site	Season	Parameters							
		Temp °C	PH	Alkalinity mg-1	NO3 mg-1	PO4 mg-1	D.O. mg-1		B.O.D. mg-1
A	Summer	30.00	8.30	334.00	1.22	1.05 0.35	4.53	4.95	10.30
	Rainy	31.00	7.60	218.00	1.00	0.62	5.47		8.55 9.00
	Winter	24.00	8.44	314.00	1.16				
B	Summer	30.25	8.34	257.00	0.95	0.82 0.25	6.10	6.50	3.52 2.85
	Rainy	30.00	7.86	175.75	1.00	0.52	6.37		3.00
	Winter	25.00	8.50	262.00	0.92				
C	Summer	31.00	8.34	208.00	1.18	1.32 0.85	6.80	6.25	9.30 8.00
	Rainy	29.75	7.65	107.00	1.74	0.80	7.10		9.00
	Winter	25.00	8.37	212.00	1.00				

The high B.O.D. values at Sampling St. A may be due to discharge of domestic sewage at these point. The low value of D.O., B.O.D. alkalinity, phosphate and nitrate in rainy season could possibly be due to the large volume and high flow rate (Imerbore, 1970, Tiwari, 1983). A minor fluctuation in the PH of Dalsagar Lake water has also been noticed. Low PH value as recorded in rainy season may be due to large volume of water and high flow rate which are expected to bring changes in the levels of carbon dioxide and carbonate and hence a fall in the PH values.

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