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Physico-Chemical Assessment of Water Quality of River Narmada in Jabalpur City Area of Madhya Pradesh State

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Abstract: ***In the present study water sample of Narmada River from six different sites like Jamtaraghat, Gwarighat, Lalpur intake well,Tilwara ghat, Lameta ghat, Panchvati ghat has been physico-chemically evaluated for its suitability for domestic and irrigation purposes. The present paper deals the physico-chemical parameters of the River Narmada. Samples were collected monthly (June/Jul./Aug./Sep.) from sampling sites for analyzing the various Physico-chemical parameters such as Temperature, pH, Turbidity, Alkalinity, Total Hardness, Chloride, TDS, Conductivity, DO, BOD. The work highlights the condition of this river water in various months with respect to the parameters mentioned above.***
Keywords: Physico-chemical parameters, Narmada River, Jabalpur (M.P).

I. INTRODUCTION

Natural water bodies like rivers are subjected to pollution comprising of organic and inorganic constituent. Jabalpur is the largest cities situated at the bank of river Narmada, which is also a tourist and holy place. The river Narmada drains the catchment between the Vindhyan Mountains to the north of the river stretching east-west in general, and the Satpura mountain ranges to the south. It flows through the undulating plains of Jabalpur about 411m high from sea level. It has a total course of 1312 km before joining the Gulf of Kchchh in the Arabian Sea and total basin of 98,796,80 sq km. Its First 1,077 km length is in Madhya Pradesh and the last 161 km. is in Gujarat. Of the remaining length, 35 km forms a common boundary between Madhya Pradesh and Maharashtra. Narmada river water is the main resource for domestic and irrigation purposes in the study area. So it is very important to estimate the superiority of water in the study area. In the present study water sample of Narmada River from six different sites has been assessed physico-chemically to evaluate its suitability for domestic and irrigation purposes.

II. MATERIAL AND METHODS

Samples were collected in from the sampling sites Jabalpur. In the physico-chemical properties of water, standard methods prescribed in literature were used. Temperature, turbidity, pH, Conductivity, T.D.S., Alkalinity, Total hardness, Chloride, Dissolve Oxygen, and B.O.D. were determined in the laboratory. The Physico- Chemical parameters were determined as per standard methods of APHA (2002) and by Indian standard-2296 (1982). pH of water sample measured by pH meter using standard solutions, Temperature of water sample measured by thermometer, Conductivity measured by conductivity meter, Turbidity of water sample measured by turbidity meter, TDS (total dissolved solid) measured by TDS meter, total Alkalinity determined by acid-base titration method, value of total Hardness of water sample determined by EDTA method, Chloride measured by titration method, Dissolved Oxygen determine by Winkler method, BOD also analyzed using BOD incubator.

III. RESULTS AND DISCUSSION

The physicochemical characteristics of surface water samples obtained from six sampling locations of river Narmada along Jabalpur City, Test results were located in Table- 1. The pH value of all the water samples analyzed which were in acceptable limit and the average value of four months analysis was varied from 7.23 to 7.85. The permissible limit of pH value of drinking water is specified as 6.5 to 8.5. Temperature of river water in ranged from 27.5oC to 30oC Conductance ranged from 140.7µs/m to 178µs/m. The temperature and conductance does not affect water quality used for drinking purpose.

Turbidity ranged from 3.9 to 8.2 NTU. The values of Total Dissolved Solids were ranged from 80 to 120 mg/L. Total alkalinity in all the samples was varied from 76 to 92 mg/L showing the alkaline nature of river water. According to IS 10500 the maximum permissible limit of alkalinity for drinking water is 100mg/L. Total hardness in study area was ranged from 86 – 126 mg/L. Chloride

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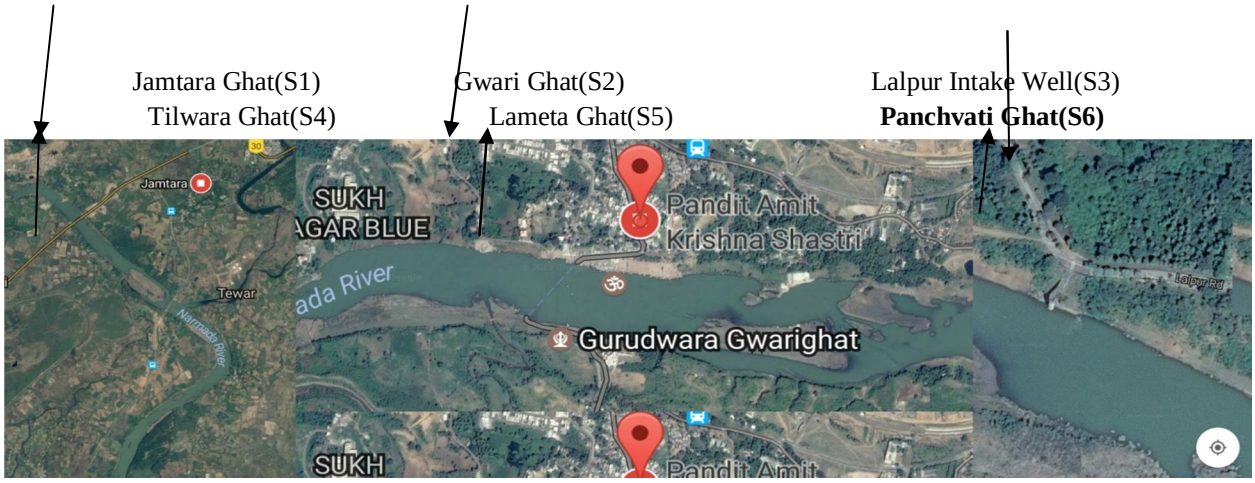
imparts a salty taste and some times higher concentration causes laxative effect in human beings. The chloride concentration was ranged from 25.9 to 40 mg/L. The values observed are within the specified limit of 250 mg/L as per IS 10500.Dissolved oxygen in river samples was varied from 7.90 to 8.10mg/L. Values of biological oxygen demand which is a indicator of bio-oxidisable organic substances was varied from 1.20 to 1.80 mg/L. Observed values clearly indicate that river water is in under the limit.

Table- 1

Water quality parameter of Narmada River Sample from Study area

S. No.	Parameters	S-1	S-2	S-3	S-4	S-5	S-6
1.	Ph	7.34	7.37	7.42	7.23	7.3	7.85
2.	Temperature(ºC)	30.3	29.5	28.4	27.9	27.7	27.5
3.	Conductivity (µs/m)	158	175.7	162.3	172.8	145.8	140.7
4.	Turbidity (NTU)	3.9	6.2	7.3	8.2	8.1	4.3
5.	T.D.S. (mg/l)	80	100	110	110	120	90
6.	Alkalinity (mg/l)	76	82	87	94	81	78
7.	Total hardness(mg/l)	96	112	120	126	92	86
8.	Chloride (mg/l)	35.3	37.2	25.9	30.7	33	40
9.	Dissolve Oxygen (mg/l)	8.0	8.1	7.9	7.9	8.2	8.1
10.	B.O.D. (mg/l)	1.2	1.7	1.6	1.8	1.5	1.3

Note:-SV=Standard Value by WHO and ISO.



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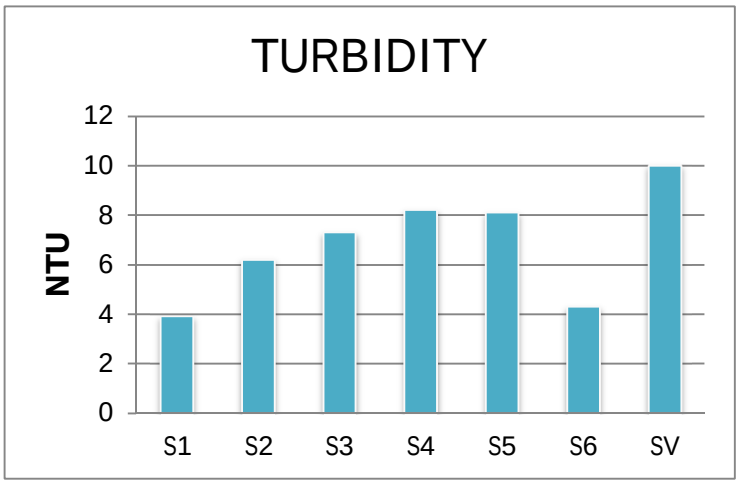

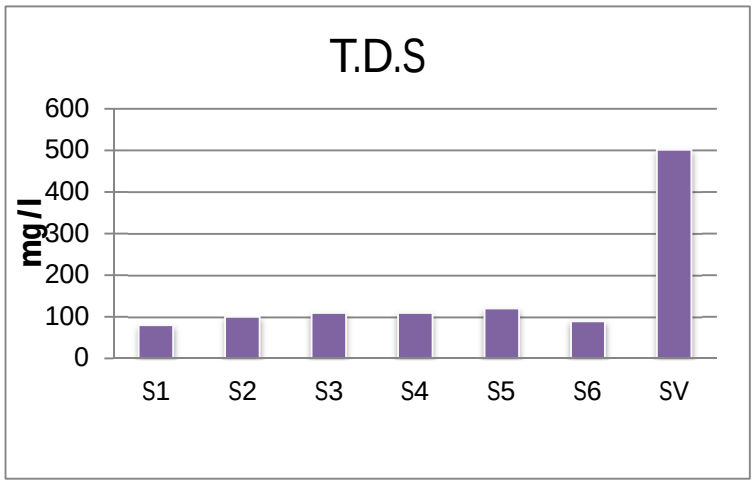

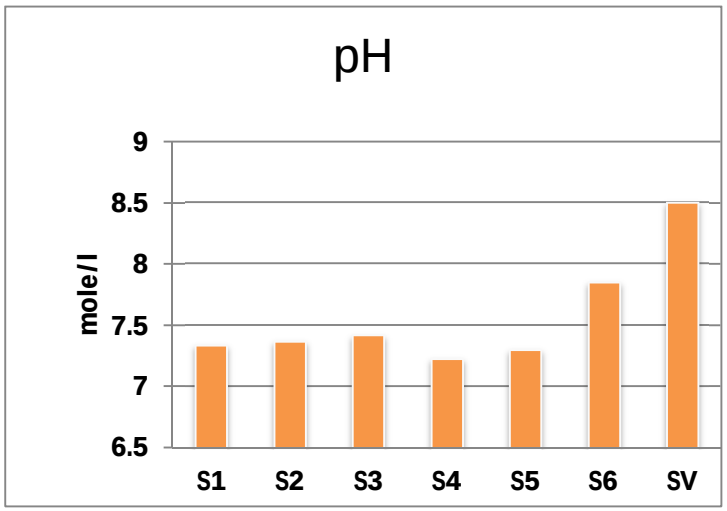

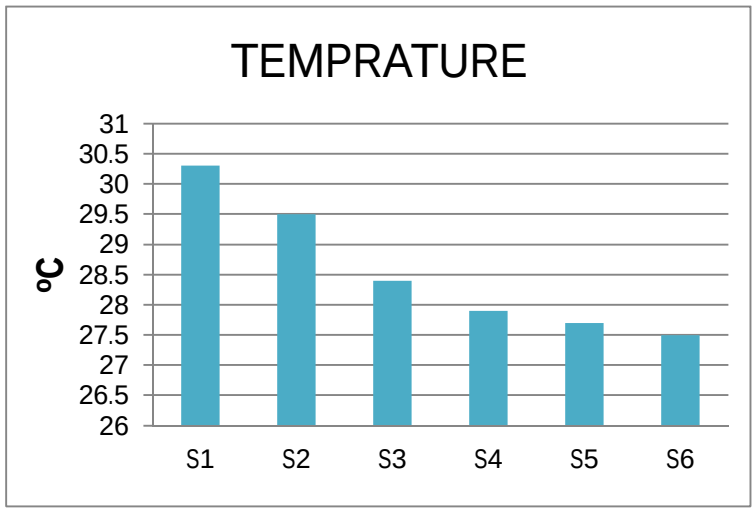

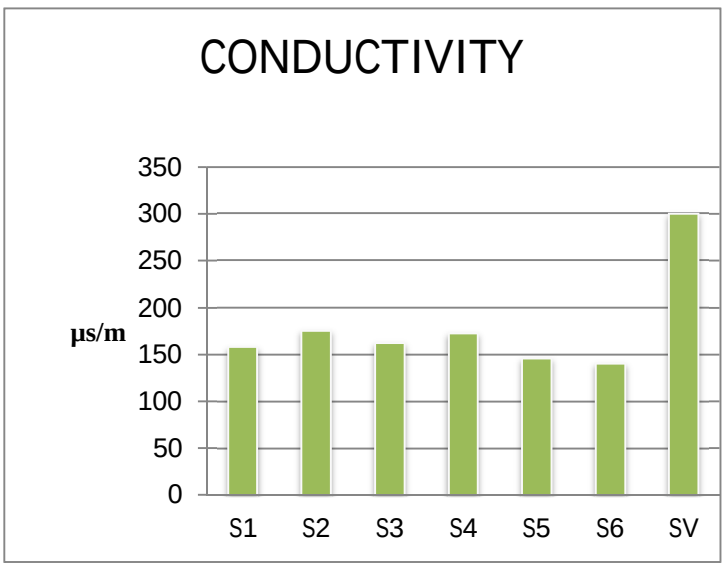

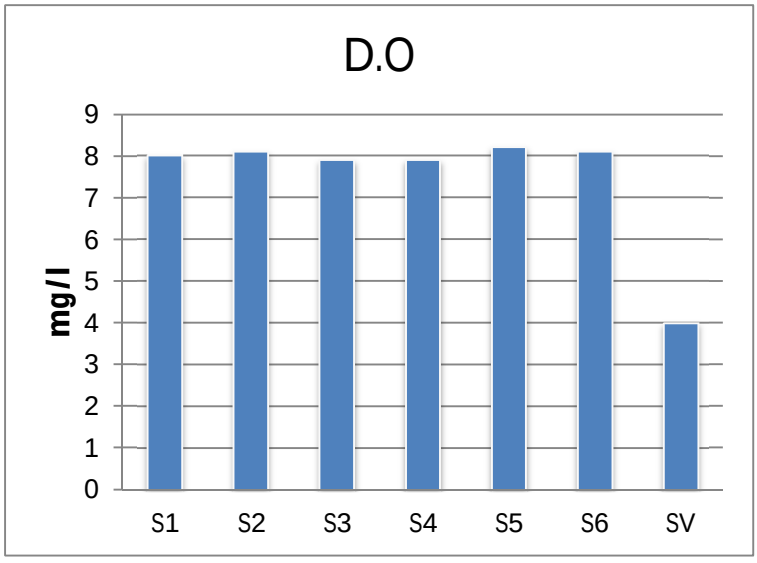

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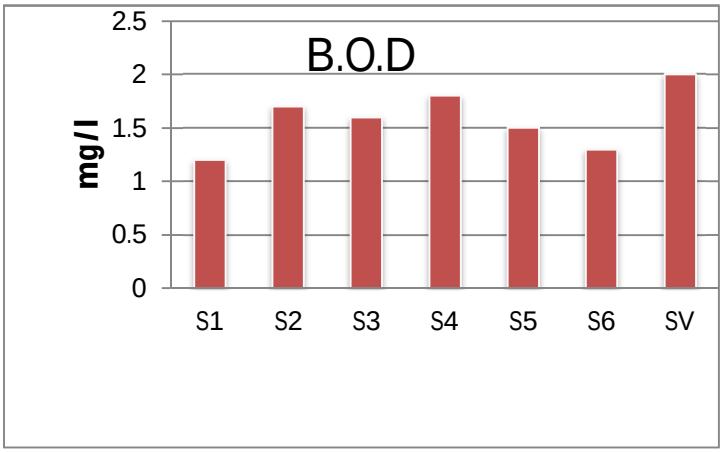

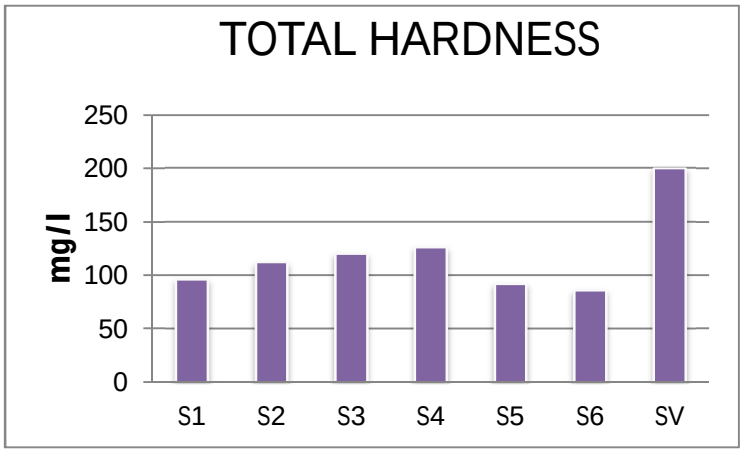

In the present study it is our efforts to evaluate many physicochemical parameters and its characteristic behavior of a river water samples in different months and different sampling stations, the water quality of river is deteriorated due to domestic, industrial effluents direct discharge in to river and various human activities along the banks of the river. So, the monthly river quality monitoring by analyzing various physico-chemical parameters and by integrating them is very much necessary in order to determine and maintain the water quality of the rivers. This study shows that the water quality was quite good.

IV. ACKNOWLEDGEMENT

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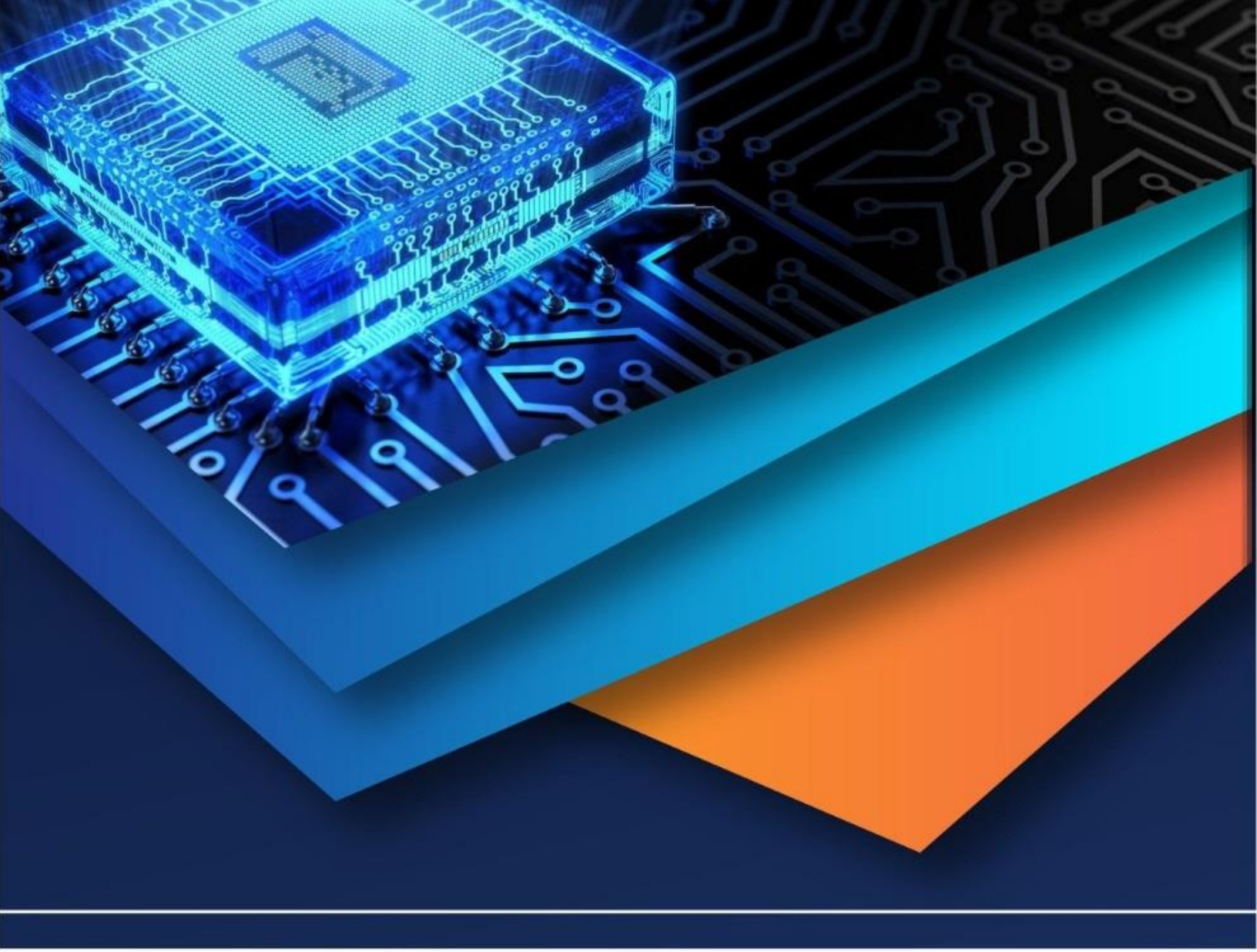

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