



Hydro Biological Study of Water in Hingoli District

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Abstract:

The consumption of water is increasing with population. Day by day the demand of water is causing serious strain on the planet due to the fixed water stock. So the ascertain the of drinking water being supplied and maintained, it is necessary to conduct water quality surveillance which will involve a suitable strategy for future planning. Ground water is one of the predominant source of drinking and other related requirements. It has the most exploited natural system due to over increasing demand of man for food, cloths, industrialization, enormous growth of population and agriculture. The drinking water quality was analyzed in all season. The water quality parameters such as Electrical conductivity, T.D.S, Hardness, Calcium, Mg, sodium, alkalinity, Chloride and Sulphate were analyzed. The water sample collected from 12 stations. One result was compared with water quality standards of WHO, ICMR indicated that it is not suitable for drinking. So, the water needs treatment before human consumption. This paper is attempted to analyze the hydrological properties of water in Hingoli district.

Keywords: *Water quality, physiochemical parameter, water pollution, traces elements.*

Introduction:

An important aspect of urbanization is the increase in demand and creation of potential with the possibility of population of ground water. (Dong et al 1988)¹. The people depend upon the groundwater as well as surface water for drinking domestic, livestock and agricultural purposes. More than 40 % of the drinking water supply to this area from ground water. The water quality was analyzed in the distribution system in entire study area.

Study area:

It is situated northern part of Marathwada Border of Hingoli is surrounded by washim and Yawatmal in northern side, Parbhani in western side and Nanded at southeastern side, Hingoli district occupies the area 4526 sq.km. Total population of district is 1177345 of which 15.60 % were urban as census 2011.

Material and Methods:

To carry out the analysis of water samples collected from five sampling points (each tehsil one) as shown in table no.1. Entire area is assessed during Feb. and Aug. 2016. The water samples were collected in brown glass containers which were thoroughly cleaned before use. Samples were analyzed Pre and Post monsoon period. The physio-



chemical parameters viz, P^H , EC, TDS, DO, hardness, Ca Mg, Sodium, chloride and sulphates of water were analyzed following method of IS 500, total hardness and chloride of water were analyzed following the methods of APHA (1989) using Hanna fresh water analysis kit.

Result and discussion:

Water sample the entire water sample observed to be colorless. The temperature of different water samples ranged between 24° to $28^{\circ}C$. And no marked variation on temperature

Was observed during the study period. Total hardness and chloride of water were analyzed following the methods of APHA (1989) using Hanna fresh water analysis kit.

PH: It is one of the most important biotic factors than serves as an index for pollution. In the present study P^H value of the water sample are slightly alkaline varying from 6.90 to 7.80 and these values are within desirable limit prescribed by BIS, WHO and ICMR.

Electric conductivity:

The electrical conductivity is a function of ions concentration. This can be used for quick checking of dissolved substance in water. Lange egger (1990)⁶ and Edit (1993)⁷ have described the importance of electrical conductance EC were observed. In the present study EC has recorded between 202 to 310. Higher percentage of EC observed in Sample no.5 (Aundha Nagnath Taluka)

Total hardness is an important parameter of water quality. Calcium and Magnesium are the, principle cations responsible for hardness in present study values of Total hardness varied in between 146 to 610 Mg/L. Above 500Mg/L concentration of Hardness observed in Sample no.2- (Hingoli) Sample no. 3- (Kalmunari) .These result exceed the limit set by WHO (150 Mg/L) and ISI (300 Mg/L) Thus the water is very hard water and not suitable for drinking and domestic purposes.

Turbidity: Turbidity various from 45 to 90 NTU, which is within the permissible limit.

Ca and Mg: Similarly calcium and Magnesium are found between 65 to 116 Mg/L and 55 to

123.70 Mg respectively. Highest concentration of these cations recorded at Hingoli district. The concentration of sodium was found in the range from 57 to 230 Mg/L. Above 100Mg/L calcium observed in sample no. 2 and 4 (Hingoli and Basmati Taluka)

Chlorides: The value of chlorides is observed between 3.7 to 4.10 ppm. The permissible limit of chloride in drinking water is 250 ppm .Highest concentration of chloride is found eastern part of study area. (522 ppm) station. Similarly calcium and Magnesium are found between 65 to 116Mg/L and 55 to 123.70 Mg respectively. Highest concentration of these cations recorded at Hingoli district. The concentration of sodium was found in the range from 57 to 230 Mg/L

Dissolve Oxygen (DO): Dissolve Oxygen is one of most important parameter in the water quality assessment. DO is an index of physical and biological process going in water. The DO level in natural water depends on physical, chemical and biological activities of the water body. (Harrison 1998) Aquatic ecosystem totally depends on DO .In the present study DO observed various from 4.80 to 12.60

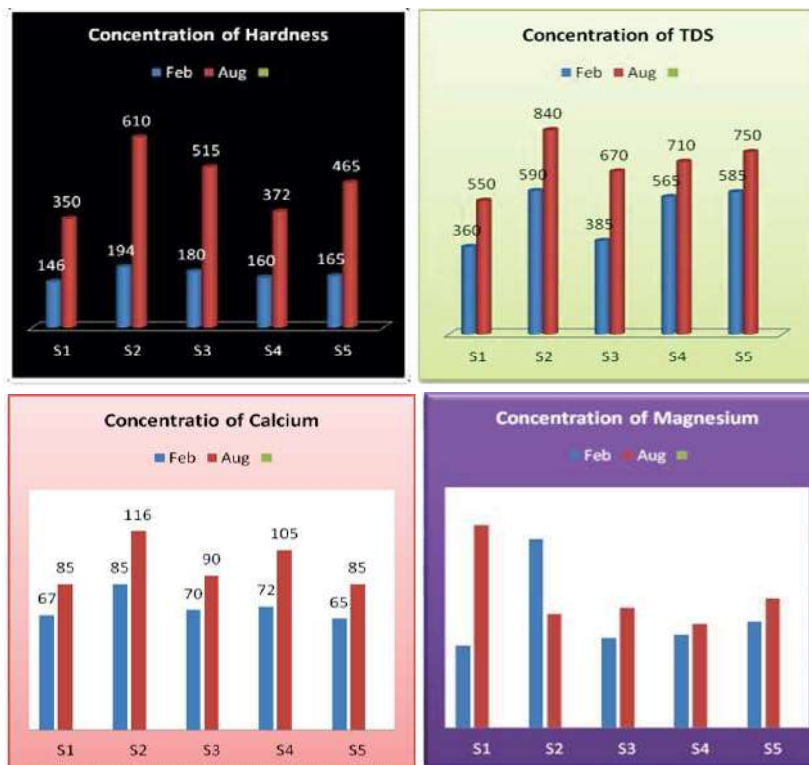
TDS:

Total dissolved solid concentration in waste water effluent represents the colloid form. The amount of TDS ranged between 360 to 840 mg/l. Higher percent of TDS shows in sample no.2 and 5 in the month of Aug.2016, whereas below 400 observed in sample no.1 and 3 in the month of Feb.2016. Water sample Permissible quality is 1500 mg/L (WHO, 1984)² and recommended level of TDS (250-2100 Mg/L) for the protection of aquatic life (USEPA, 1975)³. Irrigation (ISI, 1982)⁴ and domestics use (ICMR, 1975)⁵.

Physio-chemical parameter of the water in Hingoli District (2019)

Sr.no	Parameters	S1		S2		S3		S4		S5	
		Feb.	Aug.	Feb.	Aug.	Feb.	Aug.	Feb.	Aug.	Feb.	Aug.
1	PH	7.0	7.40	6.90	7.80	7.10	7.45	7.0	7.90	6.90	7.70
2	EC	202	242	247	295	275	305	208	231	272	310
3	Hardness	146	350	194	610	180	515	160	372	165	465
4	Turbidity	45	75	52	86	71	90	63	72	48	65
5	Ca	67	85	95	116.7	70	90	72	105	65	85
6	Mg	55.70	135.73	126.63	76.25	60.85	80.10	62.00	69.50	71.50	86.00
7	Chloride	3.8	4.7	3.7	4.10	4.2	4.8	3.9	4.12	4.4	4.9
8	DO	5.20	7.50	6.05	12.60	4.80	10.80	7.03	9.75	6.87	11.30
9	TDS	360	550	590	840	385	670	565	710	585	750

Sample 1-Sengaon, Sample 2- Hingoli, Sample 3- Kalmunari, Sample 4-Basmat, Sample 5-Aundha Nagnath The observed variation physio-chemical parameter of the water is shows in above table.





Conclusion: -

It is seen that, the quality of drinking water in the study area has been deteriorating indicted by the presence of high concentration of Ca, Mg, and TDS in Murum circle. Narangwadi circle has 2 samples having exceeded TDS Concentration. 05 samples were found to be proper for drinking purpose whereas 04 samples badly require proper chemical treatment. Hence there is an urgent need to take steps for protection of this valuable source.

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