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The Akola District Region in Maharashtra Has Been the Subject of Studies and Evaluations of Water Quality Parameters

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ABSTRACT

From October 16, 2021, to February 16, 2022, water samples were taken from open wells spread out over a 30-kilometer radius in the Akola district. Twenty samples of water were physically and chemically examined in a controlled environment. Our laboratory ran tests to determine things like hardness, alkalinity, pH, EC, ORP, BOD, chlorides, TDS, DO, and more. We compared all of the data to the ISI Standard and the World Health Organization's drinking water quality standard. It became clear from the comparison results that not all water samples matched the criteria for potable water quality. Regarding TDS, a large number of samples were severely polluted. We talked about the pros and cons of using these factors to forecast surface water quality features in open well water.

Keywords : Drinking Water, BOD, DO, Physicochemical study.

I. INTRODUCTION

Water is an inorganic chemical substance that is transparent, flavorless, colorless, and odorless. Water exists in a variety of its native forms. It produces rain as precipitation and fog as an aerosol. Water droplets in mid-air make up clouds. Water in its gaseous form is known as steam or vapour. The water quality varies from one area to another. This is because different regions have distinct chemical components and variable concentrations of these components. Water quality declines due to pollution. In other words, it's not drinkable. The presence of impurities, such as microorganisms, chemicals, industrial waste, or sewage, lowers the quality. Regardless of the season, water quality always varies. Consistent monitoring is necessary for spatial or temporal variation management[1-3].

II. EXPERIMENTAL

The dates of collection for the water samples are 16/10/2021 and 16/02/2022. Twenty locations in the Akola district region provided samples, which were all standardized and stored in glass bottles. All steps for delivering water samples to

the lab followed established protocols. The containers designated for the investigation of the potability of surface and groundwater for human consumption and other household uses. There was a mercury thermometer on hand to take readings of the water temperature. Potentiometric measurement of oxidation-reduction potential. I used a conductometer to measure the conductance. readings taken from a pH meter. We utilized distilled water and samples of A.R. grade. Tables 1 and 2 below provide the parameters and procedure utilized to analyze the samples.

The different regions have varying degrees of hardness. From 63 ppm to 472 ppm, it ranged. The presence of bicarbonates, magnesium carbonate, and calcium carbonate causes the material to be hard. Magnesium and calcium concentrations rise in relation to the rates of breakdown and evaporation[4-5].

Total dissolved solids (TDS) or dissolved solids refers to the many kinds of minerals that are present in water in a dissolved state. The concentrations of TDS vary throughout different regions. In this case, the TDS levels were between 416.6 and 566.1 mg/L. Polluted water may also contain organic compounds and industrial waste. It modulates the overall dissolved burden as well. Chloride percentages vary among regions. Sodium and chloride ions attract each other and create salt crystals in high evaporation conditions[6].

III. RESULTS AND DISCUSSION

You may find the findings of the physical and chemical parameters in the table. The samples did not have any discernible smell or color. The water samples had pH readings between 7.12 and 7.7. The majority of the water samples had an alkaline pH. Water samples had a D.O. content ranging from 7.14 to 8.4 mg/L. The concentrations of magnesium and calcium in the water samples vary between 42 and 220 mg/L and 15 and 303 mg/L, respectively[7-8].

Table 1

Parameters	Method	Standard values (WHO 1993)	ISI 1991
Colour	colorimeter		-
Odour	By smelling		-
Temperature	Thermometer	100°C	-
pH	pH meter	7.5 to 8.5	6.5 to 8.5
D.O.	Winkler method	< 5.0 mg/L	< 5.0
Alkalinity	Titrimetric	-	-
Chlorides	Titrimetric	250 mg/L	250
TDS	-	500 mg/L	500
Total hardness (as $CaCO_3$)	Titrimetric	100 mg/L	300
Total magnesium	Titrimetric	150 mg/L	30
Total Calcium	Titrimetric	100 mg/L	75 mg/L
BOD	Titrimetric	Not more than 8 mg	-
COD	Titrimetric	Not more than 250 mg/L	-
ORP	Potentiometer	-	-

Table 2

Sr.No	Location	pH	Conductance(ʊ)	ORP (mv)	TDS (mg/L)	DO (mg/L)	Chlorides (mg/L)	TH (ppm)	Mg (mg/L)	Ca (mg/L)	BOD (mg/L)	COD (mg/L)
1	Nakashi	7.57	525.5	52.6	501	8.1	167.4	213	96	15	2.09	20.7
2	Mazod	7.7	517.1	56	523	7.9	69.7	186	98	55	2.21	20.61
3	Indira nagar	7.35	501	56.6	499	7.89	43.5	258	82	50	2.21	20.52
4	Wadegaon	7.65	512	56	501	8.08	93.1	300	216	84	2.09	21
5	Channi phata	7.4	517	62.3	488.1	8.05	62.3	283	220	63	1.97	22.1
6	Chikhalgaon	7.77	501	58.6	483	7.85	47.4	98	64	49	1.90	21.3
7	Vithhalmandir	7.45	499.6	56.6	510	7.75	36.1	83	52	31.5	2.11	17
8	Pardi	7.4	477.2	58.3	488	7.95	33.6	102	52	35	2.09	16.3
9	Khanapur	7.45	438.3	54.6	443.1	8.4	35.4	106	58	41.5	2.17	22.4
10	Tapal patur	7.4	528	52.6	500	7.85	41.7	307	81	25	2.09	22.2
11	Lakhanwada	7.52	382.4	60	501	7.27	86.4	470	184	303	1.96	15.07
12	Kapashi	7.39	414.2	57.18	566.1	7.23	52.4	472	176	219	1.92	20.6
13	Chandur	7.47	404.6	62	456	7.31	73.6	63	188	184	2.07	16.3
14	Shindkhed	7.7	540	65.6	500	7.3	42.8	98	65	38	1.94	20.3
15	Sauravfarm	7.44	222.5	60.6	450	7.4	52	73	52	44	1.94	18.5
16	Rautwadi	7.32	198.7	53	416.6	7.14	77.2	103	42	18	1.84	19.3
17	Kanherisarap	7.12	250.5	56.33	486	7.95	56.3	106	52	47	2.18	19.7
18	Lothefarm	7.47	517	57.33	483.3	7.81	51.9	94	56	50	2.16	19.6
19	Pawarfarm	7.22	201	50.6	521	8.14	67.6	94	56	38	2.16	19.3

IV. CONCLUSION

The results show that the TDS is high in some areas based on the many characteristics that were considered. Gastrointestinal issues may occur with a high TDS value. Humans can benefit from open well supplies.

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