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Assessment of Physico-Chemical Parameters of Ground Water from Selected Stations of Mahudha Taluka of Kheda District-Gujarat

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ABSTRACT

In this study we are doing assessment of drinking water terms of Physico chemical parameters like pH, Total dissolve solid (TDS), Total hardness, Total alkalinity, Chloride, Sulphate, Calcium, Magnesium, Nitrate values, Chemical oxygen demand (COD), Biological oxygen demand (BOD), Fluoride and Turbidity. Measurement is done for selected areas of Mahudha Taluka of Kheda district. All the parameters are measured with respected to three different seasons such as WINTER, SUMMER and MONSOON. Results obtained are compared in terms of their highest value and lowest values among six stations.

Keywords : Physico-Chemical Parameters, Drinking water, Mahudha Taluka

I. INTRODUCTION

Water is the most valuable thing of the Mother Nature to mankind. All life and peripheral activities are ceased without water. More over to drinking and personal health, water is necessary for agricultural crop, industrial and manufacturing process, hydroelectric power generation, waste assimilation, recreation and wildlife etc.When a resource is used for so many different purposes, it is important to develop its quality and used rationally and efficiently. Water is called as life. One cannot imagine a form of lifewithout water. Pollution levels of the ground water in densely populated are reached so high because of continuously withdrawn of ground water and formation of absorption pit. As this resource becomes more contaminated and scarcer, demand for high quality water will continue to grow making groundwater even more valuable and protection more important.From above introductory part we have decided to analysed ground water of selected stations of Mahudha taluka of Kheda district, Gujarat with respect to different Physico-Chemical parameter such as pH, TDS, Total hardness, Total alkalinity, Chloride, Sulphate, Calcium, Magnesium, Nitrate values, COD, BOD, Fluoride and Turbidity in terms of MONSOON seasons.

II. METHODS AND MATERIAL

In this assessment Chemicals and Reagents all used are of AR grade and used without further purifications. Physico-chemical characterization of river, ground, and surface water such as pH, Total dissolve solid (TDS), Total hardness, Total alkalinity, Chloride, Sulphate, Calcium, Magnesium, Nitrate values, Chemical oxygen demand (COD), Biological oxygen demand (BOD), Fluoride and Turbidity were carried out by standard method given by APHA. All samples will be collect in pre cleaned polyethylene bottles. The sampling preservations and analysis of parameters. The water samples will be collected nearly from selected parts of Mahudha Taluka during the Monsoon season.

III. RESULTS AND DISCUSSION

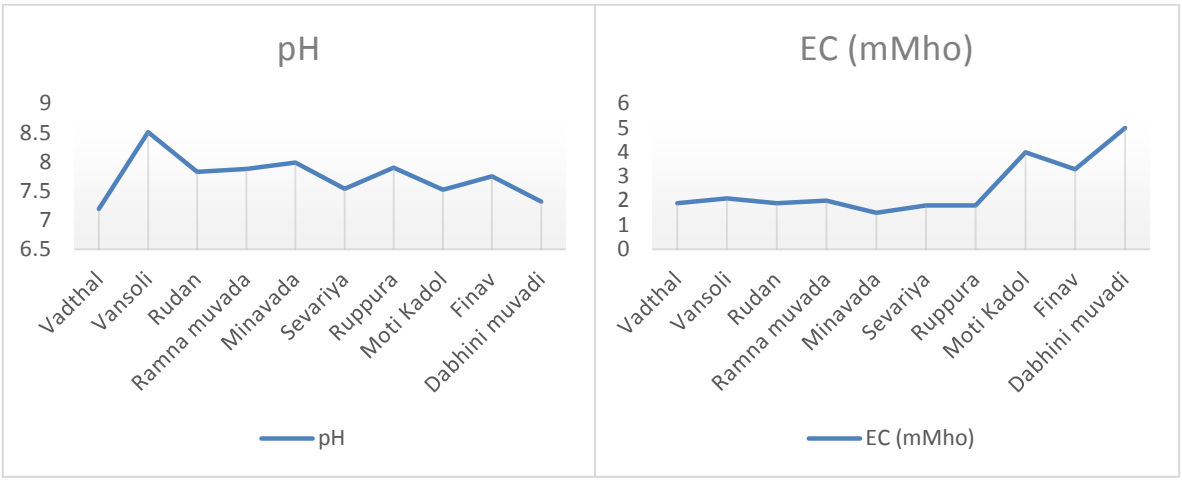
Here we discus about result of selected samples which was collected in Monsoon Session. In following table data was given after analysis of all collected samples of Mahudha Taluka. We compeer this data of all villages and analyse difference.

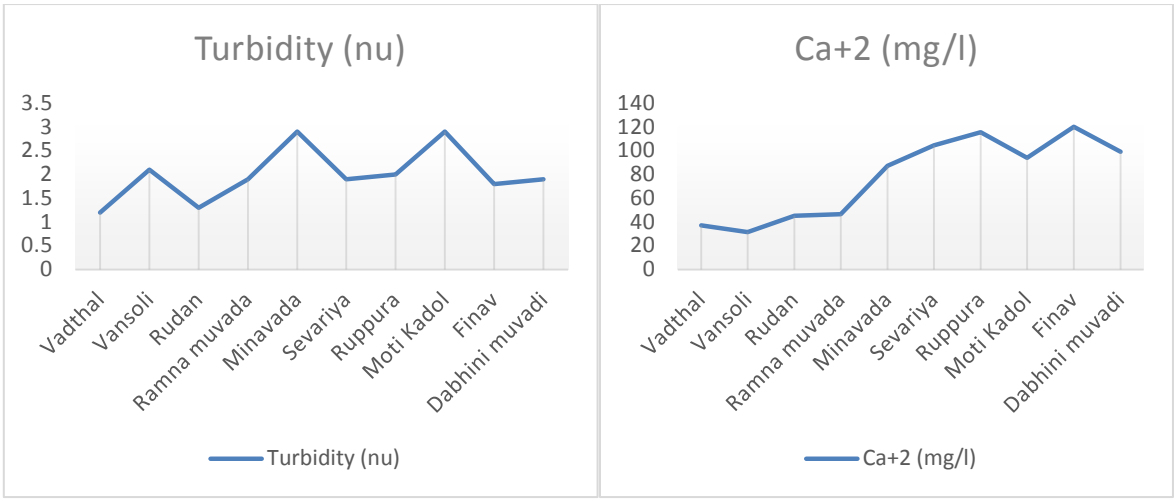
Table 1: Physico-Chemical analysis of ground water of Mahudha Taluka of Kheda district in Monsoon session

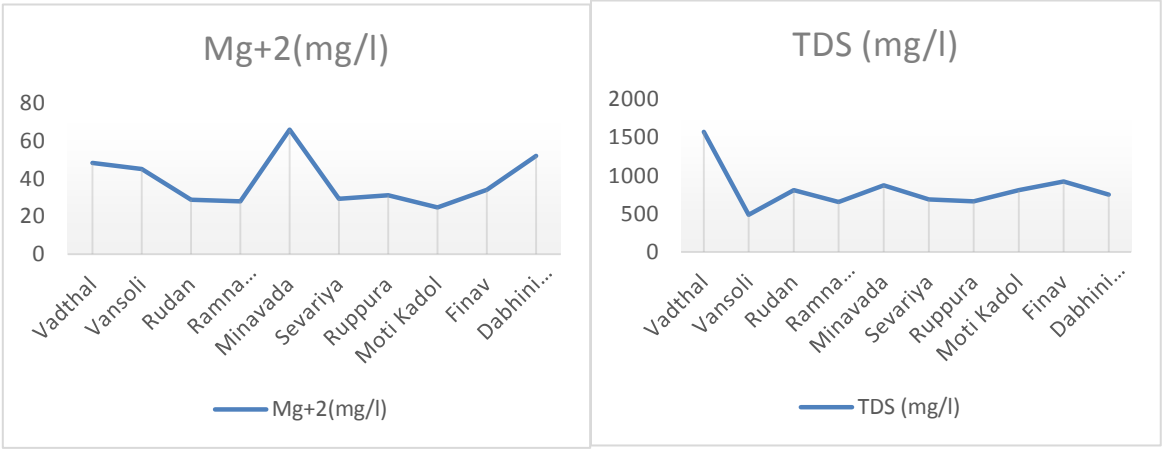
Sr. No.	Parameters	Name of Village (Sample)									
		Vadthal-1	Vadthal-2	Vansoli-1	Vansoli-2	Rudan-1	Rudan-2	Ram na muvada-1	Ram na muvada-1	Meenavada-1	Meenavada-1
1	**Depth (ft)**	180	300	108	150	105	140	130	150	180	140
2	**Temp.(°C)**	28.7	28.3	28.1	27.3	27.5	28.8	28.1	28.4	28.6	28.3
3	**pH**	7.19	7.46	8.51	7.86	7.83	7.92	7.88	7.22	7.99	8.63
4	**EC (mMho)**	1.9	1.6	2.1	2	1.9	1.3	2	5.4	1.5	0.9
5	**Turbidity (nu)**	1.2	1.4	2.1	1.1	1.3	2	1.9	2.2	2.9	1.9
6	**Total Hardness (mg/L)**	138.15	139.57	169.32	167.18	291.44	286.25	220.34	226.85	251.68	253.42
7	**Ca^{+2} (mg/L)**	37.12	42.74	31.54	35.18	45.08	43.21	46.55	51.26	87.14	82.28
8	**Mg^{+2}(mg/L)**	48.36	57.82	45.14	58.43	28.85	32.51	27.94	59.38	66.08	57.45
9	**Alkalinity (mg/L)**	295	358	405	435	544	428	609	452	529	534
10	**TDS (mg/L)**	1577	1265	486	697	810	821	654	502	874	787
11	**Cl^{-1} (mg/L)**	33.54	31.16	39.11	45.6	11.78	14.6	19.56	15.12	23.35	27.54
12	**HCO_3^{-1} (mg/L)**	271	297	282	267	262	289	255	308	334	275
13	**CO_3^{-2} (mg/L)**	29.32	27.84	24.79	27.46	33.26	31.48	26.85	29.35	27.63	28.55
14	**DO (mg/L)**	4.8	5.2	6.1	5.8	5.7	5.9	6.4	6.7	4.9	5.3
15	**SO_4^{-2} (mg/L)**	161.76	159.52	150.26	155.58	152.35	148.08	131.41	128.72	119.62	128.16
16	**NO_3^{-1} (mg/L)**	95	97	93	97	105	107	108	119	89	96
17	**F^{-1} (mg/L)**	1.07	1.08	1.02	1.08	1.12	1.19	1.17	1.12	1.22	1.23
18	**Na^{+1} (mg/L)**	186	175	208	194	444	457	288	280	306	318
19	**K^{+1} (mg/L)**	1.89	1.62	1.41	1.28	4.07	4.89	1.98	1.69	2.05	2.25

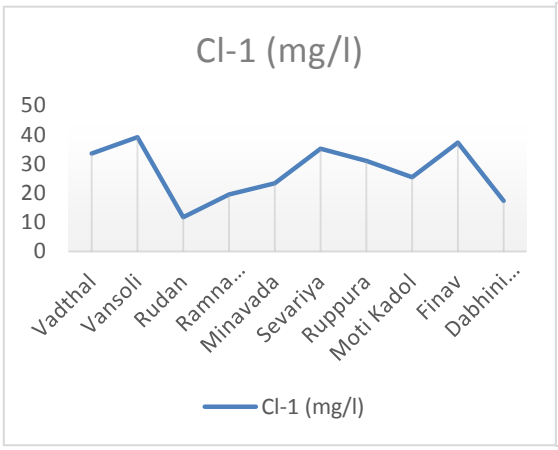
Table 2: Physico-Chemical analysis of ground water of Mahudha Taluka of Kheda district in Monsoon session

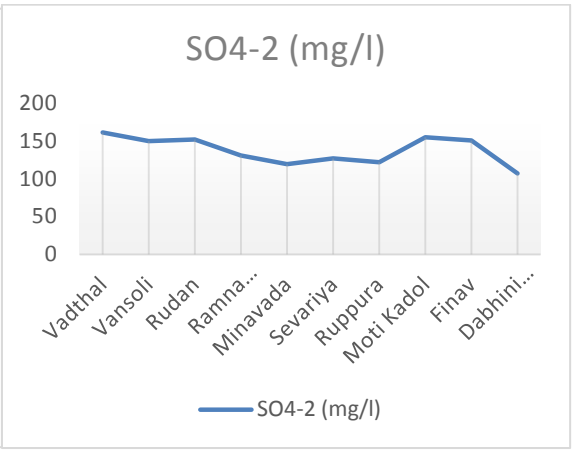
Sr. No.	Parameter	Name of Villege (Sample)									
		Sevariya-1	Sevariya-2	Rooppura-1	Rooppura-2	Moti Khadol-1	Moti Khadol-2	Finav-1	Finav-2	Dabhi ni muvadi-1	Dabhi ni muvadi-1
1	**Depth (ft)**	120	140	150	160	180	180	150	120	150	180
2	**Temp.(°C)**	28.8	28.1	27.2	28.7	28.2	27.9	28.5	28.3	28.8	28.2
3	**pH**	7.54	7.06	7.9	8.5	7.52	7.55	7.75	7.5	7.32	7.48
4	**EC (mMho)**	1.8	1.7	1.8	2.7	4	2.4	3.3	3.2	5	3.3
5	**Turbidity (nu)**	1.9	1.6	2	1.4	2.9	2.8	1.8	2.2	1.9	3
6	**Total Hardness (mg/L)**	191.7	189.56	183.22	186.92	310.64	299.26	312.23	318.45	173.36	179.58
7	**Ca^{+2} (mg/L)**	104.5	102.17	115.42	122.14	93.88	97.34	120.13	123.74	99.12	105.42
8	**Mg^{+2}(mg/L)**	29.32	60.81	31.24	45.12	24.87	29.44	34.2	29.86	52.13	48.27
9	**Alkalinity (mg/L)**	372	431	387	309	462	356	497	568	501	479
10	**TDS (mg/L)**	691	703	662	693	812	805	925	947	754	768
11	**Cl^{-1} (mg/L)**	35.24	33.58	31.08	33.46	25.41	27.6	37.31	39.28	17.33	17.22
12	**HCO_3^{-1} (mg/L)**	279	318	353	346	388	396	362	381	304	315
13	**CO_3^{-2} (mg/L)**	24.08	24.93	24.58	28.75	39.05	37.53	37.16	37.83	38.45	36.57
14	**DO (mg/L)**	7.1	6.5	5.1	4.8	6.3	5.6	4.3	4.7	5.4	5.8
15	**SO_4^{-2} (mg/L)**	127.6	129.76	122.11	124.35	155.26	153.42	151.25	154.67	107.44	102.54
16	**NO_3^{-1} (mg/L)**	99	93	114	109	92	95	112	116	111	115
17	**F^{-1} (mg/L)**	1.07	1.08	1.02	1.08	1.12	1.19	1.17	1.12	1.22	1.23
18	**Na^{+1} (mg/L)**	245	272	313	293	236	249	295	314	362	324
19	**K^{+1} (mg/L)**	1.59	1.74	1.96	2.08	1.34	1.29	1.94	1.82	1.23	1.31

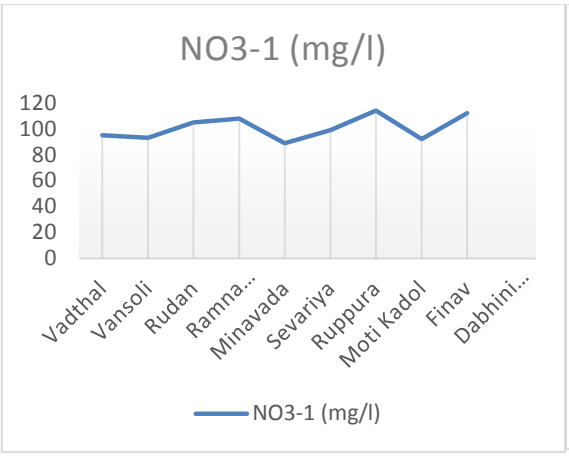

pH
9
8.5
8
7.5
7
6.5
Vadthal
Vansoli
Rudan
Ramna muvada
Minavada
Sevariya
Ruppura
Moti Kadol
Finav
Dabhini muvadi
pH
EC (mMho)
6
5
4
3
2
1
0
Vadthal
Vansoli
Rudan
Ramna muvada
Minavada
Sevariya
Ruppura
Moti Kadol
Finav
Dabhini muvadi
EC (mMho)

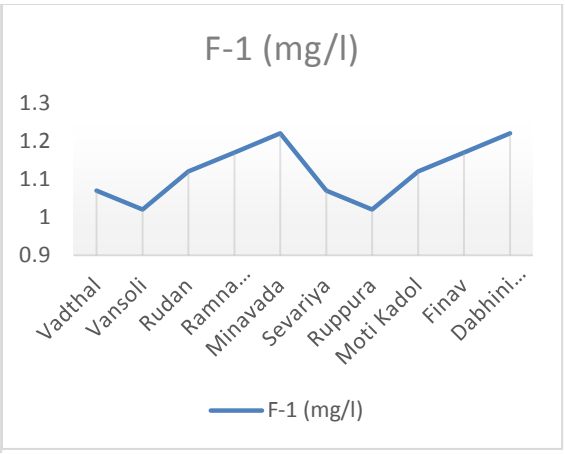

Turbidity (nu)
3.5
3
2.5
2
1.5
1
0.5
0
Vadthal
Vansoli
Rudan
Ramna muvada
Minavada
Sevariya
Ruppura
Moti Kadol
Finav
Dabhini muvadi
Turbidity (nu)
Ca+2 (mg/l)
140
120
100
80
60
40
20
0
Vadthal
Vansoli
Rudan
Ramna muvada
Minavada
Sevariya
Ruppura
Moti Kadol
Finav
Dabhini muvadi
Ca+2 (mg/l)

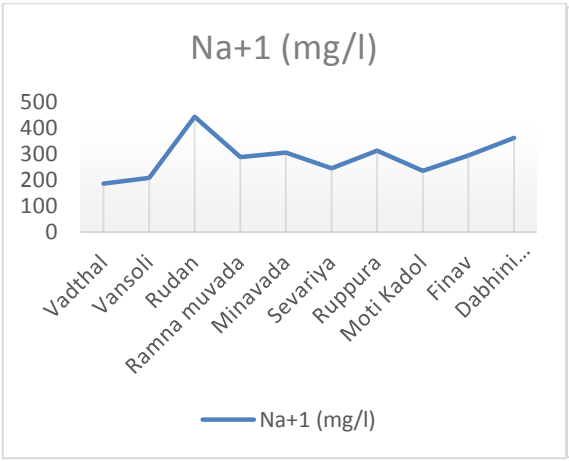

Mg+2(mg/l)
80
60
40
20
0
Vadthal
Vansoli
Rudan
Ramna...
Minavada
Sevariya
Ruppura
Moti Kadol
Finav
Dabhini...
Mg+2(mg/l)
TDS (mg/l)
2000
1500
1000
500
0
Vadthal
Vansoli
Rudan
Ramna...
Minavada
Sevariya
Ruppura
Moti Kadol
Finav
Dabhini...
TDS (mg/l)

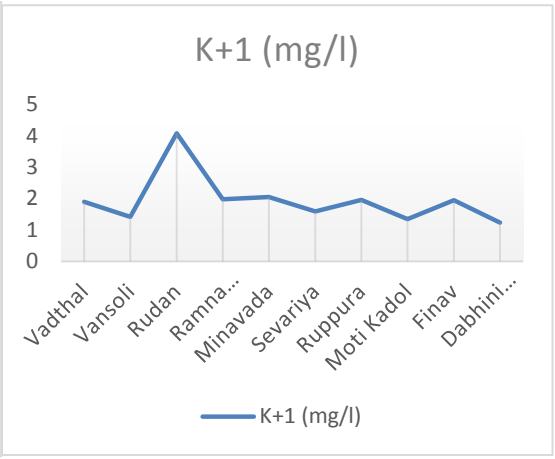












Maximum and minimum values of parameters of ground water quality of some villages of -Mahudha Taluka of Kheda district is as follow.

- In this study we found that highest value of pH at Vansoli and lowest at Vadthal in Monsoon session.

- In this study we found that highest value of EC at Dabhinimuvadi and lowest at Minavada in Monsoon session.
- In this study we found that highest value of Turbidity at Minavada & Moti Khadol and lowest at Vadthal in Monsoon session.
- In this study we found that highest value of Calcium at Finav and lowest at Vansoli in Monsoon session.
- In this study we found that highest value of Magnesium at Minavada and lowest at Moti Khadol in Monsoon session.
- In this study we found that highest value of TDS at Vadthal and lowest at Vansoli in Monsoon session.
- In this study we found that highest value of Chlorine at Vansoli and lowest at Rudan in Monsoon session.
- In this study we found that highest value of Sulphate at Vadthal and lowest at Dabhinimuvadi in Monsoon session.
- In this study we found that highest value of Nitrate at Ruppura and lowest at Minavada in Monsoon session.
- In this study we found that highest value of Fluoride at Dabhinimuvadi& Minavada and lowest at Vansoli &Ruppura in Monsoon session.
- In this study we found that highest value of Sodium at Rudan and lowest at Vadthal in Monsoon session.

In this study we found that highest value of Potassium at Rudan and lowest at Dabhini muvadi in Monsoon session.

IV. CONCLUSION

The important Physico-chemical parameters of bore well water samples collected from 20 locations in Mahudha taluka. The Sample was taken in Jan-Feb: 2013..It was observed that the PH ,Fluoride, T.D.S., total alkalinity , total hardness, chloride, nitrate, sulphate, calcium, magnesium are normal for the water samples. Only very few samples showed values above the desirable limits by Indian standard Index.

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