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RESEARCH ARTICLE

Selected Physico-Chemical Parameters of Ground Water from Limkheda Taluka of Dahod District-Gujarat

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ABSTRACT

Physico chemical parameters such as Total alkalinity COD, BOD, Calcium content, chloride content and Dissolved oxygen are measured and analysed for seventeen station of Limkheda Taluka of Dahod district. All the parameter measurements are made in terms of three different seasons such as winter, Pre monsoon and Post Monsoon. Results obtained are compared in terms of their highest value and lowest values among seventeen stations in terms of six parameters.

KEYWORDS

Ground Water, COD, BOD, Calcium Content, Dissolved Oxygen

INTRODUCTION

"Water is the driver of life", said Leonardo da Vinci. Water is one of the most abundant substances on our planet. Our planet is a complex system of land, air and water. It is the only substances on the earth that exists in all the three states (solid, liquid and gas) of matter.[1] Nobel laureate A. Szent-Gyogri has called "The Matrix of life" Water which maintains biologically active structure and it is now universally agreed that all life will perish without water. Some years ago, an engineer Thomson King epitomized the Water problem in the following words: "Of all the compounds that are required necessary to life as we know it on earth, water is by far the most important, the most familiar, and the most wonderful, yet most people know very little about it".[2] History is replete with the sagas of armies that fought over water, of monarchs and priests who worshiped it and health workers who have blessed it, of civilizations that dwindled after losing or mismanaging it, of people who died because of it. Water is extraordinary.[3] Water is precious for life and food security, where erratic rainfall, declining resources and more withdrawals in the existing scenario force every human to use it more efficaciously. It is everywhere. It was estimated that world have about 400 million cubic kilometer of water and of this only 35 million cubic kilometer (2.5 percent) is fresh water, which is present in the form of ice-caps, glaciers and deep underground water.[4] The loss of Water was there when the earth was born, and it is believed by the scientists believe that life was conceived in the earth's initial oceans. Water continues to support all life – some very simple creatures can live without oxygen. But there were none which can develop without water.[5] It has played vital role in developing living and some time it has played a very dangerous role their end.[6-8] For lot many years it has played vital role in designing the earth. In so many forms like deciding climate reformation of solid in which greenery and grains take out brought of rail it run machine. Water each an inevitable part in all type of productive process from making of food to the making

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fertilizers for fields. It is not easy to decide the important of water to man in his development of civilization.[9]

From above introductory part we have planned to analysed ground water of 17 stations of Limkheda taluka- Dahod, Gujarat with respect to six parameter such as calcium content, chloride content, DO, BOD, COD and Alkalinity in terms of winter, Premonsoon and Post monsoon seasons.

MATERIALS AND METHODS

All the reagents used are of AR grade and used without further purifications. Physico-chemical characterization of river, ground, and surface water such as total alkalinity, chloride, Calcium, C.O.D, dissolved oxygen (DO) were carried out by following methods.

Sr. No.	Parameters of water analysis	Methods
1	Ca^{+2} Hardness	Titration (EDTA-Titrimetric)
2	Total Alkalinity	Titrimetric using Indicators
3	Chloride	Argenometric
4	Dissolve Oxygen	Titratomatric
5	COD	Open reflux method
6	BOD	BOD incubator

RESULTS AND DISCUSSION

Table 1: Physico-chemical analysis of ground water quality of Limkheda taluka of Dahod district (gujarat) - (winter)

Sr. No.	Name Of Station	Ca^{+2} mg/L	Cl^{-1} mg/L	Alkalinity mg/L	DO mg/L	COD mg/L	BOD mg/L
1	**Piplapani**	61	80	312	1.72	13	6
2	**Valundi**	36	28	288	0.94	10	8
3	**Khirkhai**	34	96	308	1.33	9	10
4	**Usara**	50	164	380	0.94	10	4
5	**Devadha**	34	160	456	1.16	11	2
6	**ParmarnaKhakhriya**	51	108	352	1.00	14	4
7	**MotaHathidhara**	66	128	320	0.24	28	1
8	**Jetpur**	86	149	336	0.23	16	6
9	**Kesarpur**	36	88	344	1.43	9	8
10	**Bar**	51	124	332	1.23	14	12
11	**Rai**	61	204	336	2.12	10	3
12	**Agara**	77	148	328	-	14	8
13	**Chediya**	46	78	228	0.44	12	5
14	**Randhikpur**	86	104	208	2.42	18	9
15	**Vadela**	56	64	308	3.32	13	11
16	**Singapur**	72	96	340	2.76	4	12
17	**Chilagota**	50	56	396	4.56	2	10

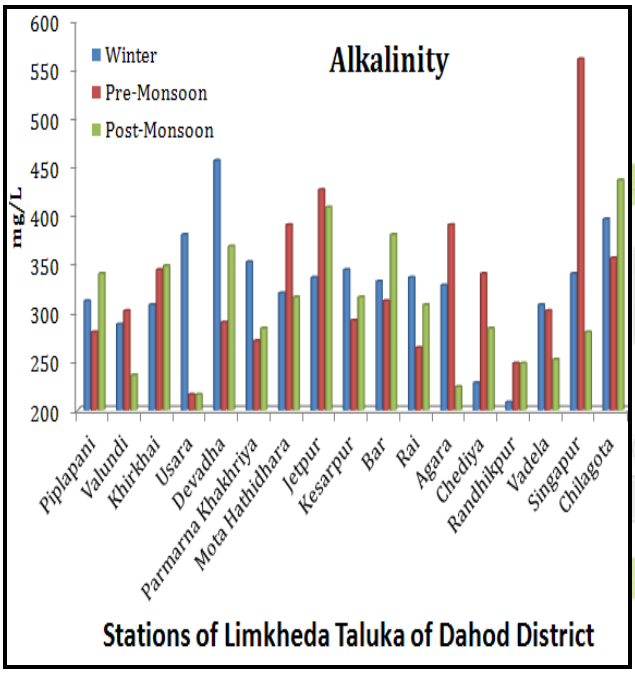
Table 2: Physico-chemical analysis of ground water quality of Limkheda taluka of Dahod district (gujarat) - (Pre-monsoon)

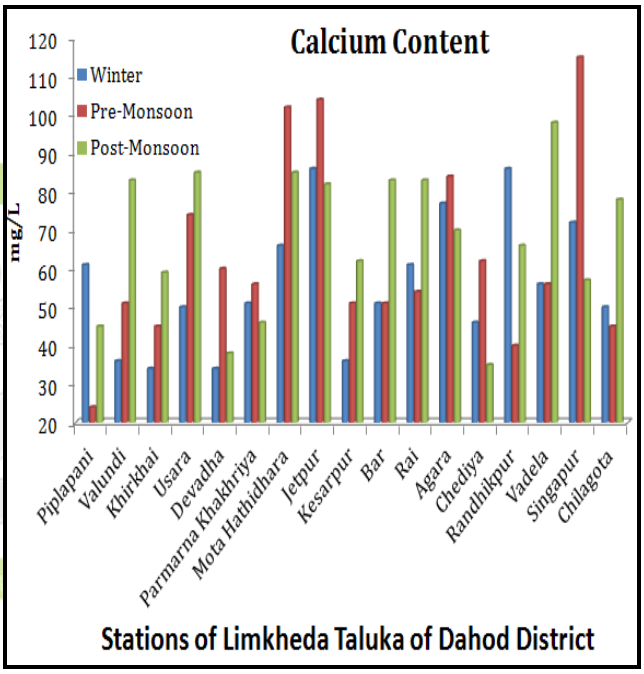
Sr. No.	Name of Station	Ca^{+2} mg/L	Cl^{-1} mg/L	Alkalinity mg/L	Do mg/L	COD mg/L	BOD mg/L
1	**Piplapani**	24	72	280	0.18	11	4
2	**Valundi**	51	42	302	0.16	8	6
3	**Khirkhai**	45	52	344	1.20	7	7
4	**Usara**	74	144	216	1.26	14	3
5	**Devadha**	60	78	290	2.16	16	0
6	**ParmarnaKhakhriya**	56	50	271	0.60	10	5
7	**MotaHathidhara**	102	340	390	0.17	5	4
8	**Jetpur**	104	172	426	0.24	7	3
9	**Kesarpur**	51	48	292	0.76	8	2
10	**Bar**	51	40	312	1.76	11	5
11	**Rai**	54	120	264	0.22	11	6
12	**Agara**	84	104	390	1.18	12	7
13	**Chediya**	62	132	340	1.24	4	3
14	**Randhikpur**	40	30	248	2.14	2	8
15	**Vadela**	56	44	302	4.00	6	5
16	**Singapur**	115	250	560	3.20	5	4
17	**Chilagota**	45	164	356	1.20	4	2

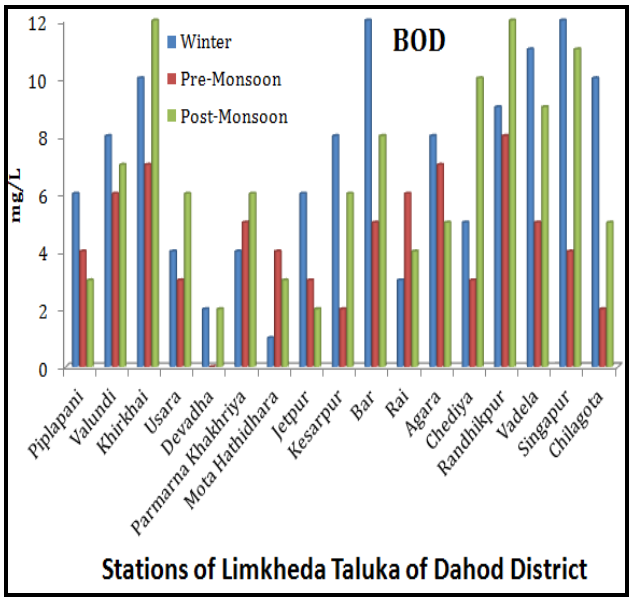
Table 3: Physico-chemical analysis of ground water quality of Limkheda taluka of Dahod district (Gujarat) - (Post-monsoon)

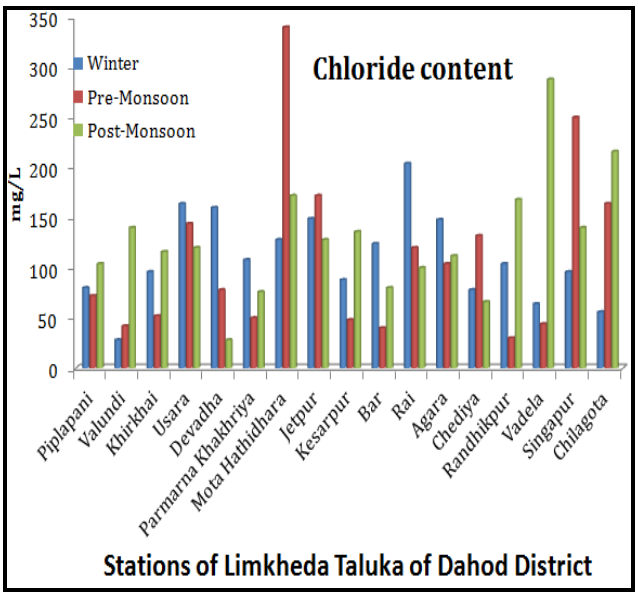
Sr. No.	Name of Station	Ca^{+2} mg/L	Cl^{-1} mg/L	Alkalinity mg/L	Do mg/L	COD mg/L	BOD mg/L
1	**Piplapani**	45	104	340	1.76	14	3
2	**Valundi**	83	140	236	2.16	12	7
3	**Khirkhai**	59	116	348	0.49	3	12
4	**Usara**	85	120	216	0.68	12	6
5	**Devadha**	38	28	368	1.12	10	2
6	**ParmarnaKhakhriya**	46	76	284	0.14	11	6
7	**MotaHathidhara**	85	172	316	1.16	8	3
8	**Jetpur**	82	128	408	1.16	10	2
9	**Kesarpur**	62	136	316	1.26	7	6
10	**Bar**	83	80	380	1.44	16	8

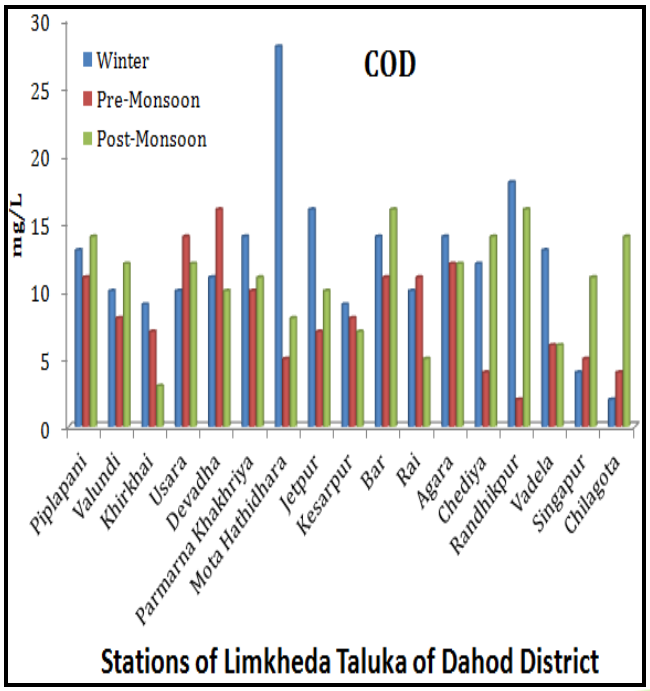
11	**Rai**	83	100	308	2.08	5	4
12	**Agara**	70	112	224	0.17	12	5
13	**Chediya**	35	66	284	0.42	14	10
14	**Randhikpur**	66	168	248	0.86	16	12
15	**Vadela**	98	288	252	1.12	6	9
16	**Singapur**	57	140	280	0.89	11	11
17	**Chilagota**	78	216	436	1.13	14	5

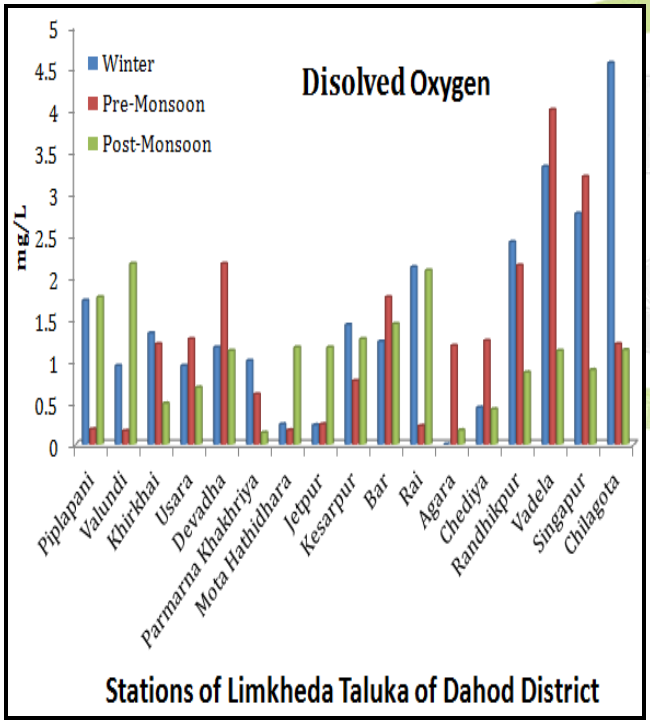












(1) Total Alkalinity

Winter Season shows highest value at Bar and lowest value at Mota Hathidhara.

Premonsoon Seasonshows highest value at Singapur and lowest at Piplani.

Postmonsoon Season **s**hows highest value at Chilagota and lowest at Usara.

(2) BOD

Winter Season shows highest value at Randhikpur and lowest value at Khirkhai.

Pre monsoon Seasonshows highest value at Randhikpur and lowest at Devdha.

Post monsoon Season **s**hows highest value at Khirkhaiand lowest at Devdha.

(3) Calcium content

Winter Season shows highest value at Randhikpur and lowest value at Usara.

Premonsoon Seasonshows highest value at Singapur and lowest at Piplapani.

Post monsoon Season **s**hows highest value at Vadela and lowest at Devdha.

(4) Chloride content

Winter Season shows highest value at Rai and lowest value at Valundi.

Premonsoon Season shows highest value at MotaHathidhara and lowest at Randhikpur.

Post monsoon Season **s**hows highest value at Vadela and lowest at Devadha.

(5) COD

Winter Season shows highest value at MotaHathidhara and lowest value at Chilagota.

Premonsoon Seasonshows highest value at Devdha and lowest at Randhikpur.

Postmonsoon Season **s**hows highest value at Bar and lowest at Khirkhai.

(6) Dissolved Oxygen

Winter Season shows highest value at Chilagota and lowest value atAgara.

Premonsoon Seasonshows highest value at Vadela and lowest at Valundi.

Postmonsoon Season **s**hows highest value at Valundi and lowest at Parmarna Khakhriya.

CONCLUSION

Physicochemical parameter such as, Total alkalinity COD, BOD, Calcium content, chloride content and Dissolved oxygen are varied

according to season so season play an important role in the quality of water.

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