

A Comparative Study of Quality of Under Ground Water of Man Tahishil and Phaltan Tahashil Which are Located at a Different Height in Satara District From Maharashtra (India)

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Abstract: A comparative study of quality of underground water of Man & Phaltan Tahasil were carried out during the year 2015- 2016. These two Tahasil are located at different heights. The Physico-chemical parameters of water such as pH electrical conductivity (EC) total hardness (TH) total dissolved solids (TDS) Calcium, magnesium, Sodium and potassium were analyzed. The observed values were compared in between these two Tahasil. It was found from present study that In general the values of the TH, Ca, Mg & Na were found to higher in Man Tahasil from summer season.

Keywords: Comparative Study of ground water of Man & Phaltan Tahasil.

I. Introduction

Water is one of abundantly available substances in nature. It is essential constituent of all animals and plants. It is also required for irrigation agriculture and industrial purpose. Among the various sources of water ground water is safe for drinking and domestic purpose but ground water contains various dissolved salt. Hence quality of ground water is very significant. In present study various samples were collected from two Tahasils which are located at different heights. The samples collected during period of pre- monsoon in the year 2015-2016 and physico - chemical characteristics has been studied. The chemical analysis was carried out according to procedure stipulated by APHA(1995). The water quality parameter viz pH, Electrical conductance (EC), Total dissolved solids (TDS), total hardness (TH), Calcium(Ca), magnesium (Mg) Sodium (Na) and Potassium (K).

II. Study Area

Two Tahasils were selected for study. These two Tahasils are near to each other and separated by **Shambhumahadeo Hill Range**. The Man Tahasil border is started from top of S.M.hill range and Phaltan Tahasil border is started from bottom of S.M.Hill range. The Man Tahasil is located about 400 meter height from Phaltan Tahasil and this our interest to select these two Tahasil. The man Tahasil is drought prone zone of satara district It lies between. 17° 38' 24" N latitude and 74° 46' 11" E longitudes. The Phaltan Tahasil was partly irrigated and partly comes in drought prone zone It lies between 17° 58' N latitude and 74° 45' E longitude

III. Experimental

Ten different places were selected for each Tahasil in order to cover the complete Tahasil. Ground water samples were collected from these ten places of each Tahasil in the month of March and April. In all 20 samples were collected in plastic bottles having capacity of 1 liter. These bottles were village wise labelled for both the Tahasil. The quality of water analyzed in laboratory. The pH was measured by pH epocket sized pH meter The conductance was measured by conductivity meter model CM 180 Elicomake. The TDS was measured by TDS meter model EUTECH instrument. The Na⁺ and K⁺ determined by flame photometer of systronic make. The total hardness Ca⁺⁺ and Mg⁺⁺ were analyzed by using standard methods (APHA-1995) The result obtained from analysis of 10 samples (M1 to M10) of Man Tahasil are given in table no. 1 and 10 samples (P1 to P10) of Phaltan Tahasil are given in table No 2

IV. Result and Discussion

pH: pH indicates the acidity and alkalinity of water pH values of ground water of man Tahasil varies from 6.7 to 9.2 that of Phaltan Tahasil varies from 7.2 to 9.0 the average values of Phaltan Tahasil is 7.78 and that of man Tahasil is 8.0.

These values were not so much distinguishable the higher pH values may be due to accumulation of salt in water.

EC: The Ec values of Man Tahasil varies from 0.6 to 1.34 that of Phaltan Tahasil varies from 0.6 to 1.11. EC values of Man Tahasil were found to be greater than the Phaltan Tahasil may be due to accumulation of more salt water as Man Tahasil is located higher position than Phaltan Tahasil.

TDS : TDS of water includes the soluble ionized and non-ionized material the TDS values of man Tahasil were found to so much greater than Phaltan Tahasil.

High TDS is due to discharge of waste water & which is percolate down to the water table Total hardness (TH) hardness of water is caused due to dissolved metallic ions like Ca^{++} Mg^{++} Sr^{++} Ba^{++} . The TH values of Man Tahasil were found to be so much greater than the Phaltan Tahasil. The high values of TH in man Tahasil can be attributed to low water level it is located above the Phaltan. High concentration of TH causes kidney problem. It is also observed by tentative survey of hospital that numbers of people suffered from kidney stone were found to be greater in Man Tahasil.

Table No. 1

The values of analyzed parameters of Man Tahasil During the year March –April 2015-16

Sample Code	pH	EC mmhos	TDS mg/L	TH mg/L	Ca ⁺⁺ mg/L	Mg ⁺⁺ mg/L	Na ⁺ mg/L	K ⁺ mg/L
M1	8.2	0.94	810	355	238	117	134	18.1
M2	8.3	0.68	815	325	219	106	112	15.1
M3	6.7	0.81	591	222	124	98	120	22.1
M4	7.3	1.14	622	252	150	102	90	16.0
M5	9.2	1.27	870	326	190	136	110	13.2
M6	7.8	1.17	780	380	253	127	105	19.1
M7	6.9	1.34	980	402	212	190	132	12.21
M8	8.0	1.0	852	295	142	153	118	16.0
M9	7.3	1.14	940	320	214	106	152	13.3
M10	8.1	1.28	985	370	260	110	138	12.1

M1 to M10 Water samples of Man Tahasil

Table No. 2

The values of analyzed parameters of Phaltan Tahasil During the year March –April 2015-16

Sample Code	pH	EC mmhos	TDS mg/L	TH mg/L	Ca ⁺⁺ mg/L	Mg ⁺⁺ mg/L	Na ⁺ mg/L	K ⁺ mg/L
P1	8.1	1.06	600	220	140	80	85	19.5
P2	7.3	0.78	450	200	110	90	67	22
P3	7.4	0.72	475	190	110	80	70	26.1
P4	8.3	0.98	640	250	150	100	90	14.2
P5	9.0	0.85	580	210	120	90	82	18.0
P6	8.2	0.76	560	205	108	97	80	16.2
P7	7.2	0.68	467	190	102	88	71	14.8
P8	8.4	0.90	620	230	140	80	88	22.8
P9	8.0	0.6	550	208	90	118	78	16.4
P10	8.2	0.91	610	212	118	94	88	19.2

P1 to P10 Water samples of Phaltan Tahasil

Calcium and magnesium: These are common constituents of natural water and which causes hardness of water the values of calcium and magnesium were found to higher in man Tahasil may be due to evaporation of water content and accumulation of salt.

Sodium and potassium: The concentration of sodium was found to be greater in man Tahasil due to evaporation of water the values of potassium were found to be slightly greater in Phaltan Tahasil.

V. Conclusion

The values of EC, TDS, TH, Ca, Mg and Na were found to be greater in Man Tahasil than the Phaltan. These higher values may be due Man Tahasil is located 400 meter height above the Phaltan Tahasil and due that summer season is sevier in Man Tahasil hence rate of evaporation of water is greater in Man Tahasil.

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