

Water Quality Assessment of Sultanpur Area, Kota (Rajasthan)

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Abstract

Kota is a fastest growing district of Rajasthan from last two decades now the population of this city is exorbitantly raise and cross the figure of 1,951,014. Groundwater is an important and renewable natural resource on the earth. The physicochemical properties of groundwater play a major role on health of Human beings and other uses. The present paper deals with the study of parameters like pH, TDS, specific conductivity, total alkalinity, hardness and levels of chloride, nitrate, sulphate, phosphate and fluoride from 20th August 2018 to 20th September 2018. During the study period various parameters were determined with the help of standard research techniques. Results of the investigations of few of the samples show that some of the parameters like nitrate and fluoride were above permitted limit affecting the quality of groundwater of Sultanpur Area of Kota District of Rajasthan state in India.

Keywords: *Hardness, chloride, nitrate, sulphate, fluoride, TDS*

INTRODUCTION

Sultanpur is a tehsil in Kota district of Rajasthan state, India. Sultanpur has latitude 25.280 and Longitude 76.210. Sultanpur tehsil headquarters is Sultanpur town. It belongs to Kota division; it is located 37 km towards east from district headquarters Kota 216 km from state

capital Jaipur towards north. Sultanpur tehsil is bounded by Anta tehsil towards south, Keshoraipatan tehsil towards west, Itawa tehsil towards north. It is 249 meter elevation (altitude). This place is in border of Kota district and Baran district.

Water is important for all forms of life including human beings. Groundwater has

been measured renewable natural resource of safe drinking water and other uses like domestic, Industrial, agricultural and commercial in the world. Groundwater quality is a function of Physical and chemical parameters that are affected by ecological formations and Anthropogenic activities. The groundwater quality is decreased by modern civilization, Industrialization, urbanization and increase in population. Their ground water is reported as polluted by various ways such as by use of fertilizers in farming, leakage from effluent bearing water body, industrial discharge. Usually groundwater quality is adapted by the hydrological cycle that depends on the natural and anthropogenic processes. Change in

quality of natural waters may disturb the equilibrium in between different forms of life and finally would become unfit for projected purpose of the human being. The main aim of study is to report of quality of the groundwater of Sultanpur Area in district Kota of Rajasthan (India). (See Figure:-1)

EXPERIMENTAL

In the present study we take 15 samples of ground water collected from tube well and kept in glass bottles carefully rinsed 2-3 times. Water samples were collected after pumping the water for 15 minutes. Water samples were analyzed for various physico-chemical parameters using standard methods.

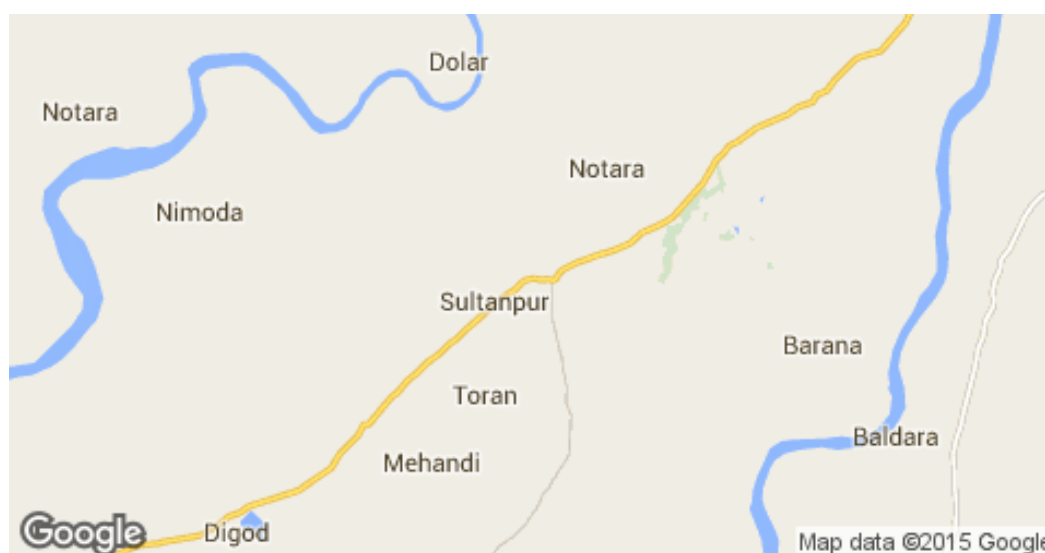


Figure:-1

Total hardness and calcium hardness were determined by Complexometric method by

EDTA titration using Eriochrome black –T (EBT). Total Alkalinity (TA), carbonate

and bicarbonate concentration were estimated by titrametric methods using phenolphthalein and methyl-orange indicator. For determination of chloride we use $K_2Cr_2O_7$ indicator via Argentometric method. Fluoride nitrate and sulphate concentration determined by Spectrophotometer.

FIELD DATA COLLECTION

GROUND WATER READINGS:

Readings considered in the study were taken from 20th August 2018 to 20th September 2018. In total 135 readings were taken on 20 days out of total period of 30 days. On any given day readings were taken in one direction only. Readings are divided on the basis of the source in two parts. Following are the locations where readings are taken:-

Table:-1

	Sample Place	Sample place Code
1.	Sultanpur Dhan Mandi	S1
2.	Sultanpur (near police station)	S2
3.	Bhankya Village	S3
4.	Napaheda village	S4
5.	Kishorpura village	S5
6.	Amarpura village	S6
7.	Dhanwa village	S7
8.	Notara village	S8
9.	Morapa village	S9
10.	Jalimpura village	S10
11.	Medhpura village	S11
12.	Banethya village	S12
13.	Mundla village	S13
14.	Toran village	S14

15.	Jhotoli village	S15
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RESULT AND DISCUSSION

To explore the groundwater quality of Sultanpur area 9 different physicochemical Parameters i.e. pH, TDS, total alkalinity, total hardness, chloride, fluoride, nitrate, sulphate and Phosphate were determined of the groundwater samples.

Table:-2

S.NO.	Sample Code	PRAMETERS								
		PH	TDS	Total hardness	Total alkalinity	Cl ⁻	SO ₄ ²⁻	NO ₃ ⁻	F ⁻	PO ₄ ³⁻
1.	S1	8.3	849	671	395	90	107	57	1.7	4.6
2.	S2	8.0	860	369	279	51	57	29	1.0	5.9
3.	S3	8.1	941	723	260	74	81	45	1.5	9.8
4.	S4	8.3	975	656	415	81	90	61	1.8	6.5
5.	S5	8.4	1128	849	430	81	108	36	1.6	7.2
6.	S6	8.1	885	561	285	60	62	47	1.4	8.1
7.	S7	8.3	924	425	321	76	87	57	1.2	9.8
8.	S8	8.4	823	293	347	89	103	59	1.5	7.6
9.	S9	8.5	1045	536	411	93	61	32	1.3	6.9
10.	S10	8.1	898	703	295	57	91	46	1.5	9.3
11.	S11	8.3	909	307	261	81	97	52	1.1	4.7
12.	S12	8.5	954	830	447	89	86	43	1.4	8.1
13.	S13	8.2	983	707	343	57	67	65	1.6	9.1
14.	S14	8.4	863	482	331	65	109	39	1.9	5.1
15.	S15	8.4	929	456	438	79	90	56	1.7	7.3

- Maximum Chloride is present in the sample of S9 & Minimum chloride is present in the sample of S2.
- Maximum fluoride is present in the sample of S14 & Minimum fluoride is present in the sample of S2.

- Maximum Sulphate is present in the sample of S14 & Minimum Sulphate is present in the sample of S2.

CONCLUSION

Physicochemical characteristics of groundwater of Sultanpur Area were analyzed to evaluate factors, influencing the groundwater chemistry of the study area. During study period of 20 days, 15 ground water samples collected for physicochemical analysis of Sultanpur Area.

It is concluded that nitrate concentration in groundwater exceeded due to agricultural practices in nearby area and other anthropogenic activities in Sultanpur Area. The nitrate contaminated ground water can never be put into fit category for drinking purpose.

On the other hand concentration of fluoride, chloride in groundwater is based on the run off and infiltration of chemical fertilizers in agricultural areas and liquid waste from industrial sources. Hence, the quality of groundwater cannot be said absolutely fit for drinking Purpose. At some of the sites of the study area some essential treatment method's needed to Apply so that groundwater can be utilized for drinking. Therefore the population

intend of the rural area is at higher potential risk of related diseases. It is recommended that Groundwater analysis should be carried out at definite time intervals to monitor the quality and to explore the rate and type of contamination. Awareness among people of the rural area is needed to maintain the cleanliness and purity of water to achieve a healthy life.

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