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RESEARCH ARTICLE

CORROSIVITY OF GROUNDWATER OF MAHAWA VILLAGE OF NEEMKATHANA BLOCK SIKAR, (RAJASTHAN) INDIA

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ABSTRACT

Availability of safe drinking water is of utmost importance, as the decline in groundwater quality over the past few decades is shown in most parts of the country. Due to the unavailability of surface water people are dependent on groundwater. Mahawa village of Neemkathana block is taken to evaluate its corrosivity within the assessment period from Jan-2022 to Dec-2022, by the Physico-chemical analysis of groundwater samples collected from the handpump.

INTRODUCTION

Approximately the world's one-third population uses groundwater for drinking purposes (Nickson *et al.*, 2005). A report published by the Central Ground Water Board for the assessment of groundwater level status of an aquifer in India reported that other than Fatehpur block, all blocks of Sikar are Over-exploited for the domestic or other purposes. Neemkathana block being an over-exploited block, water table is continuously having more depth day by day resulting into degradation of quality of groundwater. Aquifers are very convenient sources of groundwater because they are natural underground reservoirs and can have an enormous storage capacity (Morris *et al.*, 2003). As stated by UNESCO (Foster *et al.*, 2006) the concept of overexploitation indicates an imbalance within the groundwater budget of the aquifer. When water abstraction from an aquifer is or will be close to, or greater than, the total recharge, it is often said to be overexploited (Custodio, 2002). The industry's effluents, domestic sewage, dump sites, and fertilizers contributed to the contamination of groundwater by infiltrating into the underground aquifer and posing a potential risk to the receptors (Nalbantçılar *et al.*, 2015; Ali *et al.*, 2012).

According to Khosravi *et al.*, (2016) groundwater resources have contributed significantly in terms of demand for drinking and irrigation due to the lack of surface water in arid and semi-arid regions. The American Water Works Association (AWWA) developed the Aggressive Index as a part of Standard C-400, which indicates the corrosive tendency of water (Trenchless Pedia, n. d.).

RESULTS AND DISCUSSION

Assessment of groundwater of Mahawa village in Neemkathana block: Groundwater samples from Mahawa village were collected for the assessment period of Jan-2022 to Dec-2022 and analyzed for selected physico-chemical parameters. The results of physico-chemical parameters shown in the Table 2.

Aggressive index: Aggressive index value calculated for the groundwater sample for the assessment period are given in the table below

Table 1. Aggressive Index value and class of groundwater

Aggressive index (AI)	Aggressive Index Value	Class of water
	AI > 12	Non-aggressive
	10 < AI < 12	Moderately aggressive
	AI < 10	Very aggressive

Table 2. Test results of groundwater of Mahava village

Water testing of Mahava Village in Neemkathana								
Month	pH	Total Alkalinity, mg/L CaCO ₃	Total Hardness, mg/L	Chloride, mg/L	Sulphate, mg/L	Nitrate, mg/L	Fluoride, mg/L	TDS, mg/L
Jan-22	7.8	350	420	150	52	58	1.22	1879
Feb-22	7.5	320	410	130	43	45	1.24	1790
Mar-22	7.8	344	400	125	45	45	1.02	1750
Apr-22	7.4	340	395	130	48	42	1.12	1780
May-22	7.6	343	390	127	46	38	1.05	1810
Jun-22	7.9	342	392	130	45	52	1.23	1780
Jul-22	7.6	310	390	125	50	54	1.05	1755
Aug-22	7.4	325	380	130	52	56	1.02	1690
Sep-22	7.6	328	391	124	45	70	1.02	1720
Oct-22	7.5	330	385	132	48	59	1.1	1750
Nov-22	7.4	325	390	124	52	45	1.04	1780
Dec-22	7.9	340	395	130	54	51	1.05	1525

Table 3. Aggressive Index of groundwater of Mahava village

Aggressive Index value												
Month	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
AI	12.96	12.61	12.93	12.52	12.72	13.02	12.68	12.49	12.70	12.60	12.50	13.02

CONCLUSION

Results for hardness, alkalinity and TDS parameters were above the acceptable limit. Aggressive index value for the assessment period are above 12 so groundwater of Mahava village is non aggressive in nature so can be stored and supplied through metal pipelines. The groundwater of Mahava village is found suitable for human health for the assessment period.

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