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Quality assessment of groundwater quality parameters and their correlation with industrial pollution near the catchment area of Kothari River, Bhilwara (Rajasthan, India)

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ABSTRACT

This study is based on groundwater physicochemical parameters and their correlation with industrial pollutants to evaluate the quality of groundwater near the catchment area of Kothari River (Bhilwara). Kothari River originates from the patches of Aravalli Hills and flows through the Rajsamand and Bhilwara district of Rajasthan for about 145 km. In Bhilwara, the catchment area of Kothari River has many textile and other industrial units and these industrial units disposes large amount of untreated toxic industrial pollutants in the Kothari. The groundwater resources near Kothari River has greatly been affected by the untreated textile and other industrial disposals. This research work was studied the effect of industrial pollutants on the quality of groundwater near Kothari River. The groundwater was bottled from twelve sampling sites during April-May, 2021. The groundwater quality parameters are pH, electrical conductivity (EC), total dissolved solids (TDS), total hardness (TH), chloride (Cl^-), fluoride (F^-), sulphate (SO_4^{2-}), biochemical oxygen demand (BOD), chemical oxygen demand (COD), iron (Fe), lead (Pb), zinc (Zn), nickel (Ni), copper (Cu), cadmium (Cd), chromium (Cr), arsenic (As), etc. It was perceived that the physicochemical properties of groundwater near Kothari River (Bhilwara) were not as per drinking water standards of BIS and WHO, and found unsuitable for drinking purposes. The correlation between quality parameters and industrial pollutants shown that the groundwater near the catchment area of Kothari River were contaminated with untreated disposals of textile and other industrial pollutants.

Key words : *Kothari River (Bhilwara), Groundwater, Physico-chemical parameters, Industrial pollution, Groundwater pollution*

Introduction

The existence of groundwater in Rajasthan is very critical because of the poor yearly rainfall and overexploitations (Hussain *et al.,* 2013). Groundwater resources is the only significant natural resources of freshwater and the quality of groundwater is greatly affected by the various factors such as depth, geochemical processes, recharged water quality, overexploitation, average yearly rainfall and pollutions (Meena *et al.*, 2016; Sharma and Bhattacharya, 2017; Vasanthavigar *et al.,* 2010). In Rajasthan, groundwater is the primary source of freshwater and largely exploited meant for the drinking, domestic and irrigational purposes (Chinnasamy *et al.*, 2015). Therefore, the quality of groundwater is degraded by such activities.

Bhilwara is very important district of Rajasthan (India) and situated at the centre of Rajasthan state where groundwater is the primary source of water

for general activities since Bhilwara has many rivers such as Kothari, Banas, Menali, Bedach, Khari and Mansi River. In Bhilwara district, the quality and availability of groundwater is very poor due to the overexploitation, uneven distribution and industrial pollution (Pandey *et al.*, 2021). Mishra and co-authors has been reported the water quality index (WQI) of Kothari River water and found that the Kothari River's water is polluted due to industrial pollution and need to treat before usage (Mishra *et al.*, 2020). The groundwater resources near river basin area of Jahzpur tehsil of Bhilwara has been studied and found that the groundwater can only be appropriate for drinking and domestic initiatives after taking appropriate treatment to remove excess TH, TDS, F^-, Cl^-, NO_3^- and HCO_3^- (Meena *et al.*, 2016). The quality of groundwater near industrial area of Bhilwara has also been studied and most of the samples found unsuitable for irrigational purposes (Hussain *et al.*, 2001). The groundwater resources are greatly affected due to the disposal of large amount of untreated industrial pollutants. The quality of groundwater near the catchment area of Kothari River is not so far reported and therefore, it is required to evaluate the quality parameters and impacts of industrial pollutants on the groundwater near the catchment area of Kothari River of Bhilwara (Rajasthan).

In this study, the researcher has reported the physicochemical parameters and their correlation with industrial pollutants to evaluate the quality of groundwater near the catchment area of Kothari River (Bhilwara). For the groundwater quality evaluation, twelve groundwater specimens were bottled from the catchment area of Kothari River (Bhilwara) during April-May, 2021. The groundwater specimens were evaluated for the various physicochemical parameters following the SOPs of American Public Health Association (APHA, 1989). From the study, it was perceived that the physicochemical parameters of groundwater near the catchment area of Kothari River were not as per the drinking water standards of BIS and WHO (BIS, 2012; WHO, 2017) and owing to this, the groundwater near Kothari River found unsafe for drinking purposes. The correlation between quality parameters and industrial pollutants shown that the groundwater near the catchment area of Kothari River were contaminated with untreated disposals of textile and other industrial pollutants.

Materials and Methods

Description of Kothari River (Bhilwara, Rajasthan): This research work was directed at the physicochemical investigation of groundwater near the catchment area of Kothari River, Bhilwara, Rajasthan (Fig. 1). Kothari River originates from the patches of eastern slopes of Aravalli Hills near Devgarh-Mandal (Rajasthan) and flows through Rajsamand and Bhilwara district for about 145 km. The water of Kothari River finally merges with the

Fig. 1. Satellite view of the catchment area of Kothari River, Bhilwara (Rajasthan) with highlighted groundwater sampling sites (K-1 to K-12).

water of Banas River near Nandrai village in Bhilwara district after traveling about 145 km. The catchment area of Kothari River geographically coordinated between 25.242° to 025.579° North latitude and 73.792° to 75.058° East longitude in Bhilwara and Rajsamand district of Rajasthan. Bhilwara is the biggest manufacturer of fabrics in India and known as "Textile City of India". Bhilwara has thousands of textile industrial units that spinning and dyeing cotton fabrics at large scale.

Description of the groundwater sampling near Kothari River (Bhilwara): Groundwater specimens were bottled from various sampling sites from the villages near the catchment area of Kothari River, Bhilwara (Rajasthan) during the period of April-May, 2021 by applying the standard sampling procedure. In this study, the groundwater specimens were carefully bottled from various sources such as open wells, borewells and handpumps. All the groundwater specimens were preserved in fresh screw capped bottles. The groundwater specimens were then stored in standard condition in cool and dark area for further analysis. See Fig. 1 for the satellite view of the catchment area of Kothari River (Bhilwara, Rajasthan) from where the groundwater specimens were bottled for analysis. The code name of highlighted sampling sites in satellite map is quoted in Table 1.

Physicochemical of groundwater near Kothari River (Bhilwara): The groundwater specimens were bottled by applying the standard procedure and were then estimated for various physico-chemical quality parameters. The characterization of groundwater specimens was performed in research laboratory to determine the degree of contamination in comparison to drinking water standards of BIS (2012); WHO (2017). The bottled groundwater specimens were preliminarily analyzed for pH, EC and TDS at the time of sampling. For the other physicochemical parameters, the groundwater specimens were brought to the research laboratory and stored in standard condition. The parameters such as F^-, Cl^-, SO_4^{2-}, TH, BOD, COD, Fe, Pb, Zn, Ni, Cu, Cd, Cr and As in groundwater specimens were tested in research laboratory. All physico-chemical parameters were analyzed as per the standard operating procedures (SOPs) of APHA (1989). The characteristic data of the groundwater specimens given in the Table 2 and Table 3. In Table 2 and Table 3, the experiential results of groundwater specimens were also compared with the drinking water standards of BIS (2012; WHO, 2017).

Results and Discussion

Kothari River originates from the patches of eastern slopes of Aravalli Hills near Devgarh-Mandal (Rajasthan) and flows generally in a western-to-eastern direction through Rajsamand and Bhilwara district. The entire length of the Kothari River is about 145 km, which completely lies in Rajsamand and Bhilwara district of Rajasthan. It is a major tributary of the Banas River, to which it meets near Nandrai village in Bhilwara district (Rajasthan). The water of Kothari River finally merges with the water of Banas River near Nandrai village in Bhilwara district after traveling about 145 km. The catchment area of Kothari River geographically coordinated between 25.242° to 025.579° North latitude and 73.792° to

Table 1. List of groundwater sampling sites near catchment area of Kothari River, Bhilwara (Rajasthan) with their sample code name as mentioned in satellite map and type of sources.

Entry	Code	Name of Sampling Sites	Details (Type of source)
1.	K-1	Govindpura, Bhilwara	Bhilwara Dairy (Tubewell)
2.	K-2	Akola, Bhilwara	Bheru Nath Temple (Tubewell)
3.	K-3	Dhoomras, Bhilwara	Jungle Camp (Open well)
4.	K-4	Kodu Kota, Bhilwara	Private Farm (Open well)
5.	K-5	Satola, Bhilwara	Private Farm (Tubewell)
6.	K-6	Salriya, Bhilwara	Private Farm (Tubewell)
7.	K-7	Sawaipur, Bhilwara	School (Handpump)
8.	K-8	Jityas, Bhilwara	Private Farm (Open well)
9.	K-9	Redwas, Bhilwara	Teja Ji Mandir (Handpump)
10.	K-10	Gothra, Bhilwara	Private Farm (Tubewell)
11.	K-11	Mataji ka Khera, Bhilwara	Charbhuja Mandir (Handpump)
12.	K-12	Nandrai, Bhilwara	Beneshwar Mahadev Mandir (Tubewell)

75.058° East longitude in Bhilwara and Rajsamand district of Rajasthan. The general layout of Kothari River is shown in Fig. 1.

Bhilwara is one of the economically important districts of Rajasthan and it is the major hub of textile and dying industries in India. It is the biggest manufacturer of fabrics in India and therefore, Bhilwara is also known as "Textile City of India" (Hussain *et al.*, 2001). Bhilwara is basically have large number of small, medium and large textile industrial units that spinning and dying cotton fabrics at large scale. Apart from the textile industries, Bhilwara also have other industrial units belongs to the field of tobacco, rubber, stone, stone arts, construction materials, paper, food, chemicals, minerals, etc. Therefore, Bhilwara is a growing industrial area and hence, the Kothari River water and groundwater from the catchment area of Kothari River are broadly polluted owing to the large number of industrial units and disposal of toxic industrial pollutants without giving any pretreatment. The pollution is the drastic problem for the locals who live near the catchment area of Kothari River. Therefore, it is necessary to evaluate the quality of groundwater near catchment area of Kothari River (Bhilwara) with special reference to the impact of industrial pollutants on the quality of groundwater.

For the quality assessment of groundwater near catchment area of Kothari River (Bhilwara), about twelve groundwater specimens were bottled from twelve different groundwater sampling sites near catchment area of Kothari River during the period of April-May, 2021 (Table 1). The groundwater specimens were primarily analyzed for pH, EC and TDS, and later analyzed in the research laboratory for the F^-, Cl^-, SO_4^{2-}, TH, BOD, COD, Fe, Pb, Zn, Ni, Cu, Cd, Cr and As using SOPs of APHA (APHA, 1989). The observed parameters of groundwater specimens of catchment area of Kothari River are demonstrated in Table 2 and 3. All the quality parameters were compared with the drinking water standards of BIS and WHO (BIS, 2012; WHO, 2017).

Results of quality parameters of groundwater near the catchment area of Kothari River (Bhilwara)

pH of groundwater **:** The pH of groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of pH 7.09 to pH 8.73 (Table 2) with an average of pH 7.88. Therefore, the pH of the groundwater indicates that the groundwater is slightly to moderately alkaline in nature and suitable for the drinking and other purposes. The pH of all twelve sampling sites near the catchment area of Kothari River and their averages under the range of agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012;

Table 2. Quality parameters of various groundwater specimens of Kothari River's catchment area, Bhilwara (Rajasthan) bottled during the period of April-May, 2021 and their comparison with drinking water standards of BIS and WHO.

Water Sample	Name of Physico-chemical Parameters								
	pH	EC	TDS	TH	F^-	Cl^-	SO_4^{2-}	COD	BOD
BIS Std. *	6.5-8.5	-	500	200	1.00	250	200	-	-
WHO Std. **	6.5-8.5	400	600	200	1.50	250	250	-	-
K-1	7.81	4712	2310	814.70	2.43	1137.90	338.41	36.80	7.88
K-2	8.03	3009	1461	467.52	1.89	666.21	180.57	45.90	6.45
K-3	7.60	3692	1879	760.99	2.05	898.35	271.70	14.95	2.00
K-4	7.95	1642	788	304.17	3.11	367.68	96.37	29.00	4.06
K-5	8.73	2105	1056	424.51	1.97	514.80	150.37	23.35	5.10
K-6	8.54	2235	1143	404.62	1.74	569.09	153.84	16.40	2.00
K-7	7.64	2374	1223	484.97	1.66	550.36	141.74	15.60	2.00
K-8	7.58	1496	754	275.69	2.31	325.80	120.48	12.50	2.00
K-9	8.01	2366	1169	349.53	2.19	525.47	158.28	18.25	3.66
K-10	8.20	3154	1589	667.38	1.79	736.50	232.94	39.10	9.12
K-11	7.09	4322	2145	810.88	1.86	1024.67	321.95	15.65	2.50
K-12	7.41	2634	1327	489.63	2.50	640.54	162.59	17.80	4.57

Note: EC measure in ˜S/cm; and other parameters except pH and EC measures in mg/l; EC = Electrical Conductivity; TDS = Total dissolve solids; TH = Total Hardness as CaCO3; COD = Chemical oxygen demand; BOD = Biochemical oxygen demand; * BIS-2012 (IS 10500: 2012) agreeable drinking water standards (BIS, 2012); ** WHO-2004 & WHO-2017 agreeable drinking water standards (WHO, 2017; Al-Khashman *et al.*, 2017).

WHO, 2017).

***EC of groundwater*:** The EC of groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 1496 µS/cm to 4712 µS/cm (Table 2) with an average of 2811.75 µS/cm. Therefore, the groundwater resources found to have high EC and the higher EC indicates that the groundwater contains high concentration of dissolved ionic constituents. The groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) and their averages exceeds the agreeable limits of drinking water standards as prescribed by WHO-2004 (Al-Khashman *et al.*, 2017).

***TDS of groundwater*:** The TDS of groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 754 mg/l to 2310 mg/l (Table 2) with an average of 1403.67 mg/l. Therefore, the groundwater resources found to have high TDS and the higher TDS indicates that the groundwater contains high concentration of dissolved inorganic and organic constituents. The groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) and their averages exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017) and owing to this, the groundwater is unsafe for human drinking.

***TH of groundwater* :** The TH of groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 275.69 mg/l as $CaCO_3$ to 814.70 mg/l as $CaCO_3$ (Table 2) with an average of 521.22 mg/l as $CaCO_3$. Therefore, the groundwater resources found to have high TH and the higher TH indicates that the groundwater contains high concentration of calcium and magnesium hardness. The groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) and their averages exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017) and owing to this, the groundwater is unsafe for human drinking.

Fluoride (F^-) in groundwater: F^- in groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 1.66 mg/l to 3.11 mg/l (Table 2) with an average of 2.125 mg/l. Therefore, the groundwater resources found to have moderately high concentration of F^- near Kothari River (Bhilwara). The groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) and their averages exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017) and owing to this, the groundwater is unsafe for human drinking.

Chloride (Cl^-) in groundwater: Cl^- in groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 325.80 mg/l to 1137.90 mg/l (Table 2) with an average of 663.11 mg/l. Therefore, the groundwater resources found to have high concentration of Cl– near Kothari River (Bhilwara). The groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) and their averages exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017) and owing to this, the groundwater is unsafe for human drinking.

Sulphate (SO_4^{2-}) in groundwater: SO_4^{2-} in groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 96.37 mg/l to 338.41 mg/l (Table 2) with an average of 194.10 mg/l. Therefore, the groundwater resources found to have low concentration of SO_4^{2-} near Kothari River (Bhilwara). The groundwater of four sampling sites out of twelve sampling sites near the catchment area of Kothari River (Bhilwara) exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017) and owing to this, the groundwater of these four sites is unsafe for human drinking.

COD in groundwater: The COD in groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 12.50 mg/l O_2 to 45.90 mg/l O_2 (Table 2) with an average of 23.775 mg/l O_2. Therefore, the groundwater resources found to have slightly high COD near Kothari River (Bhilwara) and high COD of groundwater specimens indicates that the groundwater contains large amount of oxidizable organic and inorganic chemical pollutants. The high COD of groundwater specimens is owing to the industrial pollution and therefore, the groundwater is unsafe for human drinking.

BOD in groundwater: The BOD in groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 2.00 mg/l O_2 to 9.12 mg/l O_2 (Table 2) with an average of 4.278 mg/l O_2. Therefore, the some of the groundwater resources found to have high BOD near Kothari River (Bhilwara) and high BOD of groundwater specimens indicates that the groundwater contains large

number of microorganisms and organic matters in water (Connor, 2016; EPA, 2001). The high BOD of groundwater specimens is owing to the industrial pollution and therefore, the groundwater is unsafe for human drinking.

Iron (Fe) in groundwater: Fe in groundwater specimens of the catchment area of Kothari River (Bhilwara) varied in the range of 0.19 mg/l to 5.50 mg/l (Table 3) with an average of 1.594 mg/l. The groundwater resources found to have high concentration of Fe near Kothari River (Bhilwara). The groundwater of eleven sampling sites except K-3 near the catchment area of Kothari River (Bhilwara) and their averages exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017) and owing to this, the groundwater is unsafe for human drinking.

Lead (Pb) in groundwater: Pb in groundwater specimens of the catchment area of Kothari River (Bhilwara) was detected in two sampling sites only and maximum 0.01 mg/l Pb was recorded in both K-1 and K-2 groundwater specimens (Table 3). Therefore, the groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) doesn't exceed the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017).

Zinc (Zn) in groundwater: Zn in groundwater specimens of the catchment area of Kothari River (Bhilwara) was detected in all sampling sites and varied in the range of 0.98 mg/l to 7.23 mg/l (Table 3) with an average of 3.745 mg/l. The groundwater of four sampling sites near the catchment area of Kothari River (Bhilwara) exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017).

Nickel (Ni) in groundwater: Ni in groundwater specimens of the catchment area of Kothari River (Bhilwara) was detected in three sampling sites only and maximum 0.01 mg/l Ni was recorded in K-5 groundwater specimen (Table 3). Therefore, the groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) doesn't exceed the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017).

Copper (Cu) in groundwater: Cu in groundwater specimens of the catchment area of Kothari River (Bhilwara) was detected in two sampling sites only and maximum 0.02 mg/l Cu was recorded in K-3 groundwater specimen (Table 3). Therefore, the groundwater of all twelve sampling sites near the catchment area of Kothari River (Bhilwara) doesn't exceed the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017).

Table 3. Heavy metal element concentration in various groundwater specimens of Kothari River's catchment area, Bhilwara (Rajasthan) bottled during the period of April-May, 2021 and their comparison with drinking water standards of BIS and WHO.

Water Sample	Name of Physico-chemical Parameters							
	Fe	Pb	Zn	Ni	Cu	Cd	Cr	As
BIS Std. *	0.30	0.01	5.00	0.02	0.05	0.003	0.05	0.01
WHO Std. **	0.30	0.01	5.00	0.02	2.00	0.003	0.05	0.01
K-1	1.22	0.01	3.05	0.009	ND	ND	0.06	0.015
K-2	0.85	0.01	3.19	ND	ND	ND	0.03	0.02
K-3	0.19	ND	1.58	ND	0.02	ND	ND	ND
K-4	0.46	ND	6.37	ND	ND	ND	ND	ND
K-5	0.56	ND	5.02	0.01	ND	ND	ND	0.011
K-6	0.32	ND	1.86	ND	ND	ND	0.008	0.009
K-7	0.68	ND	0.98	ND	ND	ND	0.031	0.015
K-8	1.43	ND	5.64	ND	ND	ND	ND	ND
K-9	3.09	ND	2.56	ND	ND	ND	ND	ND
K-10	5.50	ND	4.69	ND	0.01	ND	0.055	0.019
K-11	2.11	ND	2.78	0.006	ND	ND	ND	0.01
K-12	2.72	ND	7.23	ND	ND	ND	ND	0.01

Note: All metal concentrations measures in mg/l; ND = Not detected; * BIS-2012 (IS 10500: 2012) agreeable drinking water standards (BIS, 2012); and ** WHO-2017 drinking water standards (WHO, 2017).

Cadmium (Cd) in groundwater: Cd was not detected in all twelve groundwater specimens of the catchment area of Kothari River (Bhilwara)(Table 3).

Chromium (Cr) in groundwater: Cr in groundwater specimens of the catchment area of Kothari River (Bhilwara) was detected in five sampling sites and maximum 0.06 mg/l Cr was recorded in K-1 groundwater specimen (Table 3). Therefore, the groundwater of two sampling sites near the catchment area of Kothari River (Bhilwara) exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017).

Arsenic (As) in groundwater: As in groundwater specimens of the catchment area of Kothari River (Bhilwara) was detected in eight sampling sites and maximum 0.02 mg/l As was recorded in K-2 groundwater specimen (Table 3). Therefore, the groundwater of five sampling sites near the catchment area of Kothari River (Bhilwara) exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017). The groundwater with high concentration of As is unsafe for human drinking.

Discussion of quality parameters of groundwater near catchment area of Kothari River (Bhilwara)

The groundwater near catchment area of Kothari River (Bhilwara) was evaluated for seventeen physicochemical parameters. The groundwater quality parameters are pH, EC, TDS, TH, Cl^-, F^-, SO_4^{2-}, COD, BOD, Fe, Pb, Zn, Ni, Cu, Cd, Cr, and As. The average results of the groundwater quality parameters of the current study has shown that the quality parameters such as pH, SO_4^{2-}, Pb, Ni, Cu, Cd, and Cr found under the agreeable limits of drinking water standards or not detected in few samples. The quality parameters such as EC, TDS, TH, Cl^-, F^-, and As exceeds the agreeable limits of drinking water standards as prescribed by BIS and WHO (BIS, 2012; WHO, 2017). The high TDS and TH may cause several negative impacts on the human body. The excess concentration of fluorides may cause mild dental and skeletal fluorosis in human beings (Brindha and Elango, 2011). The higher concentration of salts in groundwater resources is owing to the overexploitation and earth crust rocks and minerals that can dissolve in groundwater. The high BOD, COD and heavy metal components in groundwater resources is owing to the industrial pollution near the catchment area of Kothari River (Bhilwara) since the catchment area of Kothari River has large number of industrial units and indicates that the water is unsafe for human drinking as per the guidelines of both BIS and WHO.

Conclusion

The catchment area of Kothari River (Bhilwara, Rajasthan) is in the main emphasis for the study of physicochemical parameters and correlation with the industrial pollution to evaluate the quality of groundwater. The catchment area of Kothari River has many textile and other industrial units and these industrial units disposes large amount of untreated toxic industrial pollutants in the water of Kothari River. In this research work, the groundwater specimens were bottled from twelve sampling sites during April-May, 2021 and investigated for the various quality parameters. This study was perceived that the groundwater near catchment area of Kothari River were not as per drinking water standards of BIS and WHO, and found unsuitable for drinking purposes. The groundwater quality parameters such as EC, TDS, TH, Cl^-, F^-, and As were recorded above the maximum agreeable limits of drinking water standards. The parameters such as pH, SO_4^{2-}, Pb, Ni, Cu, Cd, and Cr fall under the agreeable limit or not detected in few specimens. The correlation study between quality parameters and industrial pollutants shown that the groundwater near the catchment area of Kothari River were contaminated with untreated disposals of textile and other industrial pollutants and found unsafe for human consumptions.

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