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Data Article

Data on trend changes of drinking groundwater resources quality in Sabzevar city (A case study)



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ABSTRACT

The data of this study was conducted to evaluate the groundwater quality trend changes in Sabzevar (Iran, Khorasan Razavi) during one decade (2006–2016). The Mean $\pm$ SD of electrical conductivity (as $\mu\text{mhos/cm}$), total hardness (as calcium carbonate, mg/l) and total dissolved solid in the first and end year of the study were 605.45 ± 194.69 and 695.22 ± 288.52 , 198.77 ± 56.83 and 214.45 ± 84.73 , 350.25 ± 106.81 and 486.44 ± 183.52 respectively. At the end of the results were compared with WHO (World Health Organization) guideline and Iranian drinking water standard (No. 1053). The results show that all of the evaluated parameters were less than the WHO guideline and the Iranian drinking water standard, only the TH (Total Hardness) was higher than the standard range. On the basis of Pearson correlation coefficient, the ascending trend of some parameters concentration with time was significant at the level of 95% of confidence limits ($\alpha \leq 0.05$).

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Specifications Table

Subject area	Water chemistry
More specific	Describe narrower subject area
Type of Data	Tables, Figures
How data was acquired	The required data were collected from the results recorded in the water in the Water and Wastewater Company of Khorasan Razavi province during the years 2006–2016
Data format	Raw, Analyzed
Experimental factors	All water samples in polyethylene bottles were stored in a dark place at room temperature until the parameters analysis
Data source location	Sabzevar, Khorasan Razavi province, Iran
Data accessibility	Data are included in this article and supplement file excel

Value of data

- Determination of the physical and chemical parameters including pH, TDS, TH, EC, Ca^{2+} , Mg^{2+} , HCO_3^- , Na^+ , K^+ , Cl^- and SO_4^{2-} in groundwater was evaluated in Sabzevar urban area, Khorasan Razavi province, Iran.
- Continuing the ascending trend of the parameters concentration and declining the quality of water resources and incompatibility with Iranian drinking water standard can lead to significant health risks.
- Data of this study can help to better understand the quality of groundwater in this area.
- Tracking the trend changes, investigating the reasons and preventive measures are important.

1. Data

Data presented here deal with monitoring of physical and chemical including pH, Na^+ , Ca^{2+} , Mg^{2+} , K^+ , EC, TDS, HCO_3^- , SO_4^{2-} , Cl^- , and TH as in Sabzevar, Khorasan Razavi Province, Iran. Fig. 1 shows the study area. A summary of Water quality characteristics and correlation of the parameters with time are presented in Tables 1 and 2 respectively. Charts 1–11 show trend changes in parameters in the years (2006–2016).



Fig. 1. Location of the study area in Sabzevar, Khorasan Razavi province, Iran.

2. Experimental design, materials and methods

2.1. Study area description

Sabzevar is one of the largest cities in Khorasan Razavi province in Northeastern Iran. Sabzevar is located in Khorasan Razavi province at UTM coordinates of $X = 560516.13$ and $Y = 4011898.18$ ($57^{\circ}40'$ East longitude and $36^{\circ}15'$ North latitude) [1–5]. The climate of the Sabzevar is dry, and the precipitation average is 188.6 mm/year. Also the air's highest and lowest temperatures are 42.5°C and -5.1°C , respectively, with an annual average of 18.5°C (Fig. 1).

Table 1

Chemical analysis report of water quality of drinking groundwater resource of Sabzevar city.

Year	pH	Na ⁺ (mg/L)	Ca ²⁺ (mg/L)	Mg ²⁺ (mg/L)	K ⁺ (mg/L)	Hco ₃ ⁻ (mg/L)	So ₄ ²⁻ (mg/L)	Cl ⁻ (mg/L)	TDS (mg/L)	TH (mg/L as CaCO ₃)	EC (μmhos/ cm)
2006	7.25	50.85	43.15	20.08	1.22	218.20	73.40	25.75	350.25	198.77	605.45
2007	8.04	50.95	44.25	22.25	1.15	250.36	94.48	26.45	375.05	201.23	625.24
2008	8.49	48.66	49.78	19.85	3.04	203.45	82.24	28.12	401.25	205.05	614.12
2009	8.44	49.56	52.32	24.22	1.46	247.25	98.17	23.55	425.13	210.22	536.21
2010	7.82	49.55	52.65	23.25	1.38	245.55	101.25	26.02	385.25	215.99	715.12
2011	7.58	51.60	54.56	22.62	1.33	232.25	95.25	21.32	437.52	228.45	725.23
2012	8.09	56.38	59.45	26.04	2.25	262.81	91.17	24.74	445.02	210.12	725.45
2013	7.41	53.39	55.31	23.12	1.56	259.25	96.25	30.54	450.35	219.45	733.12
2014	7.33	52.22	54.38	24.38	2.22	248.55	91.78	26.38	456.25	233.66	712.22
2015	7.20	49.52	47.22	23.12	1.59	212.45	99.74	27.09	407.85	224.76	732.12
2016	7.33	50.45	49.64	22.97	1.23	262.25	85.45	28.13	486.44	214.45	695.22
Mean	7.72	51.19	51.15	22.90	1.67	240.21	91.74	26.19	420.03	214.74	674.50
Max	8.49	56.38	59.45	26.04	3.04	262.81	101.25	30.54	486.44	233.66	733.12
Min	7.20	48.66	43.15	19.85	1.15	203.45	73.40	21.32	350.25	198.77	536.21
S.D	0.476	2.196	4.930	1.782	0.586	20.686	8.381	2.456	40.250	11.150	67.373
WHO	6.5–8.5	400	250	150	–	–	200	200	500	200	–
1053IR	6.5–8.5	200	300	30	–	–	250	250	1000	200	–

Table 2

Pearson correlation of the chemical parameters.

	pH	Na ⁺	Ca ²⁺	Mg ²⁺	K ⁺	Hco ₃ ⁻	So ₄ ²⁻	Cl ⁻	TDS	TH	EC
pH	1										
Na ⁺	-.121	1									
Ca ²⁺	-.575	.465	1								
Mg ²⁺	-.470	.137	.672*	1							
K ⁺	-.168	.388	.444	.590	1						
Hco ₃ ⁻	-.226	-.054	.177	-.113	.112	1					
So ₄ ²⁻	.099	.018	.345	.519	.210	.018	1				
Cl ⁻	-.030	.599	.252	.128	.568	.599	.252	1			
TDS	.434	.100	.010	.052	.148	.100	.010	.052	1		
TH	.020	.610*	.392	.456	.577	.610*	.392	.456	.577	1	
EC	.177	.629*	.475	.511	.658*	.629*	.475	.511	.658*	-.228	1

* Correlation is significant at the 0.05 level (2-tailed)

Table 3
Number of water samples in years studied (2006–2016).

Year	Number of samples
2006	68
2007	56
2008	85
2009	80
2010	65
2011	75
2012	73
2013	84
2014	79
2015	72
2016	68
Total	805

2.2. Data collection

The required data were collected from the results recorded in the water in the Iran Water resources management Company during the years 2006–2016. In this study, 805 samples were analyzed by descriptive and analytical statistics (correlation coefficients) in 10 years (Table 3). The important major cations and anions in water samples were analyzed following a standard method (APHA 2008) [6–16].

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Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.dib.2018.08.175>.

References

[1] A.I. Amouei, A.H. Mahvi, A.A. Mohammadi, H.A. Asgharnia, S.H. Fallah, A.A. Khafajeh, Physical and chemical quality assessment of potable groundwater in rural areas of Khaf, Iran, *World Appl. Sci. J.* 18 (2012) 693–697.

[2] M. Yousefi, H. Najafi Saleh, A.A. Mohammad, A.H. Mahvi, M. Ghadrpoori, H. Suleimani, Data on water quality index for the groundwater in rural area Neyshabur County, Razavi province, Iran, *Data Brief* 15 (2017) 901–907.

[3] A. Amouei, A. Mohammadi, Z. Koshki, H. Asgharnia, S. Fallah, H. Tabarinia, Nitrate and Nitrite in available bottled water in babol (Mazandaran; Iran) in Summer 2010, *J. Babol Univ. Med. Sci.* 14 (2012) 64–70.

[4] A.A. Mohammadi, K. Yaghmaeian, H. Faraji, R. Nabizadeh, M.H. Dehghani, J.K. Khaili, et al., Temporal and spatial variation of chemical parameter concentration in drinking water resources of Bandar-e Gaz City using geographic information system, *Desalination Water Treat.* 68 (2017) 170–176.

[5] A. Abbasnia, N. Yousefi, A.H. Mahvi, R. Nabizadeh, M. Radfard, M. Yousefi, M. Ali mohammadi, Evaluation of groundwater quality using water quality index and its suitability for assessing water for drinking and irrigation purposes; case study of Sistan and Baluchistan province (Iran), *Hum. Ecol. Risk Assess.: Int. J.* (2018), <https://doi.org/10.1080/10807039.2018.1458596>.

[6] M. Yousefi, M.H. Dehghani, S.M. Nasab, V. Taghavimanesh, S. Nazmara, A.A. Mohammadi, Data on trend changes of drinking groundwater resources quality: a case study in Abhar, *Data Brief* 17 (2018) 424–430.

[7] F.B. Asghari, A.A. Mohammadi, M.H. Dehghani, Data on assessment of groundwater quality with application of ArcGIS in Zanjan, Iran, *Data Brief* 18 (2018) 375–379.

- [8] V. Kazemi Moghadam, M. Yousefi, A. Khosravi, M. Yaseri, A.H. Mahvi, M. Hadei, A.A. Mohammadi, Z. Robati, A. Mokamel, High concentration of fluoride can be increased risk of abortion, *Biol. Trace Elem. Res.* (2018), <https://doi.org/10.1007/s12011-018-1250-0>.
- [9] M. Yousefi, M. Yaseri, R. Nabizadeh, E. Hooshmand, M. Jalilzadeh, A.H. Mahvi, A.A. Mohammadi, Association of hypertension, body mass index and waist circumference with fluoride intake; water drinking in residents of fluoride endemic areas, Iran, *Biol. Trace Elem. Res.* (2018), <https://doi.org/10.1007/s12011-018-1269-2>.
- [10] A.A. Mohammadi, M. Yousefi, M. Yaseri, M. Jalilzadeh, A.H. Mahvi, Skeletal fluorosis in relation to drinking water in rural areas of West Azerbaijan, Iran, *Sci. Rep.* 7 (2017) 17300.
- [11] F.B. Asghari, J. Jaafari, M. Yousefi, A.A. Mohammadi, R. Dehghanzadeh, Evaluation of water corrosion, scaling extent and heterotrophic plate count bacteria in asbestos and polyethylene pipes in drinking water distribution system, *Hum. Ecol. Risk Assess.: Int. J.* 24 (2018) 1138–1149.
- [12] M. Yousefi, M. Ghoochani, A.H. Mahvi, Health risk assessment to fluoride in drinking water of rural residents living in the Poldasht city, Northwest of Iran, *Ecotoxicol. Environ. Saf.* 148 (2018) 426–430.
- [13] H. Soleimani, A. Abbasnia, M. Yousefi, A.A. Mohammadi, F.C. Khorasgani, Data on assessment of groundwater quality for drinking and irrigation in rural area Sarpol-e Zahab city, Kermanshah province, Iran, *Data Brief* 17 (2018) 148–156.
- [14] H. Amini, G.A. Haghighat, M. Yunesian, R. Nabizadeh, A.H. Mahvi, M.H. Dehghani, et al., Spatial and temporal variability of fluoride concentrations in groundwater resources of Larestan and Gerash regions in Iran from 2003 to 2010, *Environ. Geochem. Health* 38 (2016) 25–37.
- [15] M. Shams, R. Nabizadeh Nodehi, M.H. Dehghani, M. Younesian, A.H. Mahvia, Efficiency of granular ferric hydroxide (GFH) for removal of fluoride from water, *Fluoride* 43 (2010) 61–66.
- [16] M.H. Dehghani, G.A. Haghighat, M. Yousefi, Data on fluoride concentration in drinking water resources in Iran: a case study of Fars province; Larestan region, *Data Brief* 19 (2018) 842–846.