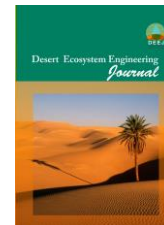




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Assessment of Groundwater Quality Changes and Evaluation of IRWQIGC in Lenjanat-Najafabad Aquifers Area

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Extended Abstract

Introduction: Groundwater is the main source of water supply for agricultural purposes, especially in arid and semi-arid regions. the Water Quality Index (WQI) is used to provide early and quick results of the assessment of water quality status, IRWQI has been developed with the aim of using appropriate method with natural conditions and water resources issues in Iran. In this research, the trend analysis of parameters and quality assessment of groundwater resources of Lenjanat-Najafabad aquifer using IRWQIGC are reviewed.

Materials and methods: In this research, the time variation of water quality parameters was investigated using data from four different sources including Regional Water Company of Isfahan, Water and Wastewater Company of Isfahan Province, Isfahan Urban Water and Wastewater Company, and Isfahan University. Based on these, qualitative analysis of presentation Became The data for the time period (1995-2016) include EC, TDS, SAR, PH, TH and also NO₃ and heavy metals including zinc, copper, lead, cadmium and arsenic. The water quality in Lenjanat-Najafabad was evaluated for agriculture and drink using the Wilcox and Schuler classification. ArcGIS software can be used for mapping the mapping of different interpolation methods. In the present study, the RMSE index was used to determine the appropriate method. In this region, the Kriging method is more appropriate.

Results: The average spatial temporal of quality parameters in Lenjanat range was compared in four-time intervals and the results indicate a decrease in the quality of groundwater resources in recent years. The trend of changes in parameters compared to the aquifer volume showed that in addition to reducing the size of the aquifer, there has been an increase in the incidence of contamination in the aquifer in recent years. In Lenjanat, agricultural water classification is mainly in the C2-S1, C3-S1 and C3-S2 regions, and in Najafabad in C2-S1, C3-S1 and C4-S2. The classification of drinking water according to the Shouler diagram in Lenjanat is mostly good and acceptable, and in Najafabad it was mostly found in acceptable and moderate class, and in some cases inappropriate. The amount of heavy metals is within the limits. The zonation of nitrate and IRWQIGC

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index were performed using Kriging method. The average nitrate value in Najafabad was 63/13 mg / L. The IRWQIGC index was calculated in Najafabad at 19/8 and in Langunat, 35/9, indicating poor water quality in the area.

Discussion and Conclusion: The results showed that in addition to decreasing the size of the aquifer, there has been an increase in the incidence of contamination in the aquifer in recent years. It can be concluded that by decreasing the size of the aquifer from the other side and increasing the input of pollutants to groundwater resources, on the other hand, the increase of water pollution in the aquifer is evident. In other studies, researchers also examined the process of changing the quality parameters for the assessment of the quality of groundwater resources, as well as the Schuler and Wilcox diagram for water quality classification. The amount of nitrate in the range of Najafabad is the highest and the average spatial range of samples measured in this range exceeds the limit. Regarding the quality of water resources in the Lenjanat-Najafabad aquifer based on Iran Water Quality Index (IRWQI), the IRWQIGC index was used in this study for groundwater resources. Other researchers also used the WQI index for review. The quality of water resources is appropriate, but in the present study, considering that the research area in Iran is located, this indicator, but suitable for the conditions of IRWQI country, was used. Indicator zonation in the study area was performed using Kriging method and the results indicate that the index is low and as a result of inappropriate water quality of the region, especially in Najafabad, the index is less and water quality is inappropriate. Nitrate zoning map in this study area also shows an amount beyond the limit of nitrate in the areas mentioned. Other researchers have also introduced the Kriging method as a suitable method for mapping the map. If one of the main causes of high nitrate levels is agricultural activity in the area, it can be said that pollutants related to the use of chemical pesticides should be considered in future measurements. The trend analysis in Isfahan Regional Water Data showed that the water quality in the resources in the aquifer area has become worse with time. However, how big the share of each pollutant is, with the amount of information available, is difficult to quantify, but the approach of not polluting water resources should certainly be considered as a national approach.

Keywords: Groundwater, IRWQIGC, Kriging, Lenjanat-Najafabad.