Evaluation of Karoon river water quality using NSFWQI and IRWQIsc and determination of weight values in those indices using cluster analysis and analytical hierarchy process

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Abstract

Karoon River is the most important river in Iran and covers numerous people. So, it is essential to note its quality. Regarding that, last ten-year data (2009-2018) from Molasani, Ahwaz and Farsiat were used to evaluate Karoon River. Parameters were consisted of Ca, Mg, Na, K, CO_3, HCO_3, EC, pH, TDS, turbidity (T), temperature (Tm) and discharge flow (Q). In order to evaluate river quality, two quality criteria, NSFWQI and IRWQIsc, were used. In addition, cluster analysis (CA) was used to clustering Karoon parameters and analytical hierarchy process (AHP) was used to weigh those parameters and evaluation abovementioned quality criteria. Results showed that there were seven, nine and ten clusters for Ahwaz, Farsiat and Molasani stations, respectively. Based on NSFWQI and IRWQIsc results, the river quality ranged 55-62 and 39-48, respectively. So, its quality was in average and semi bad-average class, respectively. Parameters SAR, Ca, Na, K, EC, TDS, Cl, SO_4 and Mg had the highest weights in all stations based on clustering and AHP method. Comparison between NSFWQI and IRWQIsc showed that IRWQIsc value was closer to current river condition. However, it is recommended to use newer standard for monitoring Karoon River quality using CA results.

Keywords: Ahwaz, AHP Method, Parameters Clustering, River Quality.