

Hydrochemical Assessment and Quality Classification of Water in Torogh and Kardeh Dam Reservoirs, North-East Iran

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Abstract : Khorasan Razavi is the second most important province in north-east of Iran, which faces a water shortage crisis due to recent droughts and huge water consumption. Kardeh and Torogh dam reservoirs in this province provide a notable part of Mashhad metropolitan (with more than 4.5 million inhabitants) potable water needs. Hydrochemical analyses on these dam reservoirs samples demonstrate that MgHCO_3 in Kardeh and CaHCO_3 and to lower extent MgHCO_3 water types in Torogh dam reservoir are dominant. On the other hand, Gibbs binary diagram demonstrates that rock weathering is the main factor controlling water quality in dam reservoirs. Plotting dam reservoir samples on $\text{Mg}^{2+}/\text{Na}^{+}$ and $\text{HCO}_3^{-}/\text{Na}^{+}$ vs. $\text{Ca}^{2+}/\text{Na}^{+}$ diagrams demonstrate evaporative and carbonate mineral dissolution is the dominant rock weathering ion sources in these dam reservoirs. Cluster Analyses (CA) also demonstrate intense role of rock weathering mainly (carbonate and evaporative minerals dissolution) in water quality of these dam reservoirs. Studying water quality by the U.S. National Sanitation Foundation (NSF) WQI index NSF-WQI, Oregon Water Quality Index (OWQI) and Canadian Water Quality Index DWQI index show moderate and good quality.

Keywords : hydrochemistry, water quality classification, water quality indexes, Torogh and Kardeh dam reservoir

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