Groundwater quality assessment for different purposes in Eshtehard district, Tehran, Iran

ABSTRACT

Eshtehard district is characterized with semiarid climate and due to insufficient surface water resources, groundwater is the main water supply in this region. In order to evaluate the major suitability of water for drinking, domestic use and irrigation, the chemical characteristics of groundwater in Eshtehard district have been investigated and evaluated. Water samples from tube wells, dug wells and qanats are collected and analyzed for pH, electrical conductivity (EC), total dissolved solids (TDS), Na+, K+, Ca2+, Mg2+, HCO3-, Cl-, and SO42-. To understand the water quality and utilitarian aspects of groundwater, chemical indices like percent sodium, Sodium Adsorption Ratio (SAR), Wilcox diagram and Salinity diagram were calculated based on the analytical results. It is observed that the quality of groundwater is not suitable for drinking and domestic purpose in most water samples. According to the EC and SAR calculation the most dominant classes (C2-S1, C3-S2, C4-S3 and C4-S4) were found. Salinity hazard in 37% of water samples is regarded as medium while in 15 and 48% of water samples is classified as high and very high respectively. Such waters are not suitable for irrigation under normal condition and further action for salinity control is required in remediating such problem. Sodium content in 42% of water samples collected is regarded as low and can be used for irrigation in almost all soils. Thus high salinity, SAR and Na% in most water samples have restricted the water quality for irrigation purposes.

Keyword: Groundwater quality; Iran; Major ions; Semi-arid climate; WHO standards