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Irrigation Water Quality Evaluation in Jiaokou Irrigation District, Guanzhong Basin

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Abstract : Groundwater is an important water resource in the world, especially in arid and semi-arid regions. In the present study, 141 groundwater samples were collected and analyzed for various physicochemical parameters to assess the irrigation water quality using six indicators (sodium percentage (Na%), sodium adsorption ratio (SAR), magnesium hazard (MH), residual sodium carbonate (RSC), permeability index (PI), and potential salinity (PS)). The results show that the patterns for the average cation and anion concentrations were in decreasing orders of Na[□] > Mg²[□] > Ca²[□] > K[□]and SO₄²[□] > HCO₃[□] > Cl[□] > NO₃[□] > CO₃²[□] > F[□], respectively. The values of Na%, MH, and PS show that most of the groundwater samples are not suitable for irrigation. The same conclusion is drawn from the USSL and Wilcox diagrams. PS values indicate that Cl[□]and SO₄²[□]have a great influence on irrigation water in Jiaokou Irrigation District. RSC and PI values indicate that more than half of groundwater samples are suitable for irrigation. The finding is beneficial for the policymakers for future water management schemes to achieve a sustainable development goal.

Keywords : groundwater chemistry, Guanzhong Basin, irrigation water quality evaluation, Jiaokou Irrigation District
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