

**Groundwater Quality Assessment Using Irrigation Water Quality Index and GIS in Baghdad, Iraq**

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**Abstract**

**Twelve water samples were collected to evaluate groundwater quality in Baghdad city, Iraq using the irrigation water quality index (IWQI) method with the help of the Geographical Information System (GIS) technique. Five chemical parameters were used including Electrical Conductivity (EC), Cl<sup>-</sup>, HCO<sub>3</sub><sup>-1</sup>, Na % and Sodium Absorption Ratio (SAR) to create the database of water quality. These parameters have been inputted to the GIS platform to produce a spatial distribution map for each parameter using the inverse interpolation technique (IDW). These parameters were used to calculate water quality index values which were also reassigned to the GIS environment to generate the IWQI maps. The map results showed that only 25 % of the studied samples fall in Low Restriction (LR) categories indicating that this water can be used for irrigation purposes without reservation. 94 % of the groundwater was found to be moderate to highly restricted for use in irrigation and can be used only in soils with a high permeability without**

**compact layers, requiring moderate leaching of salts. The map results also showed that 26 % of the studied water samples should be avoided and not used for irrigation under normal conditions because they fall within the Severe Restriction (SR) categories. The former type can be used only if the soil permeability is high, and the excess of water is applied to avoid the accumulation of salt.**

**Keywords: Irrigation Water Quality Index (IWQI), GIS, Baghdad, Iraq**