

Hydrochemical Characterization and Groundwater Evaluation of the Area West El-Minia District, Egypt

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The present study assesses groundwater resources of the densely populated area of Egypt by integrating conventional hydrochemistry and statistical analysis. Since the quantity and quality of water available for irrigation in Egypt is variable from place to place. Groundwater is exploited from Pleistocene aquifer which represents the main aquifer in the study area and it is composed of sands and gravels of different sizes, with some clay intercalations. Chemical characterization and quality of groundwater in west El-Minia district mainly depends on the complete chemical analysis of collecting 88 samples covered all the study area. The groundwater samples were categorized as $\text{Ca}(\text{HCO}_3)_2$ water type, and the hydrochemical classification shows that, most of the studied water samples are meteoric origin. The quality assessment was made by estimating pH, electrical conductivity, total dissolved solids, and hardness, besides major cations (Ca^{2+} , Mg^{2+} , Na^+ , and K^+) and anions (HCO_3^- , Cl^- , and SO_4^{2-}). As well as, irrigation quality parameters were calculated, i.e., sodium absorption ratio, Na %, residual sodium carbonate, concentration of boron, total hardness, and permeability index. The results indicate that most of the collected water samples are suitable for drinking and irrigation purposes.