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Evaluating the Suitability of Shallow Aquifer for Irrigational Purposes in Some Parts of Kelantan, Malaysia

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Groundwater is a very important asset to the people of the Kelantan, Malaysia where most the water requirements are met by groundwater. Groundwater serves as the most reliable source of water for their domestic and agricultural activities. This study was aimed at assessing the suitability of groundwater for irrigational purposes in some selected communities of Kelantan where farming activities are very intensive. Thirty-two (29 groundwater and 3 surface water) samples were collected and analysed for major anions and cations. Physicochemical parameters such as electrical conductivity (EC) and total dissolved solids (TDS) were also measured. From the results of the analyses and measurements, the suitability of the groundwater for irrigation were evaluated based on the TDS, EC, percentage sodium (%Na), sodium adsorption ratio (SAR), residual sodium carbonate (RSC), Boron classification and Nitrate. US salinity laboratory (USSL) diagram and distribution maps of different parameters were also applied in the present investigation. In terms of quality assessment as irrigation water, the analysis from SAR plots indicates that groundwater are categorized in excellence class. In sodium percentage technique, most of the samples are plotted in doubtful class with few samples in permissible class. In residual sodium carbonate technique, majority of the samples exhibit doubtful class with only few samples in permissible limit. Other samples recorded are not suitable for irrigation. Based on the boron classification, almost all of the boron concentration suggests excellent water class in the study area. The groundwater in the study area is generally good for irrigation purposes. However, there are few instances which are problematic and would require special irrigation methods.

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