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Groundwater demand projection in Albashiry basin–central Sudan

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Drinking water supply in Northern Kordofan State relies on groundwater for more than 65% of the total consumption. In Bara Basin Cretaceous sediments extend underlying the Umm Ruwaba sediments. The main purpose of this study is to assess the potential of the aquifer to satisfy the Bara well field needs. The designed model would predict the possible drawdown for 25 years due to planned groundwater development in the project area. The scenario assessed by the study was continuous pumping at the current rate of abstraction from Bara well field and other wells tapping the basin. The current abstraction was estimated at 100m3/d for the shallow aquifer and 300m3/d from wells tapping the lower aquifer. The main aquifer extends vertically from a depth of 181m to 480m, with high penetration rate from 265m to 338m. According to the model water budget, inflow from the neighbouring aquifer environments is estimated at ~ 26,000 m3/day. The safe yield of the lower confined aquifer is linked to a dynamic water level on top of this aquifer i.e. less than 181m. Safe yield of the lower aquifer can be estimated from the presented model results. In confined aquifer conditions, safe yield is the volume abstracted without aquifer dewatering (piezometric levels decline below the deep aquifer top (320 to 465 m NN)). Thus according to the model calculated drawdown, after 20 years under the current rate of abstraction the aquifer remains under confined conditions with an average dynamic water level of more than 25 m above the top of the deep aquifer.

Biography

Khalid Kheiralla has completed his PhD at the age of 30 years from TU-Frieberg High Academic. He is the Head of the Geophysics Department – FPM – Al Neelain University. He has published more than 10 papers in reputed national and international journals and serving more than 40 technical project inside and outside Sudan.

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