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Assessment of water resources in Khor Gabeit and Khor Adalaweb areas, Gabeita L Maaden, Red sea state

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This study aimed at assessing water resources in Wadi Gabeit and Wadi Adalaweb areas in the Red Sea State. Morphologically, the area is divided into three distinctive parts, the upper mountainous, the downstream, and the delta of Khor Arbaat where agriculture was practiced by the local people. Geologically the area is occupied by intermediate-basic metavolcanics with granitic rocks that intruded by acidic and basic dykes of NNE-SSW and NNW-SSE directions. The Wadi drainage is seasonal and the shallow wells have accessed small aquifer of palaeo-water accumulations that may not sustain prolonged usage. Wells commonly occupy changes in wadis direction which indicates that rock barriers have provided natural dams interrupting the flow of water through the Wadi gravels. The average measured annual discharge of Wadi is about 18.4 million m³ however, extreme values and no values were also recorded in the data. Generally the flow is erratic and displays a wide variability in run off values over years. Groundwater resource associates with the alluvium sediments; underlain by fractured basement rocks, along the channel of Khor Gabeit and Khor Adalaweb basins. The aquifer is considered as an anisotropic body. Generally, depth to groundwater varies from 1-31 m depending on type of aquifer, the time of the year, location, intensity of the flood and the relative elevation of ground surface. Considering the aquifer areal coverage, thickness, effective porosity, the storage capacity of khorGabeit aquifer is conservatively estimated at 12.6 million m³. Results of the pumping test have revealed a transmissivity (T) range 0.84×10²-0.86×10² m²/day. Dam construction will create positive impacts asrecharging groundwater thus improving well productivities and groundwater quality, and negative impacts as causing of groundwater recession and dryness of the open wells used for small agricultural production by local farmers in the delta area as well as reducing the base flow almost by 50%.

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