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# Impacts of Desalinated Irrigation Water in the Abu Dhabi surficial aquifer

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Abu Dhabi is one of the arid regions in the world having less than 100 mm of rainfall per annum. The renewability of freshwater occurs only in the eastern part. The groundwater resources under desirable quality are very scarce due to limited dilution/rainfall and higher rate of evaporation. Hence, in recent decades, desalinated water has been introduced for agriculture activities and surplus desalinated water is injected into the aquifer as artificial recharge. This study is conducted to understand the impacts in the aquifer system caused by the introduction of desalinated water for agriculture activities and for aquifer recharge structures. The simulation was carried out from 2000 to 2050 using reported rate of groundwater pumping and of desalinated water with 0.1 g/l, 0.5 g/l, 1 g/l, 1.5 g/l and 2 g/l degrees of salinity. A wide range of decline in the groundwater table is noticed in the western part of the aquifer due to less rainfall recharge. The results confirm that this region demands either reduction in agricultural activities or additional usage of desalinated water by which the pumping of groundwater can be reduced further. The improvement in the groundwater quality is noticed in the aquifer due to the addition of less saline desalinated water into the aquifer. This study confirms the long term suitability of existing aquifer recharge structure. Also, it expresses the need of further management practices in quantifying the desalinated water contribution for agriculture activities.

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