

Assessment of Groundwater Recharge Methods in Arid and Semiarid Regions.

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Abstract:

The limited availability of fresh water and its acute scarcity has led to the greater emphasis on water resources management. Rainfall is the primary source of natural water replenishment. Part of the rainfall flows as surface runoff and part infiltrates to the ground after the initial losses. Changes in the climatic condition have increased the rainfall frequency and intensity even in the Arab gulf region. Recharge is a critical parameter for understanding, modelling and protecting groundwater systems from overexploitation and contamination. Adopting the concept of sustainability and conservation of water resources using artificial recharge techniques can help to cope with the global water shortage. This study discusses the effect of hydraulic and geotechnical parameters on the different groundwater recharge methods with reference to three methods frequently used in KSA (surface spreading, injection wells into Vadose zone and direct injection wells into the aquifer. In each method, recharge capacity is evaluated at different geotechnical parameters. Also, the effect of geotechnical parameters on wetted front and infiltration rate of surface spreading

methods are studied. Moreover, the effect of deposition of suspended fines i.e. clogging on the recharge rate is studied.