



Hydrogeophysical characterization of shallow unconsolidated sediments for the artificial groundwater recharge in a water curtain cultivation area

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A water curtain cultivation system is usually used to offer a stable heat source using a geothermal heat of groundwater. However, it may cause groundwater drawdown by an excessive use of groundwater such as over-pumping. Therefore, as part of an effort to develop a sustainable water curtain system, artificial groundwater recharge is projected to minimize groundwater shortage problem and recover groundwater level. Geophysical approaches are systematically applied to characterize unconsolidated sediments and riverside porous aquifers for the artificial groundwater recharge in a water curtain cultivation area. Resistivity survey is applied to map the distribution of subsurface structure, especially unconsolidated sediments. A series of test holes are drilled, and water level, temperature, and groundwater electrical conductivity are monitored to characterize hydrogeological properties of the site. The natural gamma and induction profiles enable us to estimate stratigraphic cross section and interpret inter-borehole. Borehole compensated neutron porosity is derived for a small-diameter, dual-detector neutron logs. Consequently, geophysical methods could enhance knowledge of the physical properties of unconsolidated sediments, and they are expected to evaluate injection feasibility of artificial groundwater recharge systems to the sustainable water resource management.