

Tank management in Andhra Pradesh, India: percolation versus irrigation

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Abstract Hard-rock aquifers located in semi-arid climatic conditions are especially prone to over-exploitation because of limited storage and recharge. In Andhra Pradesh (southern India), such geological and climatic settings prevail, and rapid increase in groundwater abstraction for irrigation has led to aquifer over-exploitation in many districts. As a response to over-exploitation, Central and State governments have launched watershed development programmes aiming at augmenting aquifer recharge using different man-made structures such as percolation tanks, check dams and defunct dug wells. The objective of the present study is to determine an accurate water budget for one experimental tank and then to simulate different tank water management practices with the scope to optimise water use. The selected tank is located in Gajwel watershed, 60 km north of Hyderabad, India, and has a maximum storage capacity of about 105 000 m³. During one recession period, the water budget is calculated under present site conditions (percolation tank) and another water budget is simulated for the case of use of tank water for irrigation. Conjunctive use (i.e. optimised use of tank water complemented, if required, by groundwater) proves to be beneficial for the overall water budget as evaporative loss is minimised.

Key words tanks; hard-rock aquifer; semi-arid climate; water management; conjunctive use; India