Role of aquifer storage and recovery for harmonising irrigation with environment in connected systems

Shahbaz Khan, CSIRO and Charles Sturt University, Tariq Rana, CSIRO, Shahbaz Mushtaq, Charles Sturt University

The flows in regulated rivers are strongly dependent on water demand by downstream water users. In irrigated catchments the river flow regimes are altered to cater for crop demand. The impacts of these altered flows can have significant deleterious ecological impacts. There can be a number of opportunities to manipulate irrigation demand and supply in a way that provides better seasonality of flows and optimises the social, environmental and economic outcomes from water use in a catchment. This paper explores groundwater–surface water substitution as a possible way to change water demand patterns. Results of a modelling study show that conjunctive water use through more groundwater extraction or infiltration and extraction is also a realistic option capable of replacing over 215GL of peak period surface water use with minimum cost to overall agricultural return. To secure 215GL of water through an aquifer storage and recovery program would cost around $8.96 million.