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Impact of irrigation intensification on inter-sectoral water allocation in a deficit catchment in India

T. V. RESHMIDEVI & SHRINIVAS BADIGER
Centre for Inter-disciplinary Studies in Environment and Development, ISEC Campus, Nagarbhavi, Bangalore 560072, India
reshmidevi@isec.ac.in

Abstract Agricultural intensification across peninsular India has resulted in an increase in the demand for irrigation water leading to unsustainable extraction of surface and groundwater resources. This paper presents the case study of inter-sectoral conflicts arising from depleting resources in the Malaprabha sub-basin in Karnataka, India. Due to the changes in agricultural practices, drastic changes are happening in the hydrological regimes across the catchment including reduced streamflow and groundwater depletion. Consequently, this results in acute annual and seasonal scarcity of drinking water in urban and rural settlements. Hydrological modelling of the catchment is carried out using the ArcView integrated Soil and Water Assessment Tool (AVSWAT) to simulate streamflow. In order to study the anthropogenic impacts, various land-use scenarios are identified after considering various socio-economic and institutional constraints in the catchment. Considering the irrigation and drinking water supply requirements, the paper also presents outcomes of land-use changes on inter-sectoral water allocation that essentially prioritizes the drinking water demands of an urban settlement.

Key words water scarcity; irrigation; inter-sectoral water allocation; land-use change