

Insights from an Experiment to Gauge an Ungauged Catchment: Rapid Data Assessment, Eco-Hydrological Modelling and Lacking Crop Feedbacks.

Land use decision support modelling is one way to analyse strategies to balance ecological, societal and economical concerns. Insights to an optimal use of (water) resources are especially needed in data scarce regions, which often contradicts model applications. We present an experiment to combine a parsimonious data assessment and eco-hydrological decision support modelling in a data scarce rural semi-arid catchment at the lower mesoscale in central India.

Linking bottom-up sampling of functionally representative soil classes and top-down regionalisation based on spectral properties of the same resulted in a comprehensive data basis for the model. A clear focus on the dominating processes and the catena as organising landscape element in the given environmental setting enabled this.

We employ WASA (Güntner and Bronstert 2004) for uncalibrated water balance modelling and integrate a crop simulation subroutine based on SWAP (van Dam et al. 2008) in order to account for crop dynamics and feedbacks. The model is further used as decision support system (DSS) incorporating a cropping agent for land use strategy analysis and a simple weather generator.

While we find the data assessment strategy and the hydrological model application largely feasible under the given constraints, the simulation of feedbacks of crops within the hydrological cycle is problematic. Even full coupling of well-established models does not assure that they produce the right feedbacks. However, the DSS indicates that land use strategies should be site specific to result in distinct optima.