

Enhancing a socio-hydrological modelling framework through field observations: a case study in India

Nadja den Besten (1), Saket Pande (2), and Huub H. G. Savenije (3)

(1) Delft University of Technology, Delft, Netherlands (n.i.denbesten@student.tudelft.nl), (2) Delft University of Technology, Delft, Netherlands (s.pande@tudelft.nl), (3) Delft University of Technology, Delft, Netherlands (h.h.g.savenije@tudelft.nl)

Recently a smallholder socio-hydrological modelling framework was proposed and deployed to understand the underlying dynamics of Agrarian Crisis in Maharashtra state of India. It was found that cotton and sugarcane smallholders whom lack irrigation and storage techniques are most susceptible to distress.

This study further expands the application of the modelling framework to other crops that are abundant in the state of Maharashtra, such as Paddy, Jowar and Soyabean to assess whether the conclusions on the possible causes behind smallholder distress still hold. Further, a fieldwork will be undertaken in March 2016 in the district of Pune. During the fieldwork 50 smallholders will be interviewed in which socio-hydrological assumptions on hydrology and capital equations and corresponding closure relationships, incorporated the current model, will be put to test. Besides the assumptions, the questionnaires will be used to better understand the hydrological reality of the farm holders, in terms of water usage and storage capacity. In combination with historical records on the smallholders' socio-economic data acquired over the last thirty years available through several NGOs in the region, socio-hydrological realism of the modelling framework will be enhanced.

The preliminary outcomes of a desktop study show the possibilities of a water-centric modelling framework in understanding the constraints on smallholder farming. The results and methods described can be a first step guiding following research on the modelling framework: a start in testing the framework in multiple rural locations around the globe.