



WASA-SED: The application of a new modelling tool to simulate the generation, transport and retention processes of sediments in dryland regions of Spain and Brazil

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A process-based, semi-distributed modelling framework, WASA-SED, has been developed, that models the erosion processes at the hillslope scale, the transport processes of suspended and bedload fluxes at the river scale and the retention and remobilisation processes of sediments at the reservoir scale in dryland catchments. The modelling framework has been developed to ensure sustainable water management for dryland regions whose water supply often depends strongly on water stored in artificial reservoirs. With the aim of implementing adequate process formulations, hydrological multi-scale data sets from dryland catchments, rivers, and reservoirs in Spain and north-eastern Brazil are used and expanded by own measurements. Modelling approaches and supporting measurements are designed according to a multi-scale approach in order to capture the effect of small scale processes and landscape features on the large-scale overall hydrological dynamics. The study presents modelling scenarios that examine the link between severe erosion in headwater catchments and the resulting sedimentation of downstream reservoirs. The modelling tool WASA-SED enables the evaluation of management options both for sustainable land-use change to reduce

erosion as well as adequate reservoir management options to reduce the deposition of sediments in large reservoirs.