



Measurement and Modelling of Erosion and Sediment Transport from Headwaters to large Catchments: A Research Project to reduce Reservoir Sedimentation in semi-arid Environments

A. Bronstert (1), **E.N. Müller** (1), J.C. de Araujo (2), R.J. Batalla (3,4), T. Francke (1), A. Güntner (5), G. Mamede (1,2)

(1) Institute of Geocology, University of Potsdam, Postfach 60 15 53, 14415 Potsdam, Germany, (2) Department of Hydraulic and Environmental Engineering, Federal University of Ceara, Fortaleza, Campus do Pici, 60455-760 Fortaleza, Ceara, Brazil, (3) Department of Environmental and Soil Sciences, University of Lleida, 25918 Lleida, Catalonia, Spain, (4) Forest Technology Centre of Catalonia, Pujada del Seminari, 25280 Solsona, Spain (5) GeoForschungsZentrum Potsdam, Telegrafenberg, 14473 Potsdam, Germany (enmue@uni-potsdam.de / Phone: 0049-331-977-2975)

In dryland environments, water availability for human, agricultural and industrial use often relies on the retention of surface water in artificial reservoirs. Erosion of the land surface and deposition of the eroded material in such reservoirs threatens the reliability of reservoirs as a source of water supply. An international research consortium is currently setting up a modelling system for the quantitative assessment of sediment mobilisation in catchments, sediment transport in the river system, and sediment retention in reservoirs. The focus is laid on meso-scale river basins (several hundreds to thousands of square kilometres in size) in semi-arid regions. An existing hydrological model tailored for specific semi-arid characteristics is extended with components representing erosion and sediment transport processes. 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. This contribution presents first results, in particular concerning an adequate represen-

tation of erosion-prone landscape units, the role of suspended and bed-load sediment transport in dryland rivers and the efficiency of small and large reservoirs to trap the sediments. It has already become clear that only an integrated management of all aspects of the sediment budget, i.e. from the catchment scale with its intrinsic land-use characteristics over sediment transport in rivers to reservoir sedimentation will ensure a more sustainable management of reservoirs in dryland environments.