



Modelling soil erosion by water in a large sub-humid tropical catchment

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This study is part of the interdisciplinary research project GLOWA IMPETUS (Integrated water resource management in West Africa) and examines soil erosion by water in the upper Ouémé catchment (15.000 km², Benin) using an hierarchic approach. Previous erosion studies in this project were mainly focused on erosion plots in a small subcatchment (Aguima, 3km²). Hydrological modelling was performed with the continuous, semi-distributed physically based model SWAT (Soil water assessment tool) and the conceptual model UHP for different subcatchments (580-10.000km²). The local studies showed up to 20 times higher erosion values for agricultural land than for savannah depending on the landuse system and the settlement history. The hydrological part of the SWAT model for Terou subcatchment (2300km²) was successfully calibrated and validated for the period 1998-2003. Reliable continuous data sets for calibration and validation of sediment yield were lacking. Meanwhile continuous measurements of suspended sediment using turbidimeters are carried out at four sites of the Upper Ouémé catchment. The calculated calibration curves are satisfying but demand for some improvements in the next rainy season. Currently scenarios until the year 2025 are calculated for Terou catchment to study the effects of global change on water and sediment yield. In contrast to common simple lumped scenarios spatially explicit information about possible future landuse distribution and climate parameters are prepared from other project members. For applying the SWAT model to the whole upper Ouémé catchment an improvement of the available soil type map 1:200.000 was required. Measurements of physical and chemical soil properties were performed to link soil map to model parameters. A better delineation of hydromorphic soils by means of a digital elevation model and remote sensing was hampered by their small extension and high variability of soil texture. To adress farmers needs the modelling and field results for soil erosion will be related to soil fertility loss via simple indicators

like the FAO fertility capability index.