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SOIL EROSION MODELLING IN THE MBULUZI RIVER CATCHMENT (SWAZILAND, SOUTH AFRICA)

PART II SEDIMENT YIELD ANALYSES

ABSTRACT: MÄRKER M., DLAMINI D., MATONDO J., RODOLFI G. & SCHULZE R., *Soil Erosion Modelling in the Mbuluzi River Catchment (Swaziland, South Africa). Part II: Sediment Yield analyses.* (IT ISSN 0391-9838, 2001).

As stated by many authors in the recent past, soil erosion is one of the major environmental problems in Southern Africa and will in future become even more severe owing to population growth and potential climatic changes.

This study regards the application of the Universal Soil Loss Equation in the Mbuluzi-river catchment in Swaziland. It has been carried out within the framework of an interdisciplinary EU-funded Project aimed at developing an Integrated Water Resources Management System (IWRMS) for water resources analyses and prognostic scenario planning in semi-arid catchments of southern Africa.

In this more general framework two methods of spatial discrimination of erosion processes at catchment scale have been tested.

On one hand the Erosion Response Units (ERUs) concept (see Märker & *alii*, 2001) has been used for sediment source area identification and as a distributed modelling structure for the subsequent soil erosion modelling based on the Universal Soil Loss Equation (USLE) (Wischmeier & Smith, 1978) as well as on gully erosion models (Sidorchuk, 1999). On the other hand, the ACRU Agrohydrological Modelling System (Schulze, 1995; Smithers & Schulze, 1995) was used to simulate the erosion dynamics at a catchment scale using a semi-distributed method. This case study from southern Africa shows that the erosion processes active in the catchment can be described only partly with the traditional USLE applications whereas the more detailed distributed modelling structure of the ERU concept is able to deliver more information about the individual erosion processes and their location. Especially the gully erosion processes, which are widely distributed all over Swaziland, can be identified and subsequently modelled in order to estimate the quality and quantity of these erosion processes.

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