



RECARE MSc / PhD Research Information

Research Title

MODELING EROSION AND TRANSPORT PROCESSES IN THE CATCHMENTS OF SLOVAKIA

Abstract

The term "water erosion" belongs among serious degradation processes of soil, which not only cause the deterioration of the quality and fertility of soil, but can also cause the complete loss of a soil profile. Although water erosion, especially on agricultural land, is a process which we cannot completely prevent by appropriate agrotechnical, organizational and technical measures, we know a considerable amount as to how to reduce its intensity. One of the many regions significantly threatened by water erosion in Slovakia is the area of the Myjava Hills. The causes of the accelerated soil erosion and the related issue of the intensive transport of soil particles are often associated with muddy floods, especially in association with intensive farming, which uses slopes as arable land. Therefore, the main objective of this research work is to establish a methodology for assessing vulnerability to soil erosion in different catchments of Slovakia. Scenarios will be used for the evaluations, which will simulate rainfall - runoff relations and erosion processes. The simulations will focus on estimating the loss of soil, surface runoff and sediment transport. For a quality simulation of these processes, it is necessary to use physically or conceptually based models (PESERA or SMODERP, etc.). The simulation models will be used for assessing the effectiveness of the erosion control measures realized or for their design in risk areas. These models will be quantified and verified on the basis of the field measurements.

Objectives of the research

(i) develop a methodology for analysis of erosion and transport processes in terms of the watersheds, (ii) calculate the soil loss, transport and deposition of soil particles on watersheds and water resources by erosion models, (iii) assess the effectiveness of erosion control measures on the slopes in the basin to reduce soil erosion and sediment transport, (iiii) propose appropriate erosion control measures at the selected pilot river basins.

RECARE study site

Myjava catchment, Slovakia

Partners in this research

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