



The role of gully erosion in total soil loss at catchment scale

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The objective of this paper is to present an analysis on erosion and sedimentation in a hilly watershed, i.e. in the Tetves catchment, Hungary. The catchment has an area of 120 km², covered by loose sediments (loess, sand and their variations). At the outlet of the basin a completely filled up sediment reservoir can be found. Both sheet erosion and gully erosion contribute to soil losses from the slopes of the catchment. An attempt is made to determine the share of the material removed by gully erosion, based on the analysis of the sediment accumulated in the reservoir. If there is more topsoil in the reservoir then the role of sheet erosion is more important in the catchment, while more subsoil in the reservoir points to considerable gully erosion activity. Six sites were sampled in the reservoir. At each site an average sample was created as a mixture of seven soil samples taken randomly in a circle 1.5 meters. Each profile was divided into horizons and altogether 32 samples were investigated. Humus content and Caesium-137 activity have been used as indicators of the topsoil. Gully Erosion Activity has been investigated in the whole catchment during three years (1968, 1984 and 2004) using maps, air photos and field survey. According to our investigations approximately half of the deposited sediments came from the “subsoil” layer. This fact proves the important role of gully erosion in the catchment. In addition to this the results show that the activity of gully erosion has a yearly fluctuation on one hand and a 5-10 years periodicity on the other. In general early springtime a low volume of topsoil is deposited in the reservoir and during the periods of thunderstorms (late summertime) a high volume of subsoil was eroded and transported from the slopes of the basin. This periodicity can be seen in the stripped profile of the reservoir. According to both gully development and sedimentation, the most active period of subsoil sediment transportation was between 1984-1995. The main conclusion is that the Caesium-137 method proved to be very well applicable to identify sediments originating for gully

erosion activity.