

THE CONTRIBUTION OF GULLY EROSION IN TOTAL SOIL LOSS AT CATCHMENT SCALE

Gergely Jakab, Geographical Research Institute, Hungarian Academy of Sciences, H-1112 Budapest, Budaörsi út 45. Hungary. E-mail: jakabg@mtafki.hu
Ádám Kertész, Geographical Research Institute, Hungarian Academy of Sciences
Balázs Madarász, Geographical Research Institute, Hungarian Academy of Sciences

Soil erosion is a very important soil degradation process. 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 destroy the fields of the catchment. The authors try to determine the origin of it by investigating sediments of the reservoir. More topsoil underlines the role of sheet erosion in the catchment, while more subsoil in the reservoir means considerable gully erosion activity. Six points were sampled along the reservoir. Each profile was divided into horizons and altogether 32 samples were investigated. Humus content and Caesium-137 activity have been used as tracers 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.

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 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 causes low volume topsoil deposit in the reservoir and during the periods of thunderstorms (late summertime) a high volume of subsoil was eroded and delivered out 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 happened between 1984-1995 in the catchment.