

Erosion, landscape change and anthropogenic intervention in the Transylvanian lowlands during the Holocene

Gheorghe BĂDĂLUȚĂ^{1*}, Gabriela FLORESCU¹, Marcel MÎNDRESCU¹, Angelica FEURDEAN²

¹*University of Suceava, Department of Geography, Romania*

²*Goethe-Universität Frankfurt am Main, Germany*

* Corresponding author: G. Bădăluță. E-mail: badalutagheorghe90@gmail.com

KEYWORDS: erosion, landscape, human impact, Transylvania, Holocene

Climate changes mean we are witnessing an increase in extreme climatic events (e.g., droughts, torrential rain and flooding) that will intensify soil erosion and consequently lead to landscape change. One of the key factors influencing erosion is agriculture, which extended in the lowlands of Transylvania in the middle of the Holocene.

Lakes represent one of the landscape's best natural archives so that lake sediments can provide a continuous record of processes and impacts that occurred over time at the catchment level. Here, we present the erosion patterns reconstructed based on the Țaga lake sediment sequence and relate these changes to the human transformation of the landscape.

For this purpose, a 7.15m long lake sediment core was analysed for sediment geochemistry, particle size, and mineral magnetic properties to define erosion patterns, depositional characteristics and lake-catchment interactions. Additionally, the resources of the National Archaeological Database, historical data, as well as published quantitative reconstructions of past vegetation and fire regime dynamics were added to assess the development and impacts of the human communities on the environment of the study area.

Our results indicate that there were three major intervals characterized by high erosion, namely prior to 4200 cal yr BP, between 3800-3000 cal yr BP and over the last 1800 years. These intervals were separated by two stable episodes around 4000 cal yr BP and between 3000 – 1800 years ago.

While the first interval with elevated erosion levels was associated with natural factors, such as climate variability and/or channel instability of the river on which the lake was formed, the most recent two erosional intervals correspond to progressive anthropogenically-induced deforestation, the extension of agricultural land and finally direct intervention in the water body. Interestingly, the two low erosion episodes also appear to have been influenced by natural factors (e.g., NAO modes).

The lacustrine sediments of Lake Țaga represent an example of environmental change in an area with a long history of human habitation and will provide an essential supplement of information about the history of this area.

Acknowledgments

Romanian National Authority for Scientific Research and Innovation, CNCS – UEFISCDI (grant number PN-III-P1-1.1-TE-2019-1628)