

# Landslide hazard mapping in Voinesti catchment

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## Abstract

There are several methodological approaches to model the landslide hazard or/and susceptibility. The selection of the appropriate methodology is a matter of the required results and is very dependent on data availability. The goal of this paper is to evaluate methodologies used for landslide modelling in a small watershed situated in the western part of Sub Carpathian Mountains, Romania. An overview of the principal models used for landslide hazard/susceptibility modelling is presented and compared each other in terms of their relative advantages. The paper provides the results obtained and concludes with recommendations and solutions on landslide hazard modeling methodology.

The methodological approaches adopted include: a) HazUS methodology proposed by FEMA uses the geologic group, the slope angle and “hydraulic” condition (wet or dry); b) the infinite slope model (factor of safety Fs) uses: geological maps (lithology per geologic group) and topographic maps to define slope angle. Some geotechnical parameters must be estimated or calculated (effective angle of friction, effective cohesion).

Study area is located in the Dambovita watershed, Romania. The Voinesti catchment area is 0.76 km<sup>2</sup> and it is cross by the Muret River Valley. The slopes vary between 2-15% which are affected by major processes of erosion and landslides. An impermeable layer of clay marl exists at a small depth. The vegetation land cover of the basin is composed from: grassland - 59,10%; forest - 33,10 %; natural meadow - 3,79%; other land - 4,01%.

The methodological approaches adopted in this paper were integrated with GIS techniques. The maps obtained in this way were compared with the existing maps. Some general conclusions could be expressed: landslide susceptibility maps could be great tools used in the creation of failure probability maps; infinite slope model seems to work fine for “shallow” landslides, but needs some improvement (regarding assessment of sliding slab thickness).

Key words: landslide mapping, infinite slope model, HazUS model, GIS

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