



## **Torrential landscapes associated with gravitational slope movements in Buzău Land Geopark, Romania - A quantitative approach on the time-space evolution of denudation processes.**

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Buzău Land is an aspiring Geopark located in the southern part of the Carpathian Bend Area, covering a mountainous area to the north and hilly area to the south.

The main reason for promoting this Geopark is to foster the conservation of natural and cultural heritage, in order to generate products for social and economic sustainable development. A first step in achieving this is, from an environmental point of view, to evaluate the natural hazards that may impede sustainable development in the area. Our activity, as part of a larger project targets the study of landslides, collapses and fluvial-denudation processes and the assessment of the problems that these geological and geomorphologic phenomena pose to communities and habitats.

The occurrence and development of these processes are conditioned by the following factors:

- precipitations per 24 hours (e.g. in 2005 values of about 80-100 mm/24 hours were recorded), which trigger severe flooding processes, landslides and mudflows;
- the predisposition of rocks to erosion: the presence of non-cohesive or “soft” rocks (sand, shale, marl) and for fluvial-denudation processes the reduced moistening degree;
- differences in permeability of rocks and in stiffness (sandstones and plastic shale);
- anthropogenic activity such as deforestation which results in surfaces being exposed to pluvial action (national average of deforestation is of 3 Ha/hour).

The intensity and space-time development of these morphogenetic processes can be evaluated by re-establishing the old drainage surfaces (early Quaternary) and by defining the volume of removed material (the eroded, transported and evacuated volume). This method was applied in Buzău Land, thus creating a clear distinction between the material displaced through landslides, the eroded material transported within the area and the material evacuated from the respective area.

Calculations for denudation ratios in Buzău Land yield values between 5-11 m<sup>3</sup>/m<sup>2</sup>, for a known thalweg depth (6 and 8 m); the gullies developed on the inferior part of the slopes show values between 2-11.8 m<sup>3</sup>/m<sup>2</sup>. These values can be compared on the resulted maps.

A special category of torrential forms occur on the Meledic salt plateau as a result of chemical denudation, physical denudation and intense gully erosion.

The identification, quantification and monitoring of the intensity of these morphodynamic processes may contribute to the more efficient exploitation of the geomorphologic resources, in order to reduce land vulnerability and environment risk, according to the requirements of sustainable development.

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