



USING GEOMATICS TECHNIQUES FOR RELIEF ANALYSIS IN THE CONTEXT OF SOIL EROSION

Silviu MUŞAT

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania

Abstract: *This study applies digital geomatics tools to analyze terrain characteristics relevant to soil erosion. Using open-source GIS and elevation models, slope, relief fragmentation, and topographic structure were mapped and evaluated. The results offer a reliable approach for identifying areas at risk of degradation and contribute to effective land conservation strategies.*

• Introduction

This study applies geomatics tools to analyze relief features that influence soil erosion. The goal is to identify vulnerable areas using digital models and GIS methods.

Material and method

The analysis was carried out using QGIS, relying on an ALOS PALSAR DEM (12.5 m resolution). The dataset was processed to generate thematic maps of slope, relief fragmentation, and topographic position index (TPI). Each spatial parameter was classified and validated through field observations. The methodology emphasizes accessibility and replicability using open-source tools.

• Results and discussions

The slope analysis revealed a high concentration of steep areas in the upper basin, correlating with visible erosion signs. Relief energy maps showed increased fragmentation in the same regions. TPI classification highlighted areas prone to either runoff concentration or accumulation. Together, these results underline the topographic control over erosion dynamics and guide the identification of critical zones.

Conclusions

Geomatics techniques provide an efficient way to detect erosion-prone areas. The method supports land management through accessible, replicable tools.

Acknowledgement: This research is part of an ongoing PhD thesis at the University of Agronomic Sciences and Veterinary Medicine of Bucharest, based on field and spatial analyses in the Bizdidel River basin.