

Landslide Susceptibility Assessment by Information Entropy Model, Uzundere NE Turkey

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Abstract

The main objective of this research is to evaluate the results applying the Information Entropy Method (IEM) for predicting landslide susceptibility in Uzundere County, Erzurum Province, Turkey. To do this, first, 42 past landslide occurrences were mapped in the GIS environment. 30 (70%) out of the landslides were selected for the modeling and the remaining (30%) were employed for validation of the model. Afterward, 12 landslide contributing factor layers were prepared including distance from settlements, local relief, dominant soil, total curvature, drainage pattern, drainage proximity, road buffer, ruggedness number, lithological units, slope inclination, slope orientation, and compound topographic index (CTI). The relationships between landslide distributions and these factors were determined using IE model and the results were then used to calculate the landslide susceptibility of the entire study area. To verify the model, the results were compared with validation landslide data not employed in training process of the model. Accordingly, Receiver Operating Characteristic (ROC) curves were applied, and Area Under the Curve (AUC) was calculated for the obtained susceptibility map using the success (modeling data) and prediction (validation data) rate curves. The validation results showed AUC = 72.36 % and AUC = 70.15 % for success and prediction rates, respectively. The landslide susceptibility map produced from this research were successful and can be useful for general land use planning and future hazard management purposes.

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Biography:

Azimollah Aleshzadeh has completed his BA degree (2002) and MA degree (2007) from Sahand University of Technology, Iran. He is the PhD Candidate at the Graduate School of Science Engineering & Technology at Istanbul Technical University.