Landslide susceptibility assessment applying artificial neural network and support vector machine methods to Mt. Umyeon, Korea

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A landslide susceptibility mapping is an essential task of determining where landslides are most likely to occur and an indispensable step in the prevention and mitigation of landslide hazards. The main purpose of this study is to produce a landslide susceptibility map of Mt. Umyeon using artificial neural network (ANN) and support vector machine (SVM) techniques. A total of 151 landslide events consisting of ten GIS-based geomorphological, hydrological, geotechnical, and geological datasets were constructed from aerial photographs before and after landslides. The collected datasets were applied to Pearson's correlation analysis to ensure the correlation of independency among the variables. Using the ANN and SVM methods, landslide susceptibility models were developed relying on training datasets (70%) and validated by randomly selecting a validating dataset (30%). The performance of the suggested models was compared through receiver operating characteristic curves and the Kappa index. The study draws conclusions with discussions on the model performance results.