

Fuzzy Clustering Algorithms for Establishing Landslide Susceptibility Map

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In recent years, the rainfall distribution is not uniform because of extreme weather events, the occurrence frequency of heavy rain increases. Coupled with steep terrain and complicated geological condition, so that the slope often occurred landslide when typhoon or heavy rain. Landslide susceptibility map delineates the potential zones for landslide occurrence. To develop the landslide model, we used several independent data layers that are recognized as effective factors in landslide occurrence, including slope, aspect, shear strength of rock or soil, dip and dip direction of stratum, and distance to road. All data layers were converted to raster layers with a 30 m ×30 m cell size. A total of 231336 cells were derived in study area. For assessing landslide susceptibility spatially, this study used fuzzy c-means clustering algorithm to classify the aforementioned data set in the study area into six clusters. Each cluster has similar natural environmental conditions and collapse situation. It is helpful to establish the monitoring management system and it can be applied to an early warning system in the landslide. Results of validation show that this model can accurately predict the occurrence of new landslides.

Keywords: Landslide susceptibility map, Fuzzy c-means , Clustering algorithm