Comparison of the Results Obtained from Three Different Landslide Potential Models in Lawnon River Watershed, Taiwan

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The impacts of global warming and climate change possibly result in more frequent occurrences of extreme rainfall events. Also, the steep topography, earthquakes, and fragile geological formations, Taiwan is subject to landslides and other sediment related disasters. It's more easily for policy makers to make decisions on remediation orders by comparing landslide susceptibility models. The study compares the correct ratio and suitability of the landslide susceptibility models in the watershed with a large number of heavy rainfall-induced landslide cases by using the frequency ratio method, instability index method and logistic regression method. The research area in the study is Lawnon river watershed with the mean accumulated rainfall of 1,820 mm and the landslide ratio of 7.5% after Typhoon Morakot. The landslide susceptibility model of Lawnon watershed is constructed on relation between 7 factors (elevation, slope, aspect, the distance to the river, land use geology and accumulated rainfall) and landslides during Typhoon Morakot in the Lawnon river watershed.

According to the statistics, the landslide susceptibility accuracies for frequency ratio method, instability index method and logistic regression method are respectively 52.9%, 89.9% and 99.2%. The correct ratios which are calculated by using the error matrix for frequency ratio method, instability index method and logistic regression method are 51.3%, 55.8% and 53.2%. The correct ratios among different methods are insignificant statistically and vary between 51% and 56%. On the whole, the predicted landslide susceptibility is low estimated in frequency ratio method and high estimated in logistic regression method. Therefore, it's more conservative to predict landslide potential as logistic regression method (with 99.2% landslide susceptibility accuracies) and more suitable to predict landslide potential as instability index method (with 55.8% correct ratios).