Paper Number: 3047

Quantitative Assessment on the Influence of Rainfall on Landslides in Jianshi County of Qing River Basin, China

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Rainfall is one of the main inducing factors of landslide disaster. Based on many years of landslide monitoring data and meteorological data of Jianshi County, 66 landslides occurred from 2002 to 2008 were chosen, which is about 52.38% of the total 126 landslides in the whole area. There are 13 landslides with deformation or displacement over twice, this is about 19.70% of 66 landslides chosen. According to analysis the correlation between rainfalls and landslides with the geostatistics method, the critical rainfall and effective rainfall are determined. Using the Bayes statistical inference model to improve the probability model, the probabilities of landslide early warning system zones are determined. The landslide early warning model is established on basis of the result of landslide susceptibility, rainfall model and probabilistic model with ArcGIS software. The probability value (T) is from 0.002168 to 0.909062. The whole county is divided into 4 grades of landslide early warning system. The data of second deformation or displacement of 13 landslides induced by the rainfall are used to validate the model.

Totally, the result of landslide early warning model is scientific and reliable. The rainfall data of 8 landslides are in line with the model and in the range of level IV/V. The accuracy is about 61.54% according to the relationship between landslide and rainfall. The distributions of 11 landslides are located in the level V zone and the accuracy is 84.62% according to the relationship between landslide early warning result.

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