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Evaluation of rainfall-induced landslide potential due to land use in the slope

Yie-Ruey Chen[1], Kuang-Jung Tsai[1], Jie-Lun Chiang[2], Meng-Hsuan Huang[1] and Chia-Ching Yu[1]
[1]Chang Jung Christian University, Taiwan
[2]National Pingtung University of Science and Technology, Taiwan

Recently, because technological and economic development, the original plain area in Taiwan has been nearly fully developed and human development has extended to the hillside area. Human development coupled with the global impact of extreme weather, typhoons and heavy rains caused the hillside disaster. The scope and impact extent of the damage are more serious than ever before. For this reason, evaluation of rainfall-induced landslide potential due to land use is essential to disaster prevention. Based on the situations before and after the attack of typhoon or extreme rainfall events on the study area in Tsengwen catchment of southern Taiwan in recent years, this study applied the architecture of genetic adaptive neural networks combined with image texture analysis and GIS in satellite image interpretation and land use change analysis to obtain surface information and hazard log data. This study applied the optimum seeking method in the quantitative analysis of the weights of the various natural environmental and slope development hazard factors. Then, through GIS the landslide potential map is plotted. In addition, the evaluation processes for landslide potential after rainfall due to slope land use are established. Results of image classification show that the values of coefficient of agreement for different time periods are at intermediate-high level. The predicted potential of landslide is in reasonable confidence level. The findings of this study can provide a reference for subsequent slope development countermeasures, and the academic and engineering assessment of landslide disasters caused by slope development.

Biography

Yie-Ruey Chen received the BS degree in Civil Engineering from Feng Chia University, Taiwan, in 1983, and the MS degree in Geotechnical Engineering from Louisiana State University, Baton Rouge, in 1990, and the PhD degree in Geotechnical Engineering from the University of California, Davis in 1995. He is a Professor in the Department of Land Management and Development, Chang Jung Christian University, Taiwan.

yrchen@mail.cjcu.edu.tw

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