Geophysical Research Abstracts
Vol. 15, EGU2013-6645, 2013
EGU General Assembly 2013

Landslide Potential Assessment by Using Geographical Index

Ming-Hsi Lee (1), Huan-Hsuan Lin (2), and Jie-Lun Chiang (3)

(1) Dept. of Soil and Water Conservation, National Pingtung University of Science & Technology, Pingtung, Taiwan (mhlee@mail.npust.edu.tw), (2) Dept. of Civil Engneering, National Pingtung University of Science & Technology, Pingtung, Taiwan (P10033002@mail.npust.edu.tw), (3) Dept. of Soil and Water Conservation, National Pingtung University of Science & Technology, Pingtung, Taiwan, (jlchiang@mail.npust.edu.tw)

In the August of 2009, Typhoon Morakot brought heavy rainfall and caused several landslides, floods and debris flows in southern Taiwan. The horrible disasters seriously threaten the safety of the residents live and property. Typhoon Morakot struck Taiwan from 6th to 10th August, 2009 and caused serious damage in the middle and southern part of Taiwan. Under the effect of rainfall type with high intensity and long duration, it had been causing server damage especially in GaoPing drainage area.

While the potential landslide occurrence evaluated by physiographical factors has been extensively investigated, the independence of physiographical factors and the quantification relationship between physiographical factors and landslide occurrence are relatively unexplored. Using 98 debris-flow-prone streams within Gaoping river watershed in southern Taiwan as an example, the independence of physiographical factors were analyzed by statistical method. The quantification functions of the physiographical factors were established by using the fuzzy statistics method. Aside from these, each weighed value related to landslide occurrence for the physiographical factors was estimated by using the Analytic Hierarchy Process (A.H.P.). The product of the weighting values and the quantification values for the physiographical factors is defined as a landslide potential index (PI), mentioned in this paper, is using the Weibull distribution which divided into (low, medium & high) three different landslide potential index, and mapping the landslide potential index in the small watersheds.

To excerpt from the events of Typhoon Morakot and Typhoon Fanapi, this paper is developed by applying (landslide potential index in watershed), through (correlation analysis) to check the ratio between PI value and the landslide ratio. Hence, this particular research can easily and effectively demonstrate the level of landslide potential in watershed area. Moreover, the PI value has moderately positively correlation with landslide ratio. Thus, this research paper can be a handful tool for slope disaster prevention.