Geophysical Research Abstracts,
Vol. 11, EGU2009-8438, 2009
EGU General Assembly 2009

Landslide Risk Assessment in Lushan Area, Taiwan

M.-L. Lin (1), S.-C. Lin (1), K.-L. Wang (1), L.-Y. Fei (2), C.-C. Chi (2), and H.-H. Lin (2)

(1) National Taiwan University, Department of Civil Engineering, Taipei, Taiwan (linml@ntu.edu.tw, 886 2 33664361), (2) Ministry of Economic Affairs, Central Geological Survey

Risk assessment is an important part of landslide hazard management. In this study, the landslide risk assessment is developed using the following steps: landslide scope definition, hazard identification, potential analysis, consequence analysis and risk estimation. For the first step, the study area of the Lushan landslide in central Taiwan is identified, for which the types of landslide include several shallow sliding and a deep-seated sliding. Field investigation and delineation of scars of the past landslides by aerial photographs were conducted for landslide hazard identification. For the landslide potential analysis, the favorability function such as the conditional probability function or the likelihood ratio function could be used for modeling of spatial predictions of landslide hazard and zonation. Such analysis makes use of data layers of scars, elevation, slope and aspect, and being conducted using Geographic Information System. Based on the likelihood ratio function estimation, a prediction model identifying the area of potential landslide was generated, and the results agreed well with previous landslide events. For the third step, the consequence analysis consisted of identifying elements at risk, vulnerability analysis, and temporal probability analysis. In this study, the elements at risk included people, land use, and building types, and were obtained from field investigation and government records. The maximum loss of people, land use, and building were considered as the vulnerability of the area when the deep-seated sliding occurred. Next, the temporal probability was estimated from occurrence of triggering factor. Based on the records of past landslides in Lushan area, most events were induced by typhoons, therefore, the temporal probability were estimated based on typhoon event occurrences. Finally, from hazard zonation, temporal probability, and vulnerability analysis, the landslide risk of Lushan area can be assessed. It was identified as with medium risk when the shallow sliding or deep-seated sliding occurred, and the results appeared to be consistent with the real situations.

Keywords: landslide, risk assessment, landslide hazard analysis, consequence analysis