



Impacts of the Chi-Chi Earthquake on subsequent rainfall-induced landslides in Tahan River watershed, northern Taiwan

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The Tahan River watershed in northern Taiwan which covered 760 Km² is chosen to evaluate the influence of the Chi-Chi earthquake on subsequent rainfall-induced landslides. The study area has suffered slight to moderate ground motion 50-300 PGA and only a few coseismic landslides occurred in the earthquake. However, the typhoon Aere which brought heavy rainfall in 2004 induced serious slope failures in the study area. Therefore, it is interested to know whether the earthquake also affect the later rainfall induced landslides. To evaluate the impact of the earthquake, the characteristics of landslides and their corresponding rainfall information in six typhoons that covered the period from 1996 to 2006 are studied, and the PGA of the Chi-Chi earthquake is also correlated to the landslide intensity. The landslides of the study area were identified through three SPOT and six FORMOSAT images. The corresponding rainfall information in places where landslides occurred is interpolated from one hour interval rainfall data recording at 24 stations by using Kriging method. The study results show that the landslide intensity does not well correlated to the corresponding maximum rainfall intensity and the cumulative rainfall of the typhoon Aere. In contrast, the landslide intensity increases in place with increasing the PGA of the Chi-Chi earthquake. Similar trend is also found in the study result of the following typhoons. However, for landslides induced by the typhoon Matsa in August of 2005, the landslide intensity increases with increasing the maximum rainfall intensity. In addition, landslides induced by typhoon Herb in 1996 were mainly distributed in mid-slope areas, with slopes of 20o-30o, but after the Chi-Chi earthquake, the rainfall-induced

landslides occurred mainly in places with slopes between 30o-40o. These imply the rainfall induce landslides in the study area were affected by the Chi-Chi earthquake but its impact diminishes significantly.