Analyzing the behaviors of the landslide triggered by Rainfall Event in the Western Foothills in the Northern Taiwan using Digital Elevation Models

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During August 23 to 24, 2004, a typhoon named AERE hit the Northern Taiwan and caused great damage to the people and the natural environment. The accumulated amount of rainfalls in the western part of Taiwan exceeded 1,000 mm during the hitting of AERE. The disaster took place concentrated in the Wufong Township, Hshinchu County part of the Western Foothills in the northern Taiwan. This study is focused on one of the numerous landslides due to the typhoon AERE which is located at Huayuan Tribe in the Wufong Township. We compared and analyzed two Digital Elevation Models (DEM) of the study area generated by two pairs of aerial photographs taken on July 22, 2003 and October 17, 2004. From the two DEMs, the resolution is 2 m per pixel, we observed fine characteristics of the topography around the study area and the morphology of the landslide. These two DEMs reveal that the landslide event developed on the western slope of a ridge, and the slope angle is about 50°.By means of comparing and analyzing the two DEMs, we obtained that the slope angle of the landslide is about 50° parallel to the slope of the topography. In addition, the total area of the landslide is about 10,000 m^2, and the total volume of the landslide material is calculated about 140,000 m^3. The landslide material is siltstone and shale with high water content and lower cementation. After the heavy precipitation due to the typhoon AERE, the landslide occurred as the type of the arc-shaped failure which can be observed from the DEM. By means of observing and analyzing the high resolution DEM from the aerial photographs, we can understand the morphology, behaviors and mechanisms of landslide events in detail.