

## 南投縣神木集水區崩塌特性分析

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**摘要** 崩塌是神木集水區引發多次土石流主因，本區岩性以砂岩與頁岩為主，地質結構脆弱；集集地震、中長延時（降雨時數超過 12 小時）或高強度（平均降雨強度超過 30mm/hr）降雨是集水區引發嚴重崩塌主因；2009 年莫拉克颱風之強降雨導致下邊坡嚴重崩塌，48 小時累積雨量 1,628.0 mm 造成下邊坡崩塌為上邊坡崩塌之 8 倍，也引發 7 個崩塌面積超過 10ha 之大崩塌，包括 2 處舊崩塌及 5 處新崩塌。颱風事件仍為神木集水區之崩塌主因，且近年崩塌比仍有增加之趨勢。

**關鍵詞：**神木集水區、長延時高強度降雨、大崩塌。

## Characteristics of the Landslides in Shenmu Watershed in Nantou County

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**ABSTRACT** Landslides are the main reason for the serious debris flow disaster events in Shenmu watershed. The geology of Shenmu is sandstone and shale, making it fragile. The Chichi earthquake in 1999 and the following long-duration rainfall with a duration over 12 hrs or high intensity rainfall with a mean rainfall intensity over 30 mm/hr were the main reasons for the serious landslide events in Shenmu watershed. The rainfall-induced landslides are mainly located in the down-hillslope due to scouring by flooding. The total area of the down-hillslope landslide is eight times larger than that of the up-hillslope landslide in the landslide event following Typhoon Morakot in 2009 with accumulated rainfall of 1628 mm in 48hrs. Further, 7 large landslide cases with a landslide area > 10ha, including 2 old landslide cases and 5 new landslide cases, in Shenmu watershed were also induced after Typhoon Morakot in 2009. Typhoon events with long-duration rainfall or high intensity rainfall are the main reasons for the landslide events in Shenmu watershed, and the landslide ratio has an increasing trend based on the analysis of the heavy-rainfall events in recent years.

**Key Words :** Shenmu watershed, long-duration high-intensity rainfall, large landslide.

### 一、前言

南投縣信義鄉神木集水區由 1996 年賀伯颱風 (Typhoon Herb) 於出水溪引發重大土石流災害後，每逢夏秋颱風豪雨季節，便可能引發土石流災害；甚至也因頻繁的土石流災害，神木集水區幾乎等同是土

流災害的代名詞。神木集水區內主要溪流包含出水溪、霍薩溪（也稱那瑪嘎班溪）及愛玉子溪（本文於後述將此三條河川集水區簡稱為神木集水區），根據水土保持局監測資料（2011）及相關文獻（黃清哲等，2007；方耀民等，2008），此三條溪流過往曾發生過土石流的紀錄如表 1 所示，由表 1 可發現神木集水區由