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On the ancient Song-Mao landslide in Taiwan

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Located at the midway of the highway 7A, Song-mao is a small mountain town in central Taiwan. In July 2004, due to heavy rain induced by Typhoon Mindulle, this site significantly subsided as its foundation are located at an ancient landslide. It is generally suggested that the Song-mao is located at a colluvial formations originally from the Miocene Lushan slate formation. This landslide is predominantly caused by heavy rain together with poor drainage condition. In order to keep the highway functioning and secure the town for living, the government had executed the preliminary remediation treatments and monitoring since 2004.

In view of the complicated characteristics of the sliding area, it is of great interest to understand to the failure mechanism. In this study, topography, geology, and groundwater condition of this area were first studied with field investigations. Limit equilibrium back analyses were performed to understand the failure mechanism of this landslide. Through a series of analyses, the hazards of sliding bodies as well as sliding areas are evaluated. And the results show the influence of groundwater level is significant, which reveals the importance of groundwater control and monitoring in the risk mitigation.