



The geomorphological features of a large scale deep-seated landslide in the Luchang area, Taiwan

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Landslides events are frequently induced by high-intensity precipitation and active tectonic in Taiwan. Several catastrophic deep-seated landslides have been occurred in past few decades. The pre-existing landslides are the potential sites to occur again. The geomorphology features could provide their important information in reflection of landslide activity. The large scale deep-seated landslide of Luchang locates in the mountain area of Miaoli County, west-northern Taiwan. The site is about 60 hectares in area and from west to east is comprised of a ridge (El. 1100~950 m), main scarp, terrace (El. 925~900 m), hilly slope (El. 900~700 m), and the Luchang River. The regional geology is mainly the middle Miocene sedimentary rock which composed of thick sandstone, interlayered sandstone and shale, and coal. The major structures include the Luchang fault and the Shibi anticline, which the location of the former is approximately coincidental to the Luchang River and the latter is approximately coincidental to the ridge. In this study, we identify the geomorphology features by viewing stereo pairs of aerial photographs and examine in the field. UAV (Unmanned Aerial Vehicle) is adopted to assist in unreachable area. Several clear topographic features including scarps, anti-slopes, bulges, etc. are observed in this site. Active bedrock incision has caused many slope collapsed in the Luchang River, which could possibly be the important factors affecting the stability of this site. We also compared the topographic changes through the chronological aerial photographs. The topographic changes likely include several small-scale landslides. The preliminary evolution model of the large scale landslide is proposed in this study. The results help us to evaluate the recurrence potential of a large scale deep-seated landslide.