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Deformation Mechanisms of Consequent Bedding Rockslides in Southwest China

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Two deadly rockslides, triggered by heavy precipitation and open-pit mining, were reported in Emei County, Sichuan Province, China, from 2011 to 2015. About 6.0 million m3 of rock detached from the upper slopes, pushed the pre-sliding deposits, and hit the opposite mountains at average velocity of 18 km/h to 36 km/h. Detailed field investigation, geological mapping and UAV aerial photographic interpretation are presented to analyze the failure mechanisms of the events. The results suggest that the high-speed consequent bedding rockslides were triggered by the failure of rock mass, which were influenced by the engineering activities and climate change. Key contributive factors were weathered and fragmented basalts that were affected by open-pit mining and frequent blasting, as well as the weak underlying tuffs with swell-shrink potential. Persistent rainfall was the direct trigger in initiating and reactivating the landslide. Water affected the slope stability by increasing the slope material's unit weight and penetrating into joints and cracks to make the tuffs degrade and causing a reduction in effective stress. The mechanisms for the two landslide events, are a high-speed regressive consequent bedding (RCB) rockslide in 2011 and a reactivated high-speed advancing consequent bedding (ACB) rockslide in 2015. This paper can provide an insight into large-scale consequent bedding rockslides associated with the interaction between the rainfall and open-pit mining slopes instabilities

Biography:

Guotao Ma, PhD candidate at University of Warwick. Start 2017. Ma was born in Chengdu city, China, in 1990. He completed his Bachelor degree of Engineering in 2013 and obtained his first class Master degree of Engineering in Geological Engineering from Southwest Jiaotong University in China in 2016. His Master dissertation is focused on the reliability analysis of landslide in Tibet plateau by using Monte-Carlo simulation and numerical modelling. After his master degree, he worked as a teaching assistant in the Southwest Jiaotong University and collaborated with China Geology Survey to do some research about the failure mechanism of consequent bedding rockslides. At the same time, he visited the University of Canterbury to do academic research in New Zealand. In 2016, he was selected to attend IRALL School which was held by the state key laboratory in China. Currently, He is pursuing his PhD degree in the research direction on the reliability and stability analysis of engineering slopes and landslides