

Experimental Study on the Formation of Debris Flow from Landslide

Clastic Deposition

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Abstract:

The debris flow from landslide clastic deposition is a special type of debris flow originated from landslide collapse following earthquakes or strong rainfalls. The consequential accumulation of debris in the channels will become the source for debris flows later when there is sufficient rainfalls. Because of the abundant sources comes from the landslide, the required rainfall induced debris flow is much lower than before landslide. It is meaningful to disaster prevention by analyzing influencing factors of debris flow initiation. This research explores the characteristic parameters affecting the initiation of debris flow from clastic accumulation, including surface slope of clastic accumulation, soil clay content, median grain size and non-uniformity coefficient. The experimental results suggest that neither the surface slope nor the clay content but the median grain diameter and non-uniformity coefficient in clastic deposition has significant influence on required discharge per unit width. Moreover, the initiation and erosion unit width flow increases when median grain diameter and non-uniformity coefficient increase. Based on experimental data, formulas calculating unit width discharge are developed. Furthermore, compared with the hydrologic calculation value, these formulas are validated with the influences of median particle size and non-uniformity coefficient in debris-flows in Niujuan and Wenjia gully.

Keywords: Clastic deposition; Debris-flow; Grading; Initiation flow; Erosion flow; Discharge formula