

EMPIRICAL VOLUME ESTIMATION OF LANDSLIDE INDUCED BY SINGLE HEAVY RAINFALL EVENT AT SOUTHERN TAIWAN FROM PROJECTION AREA OF REMOTE SENSED IMAGERY

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ABSTRACT

The purpose of this study is to establish an empirical formula to calculate the heavy rainfall induces landslide volumes via areas derived from remote sensing imagery. Photogrammetry and LiDAR gather the post-event terrain data at southern Taiwan. Besides the precise LiDAR DEM, hillside image method by Single Imagery Similarity (SIS) also utilized to estimate the volume change of the landslide events triggered by single rainfall. Better estimating inaccuracies is founded while using the horizontal projection area instead of traditional landslide surficial area. The volume estimating equation of this study is $V=0.7604A^{1.2369}$, ($R^2=0.8901$) with horizontal projection area and $V=0.2422A^{1.2599}$, ($R^2=0.7384$) via surficial area. Deep-seated landslide triggered by single rainfall event is more likely to happen at landslide projection area large than 3000 m². We also found the coefficients in affecting the estimating volume via area of landslide induced by heavy rainfall is 15 times larger than regular rainfall event.

KEYWORDS: Landslide, Volume Estimate, Projection Area