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Development of potential map for landslides by comparing instability indices of various time periods

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In recent years, extreme rainfall events occur frequently and induced serious landslides and debris flow disasters in Taiwan. The instability indices will differ when using landslide maps of different time periods. We analyzed the landslide records during the period year, 2008∼2012, the landslide area contributed 0.42%∼2.94% of the total watershed area, the 2.94% was caused by the typhoon Morakot in August, 2009, which brought massive rainfall in which the cumulative maximum rainfall was up to 2900 mm. We analyzed the instability factors including elevation, slope, aspect, soil, and geology. And comparing the instability indices by using individual landslide map of 2008∼2012, the landslide maps of the union of the five years, and interaction of the five years. The landslide area from union of the five years contributed 3.71%,the landslide area from interaction of the five years contributed 0.14%.

In this study, Kriging was used to establish the susceptibility map in selected watershed. From interaction of the five years, we found the instability index above 4.3 can correspond to those landslide records. The potential landslide area of the selected watershed, where collapses occur more likely, belongs to high level and medium-high level; the area is 13.43% and 3.04% respectively.