Application of multi-temporal landform analysis in landslide susceptibility assessment for mountainous highway - a case study in southeastern Taiwan

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This study divided a coastal mountainous highway into small sections with slope unit, plot the multi-temporal landslide inventories, and analyze the relationships between the revegetation areas of the existing landslide and newly activated landslide to calculate landslide status Index (LSI). The RI represents the multi-temporal status of landslide status in each slope unit; three statuses and their representing colors were defined in this study. Red representing slope unit with continuously landslides, yellow for those with previous landslide but stable and revegetating, green are those without landslides. The regression lines became one of the parameters in establishing landslide status map.

The study area, 407K to 439K of Provincial Highway No. 9, located in southeastern Taiwan and is the most important transport corridor connecting southern Taiwan and the east coast. In 2009 this mountainous highway was hit by Typhoon Morakot and several landslides, debris slides were triggered in the study area. The debris blocked the traffic and residential communities alone the highway became isolated. To this date some section of the highway still suffer from landslide hazard and transportation had to be temporarily interrupted during some occasions.

The landslide status map of this transport corridor was established combining the result of field investigation, remote sensing interpretation, and the regression lines of LSI. The preliminary result shows that out of the 258 slope units, 13 (5%) showing continuous landslides, 44 (17%) became stable and revegetating. The result of this study could provide better information for mountainous highway safety management.