



New slope indexes for landslide potential analysis in debris flow Stream

T.C. Chen (1) and T.T. Wang (2)

(1) National Pingtung University of Science and Technology, Soil and Water Conservation, Pingtung, Taiwan.
(tcchen@mail.npust.edu.tw / Fax: +886-8-7740287 / Phone: +886-8-7723202-7169), (2) Department of Civil Engineering,
R.O.C. Military Academy

There are frequent earthquakes and fracture of geomorphology in Taiwan, hazard analysis and assessment has become an important tool in addressing potential in landslide hazards. Slope of topography is commonly regarded as directly related to landslide initiation; it is an important factor in landslide hazard analysis. However, there are numbers of grids in a watershed unit, and the slope angles of each grid could be ranged from 0 to 90 degrees. This shows that the slope factor is a multi-value parameter for a watershed unit. Although, a multi-value parameter could not be directly applied into discriminate analysis on regional landslide hazard. In general, the simplified factor, such as average slope or weighting-method factor of watershed, is adopted to represent the geomorphology variability of a watershed unit. However, average slope factor lacks the topographical characteristic of watershed and the slope weighting-method factor is affected by the adjustment.

Thus, 2 single-value parameter of slope index, Landslide Susceptibility Area (LSA) and Ratio of Landslide Susceptibility Area (RLSA), are developed in the paper. As results of 240 debris flow stream shown, LSA correlates well to watershed landslide area with the R-square 0.96, and RLSA correlates to landslide ratio with the R-square 0.693. Oppositely, Average slope of watershed correlates to landslide ratio only with the R-square 0.169 and mean slope of riverbed correlates to landslide ratio with the R-square 0.16. The result demonstrates that the slope indexes of LSA and RLSA could well characterize the landslide phenomenon then average slope of watershed and mean slope of riverbed. Both single-value factors show the possibility to be applied in landslide hazard analysis.