



{Links between rainfall kinetic energy, landslide and colluvial sediments in Central Taiwan}

H. Chen and G.-W. Lin

Department of Geosciences, National Taiwan University, Taipei, Taiwan (r92224101@ntu.edu.tw)

Hourly precipitation intensity was measured to estimate rainfall kinetic energy at over 300 rain gauge stations around Taiwan. Specifically, the landslide ratios and kinetic energy of rainstorms triggered by three major typhoon events in two mountainous catchments of central Taiwan in the periods from 1996 to 2004 were analyzed. The results point to a relationship between the kinetic energy of rainstorms induced by typhoons and the typhoon routes and topography. The investigation indicates that landslide ratios range from 1.7 % to 13.5 % for Tachia River catchment and from 0.8 % to 8.7 % for Chenyoulan River catchment. The threshold at which rainfall kinetic energy E_k induces landslides in the Chenyoulan River catchment is about $4,000 \text{ J m}^{-2}$, and the threshold in the Tachia River catchment is about $2,000 \text{ J m}^{-2}$. The lower threshold of E_k in the Tachia River catchment explains why the landslide ratios for the Tachia River are always higher than those for the Chenyoulan River. The slope distribution in the Tachia River catchment, which is slightly higher than that in the Chenyoulan River catchment, also accounts for the increased erosion capacity of runoff induced by rainstorms. Additionally, the study demonstrates that a higher rainfall kinetic energy would produce and transfer more colluvial sediment into rivers, and have a well linear relationship ($R^2 = 0.94$) during typhoon periods.