# A study of landslide warning based on the RTI model in Korea

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This study performed a feasibility study to make a warning of landslides in Korea based on the Rainfall Triggering Index (RTI) model which had been proposed by Jan et al. (2004). The RTI model is a hyperbolic I-R model, which is defined as the product of rainfall intensity (mm/hr) and effective accumulated rainfall (mm). Time of the calculated RTI value exceeding the threshold of RTI 70, meaning landslide probability of 70%, is a pre-warning time of landslide and a period between a pre-warning time and a landslide occurrence time is a responding time. Rainfall data which had been provided by the Korea Meteorological Administration was acquired at multiple locations near landslide areas. The starting time of rainfall was defined as the time at which the hourly rainfall (mm) larger than 4 mm, and when hourly rainfall (mm) less than 4mm and lasting at least 6 hours was the rainfall event ending time (Jan, 2004). The period of antecedent rainfall was determined as two days prior to landslide occurrence, because average permeability coefficient in soils is large and average duration of the effective rainfall is not exceeded two days in Korea.

To analyze appropriate threshold of RTI values for landslide pre-warning, this study evaluated rainfall intensities to calculate reasonable RTI values. Based on the original RTI model using 60 minutes rainfall intensity, rainfall intensities for 30 minutes and 10 minutes were analyzed. Results show that there was no false warning using 10 minute model, but there are 20% events are never warned using 60 minutes model. The pre-warning time in 10 minutes model is earlier than 60 minutes model in most of the cases. The evacuation time can get 1 hour to 12 hours with 10 minutes model than using 60 minutes model. However, 10 minutes model is more sensitive than 60 minutes model. If we apply 10 minutes warning model in the future, it may increase the false alert rate. Therefore it needs more events of landslides to modify this model.