



An analysis of on time evolution of landslide

Chienwei Tsai (1) and Huipang Lien (2)

(1) Department of Water Resources Engineering and Conservation, Feng Chia University, Taichung Taiwan (ray40201@gmail.com), (2) Department of Water Resources Engineering and Conservation, Feng Chia University, Taichung Taiwan (hplien@fcu.edu.tw)

In recent years, the extreme hydrological phenomenon in Taiwan is obvious. Because the increase of heavy rainfall frequency has resulted in severe landslide disasters, watershed management is very important and how to make the most effective governance within limited funds is the key point. In recent years many scholars have developed empirical models that state that virtually rainfall factors exist and as long as rainfall conditions are met the minimum requirements of the model, a landslide will occur. However, rainfall is one of the elements of a landslide, but not the only one. Rainfall, geology, and earthquakes all contribute to a landslide as well. Preliminary research has found that many landslides occur at the same location constantly and after a repeated landslide, the slope has the characteristic of landslide immunity over time, even if the rainfall exceeded the standard, the landslide could not be triggered in the near term. This study investigated the surface conditions of a slope that occur repeated landslides. It is difficult to be the basis of subsequent anti-disaster if making rainfall is the only condition to contribute to the landslide.

This study analyzes 50 landslides from 2004 to 2013. A repeated landslide is defined as an existing landslide in satellite images of a reference period which its bare area is shrinking or disappearing gradually but the restoration occurs again in some period of time. The statistical analysis of the study found that 96% of landslides have repeated and on average a repeated landslide occurs 3.4 years in 10 years by one year as the unit. The highest of repeated landslides happened in 2010. It would be presumed that Typhoon Morakot in 2010 brought torrential rain which severely affected southern mountain areas so the areas occurred repeated landslides.