Shallow landslide susceptibility mapping using TRIGRS

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Abstract

Rainfall induced landslides is one of the most devastating natural disasters acting on mountainous areas. In Korea, landslide damage areas increase significantly from 1990s to 2000s due to the increase of both rainfall intensity and rainy days in addition with haphazard land development. This study was carried out based on the application of TRIGRS unsaturated (Transient Rainfall Infiltration and Grid-based Regional Slope stability analysis), a Fortran coded, physically based, and numerical model that can predict landslides for areas where are prone to shallow precipitation. Using TRIGRS combining with the geographic information system (GIS) framework, the landslide incident happened on 27th, July 2011 in Mt. Umyeon in Seoul was modeled. The predicted results which were raster maps showed values of the factors of safety on every pixel at different time steps show a strong agreement with to the observed actual landslide scars in both time and locations. Although some limitations of the program are still needed to be further improved, some soil data as well as landslide information are lack; TRIGRS is proved to be a powerful tool for shallow landslide susceptibility zonation especially in great areas where the input geotechnical and hydraulic data for simulation is not fully available.

Keywords : Landslide, Slope stability, Pore-pressure, Infinite slope model, TRIGRS

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