Evaluation of factors of safety and landslide risk for a watershed by Scoops3D

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In this study, the Scoops3D code (USGS, 2015) is used to analyze the three-dimensional stability of the slopes in a watershed in Taiwan. To perform Scoops3D it requires the inputs such as digital elevation model (DEM), geological materials, groundwater level, earthquake, etc. The code calculates the minimum factor of safety (F.S.) and the associated potential failure volumes by using three-dimensional limit equilibrium method. We performed a comprehensive analysis of slope stability for the research areas using the Scoops3D code. The ArcMap software was used to present the F.S. that are less than unity as a 2D contoured map. We can observe this contoured map to understand the overall slope stability of the studied watershed. We perform a parametrical study by set three different sizes of sliding volume, "large", "medium" and "small", for evaluating the risk of landslide for the three different volume sizes.

Keywords: Landslide, Scoops3D, Factor of safety, Risk