

Evaluating Landslide Hazard Areas Considering Uncertainty of Spatial Distribution Models

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Abstract

Natural disasters due to extreme weather events such as, landslides, floods, and heatwaves have increased. Especially landslide is the representative disaster in Republic of Korea. For example, Inje-gun, Gangwon-do, had severe damages due to landslides in 2006. Additionally, damages due to landslides can be increased due to impacts of climate change. Therefore, adaptation plan for natural disasters in Inje-gun is urgent to prevent damages. Mapping landslide hazard areas is an important issue to support spatial adaptation plan for landslides. There were lots of studies related to estimate landslide hazards areas using spatial distribution models (SDMs). However, there are lots of uncertainties to make landslide hazards map by using SDMs. Thus, the objective of this study is finding landslide hazards areas considering uncertainties. Ensemble model, Biomod2 was used to assess uncertainties among SDMs. Landslide occurrence points and environmental variables were used as input data for establishing 10 types of SDMs. 7 ensemble methods were used to analyze uncertainties. As a result of analysis, a map of quantitative uncertainty among SDMs and synthesized landslide hazard maps were derived. The maps can be utilized to establish adaptation plan for reducing damages due to landslides.

Keywords: Ensemble model, Landslide susceptibility map, Climate change

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