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## Prediction of landslides considering the depth ratio of the wetting front

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This study presents a modified equation of infinite slope stability analysis based on the concept of the saturation depth ratio to analyze the slope stability change associated with the rainfall on a slope. A rainfall infiltration test in unsaturated soil was performed using a column to develop an understanding of the effect of the saturation depth ratio following rainfall infiltration. The results indicated that the rainfall infiltration velocity due to the increase in rainfall in the soil layer was faster when the rainfall intensity increased. In addition, the rainfall infiltration velocity tends to decrease with increases in the unit weight of soil. The proposed model was applied to assess its feasibility and to develop a regional landslide susceptibility map using a GIS method (Fig. 1). For that purpose, the spatial databases for input parameters were constructed and landslide locations were obtained. In order to validate the proposed approach, the results of the proposed approach were compared with the landslide inventory using ROC (Receiver Operating Characteristics) graph. In addition, the results of the proposed approach were compared with the previous approach used steady state hydrological model. Consequently, the approach proposed in this study displayed satisfactory performance in classifying landslide susceptibility and showed better performance than the steady state approach.

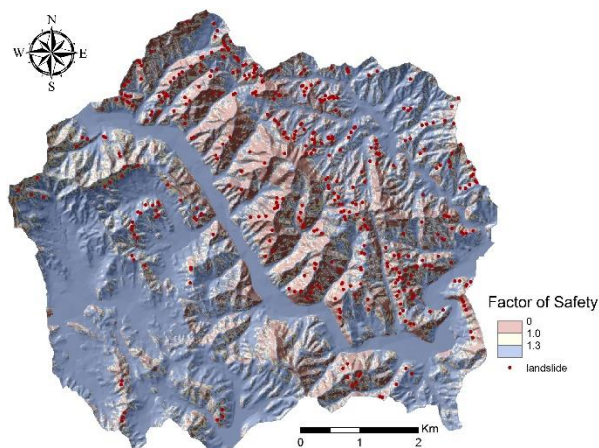


Figure 1: Map showing the factor of safety predicted using the proposed model

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