



Shallow landslides in unsaturated soils triggered by rainfall: A parametric study

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Mechanisms and processes of landslides induced by water can be broadly grouped into two categories. In the first group, we can place those landslides that occur in saturated soils, (or along slip surfaces that are saturated), where the positive pore water pressure in the slope (or along the slip surface) increases due to rainfall/snowmelt, causing instability often displayed as relatively deep-seated and slow mass movements. In the second group, we can place those landslides that occur in unsaturated soils, where the negative pore water pressure (suction), that was existing in the slope (and keeping the slope stable), decreases due to rainfall/snowmelt, causing instability often displayed by shallow (typically less than 5 m thick) and relatively rapid mass movements. In the second group of landslides, unsaturated soil mechanics principles govern the stability. Shallow landslides in unsaturated soils triggered by rainfall frequently occur in the northern part of Turkey. In this study, typical characteristics of such shallow landslides will be given based on the information collected from the landslide cases in Turkey. A parametric study will be presented that takes into account several variables including the slope angle, thickness of the sliding mass, degree of saturation and shear strength of the overlying soil, permeability of the soil and underlying bedrock etc. The results of this preliminary study could be useful as an initial guide on evaluating the relative importance of factors affecting the stability in shallow unsaturated landslides.