Physical modelling of landslides induced by rainfall

Askarinejad, Amin

Publication date
2015

Document Version
Final published version

Citation (APA)
Askarinejad, A. (2015). *Physical modelling of landslides induced by rainfall*. Abstract from 4th Italian Workshop on Landslides, Napels, Italy. http://www.iwl.unina2.it/abstracts/Askarinejad-2.pdf

Physical modelling of landslides induced by rainfall

Amin Askarinejad, Faculty of Civil Engineering and Geosciences, TU Delft, the Netherlands, Stevinweg 1, 2600 GA Delft, The Netherlands. Formerly at IGT, ETH Zurich, Switzerland. Stefano-Franscini-Platz 5, 8093 Zurich, Switzerland, Email: A.Askarinejad@tudelft.nl

Abstract

Landslides triggered by hydraulic perturbations are initiated by a decrease in the effective stress, and hence the shear strength of the soil, as a result of the increase in pore water pressure which might occur due to either rain infiltration or exfiltration of water from the bedrock. However, several factors including the shape and hydraulic properties of the bedrock, root reinforcement have significant effects on the behaviour of the slope alongside the geo-mechanical properties of the overlaying soil. The complex interactions between these processes impose serious challenges in prediction of the occurrence and extends of this type of landslides. This paper presents the findings of a full scale landslide triggering experiment on a steep forested slope and several centrifuge tests which were performed to investigate the mechanisms leading to the initiation and propagation of the shear deformations in an unsaturated silty sand slope. The results observed from the test site illustrated the close interaction between the pore pressure development and rate of movements. Precursors of movements were detected before the failure using the horizontal soil pressure measurements, and surface and subsurface records. The centrifuge tests also showed that, the geometry of the bedrock, in addition to the hydrogeological effects, and vegetation reinforcement can play an important role in the stability of the slope.