Geophysical Research Abstracts
Vol. 17, EGU2015-12900, 2015
EGU General Assembly 2015

Flowslide Early Warning System in pyroclastic deposits

Lucio Olivares (1), Emila Damiano (1), Martina De Cristofaro (1), Greco Roberto (1), Luigi Mollo (1), Nadia Netti (3), and Giovanna Capparelli (2)

(1) Seconda Università di Napoli, Dip. Ing. Civile, Design, Edilizia, Ambiente DICDEA- Aversa (CE), Italy , (2) Università della Calabria, Dipartimento di Ingegneria Informatica, Modellistica, Elettronica e Sistemistica - DIMES, Cosenza, Italy, (3) Università di Napoli "Federico II", Dipartimento di Economia, Management, Istituzioni - Napoli

Most of the mountains of Campania are covered by airfall pyroclastic deposits in primary deposition generally in unsaturated conditions. These deposits are periodically subjected to rainfall induced landslides that may evolve into catastrophic flowslides.
To protect towns EWS can be implemented in order to correctly and promptly predict the trigger.
In the paper we detect some ‘essential ingredients’ for effective EWSs which are new with respect to those already employed and essentially based on pluviometric thresholds (Greco et. Al., 2013) and extremely simplified models not able to correctly follow the physical phenomena which are responsible of flowslides generation (Olivares et Al. 2009).
Complex models, able to correctly simulate those physical phenomena such as infiltration processes and the effects of partial saturated conditions on shear strength contain the ‘essential ingredients’ that we discuss in the paper. A particular attention is devoted to define the relation between suction and shear strength and the water retention curve obtained from different techniques to assess a reliable hydro-geotechnical model to analyze the slope response of loose unsaturated pyroclastic deposits.
An EWS that contains these elements can provide many advantages. In fact, catastrophic flowslides but even false alarms about such events, produce negative technological and productive shocks that strongly reduce the actual and prospective value added of investment in the areas at risk suggesting the opportunity of their shrinking and postponement. Of course this severely compromises the economic development of those areas.
In the paper we propose to examine this subject in the Dixit e Pindyck framework of the Real Option Valuation Approach in order to explain the socio-economic value of effective EWS. In fact, such EWSs will embed valuable new real options in the investment opportunities in the areas at risk increasing their actual and prospective values.

Keywords: slope stability, pyroclastic soil, monitoring, unsaturated soil, socio-economic framework