



What can hillslope hydrologists learn from landslide research?

Thom Bogaard (1) and Roberto Greco (2)

(1) Delft University of Technology, Water Resources Section, Delft, Netherlands (t.a.bogaard@tudelft.nl), (2) Dipartimento di Ingegneria Civile Design Edilizia e Ambiente, Sec-onda Università di Napoli, Aversa (CE), Italy

Rainfall induced landslides are a hydrological phenomenon. It deals with all hydrological processes from rainfall to discharge focussing on the role of the variably saturated hillslope soil. However, where much of the hillslope and catchment hydrology traditionally focus on the lumped fluxes of the entire slope, the landslide community is more interested in the distributed storage of the water in the hillslope and concentrated seepage points. In recent years, water storage got increasing research attention as it became clear that state-variables needed to be taken into account to improve our hydrological understanding of the behaviour of hillslopes. Interestingly, slope deformation is the direct result of water storage at that specific point! Furthermore, the role of preferential flow paths and perched water bodies is very important in stable slopes, but even more in slowly deforming slopes or active landslides. However, the role of a dual permeability system is not unambiguous; it can increase not only infiltration, but also drainage. Not mentioning that (vertical) infiltration takes place at the soil surface whereas lateral drainage can be concentrated somewhere within the soil profile. Infiltration, drainage and temporarily storage of water within the different parts of the landslide are in delicate balance. Lastly, many landslides take place in fine textured soils, like clay-shales or in very steep environments like pyroclastic deposits. These lithologies are less abundant in hillslope and catchment observatories and research projects and as such can help expanding our hydrological knowledge. We will highlight and discuss recent insights in landslide hydrology and how we think this can add to our knowledge on hillslope hydrological behaviour. Interdisciplinarity is key in advancing our knowledge on water flows in (un)stable slopes.