



The role of hydrology in landslide hazard assessment.

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In most countries the main cause of landslides is rainfall. In fact, rainwater infiltration determines a decrease in suction in the zone above the phreatic surface thus in the zone immediately below the ground surface, and an increase in pore pressure in the zone below the phreatic surface, leading to a decrease in the shear strength of soil. Traditionally, the analysis of slope stability has been carried out using deterministic methods under well established and conservative assumptions about the pore pressure regime regardless of its continuous variation in time. Thanks to the development of advanced and reliable codes which are able to consider the effects of infiltration in unsaturated and saturated media, the attention of researchers is now focusing on slope stability analyses having rainfall as a fundamental input. This allows to take into account the real environmental conditions and, mostly, the time, as a fundamental factor for assessment of the slope behaviour. A noticeable consequence is the fact that the development of alert criteria based on short-term weather forecasting and real-time slope behaviour analysis is today, in principle, possible. This can become a powerful tool for real-time risk analysis, especially in those areas which are exposed to catastrophic landslides, and the establishment of emergency plans including the use of early warning systems.