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On the significance of mechanisms of disastrous rainfall triggered landslides

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Rainfall triggered landslides have caused major disasters worldwide. As such, human and economic losses have had a considerable impact in different regions of the planet, but they have been particularly severe in developing countries. During the fall of 1998, due to the intense rainfall caused by hurricane Mitch, a complex mass movement –rock fall-avalanche- took place in the South flank of Casita Volcano, in Nicaragua; the towns of El Porvenir and Rolando Rodríguez were completely swept away and around 1600 people died. A year later, in the Sierra Norte de Puebla, Mexico, dozens of landslides triggered by an extreme rainfall event caused approximately 200 victims. A month after, in December, 1999, Northern Venezuela suffered the loss of more than 10,000 people as a result of flash floods and debris flows. In 2006, the village of Guinsaugon in St. Bernard, Southern Leyte, Philippines, was buried by a mudslide that killed about 1,000 inhabitants, among which there were 246 students and 7 teachers of an elementary school. In this paper, a review of both, landslides mechanisms -hazards-, and conditions of the exposed populations -vulnerability- was undertaken in order to analyse the factors that control the occurrence of disasters and their associated magnitude and impact. Preliminary results indicated that while magnitude is derived by landslides mechanisms, impact of disasters associated to rainfall induced landslides is determined by the vulnerability of the population groups. It is suggested that in order to prevent disasters, findings from vulnerability analysis need to be always considered for risk assessment and management.

Key words: Landslides mechanisms, rainfall triggered, vulnerability, disasters.