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# Analysis of post-earthquake landslide activity and geo-environmental effects

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Large earthquakes can cause huge losses to human society, due to ground shaking, fault rupture and due to the high density of co-seismic landslides that can be triggered in mountainous areas. In areas that have been affected by such large earthquakes, the threat of landslides continues also after the earthquake, as the co-seismic landslides may be reactivated by high intensity rainfall events. Earthquakes create Huge amount of landslide materials remain on the slopes, leading to a high frequency of landslides and debris flows after earthquakes which threaten lives and create great difficulties in post-seismic reconstruction in the earthquake-hit regions. Without critical information such as the frequency and magnitude of landslides after a major earthquake, reconstruction planning and hazard mitigation works appear to be difficult. The area hit by Mw 7.9 Wenchuan earthquake in 2008, Sichuan province, China, shows some typical examples of bad reconstruction planning due to lack of information: huge debris flows destroyed several re-constructed settlements.

This research aim to analyze the decay in post-seismic landslide activity in areas that have been hit by a major earthquake. The areas hit by the 2008 Wenchuan earthquake will be taken a study area. The study will analyze the factors that control post-earthquake landslide activity through the quantification of the landslide volume changes well as through numerical simulation of their initiation process, to obtain a better understanding of the potential threat of post-earthquake landslide as a basis for mitigation planning. The research will make use of high-resolution stereo satellite images, UAV and Terrestrial Laser Scanning(TLS) to obtain multi-temporal DEM to monitor the change of loose sediments and post-seismic landslide activities. A debris flow initiation model that incorporates the volume of source materials, vegetation re-growth, and intensity-duration of the triggering precipitation, and that evaluates different initiation mechanisms such as erosion and landslide reactivation will be developed. The developed initiation model will be integrated with run-out model to simulate the dynamic process of post-earthquake debris flows in the study area for a future period and make a prediction about the decay of landslide activity in future.