

Rapid field-based landslide hazard assessment in response to post-earthquake emergency

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On April 25, 2015 a Mw 7.8 earthquake occurred 80 km to the northwest of Kathmandu (Nepal). The largest aftershock, occurred on May 12, 2015, was the Mw 7.3 Nepal earthquake (SE of Zham, China), 80 km to the east of Kathmandu. . The earthquakes killed ~9000 people and severely damaged a 10,000 sqkm region in Nepal and neighboring countries. Several thousands of landslides have been triggered during the event, causing widespread damages to mountain villages and the evacuation of thousands of people. Rasuwa was one of the most damaged districts. This contribution describes landslide hazard analysis of the Saramthali, Yarsa and Bhorle VDCs (122 km², Rasuwa district). Hazard is expressed in terms of qualitative classes (low, medium, high), through a simple matrix approach that combines frequency classes and magnitude classes. The hazard analysis is based primarily on the experience gained during a field survey conducted in September 2014. During the survey, local knowledge has been systematically exploited through interviews with local people that have experienced the earthquake and the coseismic landslides. People helped us to recognize fractures and active deformations, and allowed to reconstruct a correct chronicle of landslide events, in order to assign the landslide events to the first shock, the second shock, or the post-earthquake 2015 monsoon. The field experience was complemented with a standard analysis of the relationship between potential controlling factors and the distribution of landslides reported in Kargel et al (2016). This analysis allowed recognizing the most important controlling factor. This information was integrated with the field observations to verify the mapped units and to complete the mapping in area not accessible for field activity. Finally, the work was completed with the analysis and the use of a detailed landslide inventory produced by the University of Milano Bicocca that covers most of the area affected by coseismic landslides in Nepal (Valagussa et al, 2016). As a result, a 1:10.000 hazard map was produced. About 47% of the area is classified at high hazard, almost 19 % at medium level and 34% at low risk. In addition, the hazard map reports 262 polygons of active coseismic or postseismic landslides.