



Qualitative and quantitative evaluation of earthquake-triggered landslide inventories in Nepal.

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Landslide inventories are generated around the world at different scales and for different purposes, but limited efforts are made to critically evaluate landslide inventories prepared using various techniques or by different investigators. Event-based landslide inventories indicate the location, distribution, and ideally the boundaries of landslides caused by a single event such as an earthquake or heavy rainfall. Such landslide inventories are essential for landslide susceptibility mapping, hazard modelling and further management of risk mitigation. In this research, we compare the statistical characteristics of several landslides inventories that were created in the aftermath of the Gorkha earthquake in Nepal.

In Nepal, there have been several attempts to map landslides after the Gorkha earthquake of April 25, 2015. The landslide inventories that have been prepared for the same area differ per interpreter, depending upon the personal perspective in mapping, the method of mapping adopted and the detail in delineating landslides. The landslide area mapped by different interpreters ranges from 35 m² to 118805 m² per inventory.

We use four inventories obtained from different sources which are prepared through visual interpretation of remote sensing images. Landslide inventories were analysed based on the methodology used, their quality and completeness levels. The quality was determined based on the direct comparison between the inventories, i.e. the cartographic match/mismatch between the landslide polygons. Statistical properties of landslide areas were calculated and the correlation between the frequency-area statistics distribution of landslides was assessed. There is a zigzag pattern of the plotted landslide probability density to the inverse gamma fit. Differences in the probability density distribution and the inverse gamma fit can be the result of mapping gaps for given inventories which means that some landslides are missing or not mapped by the respective interpreters. Results of our work give a basic overview of the impact of methodology selection for landslide inventory mapping and outline the limitations and advantages of different remote sensing and mapping techniques.