

A regional inventory of the landslide processes and the elements at risk on the Rift flanks west of Lake Kivu (DRC)

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The Rift flanks west of Lake Kivu (DRC) are one of the Congolese regions most affected by fatal landslides. However, information on the distribution of these processes and their impact on society is still lacking. Here we present a first regional landslide inventory and the associated elements at risk. The inventory was conducted in an area of 5,700 km² in three administrative territories between the cities of Bukavu and Goma. The region is one of the most densely populated area of DRC with a density of up to 200 persons/km². The approach for the inventory relies on visual analysis of Google Earth imagery and a 5 m resolution DEM that we produced from TanDEM-X interferometry. Field validation was performed in target places accounting for 5% of the study area. More than 2,000 landslides were mapped and distinction was made between deep and shallow, and slide and flow processes. Average landslide area is 6 ha (max. = 430 ha). Geomorphological analysis of landslide distribution shows topographic, lithologic, climatic and seismic controls. For 600 randomly-selected landslides, elements at risk (house, road, cultivated land, river) were inventoried in the areas affected and potentially affected by the instabilities; 10% of the landslides are inhabited and 25% do not present any risk. Numerous landslides have caused direct and indirect damage in recent years. In some places, the impact of mining activities on slope stability can be important. Google Earth was the only way to locate the recent shallow failures triggered by known extreme rainfall events. This inventory is a first step towards the understanding of the landslide processes in the region. Further studies are needed to complete and validate the information, to better infer about the triggers, and to compute susceptibility and risk maps.