
Landslides in Rwanda: Exceptional 6th-7th May 2018 Shallow landslides in the Karongi Area

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Résumé

Rwanda, in equatorial eastern Africa, is the most densely populated country of the continent (500 pop/km²). The topography of western Rwanda is characterized by steep slopes that result from the activity of the western branch of the East African Rift. These hill slopes are regularly affected by landslides that kill people, destroy houses, roads, and other crucial infrastructures. Therefore, assessing landslide hazards represents a priority including landslides mapping and understanding of their potential causes and consequences. However, the accuracy of current landslide susceptibility maps is limited by the lack of field data. In addition, these maps fail to monitor active landslides and to characterize the population vulnerability. In the present study, we focus on a specific catastrophic climatic event that occurred between 6th and 7th May 2018 in the Karongi area (about 110 km²) nearby Lake Kivu, confirmed through consultation of newspapers, field, and population surveys. A two-step approach was adopted: 1) we mapped all landslides in the study area by visual interpretation of high-resolution remote sensing images from Google Earth, and 2) we analysed CHIRPS and ERA5-land data to assess the triggering role of an extreme meteorological event. Our mapping revealed that the studyarea has been affected by about 735 shallow (< 1m of depth) landslides (density > 6 landslides/km²), i.e., a rare concentration of landslides in a small area. In addition, meteorological data indicate that the 2018 year was exceptional with intense rainfall during March (228.70 mm) and April (232.78 mm) compared to the long-term average of 42 years, March (157.46 mm) and April (161.08 mm), a difference of 142.94 mm. Besides the 6th of May 2018 was among the rainiest 3 days of the year (35.9 mm) with an intense storm weather that lasted over 8 hours (3 PM to 11 PM). We propose that this major landslide cluster in a dense farming area was triggered by an extreme weather event during of the 6th of May 2018, which concluded an extremely rainy two-month period on steep topography.

Mots-Clés: Landslides, rainfall, wind, May 2018, Rwanda, Karongi

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