

The vulnerability to multi-hazards: assessment to support geo-risk management in Central Africa.

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The densely populated area extended from the North Kivu province in Democratic Republic of the Congo (DRC) to North Burundi and East Rwanda is vulnerable to several geohazards combination.

Throughout the area, the population is at risk of landslides triggered by geodynamical processes like climate, seismicity, volcanism, or a combination of them; and possibly worsen by anthropic actions. Located in the East African rift valley, the region is also characterized by a strong seismicity, with increasing people and infrastructure exposed. East DRC hosts the two most active African volcanoes: Nyiragongo and Nyamulagira. Their activity can have serious impacts, as in 2002 when Nyiragongo directly endangers the ~700.000 inhabitants of Goma city, located ~15 km to the south. Linked to passive volcanic degassing, SO₂ discharge may impact human health on the long term; besides, *mazuku* (CO₂ accumulation in on-land depressions up to lethal concentration) cause frequent casualties from asphyxiation around Goma. Besides, high CO₂ gas concentration dissolved in the Lake Kivu water raises the risk of a limnic eruption. The potential for geohazards occurrence is thus high in the study region.

This research focuses on the vulnerability defined as the susceptibility of elements at risk to suffer from damages if a hazard occurs. It is a complex variable identified as a combination of the exposed elements and their adaptive capacity to absorb disturbance (resilience). This project aims at (1) assessing the regional and local scales' vulnerability to the identified geohazards, considering evolution through time; (2) developing a vulnerability assessment methodology; (3) delivering a series of dynamic regional and local vulnerability maps and databases to support decision-making; (4) and finally, once such information is associated with geohazards data, enforcing risk management processes through communication of our results with existing preparedness and mitigation institutions, as well as authorities and other concerned organisations.