

Assessing the global geological risk in the Kivu Basin region: the necessity of a global approach

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Since the eruption of the Nyiragongo volcano in January 2002, the Kivu Basin region has recorded a continuous increase of attention on various aspects. The region is one of the most densely populated areas of Africa where major geohazards concentrates and add more stress on populations already affected by endless and devastating conflicts. This paper is presenting a general overview and framework of scientific research projects focused on geohazards, the main achievements recorded, and the coming year's foreseen developments. From the researches first focused on the study of the volcanic activity of the Nyiragongo and its neighbor the Nyamulagira active volcanoes, the need for a regional and more global approach was clearly identified; especially because geohazards are not limited by political boundaries. Volcanic eruptions cannot be dissociated from tectonic activity of the rift and, when risk management comes into consideration, one cannot only consider the volcanic hazard. Assessing the global risk to improve the response requires an assessment of the vulnerability of population and assets. A wide variety of parameters must therefore be taken into consideration ranging from main hazards assessment to the socio-economic context definition. Since the first systematic analysis of ground deformations associated to the Nyiragongo – Nyamulagira volcanoes activity, Belgium-Luxemburg field of investigation has evolved and nowadays includes the societal aspects and the main geological hazards that also affect the region, i.e. earthquakes and mass movements (see Delvaux *et al.* and Dewitte *et al.* this conference). Whereas the vulnerability assessment is presented in a joined paper (see Michellier *et al.*, this conference), the main results obtained for the study of the volcanic hazards show that combining remote sensing and ground based techniques is essential. Recently obtained results by NMNH-ECGS in Luxembourg are showing that from the study of multi-temporal spaceborne InSAR deformation data, a signal was detected weeks before the eruption of the last Nyamulagira eruption in 2011 at the exact location where it occurred. Confronted to seismic event rate, and even to SO₂ flux from the Nyiragongo lava lake, it appeared that a synchronous kink is observed in each dataset that would have been missed without such a combined approach. That approach is the core of the coming RESIST project which aims at characterizing the changes in monitored parameters for volcanoes that are associated to an eruption. Similarly, InSAR detected landslides in the North Tanganyika – North Kivu Basin region will be studied in combination of rainfall monitoring to characterize precipitation threshold before an event occurs.