



# GeoRisCA

## Geo-risk in Central Africa: integrating multi-hazards and vulnerability to support risk management

DURATION OF THE PROJECT  
01/05/2012 – 30/04/2016

BUDGET  
998.158 €

### CONTEXT

Including Burundi and Rwanda, as well as the East of the Democratic Republic of the Congo, the study area corresponds to the center of the West Branch of the East African rift. This densely populated region that extends from North Tanganyika to the Virunga Volcanic province (VVP) is affected by a combination of several types of geological hazards (landslides, earthquakes, volcanism). Local scientific institutions still have limited knowledge of these phenomena. Their abilities and their limited financial resources do not allow a significant deepening of the understanding of this issue. It is in this context that the GeoRisCA project takes place. It aims the development of decision support tools which will help local stakeholders facing disaster management and risk prevention.

### PROJECT DESCRIPTION

#### Objectives

The main objective is the evaluation of the geo-risks in the region of Lake Kivu (DRC, Rwanda, Burundi), analyzing and combining seismic, volcanic and mass movement hazards, as well as the vulnerability of the population and infrastructures, in order to provide decision support tools for risk prevention. This includes:

1. Contribute to the scientific assessment of geo-hazards at the regional level and in urban contexts.
2. Assess the overall vulnerability to these geo-hazards.
3. Develop a methodology for risk assessment, which will provide a regularly updated picture of the level of risk in a specific zone.
4. Provide a series of risk maps - decision support tools – designed at the regional and local level, combining hazards and vulnerability.
5. Strengthen management of natural risks through the presentation of the results to the institutions, authorities and other concerned organisations.

### Methodology

An innovative approach, based on the integration of scientific methodologies from geology, geophysics, geomorphology, geography and anthropology is developed in GeoRisCA.

At the regional scale, hazard and vulnerability indicators are associated in order to provide a realistic picture of the level of risk in the study area. At the local level, elements reflecting risk perception are also integrated. In addition, GeoRisCA aims at providing a scalable image of the level of risk, taking into account the variations of these factors, as well as the resilience mechanisms developed by the population to deal with catastrophic events.

Quantitative and qualitative data collected are standardised and compiled in a Geographic Information System (GIS) according to a specific weighting. The precise methodology is based on the scientific literature and on the advice of risk assessment's experts, as well as local stakeholders.

A series of maps defined as decision support tools will be produced and will highlight different aspects of risk, depending on the type of hazard, the scale and the objective.

### INTERACTION BETWEEN THE DIFFERENT PARTNERS

RMCA, ULg and VUB interactions: these three teams interact in the context of the realization of the morpho-structural analysis required for the volcanic and seismic hazard assessment, as well as mass movement hazard.

These three teams, and ULB, finally feed the WP 5000 which will integrate their results for the overall assessment of the risk.

### LINK INTERNATIONAL PROGRAMMES

GeoRisCA has been designed based on the many years' experience in the region and on a global approach to the problems related to geological hazards. All actions in the region promote complementarity.

GEOBSNET: initiative initiated by the RMCA and the MNHN (Lux.) to improve the sharing and management of information relating to geohazards. GEOBSNET aims at the creation of a regional network of Geobservatories of geological hazards.

MIRECA: project supported by the Belgian Ministry of Foreign Affairs; it aims at strengthening the sector of Earth Sciences in the DRC and Burundi.



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**COOPERATION Rwanda:** synergies could be established with the Belgian cooperation programme in the field of energy (geothermal-Virunga and hydroelectric-Ruzizi).

**USA CONSORTIUM:** GeoRisCA works closely with this consortium supported by the NSF, in particular for the seismological aspects in Rwanda.

**VI - X:** this project supported by the STEREO programme of Belspo brings to GeoRisCA innovative products and tools.

**EAGLES:** this project supported by the DSS programme of Belspo focuses on the sensitivity of the Lake Kivu ecosystem to climate changes. EAGLES will contribute to the study of limnic eruption risk in the Bay of Kabuno.

**DGD georisk training:** regional project on the initiative of the RMCA for reinforcement of capacities and expertise on geohazards. It is designed to contribute to the sustainability of scientific activities in the region through the creation of local expertise.

**UNOPS:** this project is designed to contribute to the management of volcanic hazards in the Goma region. As such, it may benefit from the expected results of GeoRisCA, decision-support tools.

## EXPECTED RESULTS AND/OR PRODUCTS

The various spatial scales of the project and important quantity of societal and multi-hazard data which will be used and compiled will lead to the development of several tools such as a Geographical Information System (GIS), thematic maps, databases, and models for the improvement of the overall assessment of risk. GeoRisCA will provide tools to help decision and risk management.

Therefore, GeoRisCA assessment will take the form of a dynamic interface, scalable, editable and adapted to the study situation, in order to provide an up-to-date picture of the risk for a specific area. Publications in the various disciplines involved will be based on this innovative scientific approach for the study area.

## PARTNERS

**RMCA – Remote sensing and Cartography section :** Maps library, expertise in Geomatics focusing on Africa, scientific research, mainly oriented towards the study of geological hazards.

**ULg – ‘Georisks and Environment’ :** analysis of surface effects of the major earthquakes that may be at the origin of hazards induced by the local and regional level.

**VUB – Geography department :** study of geomorphological and volcanic hazards, through remote sensing combined with field observations and application of digital terrain models.

**RMCA – Contemporary history :** socio-political analysis of the DRC, research in environmental governance, and documentation centre on the post-colonial Congo.

**ULB – ANAGEO/IGEAT:** mapping and analysis by remote sensing of land use/cover and its evolution, in order to provide appropriate recommendation on land use planning, management of resources and natural hazards

## CONTACT INFORMATION

### Coordinator

#### **François KERVYN**

Royal Museum for Central Africa  
Leuvensesteenweg 13  
B-3080 Tervuren, Belgium  
Phone: +32 (0)2 769 5433  
Fax: +32 (0)2 769 5432  
francois.kervyn@africamuseum.be

Website: <http://www.africamuseum.be>

### Partners

#### **Hans-Balder HAVENITH**

Université de Liège,  
Département de Géologie, B18  
B-4000 Liège, Belgium  
Phone: +32 (0)4 366 93 16  
Fax: +32 (0)4 366 20 29  
HB.Havenith@ulg.ac.be

Website: <http://www.georisk.ulg.ac.be/>

#### **Matthieu KERVYN**

Vrije universiteit Brussel  
Vakgroep Geografie, Earth System Science,  
Pleinlaan 2  
B-1050 Brussels, Belgium  
Phone: +32 (0)2 629 36 61  
Fax: +32 (0)2 629 33 78  
makervyn@vub.ac.be

Website: <http://www.vub.ac.be/DGGF/personnel/matthieu.htm>

#### **Théodore TREFON**

Royal Museum for Central Africa  
Leuvensesteenweg 13  
B-3080 Tervuren, Belgium  
Phone: +32 (0)2 769 5846  
Fax: +32 (0)2 769 5820  
theodore.trefon@africamuseum.be

Website:  
<http://congomasquerade.blogspot.com/>

#### **Eléonore WOLFF**

Université Libre de Bruxelles,  
IGEAT/ANAGEO, CP130/03  
Av. F.D. Roosevelt 50,  
B-1050 Bruxelles, Belgium  
Phone: +32 (0)2 650 6820  
Fax: +32 (0)2 650 6830  
ewolff@ulb.ac.be

Website:  
<http://igeat.ulb.ac.be/fr/equipe/details/person/eleonore-wolff/>

### Follow-up Committee

For the complete and most up-to-date composition of the Follow-up Committee, please consult our Federal Research Actions Database (FEDRA) by visiting <http://www.belspo.be/fedra>



**RISKS**

## Belgian Science Policy

Louizalaan 231 Avenue Louise • B-1050 Brussels  
Tél. +32 (0)2 238 34 11 • Fax +32 (0)2 230 59 12 • [www.belspo.be/ssd](http://www.belspo.be/ssd)  
Contact. Georges Jamart