HARISSA: Natural HAzards, RISks and Society in Africa: developing knowledge and capacities

Ruzizi gorge: the photo is taken from the DRC (South Kivu province), with Rwanda in the background (© O. Dewitte, RMCA, 2013)

Dear reader,

In Central Africa, as in many parts of the world, natural disasters have a significant negative impact on development. Launched in mid-2019, the overall objective of HARISSA is to contribute to reducing the incidence of natural hazards and associated risks in Central Africa (DRC, Uganda, Rwanda and Burundi), in support of the achievement of UN sustainable development goals.

The project aims to strengthen scientific knowledge and expertise, develop awareness-raising activities and support local, national and regional initiatives by following four specific objectives: 1/ university training, 2/ mapping and data collection on natural hazards and associated risks, 3/ improving risk awareness and preparedness, and 4/ consolidating previous achievements (more information on the following web page https://georiska.africamuseum.be/en/projects/harissa). As HARISSA targets a wide range of actors concerned by natural hazards and associated risks, from scientists to citizens and political decision-makers, several partners are involved. After a year and a half of intense activities, we are pleased to present the first HARISSA newsletter, highlighting key achievements of the project by partner (in alphabetical order).

Dr. François Kervyn
Coordinator of the HARISSA project

CURRENT ACTIVITIES

The ***Centre de Recherche en Sciences Naturelles de Lwiro***, through its Geophysics and Environment Departments, is working towards the achievement of two objectives of the project:

- **Maintenance of seismological and rainfall measurement stations**: The seismo/GNSS stations of Lwiro and Idjwi transmitted data continuously throughout the year 2020. The maintenance and data collection of the stations of the KivuSnet and KivuGnet networks are carried out by a researcher from the Geophysics Department, who takes care to prevent any disruption. The 12 rain gauge stations spread along the west coast of lakes Kivu and Tanganyika, from Matanda in the north to Uvira in the south, provide unique data for the region, which are used in ongoing research carried out by researchers from the CRSN.

- **Supervision of a network of 20 citizen observers (CO):** this very dynamic network brings together Civil Protection agents. They collect data on disasters associated with natural hazards (floods, storms, earthquakes, landslides, lightning), which occur in the provinces of North and South Kivu. Between December 2019 and December 2020, they collected information on **more than 370 events**, some of which resulted in loss of life, injuries and destruction of infrastructures. The CO supervisor visited all of them during November and December 2020. Recommendations were made regarding the realities that CO are experiencing in the field and solutions are proposed to ensure their missions are sustainable. **This activity is carried out in collaboration with the Civil Protection of North and South Kivu.**

Figure 1 : Group of the Kivu Citizen Observers, December 2019 (© C. Michellier, RMCA)

INSTITUT GEOGRAPHIQUE DU CONGO

L'Institut Géographique du Congo **(IGC) Nord-Kivu** benefited from technical and scientific monitoring by the RMCA in carrying out two activities :

- **Reinforcement of Geographic Information System skills for nine people (5 in Goma, 2 in Bukavu and 2 in Kindu)**: weekly tele-training, given by an expert from the RMCA, to strengthen skills in map development and spatial analysis.

- **Development of two cartographic applications to meet the priorities of the IGC**: (1) administrative and road maps of the city of Goma (at the city level and by district) and (2) maps of the administrative boundaries (provinces, territories and sectors) of the Kivu provinces (North and South Kivu) and Maniema, based in particular on the 2015 organic law on the establishment of the boundaries of the provinces and the city of Kinshasa.

Figure 2 : Road network of the city of Goma updated by IGC/RMCA

Figure 3 : Administrative boundaries of the provinces of North and South Kivu and Maniema updated by IGC/RMCA

Since December 2019, researchers at **Mbarara University** have been managing a network of 15 citizen observers trained to collect data on disasters associated with natural hazards in the three districts of Kabale, Rubanda and Kisoro (south-western Uganda). Over the past 12 months, **190 events have been recorded**, mainly associated with landslides and floods.

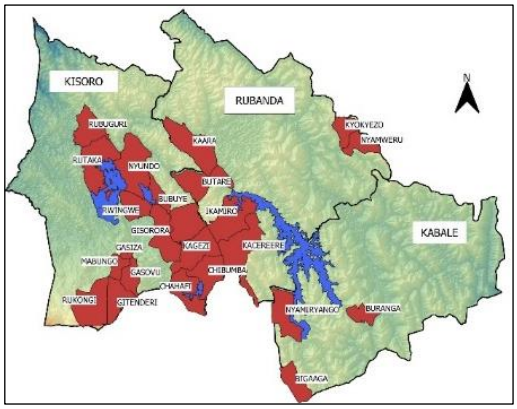

Figure 4 : Map showing the project area and the areas (in red) covered by the citizen observers

The Covid-19 containment imposed by the Ugandan government between April and July 2020 unfortunately suspended the collection of information during a period of heavy rains, which caused numerous landslides and floods in the region.

The **Goma Volcano Observatory (GVO)** has begun work on the **development of a Volcano Museum**. After the rehabilitation of the room of the Volcano Information Centre, the posters presenting the different themes are being developed. A 3D model of the Virunga chain, measuring approximately 1.60m on each side, has been produced. This model, on which several layers of information will be projected, will be a key part of the exhibition and a support for the explanations given to visitors (pupils, students, tourists, etc.) by GVO researchers.

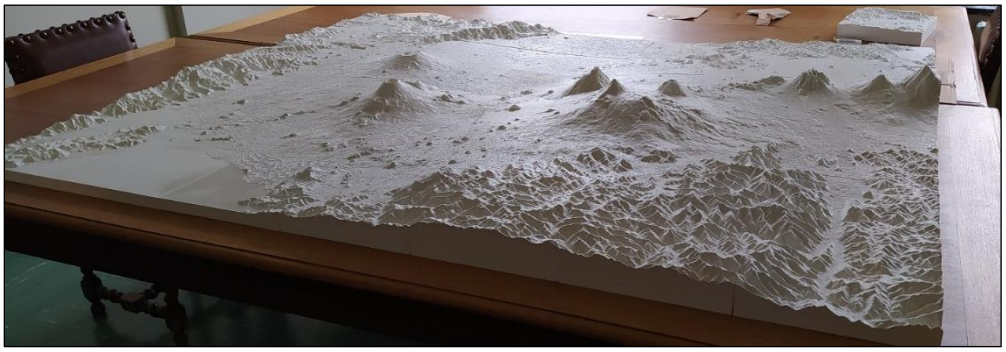

Figure 5 : 3D model of the Virunga chain, central piece of the future volcano museum at the Goma Volcanological Observatory (© F. Kervyn, RMCA)

GVO is also continuing **to monitor the activity of the Nyiragongo and Nyamulagira volcanoes** with the assistance of HARISSA for the collection and transmission of data and the **maintenance of the KivuSnet and KivuGnet network stations**.

In addition to the involvement of its agents in the **network of citizen observers in Kivu** supervised by CRSN-Lwiro (presented above), the **Civil Protection of North Kivu** has carried out several activities in schools and with target groups using the ***Hazagora* awareness-raising tool**. Hazagora is an educational game whose common objective is to develop a resilient community. By participating in Hazagora, everyone discovers in a playful way essential information on hazards (their characteristics, their spatial extent, their impacts), while experimenting with different strategies to cope with them.

Although Covid-19 led to the suspension of classes in schools in North Kivu, several secondary schools in Goma had nevertheless benefited from these activities organised by the North Kivu Civil Protection at the beginning of 2020.

Figure 6 : Hazagora presentation by the representative of the North Kivu Civil Protection on 24 January 2021, on the occasion of the Bonana des jeunes de la 3ème CEV, Quartier Sacré cœur, Paroisse Saint François, Ndosho district, Karisimbi commune (© I. Mutazihara, North Kivu Civil Protection).

L'Université du Burundi and ***l'Université Officielle de Bukavu*** are involved in setting up an **inter-university master's degree on risks linked to natural hazards**. The UB representative had the opportunity to travel to Bukavu to meet his UOB counterpart and discuss the content of the programme and the resources (human and material) available in the region. However, several steps still need to be taken to make this inter-university programme, which aims to start in September 2021, a reality.

L'Université Officielle de Bukavu has also launched the development of an Information Centre on "Natural" Risks (CIRiNa): the future exhibition and animation room for CIRiNa activities is ready. The posters on the selected themes (landslides, earthquakes and gullying erosion) are being finalised.

Figure 7 : Renovated room of the future UOB Natural Hazards Information Centre (© D. Akonkwa, UOB)

In connection with the future CIRiNa, **four radio programmes on natural disasters and risks** in the region (in collaboration with the Civil Protection of South Kivu and CRSN-Lwiro) were organised on Radio Maendeleo in Bukavu in December 2020 and January 2021, in order to raise the population's awareness of these dangers at the height of the rainy season.

Figure 8 : Radio broadcast at the Maendeleo station with the representatives of CRSN-Lwiro and UOB (© T. Mugaruka Bibentyo, UOB)

RECENT ACTIVITIES OF HARISSA PhD STUDENT

Blaise Mafuko (MRAC/VUB/UNIGOM) : As the first field activity in the framework of my thesis, I coordinated and participated in the collection of data on risk perception from 2400 households in 8 neighbourhoods of the city of Goma, in 21 days, with the help of 18 interviewers.

Violet Kanyiginya Twagira (MRAC/VUB/MUST) : I participated in the field inventory of landslides and floods with citizen observers, notably in Kisoro, southwest Uganda, in November 2020.

Toussaint Mugaruka Bibentyo (MRAC/UGent/UOB) : In October 2020, I carried out the geometric identification of the stratification in a meta-sedimentary rock in the Ruzizi gorge, with the participation of two students from the Geology Department of the UOB.

Jos Subira (MRAC/ULiège/OVG) : During the fieldwork period, I installed a temporary seismic station on the Nyamulagira volcano.

Mercy Gloria Ashepet (MRAC/KUL) : Since 3 January 2021, and until mid-March, I have been interviewing several dozen citizen observers active in the HARISSA project (and two other projects) in order to better understand their motivations and expectations. I am here with a citizen observer in Bushenyi.

Jean Nsabimana (MRAC/UNamur/UB) : I investigated the gully areas in Kamenge, in the Gihosha zone, urban commune of Ntahangwa, in the city of Bujumbura. This gully is active and threatens housing and infrastructure. The population is trying to protect itself by planting gabions and bamboo or by combining the structural solution (gabion) and the biological one (bamboo).

From left to right, Toussaint, Jos, Violet, Jean and Blaise visit Brussels during their first research stay between February and August 2020. Here, in front of the Atomium.

Conferences (past and coming)

- **2020/09/6-11 : Conference of the Association of European Citizen science (on-line) ; participation of M.G. Ashepet and C. Michellier.**
- **2020/10/14-15 : Conference Citizen science and sustainable development goals (on-line) ; participation of M.G. Ashepet.**
- **2020/11/20 : PhD Day of RMCA (on-line) ; participation of all HARISSA PhD students**
- **2020/11/26 : Citizen Science & Science Communication workshop (FWO, on-line) ; participation of M.G. Ashepet.**
- **2020/12/15 : Young Researchers Overseas Day (Royal Academy of Overseas Sciences, on-line) ; participation of all HARISSA PhD students.**
- **2021/02/26 : AfricaMuseum geo-webinar (➔ *do not hesitate to contact Caroline Michellier if you would like to make a presentation of your activities. (caroline.michellier@africamuseum.be*))**
- **2021/04/19-30 : vEGU 2021 : Annual conference in geosciences welcoming this year 13.500 participants on-line**

Publications

- **Dewitte, O., Dille, A., Depicker, A., Kubwimana, D., Maki-Mateso, J.-C., Mugaruka Bibentyo, T., Uwihirwe, J., Monsieurs, E., 2021. Constraining landslide timing in a data-scarce context: from recent to very old processes in the tropical environment of the North Tanganyika-Kivu Rift region. Landslides 18, 161-177. https://doi.org/10.1007/s10346-020-01452-0**
- **GeoRiskA website : Launch of the GeoRiskA website (https://georiska.africamuseum.be/). The HARISSA project is presented as well as the involved partners, PhD students and citizen observers**

Acknowledgements

We would like to thank all the teams who contributed to this first Newsletter that we would like to publish three times a year.