January, 2015
Issue 2

AfReSlide *Newsletter*

AfReSlide - Landslides in Equatorial Africa:
Identifying culturally, technically and economically feasible resilience strategies

Dear reader,

The AfReSlide project is celebrating its first year of activity. A lot has already been accomplished: 5 stakeholders' workshops, over 56 weeks of field work by AfReSlide researchers, 300 landslides documented, dozens of interviews and group discussions … and many interesting meetings with exceptional persons in Uganda and Cameroon: politicians, local leaders, scientists, students, but also farmers, school teachers, … all willing to contribute to a better understanding their environment and applying adapted strategies to mitigate landslide impacts. We would like to thank all of you for your enthusiastic participation in the project!

This second newsletter presents the different types and causes of landslides and some of the observations from extensive field work in the Rwenzori Mountains over the last six months. Landslides have been systematically characterised in targeted sub-counties, interviews and group discussions have been carried out to characterise the impacts of landslides and the risk management strategies. In 2015, similar field campaigns will be carried out in the other AfReSlide study areas: Mt Elgon in East Uganda, Limbe in SW Cameroon, the Mount Bamboutos and Bamenda in NW Cameroon. Pace of research is however not the same as the speed of daily life! Data collection, analysis, modelling and identification of applicable conclusions require time and detailed scientific work – but be sure that we will keep you informed throughout this process and that you will benefit from the outcome.

This newsletter is already distributed to more than 200 persons: not only key informants in Cameroon and Uganda, but also scientists and practitioners' around the worlds interested in mitigating landslide risk. Help us to extend this network: forward this newsletter, ask your contacts to *like* the AfReSlide webpage on Facebook or register for the newsletter via our brand new website http://afreslide.africamuseum.be/ !

We look forward to meet you again during our upcoming field missions.

I wish you all a safe and happy 2015 year!

Matthieu Kervyn – AfReSlide coordinator

News flash

- September 2014: landslide in Bushiyi, Mt. Elgon

Figure 1: Landslide in Mt. Elgon (Poesen, 2014)

- October 2014: Earthquake in western Uganda (M4.5)
  - 14km NE of Margherita peak
  - 31/10/2014 at 01:05 UTC
- Workshops in western Uganda:
  - Fort Portal on 12/08/2014
  - Bundibugyo on 1/09/2014
- AfReSlide website has been renewed: afreslide.africamuseum.be/home

Belgian Science Policy Office
belspo

We need your input!

In case you have information to share about landslides in Uganda or Cameroon, please do not hesitate to contact us!
afreslide@vub.ac.be

Don't forget to subscribe to our newsletter!

Types and causes of landslides

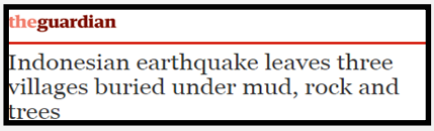
There are many classifications of landslides (LS). Variation exist in the dimensions of the slide (short, long, wide, narrow, deep or shallow slides), the material that moved (soil, debris, mud, boulders), the speed of sliding (very fast LS or slow creep movements) and the type of movement (translational, rotational, flows, falls, topples). For example, on March 22 2014, a slope collapsed in Washington and caused large volumes of mud to flow down after a period of intense rainfall, killing 43 people. Two weeks later, 16,000 tons of rocks broke down from a cliff and blocked a hiking trail in California, however without causing any casualties. After two earthquakes in the Gansu province (China) in July 2013, large volumes of loess soil covered an entire village. The removal of trees and stone quarrying for construction works are believed to have triggered mass wasting one year later in India, causing 30 casualties. Also, in 2012 rock and debris were transported over five-miles due to glacial melting in Alaska. Finally, in November 2014, mud and debris covered a house in Los Angeles after a large wildfire and heavy rains.

Figure 2: Examples of landslides (www.bbc.com, www.nps.gov, blogs.agu.org, indianexpress.com, usnews.nbcnews.com)

Variation exist in the dimensions of the slide, the material which is moved, the speed of sliding and the type of movement.

How can these different processes be described?

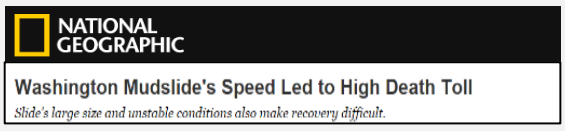
All the examples above are called LS, which all fulfill the definition: "*the transport of material down a slope under the influence of gravity*". However, a LS is the result of different controlling and triggering factors and environmental conditions. Given the endless possibilities in combinations of these factors, **each LS is unique.** In order to create some structure in this wide range of processes, many researchers have suggested a classification system to distinguish between different types of landslides. The most commonly used classification is based on the type of material (rock-debris-earth) and the type of process (fall-topple-slide-spreads-flows-complex slides). The earthquake-triggered LS in China for example can be called an earth slide. While the movement in California might be called a rock or debris flow. Other features of the LS have to be accounted for when trying to characterise this process. The importance of triggering factors cannot be underestimated. Was the LS triggered by rainfall, by seismic shaking or by humans? These questions are very important when considering the hazard of the slides, early warning systems and management of human interventions.


theguardian

Indonesian earthquake leaves three villages buried under mud, rock and trees

But what makes a landslide potentially destructive?

Besides the size of the slide, its material, the type of process and the trigger(s), the speed of the movement also determines the potential impact of the slide. While slow-moving slides can cause devastating damage to infrastructure, fast-moving slides are potentially fatal.


NATIONAL GEOGRAPHIC

Washington Mudslide's Speed Led to High Death Toll

Slide's large size and unstable conditions also make recovery difficult.

What about landslides in Uganda and Cameroon?

Both Cameroon and Uganda are characterised by a tropical climate. In the Ugandan study areas, both shallow and deep-seated LS are frequently occurring on Mt Elgon and Mt Rwenzori. Intense rains are believed to be the most important trigger while the latter also experiences frequent seismic activity (see page 3). Along the Cameroon Volcanic Line in the NW and SW provinces of Cameroon, dominantly shallow translational LS have been reported to affect the steep and highly weathered residual soils formed on dominantly volcanic rocks. Voluminous and intense rains are thought to be the main LS trigger, although seismic triggering has been proposed for specific LS.

Observations from field work in the Rwenzori Mountains

This summer our PhD students, Lies, Jan and Kewan have conducted their first fieldwork in the Rwenzori Mountains, Uganda. Together they have:

- Mapped over 300 LS in the region,
- Selected focus areas for conducting detailed research,
- Interviewed actors in disaster risk management at all policy levels,
- Interviewed affected households and organised group discussions,
- Encountered enumerators that will join their team for further data collection.

It has become clear that LS are a frequent issue in the Rwenzori region! The Mt Rwenzori has steep slopes, a high population density and seismic activity, making it susceptible to LS. A recent preliminary inventory of LS based on scientific reports and website search (Jacobs et al. 2015) identified 48 LS and flash flood events in the last 100 years, most of them occurring in the last 15 years. They caused 56 fatalities, considerable damage to road infrastructure, buildings and cropland, and rendered over 14,000 persons homeless. LS can be triggered by excessive rainfall or by earthquakes. Their occurrence seems strongly linked to the geology in the catchment: areas of amphibolite rock seem to be less prone to LS. LS mainly affect plots of smallholder farmers, who can lose their crops and income. This leads to periods of need and can push farmers deeper into long-term poverty. Currently, most disaster risk reduction (DRR) measures are taken after a disaster happens, and essentially concentrates on bringing relief. From focus group discussions held at community level several possible DRR measures have been identified, such as back sloping to prevent the collapse of retaining walls, planting of trees next to roads and houses, channelisation to prevent runoff water stagnation and moving to neighbours or relatives during rainy seasons. Awareness raising about LS is done by drama groups, local government and radio stations, albeit to a rather limited extent.

Figure 3: Landslide in Kirumya sub-county, Bundibugyo district on September 2014 (Maes 2014)

Workshop reports

During the summer of 2014, 2 additional workshops were successfully organised in western Uganda: one in Fort Portal and one in Bundibugyo. The structure of the previous workshops was followed (for more information, see Issue 1). In total, the AfReSlide project has thus far arranged 5 workshops with local stakeholders. The integrated approach of organising stakeholder's workshops in the different study areas appears highly relevant because of the essential information that can be gained through involvement of local stakeholders at an early stage, so that the research plan can be adjusted if needed.

Figure 4: Stakeholders' workshop at Fort Portal (Sekajugo 2014)

The workshop outcome and field reconnaissance confirm that LS are more widespread in Equatorial Africa than generally thought. LS are generally of small to moderate scale but they have a high frequency. Their occurrence is mainly controlled at the local scale by an interplay of slope gradient and lithologies. In both countries, the workshops highlighted that the stakeholders, and the exposed population, have a high awareness of the LS hazard and some understanding of the processes. Local stakeholders especially stress the long-term and indirect impacts of LS on the livelihood of local communities. They are generally aware of the main DRR strategies but struggle to implement them, due to a lack of means, the lack of enforcement of land use plans and the high pressure on the land. So far, DRR strategies are mainly limited to poorly-coordinated rescue and recovery actions after a LS event. Beyond the financial limitations, the need to raise the level of awareness among the local population but also to train technical experts in the identification of efficient risk reduction strategies are identified as first steps in order to gain local support and capacities to translate the current national policies and plans into effective measures. The local stakeholders that were involved in the initial workshops are urgently demanding to investigate efficient resilience strategies that would be acceptable for the local population, adapted to their livelihood and enabling a safer and sustainable development of the region.

Upcoming missions & conferences

In the following months, research is planned in Uganda and Cameroon:

- Astrid de Hontheim: anthropological fieldwork in western Uganda from mid-December 2014 until mid-January 2015 and from mid-May until mid-June 2015. In Cameroon from 15th of February until 15th March of 2015.
- Kewan Mertens: fieldwork in western Uganda from mid-January 2015 until mid- March 2015 concerning interviews of households about landslide impact.
- Liesbet Jacobs: fieldwork in Bamboutos caldera, Cameroon, in May and June 2015.

Scientific output

1. Publications

Jacobs, L., Dewitte, O., Poesen, J., Delvaux, D., Thiery, W., Kervyn, M., accepted with revision. The Rwenzori Mountains, a landslide-prone region? Landslides. [I.F. 2.814]

2. Conference presentations

Research of the AfReSlide project was presented at the following conferences:

- BAG Day of young researchers, Liège, 13 November 2014 (Oral).
- Royal Geographical Society (RGS-IBG) Annual International Conference, London, UK; 26-29 August 2014 (Oral).
- 25th Colloquium of African Geology (CAG25), Dar es Salaam, Tanzania, 14-16 August 2014 (Oral).
- 17th Joint Geomorphological Meeting (JGM) "The geomorphology of natural hazards: mapping, analysis and prevention", Liège, Belgium, 30 June – 03 July 2014 (Poster).
- European Geosciences Union (EGU) General Assembly, Vienna, Austria, 27 April – 02 May 2014 (Poster).
- Young Researchers Overseas - Royal Academy for Overseas Sciences, Brussels, 16 December 2014 (Posters).

3. Stakeholders' workshops

- Organisation of a stakeholders' workshop in Fort Portal on Tuesday 12/08/2014, with 27 participants.
- Organisation of a stakeholders' workshop in Bundibugyo on Monday 1/09/2014 with 31 participants.

Thank you note

We would like to thank you for your cooperation. This project would not have been possible without the input of the many participants during the stakeholder workshops. It is vital to this project that all different views are included. Our research team also wants to show their gratitude to the host families in Kasese and Bundibugyo districts. Their hospitality has made our stay a pleasant experience by introducing us into Ugandan culture.

Special thanks go to John Sekajugo for his commitment to the VLIR SI project and his passion for GIS software, Bosco Bwambale for his assistance during the many focus group discussions, George Bwambale for his assistance during the exploratory fieldwork weeks and Collins Kabaseke for his enthusiasm in taking care of the rainfall stations. We greatly acknowledge the contribution of Annet and Edison, David and Syliviah, Biira and Saul, who acted as facilitators during the focus group discussions at Kirumya, Mahango and Kateebwa sub-county respectively. Of course, the assistance from environmental and community development officers of the 3 studied districts was essential for our work, especially of Eri Thembo Nyakango, Emmanuel Masereka and Mugume Mumbere Enos.

We would also like to thank all the people we encountered during our fieldwork and who shared their experiences and knowledge with us. Special thanks goes to Paul, Iris Irisa, Enock, Sam, Methodius, Longino, David, Swisin, Abel, Juspus, Kevin and Emanual who dedicated several days to weeks in guiding us on the field. Furthermore, we want to express our appreciation to the Rwenzori trekking services and the Uganda Wildlife Authority for their enthusiasm and the highly valued contributions they made to the project.