



The ICL Latin American Network: Past Activities and Challenges Ahead

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Abstract

Landslide disasters have major impact in developing countries due to the social vulnerability of communities and the lack of integrated risk research. In the last decades landslide disasters in Latin America triggered by precipitation, earthquakes volcanic eruptions and the built environment, have increased considerably. Therefore, scientific contributions towards reducing vulnerability of exposed communities to landsliding are quite urgent. The International Consortium of Landslides Latin American Network (ICCLAN) is currently under the commitment of strengthening collaboration among Latin American countries in the field of integrated disaster risk research on landslides through a multi and trans-disciplinary approach. Aiming at achieving such commitment, the organisation of two main activities has taken place in 2013. First of all, the First Central American and Caribbean Congress on Landslides was held in Tegucigalpa, Honduras. Secondly, an International Workshop on Forensic Investigations of Disasters (FORIN) associated with Landslides was also organised (Tuxtla Gutiérrez, Chiapas, México). Additional activities carried out in Colombia were included.

The objectives of ICL Latin American network (ICCLAN) include (a) Setting up a database of experts on landslides in the region; (b) Identifying the areas of landslide expertise of the participants; (c) Establishing a programme of necessities and priorities to be addressed; (d) Organizing a summer/winter school of landslides for young students/researchers, and landslide workshops; (e) Strengthening activities associated with landslide capacity building within Universities and governmental institutions; and (f) Facilitation of scientific support during and after landslide disasters.

Keywords

Landslide disasters • Risk assessment • Latin America • Caribbean region

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Introduction

Landslide disasters in Latin America have increased during the last decades. Examples include the consequences of hurricane Mitch in 1998, which were devastating in Central America, and particularly in Nicaragua and also in Honduras, a country that has been considered by the United Nations as the third most vulnerable, world-wide.

In almost all the Latin American region, landslide disasters are increasing as result of unsustainable development policies. Most of the cities do not have risk maps and

also there is a lack of expertise in many areas to assess and to evaluate mass movement potential zones. There is a clear need to share capacity and experiences to improve the Latin America programmes for landslide disasters reduction.

First Central American and Caribbean Congress on Landslides

The Congress

The First Central American and Caribbean Congress on Landslides took place in Tegucigalpa, Honduras, from March 20 to March 22, 2013. It was hosted by the Engineering Polytechnic University (UPI-Universidad Politécnica de Ingeniería). Support for the organisation was kindly provided by the Japan International Cooperation Agency (JICA), the International Consortium of Landslides (ICL), Honduran Civil Engineering Association (CICH), and some others institutions including the PanAmerican Union of Engineering Organizations (UPADI), the Federation of Engineering Organizations of Central America and Panama (FOICAP), Honduran Geoscience Institute, and the Center for Disaster Management Information Research of Ehime University in Japan (Figs. 1, 2 and 3).

The objectives of the Congress were: (1) Strengthening and promoting the study of landslides in Honduras and the whole Central American and Caribbean Region; (2) Sharing state-of-the-art landslide knowledge, including strengths and weaknesses; (3) Experience exchange; (4) Commitment and organization of future landslide events for Latin America and the Caribbean region.

Topics considered included: landslide typology, case studies, landslides disasters, urban landslides, human-made landslides, landslides and mining, landslide mapping and GIS, landslides and infrastructure, mitigation measures, landslides and planning, and landslides and watershed management.

The Seminar “Introduction to Landslide Identification, Assessment and Mitigation Measures”

From 16 to 19, March, 2013, as the main pre-activity to the First Central American and Caribbean Congress on Landslides, the ICL Latin American network (ICLLAN) organised the Seminar, *Introduction to landslide identification, assessment and mitigation measures*. The seminar took place in the Polytechnic University of Engineering—UPI, and was attended by 33 professionals and engineering students.



Fig. 1 Opening ceremony of the First Central American and Caribbean Congress (from Facebook-Congress page)



Fig. 2 Certificates were provided to participants by ICLLAN members (from Facebook-Congress page)



Fig. 3 Activities during the Seminar and Congress included landslide information dissemination through different media (from Facebook-Congress page)

The ICLLAN seminar comprised different topics as follows (1) Introduction to Disaster Risk Reduction associated with slope instability; (2) Hillslope instability: causes and mechanisms involved; (3) Landslide taxonomy; (4) Landslides in Honduras; (5) Mitigation measures; and (6) Landslide identification, mapping and monitoring.

At the end of the seminar, on March 18, 2013, a field trip to El Playon at Ajuterique, Comayagua was organised. In that area it was possible to observe and discuss the occurrence of a large landslide.

Forensic Investigations of Disasters Associated with Landslides

Introduction

The International Course-Workshop on Forensic Investigations of Disasters (FORIN) associated with landslides took place at Universidad de Ciencias y Artes de Chiapas, Tuxtla Gutiérrez Chiapas, Mexico during June 24–July 5, 2013 (Fig. 4). The main objective of the workshop was to share FORIN, a methodology proposed by the program on Integrated Research on Disaster Risk (IRDR), in order to understand the complex and underlying causes of disasters (Burton, 2010; IRDR 2011, 2013). The course was directed to young scientists and students from all disciplines related to the field of disaster risk reduction. Participants are expected to apply the FORIN methodology through study cases in different Latin-American countries (Fig. 5) (Alcántara-Ayala and Oliver-Smith 2014).

The workshop was sponsored by the International Council of Science (ICSU) and the International Geographical Union (UGI). It was supported by the ICSU program on Integrated Research on Disaster Risk (IRDR), the ICSU Regional Office for Latin America and the Caribbean (ICSU-ROLAC), the Mexican Academy of Sciences, the International Consortium on Landslides (ICL), the National Autonomous University of Mexico, the University of Sciences and Art of Chiapas, and the National Center for Disaster Prevention (CENAPRED) (Alcántara-Ayala and Oliver-Smith 2014).

Twenty five young scientists from different countries of Latin-America participated in the workshop. They included Argentina, Brazil, Colombia, Guatemala, Mexico, Panama and Venezuela. Scientific backgrounds of participants were variable. They comprised fields in both natural and social sciences, such as Geological Engineering, Geophysics, Geography, Anthropology, Politics Sciences, Architecture, Sustainable development, planning and environmental sciences. There was a gender balance since participants were 13 males and 12 females (Fig. 6).



Fig. 4 Conference on Integrated Research for Disaster Risk applied to landslides



Fig. 5 FORIN workshop activities



Fig. 6 Participants of the FORIN Workshop

Workshop activities included a series of lectures, presentations of individual projects, working groups, interviews with local media, fieldwork in a local community threatened by landslides (Fig. 7), and final project proposals.



Fig. 7 Fieldtrip to Las Cuevas del Jaguar landslide

Study cases incorporated the disasters of Yungay, Perú, 1970; hurricane Mitch in Honduras, 1998; hurricane Katrina, New Orleans, 2005; and the earthquake of Haiti, 2010, and others. Particular attention was paid to different aspects of the theory associated with the social construction of disasters, vulnerability analysis, landslide hazard assessment, field evaluation of landslides and mapping, displacement and resettlements, risk reduction and integrated research on disaster risk (Alcántara-Ayala and Oliver-Smith 2014).

Landslide Assessment in Colombia

Landslide hazard and risk evaluation has taken place in several municipalities of Colombia. It involved the multi-disciplinary work of engineers, geologists, social workers and GIS experts. Physical or structural vulnerability, as well as social vulnerability has been evaluated by considering surveys and detailed interviews of a certain number of families and houses that provide a representative sample.

Landslide hazard has been evaluated deterministically, that is to say, factors of safety of the slopes and a risk matrix that can be related to vulnerability and hazard. Direct communication with communities and local authorities has been very useful in these studies since a true representation of the results can be easily noticed. The produced risk maps will serve as tools to elaborate on the plans of expansion and land-use planning.

One of the studied municipalities, Guayabetal, is situated in a seismically active region about 80 km south of Bogotá (Fig. 8). The urban area is topographically constrained by a deep river channel and very steep slopes.



Fig. 8 Guayabetal municipality: unstable vegetated slopes



Fig. 9 Rock-fall at Guayabetal municipality

Precarious housing is located on unstable escarpments, where rainfall is higher than 4,000 mm per year. In July, 2013 a landslide and rock-fall (Fig. 9) occurred affecting approximately 20 houses, and fortunately there were no casualties. Risk analysis carried out for this area suggested that mitigation works would be more expensive than relocation of affected families.

Conclusions

Landslide disaster risk reduction focuses on the necessity to develop and implement integrated landslide research for disaster risk from a multi- and trans-disciplinary scheme to support and help societies. Understanding risk and investigating both natural and social spheres of disasters are essential practices for disaster risk reduction. Integrated risk research should be therefore viewed as a

key element for sustainable development, principally in vulnerable communities that have been frequently exposed to several hazards.

Consequently, reinforcing capacity building and promoting integrated disaster risk research on landslides would be the major challenge to be faced by our network as it could help to reduce vulnerability in the Latin-American region.

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