

IPL Project Report Form 2020-2021

1. Project Title

Studies of disasters related to natural and anthropogenic landslides in Brazil - Characterization of landslides triggers and impacts as a tool to rapid risk analysis – IPL 242 – PHASE I

2. Main Project Fields

(1) Technology Development

A. Monitoring and Early Warning,

B. Hazard Mapping, Vulnerability and Risk Assessment

(2) Targeted Landslides: Mechanisms and Impacts

A. Catastrophic Landslides,

B. Landslides Threatening Heritage Sites

C. Landslide hazard risk management in urban areas

(3) Capacity Building

A. Enhancing Human and Institutional Capacities

B. Collating and Disseminating Information/ Knowledge

(4) Mitigation, Preparedness and Recovery

A. Preparedness,

B. Mitigation,

C. Recovery

3. Name of Project leader: **Prof. Renato Eugenio de Lima**

Affiliation: (office and position)

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Core members of the Project: Names/Affiliations: (4 individuals maximum)

1. Prof. Lazaro Valentim **Zuquette**(CENACID –USP-SCar)

2. Prof. Tiago **Marino**(CENACID –UFRRJ)

3. Prof. Wilson **Soares**(CENACID –UFPR)

4. Prof. Adriana Ahrendt **Talamini**(CENACID –UFPR)

4. Objectives: (5 lines maximum)

- **To continue the research of the project IPL 182 studying the Brazilian disasters related to landslides,**
- **Prepare the map of the distribution of types of mass movements throughout the country,**
- **Classify the most destructive landslides in Brazil.**
- **Provide scientific knowledge to facilitate the preparation and response of landslides disasters.**
- **Apply and develop RRLA (Rapid Risk Landslides Analysis) methodology for rapid analyses of landslides, useful in disasters.**

5. Study Area: (2 lines maximum)

The project aims to evaluate all the most prone landslide areas in Brazil, and is planned to develop detailed studies in the States of Paraná, Rio de Janeiro and Santa Catarina.

6. Project Duration (1 line maximum)

-4 years (2019 to 2022)

7. **Report**

1) Progress in the project: (30 lines maximum)

During the period, the difficulties faced related to the pandemic and in relation to the new stance of the Federal Government in relation to universities were very significant. Since February, all face-to-face activities are prohibited at the university, with the exception of some emergency disaster response missions.

Despite the difficulties during the period, CENACID promoted several scientific activities, including a Training Field Seminar in December 2019 studying landslides in Santa Catarina State and a virtual CENACID National Meeting with the participation of 21 members of the center who work on the project and scholarship students, from different universities and Geological Services in Brazil.

Even in the pandemic, emergency missions were carried out to assess, study and provide emergency support to respond to disasters related to landslides in the states of Minas Gerais

(translational landslides and gravitational flows) and Paraná (gravitational mass movements in karstic areas). All the landslides assessed were classified using the RRLA (Rapid Risk Landslides Analysis) methodology for rapid analyses of landslides.

During 2020 the team made progress in preparing the database on major landslide disasters in Brazil, and the results could be published shortly. As proposed in this project the database provides information about the distribution, the types and classifies the most significant gravitational mass movements in Brazil.

In addition, group members presented several virtual conferences and published scientific articles on processes and consequences of landslides. We highlight the publication in Landslides magazine as we reported in the item "4-Results".

The members also conducted virtual mini-courses in disaster response associated with landslides, in addition to a disaster resilience education program for public schools.

The activities resulted in specific reports of each dangerous process studied and allowed to share many experiences in different governmental and scientific forums.

2) Planned future activities or Statement of completion of the Project (15 lines maximum)

Despite the difficulties posed by uncertainties related to the pandemic, the next planned activities include the continuation of the project's virtual activities, in particular:

- Advance with the landslide disaster database, including the significant landslide disasters of 2020;

- To study specific areas on the ground favorable to the occurrence of natural and anthropogenic disasters associated with gravitational mass movements.

- Promote virtual technical meetings with members

- Improve participation in international scientific events, mainly in Latin American seminars and congresses on the topic.

- The group intends to reinforce the participation in national and international meetings as a strategy to get more members that are experienced.

One of the challenges is to get more financial support to replace the reductions imposed by the reduced federal budget.

3) Beneficiaries of Project for Science, Education and/or Society (15 lines maximum)

The main beneficiaries of the project are the communities that live in areas favorable to landslides in Brazil, which are safer when they are assisted by CENACID's emergency missions. Also the national, state and local government authorities, which have the responsibility to coordinate the prevention and response to these dangerous geological processes are benefited.

The scientific groups from Brazilian universities involved in the project activities are direct beneficiaries of the project.

Schools served by disaster resilience courses offered to public school teachers also result in better-prepared communities.

Other agencies like Civil Protection, Planning services and municipalities can use the studies for disaster preparation and prevention. Other direct beneficiaries are the students involved in the activities of the project.

4) Results: (15 line maximum, e.g. publications)

CENACID's emergency missions to areas affected by landslides in the states of Minas Gerais and Paraná, resulted in specific reports that were presented, discussed and delivered to local authorities and communities. These documents were useful for responding to the respective disasters, and also caused the re-planning of the occupation of these areas.

As a result, group members were invited to present several conferences on the topic, in addition to the publication of scientific articles in the next Brazilian Congress of Geology (June / 2021).

Some specific results:

-de Lima, R.E., de Lima Picanço, J., da Silva, A.F. *et al.* An anthropogenic flow type gravitational mass movement: the Córrego do Feijão tailings dam disaster, Brumadinho, Brazil. *Landslides* 17, 2895–2906 (2020). <https://doi.org/10.1007/s10346-020-01450-2>

Technical Reports (in Portuguese):

-Preliminary assessment of areas affected by landslides and floods in Betim - Minas Gerais – 2020, 24pg.

-Evaluation of areas visited with subsidence and collapses in the region of karstic processes and aquifer exploration in the municipality of Colombo – Paraná (2020) 13pg;

1) Please fill and submit this form to the IPL and WCoE Network Committee:
icl-network@iclhq.org