

Date of Submission	September 15, 2020
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IPL Project Proposal Form 2020

(MAXIMUM: 3 PAGES IN LENGTH)

1. Project Title: Integrated Landslide Disaster Risk Research in Mexico
2. Main Project Fields

Select the suitable topics. If no suitable one, you may add new field.

(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

(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 Irasema Alcántara-Ayala

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Core members of the Project

Names/Affiliations:

Ricardo Garnica-Peña, Institute of Geography, National Autonomous University of Mexico (UNAM)

Atlántida Coll-Hurtado, Institute of Geography, National Autonomous University of Mexico (UNAM)

Franny G. Murillo-García, Geography, postgraduate Unit, National Autonomous University of Mexico (UNAM)

Ana Rosa Moreno, Faculty of Medicine, National Autonomous University of Mexico (UNAM) (risk communication)

4. Objectives:

Aligned with the Kyoto Commitment and the Landslide Partnerships, we aim to develop integrated landslide disaster risk research in mountain areas of Mexico to encourage a stronger link between science and policy making; this will involve the understanding of hazards, vulnerability and exposure, landslide disaster risk communication among different stakeholders and community-based disaster risk research in vulnerable communities exposed to landsliding.

5. Background Justification: Owing to the mountainous nature of Mexico, landslides are among the most significant hazards and therefore, to reduce landslide disaster risk stronger collaboration with different relevant stakeholders is needed. Strengthening collaboration between disaster risk science and policy

making requires not only the understanding of hazards but addressing vulnerability and exposure. This is a complex process since it involves the participation of different actors, on which the Science and Technology community plays a significant role. Despite the significant impact of landslide disasters in Mexico, there is a lack of integrated strategies at national, state and municipal levels. Consequently, more efforts are needed to fortify such endeavour, being this project one step towards landslide disaster risk reduction at local scale. As such, this proposal is part of a continuous effort to strengthening the collaboration with Civil Protection authorities, but also with the communities in terms of landslide disaster risk awareness and preparedness.

6. **Study Area:** (2 lines maximum; where will the project be conducted/applied?)

The project will take place in different municipalities of the mountain range of Sierra Norte de Puebla, Puebla, Mexico.

7. **Project Duration:** 3 years

8. **Resources necessary for the Project and their mobilization**

The existing personnel and facilities of the Institute of Geography (UNAM) will allow to undertake the proposed project. The Institute possess the necessary equipment to undertake landslide mapping (high resolution GPS, UAVs, Terrestrial LIDAR, etc.) and resources required to carry out community workshops and conferences. UNAM also offers support to undertake research projects at local level and resources will be allocated for the development of the research proposal.

9. **Project Description:** (30 lines maximum)

10. This project involves the development of different activities to understand landslide disaster risk in the context of addressing hazards, exposure and vulnerability of people in different municipalities of the Sierra Norte de Puebla, an area that has been historically affected by landslide related disasters. By building on previous collaborations undertaken in Teziutlán municipality, with the results to be obtained, we will continue enhancing awareness and preparedness of people at community level by working in new localities. Likewise, we will expand our research to the municipality of Tlatlauquitepec to help to improve their understanding of landslide disaster risk and enhancing the involvement of policy makers. The main contribution of the project is to get involved with communities at local level in both rural and urban areas and helping to establish collaboration linkages with local authorities and other relevant stakeholders. The execution of this project will allow us to contribute and support the Landslide Partnerships and the Kyoto Commitment (Actions 2, 4, 5, 9 and 10), and will be especially directed towards fostering initiatives to study research frontiers in understanding and reducing landslide disaster risk by promoting joint efforts by researchers and policy makers.

11. **Work Plan/Expected Results:** (20 lines maximum; work phases and milestones)

1st year: *Municipality of Teziutlán:* starting collaboration with a new locality and initial activities for landslide mapping, including field work, satellite images acquisition and production of photographs and DTMs at local scale by using Unmanned Aerial Vehicles (UAVs), organization of community-based workshops and seminars, landslide disaster risk analysis, preparation of landslide disaster risk communication information. Fostering initiatives to study research frontiers in understanding and reducing landslide disaster risk by promoting joint efforts by researchers, and policy

makers.

2nd year: *Municipality of Tlatlauquitepec*: first contact with municipal authorities to establish a collaboration. Initial activities for landslide mapping, including field work, satellite images acquisition and production of photographs and DTMs at local scale by using Unmanned Aerial Vehicles (UAVs), landslide disaster risk evaluation, organization of community-based workshops and seminars, preparation of landslide disaster risk communication information and scientific publications. Fostering initiatives to study research frontiers in understanding and reducing landslide disaster risk by promoting joint efforts by researchers, and policy makers.

3rd year: Selecting another municipality or continuing working in Teziutlán or Tlatlauquitepec. Landslide disaster risk assessment, organization of seminars, workshops and conferences with different stakeholders, among them the communities involved, and publication of scientific papers/book chapters. Fostering initiatives to study research frontiers in understanding and reducing landslide disaster risk by promoting joint efforts by researchers, and policy makers.

12. Deliverables/Time Frame: (10 lines maximum; what and when will you produce?)

Landslide, vulnerability and exposure maps

Landslide disaster risk assessments at local level

Organization of community-based workshops

Landslide disaster risk communication publications directed to vulnerable communities

Scientific publications (papers to be submitted to Landslides Journal and other journals and books)

13. Project Beneficiaries: (5 lines maximum; who directly benefits from the work?)

The authorities of Civil Protection of the municipalities located in the Sierra Norte de Puebla; and their inhabitants. The National Centre for Disaster Prevention and the Civil Protection Coordination unit of Puebla state.

14. References (Optional): (6 lines maximum; i.e. relevant publications)

Ruiz-Cortés N.S., Alcántara-Ayala I. (2020). Landslide exposure awareness: a community-based approach towards the engagement of children. *Landslides* 17, 1501–1514

Murillo-García, F.G., Steger, S., Alcántara-Ayala, I. (2019), Landslide susceptibility: a statistically-based assessment on a depositional pyroclastic ramp, *Journal of Mountain Science*, 16, 3, 561–580

Alcántara Ayala, I., Garnica-Peña, R.J., Murillo-García, F.G., Salazar-Oropeza, M.O., Méndez-Martínez A., Coll-Hurtado, A., (2018) Landslide disaster risk awareness in Mexico: community access to mapping at local scale, *Landslides*, 15, 8, 1691–1704

Murillo-García, F.G., Alcántara-Ayala, I. (2017), Landslide inventory map of the municipality of Teziutlán, Puebla, México (1942-2015), *Journal of Maps*, 13:2, 767-776

Hernández-Moreno, G., Alcántara-Ayala I. (2017) Landslide risk perception in Mexico: a research gate into public awareness and knowledge, *Landslides*, 14, 1, 351–371

Note: Please fill and submit this form by **15 September 2020** to ICL Network

<icl-network@iclhq.org> and ICL secretariat <secretariat@iclhq.org>