| Date of Submission | June 23, 2024 |

IPL Project 253 Annual Report Form

Period of activity under report
from 1 January 2023 to 31 December 2023

1. Project Number and Title:

IPL 253 "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

    B. Hazard Mapping, Vulnerability and Risk Assessment

(2) Targeted Landslides: Mechanisms and Impacts

    A. Catastrophic Landslides

(3) Capacity Building

    B. Collating and Disseminating Information/ Knowledge

(4) Mitigation, Preparedness and Recovery

    A. Preparedness

3. Name of Project Leader

Affiliation:

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Core members of the Project:

Irasema Alcántara Ayala

Ana Rosa Moreno

Javier Urbina

Ricardo J. Garnica Peña

Gema Velásquez Espinoza

4. Objectives (5 lines maximum)

To further the goals of the ICL Kyoto Commitment and the Landslide Partnerships, our objective is to advance comprehensive research on landslide disaster risks in mountainous regions. Our focus is to foster a stronger connection between scientific findings and policy development. This involves studying hazards, vulnerability, and exposure to landslides, improving communication about

landslide risks among various stakeholders and communities, and conducting research on at-risk communities that are particularly susceptible to landslides.

5. Study Area

The project took place in various municipalities of the Sierra Norte de Puebla, Puebla, Mexico.

6. Project Duration
4 years (2020-2023)

7. Report

1) Progress in the project (30 lines maximum)

Various activities have been carried out to map landslides. These activities involved taking photos and creating digital terrain models (DTMs) on a small scale using Unmanned Aerial Vehicles (UAVs) to study the risks, susceptibility, and exposure to landslides. The project has also reached out to local communities, specifically in schools, where we have collaborated with local authorities. These efforts have been guided by community involvement, with important contributions from teachers and students, including the production of landslide disaster risk maps at the local level.

In Mexico, students have participated in surveys to assess their perception of the risk of landslides. Additionally, local assessments of landslide risk and the creation of informational materials and scientific publications regarding landslide risk communication have been completed. These efforts have involved the development of landslides and vulnerability exposure maps and evaluations of disaster risk.

We have participated in several conferences to present the project's progress, including the 6WLF in Florence. Furthermore, we have prepared various publications on landslides and mountain areas based on the project's activities, which included several chapters for the ICL Open Access Book Series Progress in Landslide Research and Technology (P-LRT). Additionally, research theses have been finalized, and some are still in progress. A popular science book story on landslide disaster risk was published.

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

The project ended in 2023, but we plan to submit a subsequent IPL project building on the activities carried out during these years.

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

The authorities of Civil Protection of diverse municipalities in the Sierra Norte de Puebla, along with their residents, the National Center for Disaster Prevention, the Civil Protection Coordination Unit of Puebla State, the students of UNAM, and all members of society and the communities involved in the project.

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

Research articles

Alcántara-Ayala I., Ribeiro Parteli, E. J., Pradhan, B., Cuomo, S., & Vieira, B. C. (2023). Physics and modelling of landslides. Frontiers in Physics1, 11:1146166. doi: 10.3389/fphy.2023.1146166

Sarmiento, F. O., Haller, A., Marchant, C., Yoshida, M., Leigh, D. S., Woosnam, K., Porinchu D.F., Gandhi K., King E.G., Pistone M., Ka-voori A., Calabria J., Alcántara-Ayala, I.... & Reap, J. (2023). 4d Global Montology: toward convergent and transdisciplinary Mountain Sciences across time and space. Pirineos, 178, e075-e075.

Alcántara-Ayala, I., Burton, I., Lavell, A., Oliver-Smith, A., Brenes, A., & Dickinson, T. (2023). Forensic investigations of disasters: Past achievements and new directions. Jàmbá: Journal of Disaster Risk Studies, 15(1), a1490. https://doi.org/10.4102/jamba.v15i1.1490

Wisner, B. & Alcántara-Ayala, I., (2023). Revisiting frameworks: Have they helped us reduce disaster risk?, Jàmbá: Journal of Disaster Risk Studies 15(1), a1491.
https://doi.org/10.4102/jamba.v15i1.1491

Alcántara-Ayala, I., Sassa, K. (2023). Landslide risk management: from hazard to disaster risk reduction. Landslides 20, 2031–2037 https://doi.org/10.1007/s10346-023-02140-5

Book Chapters

Alcántara-Ayala, I., Garnica-Peña, R.J. (2023). Landslide Warning Systems in Low-And Lower-Middle-Income Countries: Future Challenges and Societal Impact. In: Sassa, K., Konagai, K., Tiwari, B., Arbanas, Ž., Sassa, S. (eds) Progress in Landslide Research and Technology, Volume 1 Issue 1, 2022. Progress in Landslide Research and Technology. Springer, Cham. https://doi.org/10.1007/978-3-031-16898-7_9

Alcántara-Ayala, I., Garnica-Peña, R.J. (2023). Landslide Warning Systems in Upper Middle-Income Countries: Current Insights and New Perspectives. In: Alcántara-Ayala, I., Arbanas, Ž., Huntley, D., Konagai, K., Mikoš, M., Sassa, K., Sassa, S., Tang, H., Tiwari, B. (Eds.) Progress in Landslide

Research and Technology, Volume 1 Issue 2, 2022. Progress in Landslide Research and Technology. Springer, Cham. https://doi.org/10.1007/978-3-031-18471-0_13

Alcántara-Ayala, I., Garnica-Peña, R.J. (2023). Landslide Warning Systems in High-Income Countries: Past Accomplishments and Expected Endeavours. In: Alcántara-Ayala, I., et al. Progress in Landslide Research and Technology, Volume 2 Issue 1, 2023. Progress in Landslide Research and Technology. Springer, Cham. https://doi.org/10.1007/978-3-031-39012-8_5

Garnica-Peña, R.J., Alcántara-Ayala, I. (2023). Do not Let Your Guard Down: Landslide Exposure and Local Awareness in Mexico. In: Alcántara-Ayala, I., et al. Progress in Landslide Research and Technology, Volume 2 Issue 2, 2023. Progress in Landslide Research and Technology. Springer, Cham. https://doi.org/10.1007/978-3-031-44296-4_6

Books
Alcántara-Ayala I., Gomez, C., Chmutina, K., van Niekerk, D., Raju, E., Marchezini, V., Cadag J.R. & Gaillard, J. C. (2023). Disaster Risk. Taylor & Francis, London, 626 pp.

Alcántara-Ayala, I., Arbanas, Ž., Cuomo, D., Huntley, D., Konagai, K., Mihalić Arbanas, S., Mikoš, M., Sassa, K., Sassa, S., Tang, H., Tiwari, B. (Editors) (2023) Progress in Landslide Research and Technology, Volume 2 Issue 1, 2023, Springer Cham, ISBN: 978-3-031-39012-8, DOI: 10.1007/978-3-031-39012-8, 482 pp.

Alcántara-Ayala, I., Arbanas, Ž., Huntley, D., Konagai, K., Mihalić Arbanas, S., Mikoš, M., Ramesh, M.V., Sassa, K., Sassa, S., Tang, H., Tiwari, B. (Editors) (2023) Progress in Landslide Research and Technology, Volume 2 Issue 2, 2023, Springer Cham, ISBN: 978-3-031-44296-4, DOI: 10.1007/978-3-031-44296-4, 503 pp.

Popular Science Book
Alcántara-Ayala, I. 2023. Érebo y las montañas movedizas, Instituto de Geografía, UNAM. ISBN 978-607-30-6794-2 (Erebus and the moving mountains). In Spanish.