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Prof. Irasema Alcántara-Ayala

Born in Mexico City in November 1970. In 1993, she got her bachelor's degree with First Class Honours in Geography at the Faculty of Philosophy and Letters, National Autonomous University of Mexico (UNAM), where she was awarded the “G. Barreda Medal” as the best-qualified student of her generation. She was granted a scholarship by UNAM to undertake postgraduate studies; in 1997, she obtained her PhD in Geography/Geomorphology from King’s College London, University of London. She completed a postdoctoral stay in the Department of Civil and Environmental Engineering at Massachusetts Institute of Technology, Boston, in 1998-1999 and a risk analysis and management specialization course at the University of Geneva, Switzerland, in 2000.

Upon her return to Mexico in 2000, she was appointed Assistant Professor at the Institute of Geography, National Autonomous University of Mexico (UNAM). In 2005, she was promoted to Full Professor. Three years later, in 2008, the UNAM Government Board appointed her as Director of the Institute, making her the youngest individual to hold this position in its history. In 2017, she undertook a sabbatical year at the Disaster Prevention Research Institute at Kyoto University in Japan.

Her geographical research focuses on landslides, natural hazards, vulnerability, disaster risk, disaster prevention, and integrated disaster risk research. She has been actively collaborating in Mexico with the National Centre for Disaster Prevention and has published bulletins highlighting the importance of educating and promoting a culture of managing disaster risk and preventing disasters.

She has published over 200 publications. Her work covers the full spectrum: peer-reviewed papers, book chapters, atlases, maps, and publications focused on disaster risk reduction, policy-making, and practice. She has also presented her work at dozens of international meetings across the five continents, often as a keynote or invited speaker.

In 2010, she coedited a book on geomorphological hazards and disaster prevention with a well-known scientist from the University of Oxford (Cambridge University Press). This book emphasizes the need to establish sound strategies for understanding and forecasting hazard mechanisms, and for disaster prevention and mitigation. It has become a fundamental publication for risk assessment and management among Earth and social scientists, decision-makers, and planners.

Irasema coauthored the book Forensic Investigations of Disasters (FORIN) with pioneering disaster risk researchers. It provides the tools to examine the root causes of disasters and disaster risk drivers as a prerequisite to addressing disaster risk issues and mitigation. This theoretical-methodological approach has greatly influenced the development of thinking and practice at the local level in the integrated management of disaster risk in Latin America and the Caribbean (LAC), Africa, Europe, and Asia. This perspective serves as the gear needed to generate integrated knowledge of disaster risk, including social, economic, political, and institutional structures, as well as the participation of different actors in integrated disaster risk management (IDRM).

She has made an invaluable contribution to the field of disaster risk research at the international level through their comprehensive exploration of natural hazards and disaster risk reduction in the book Disaster Risk, published by Routledge. This publication bridges the gap between pioneering academic debates and contemporary discussions, offering both theoretical depth and practical insights. By drawing on a wide array of disciplines, including geography, environmental science, public health, and policy, Prof. Alcántara and co-authors have provided a holistic and interdisciplinary approach to understanding disaster risk. Their ability to synthesize and contextualize a broad range of topics—from foundational research to cutting-edge advancements—makes Disaster Risk essential reading for scholars, policymakers, and professionals dedicated to improving global disaster resilience. Through her continued contributions to this type of publication, Prof. Irasema has advanced both the academic field and the real-world applications of disaster risk management.

At the national level, she has also coordinated initiatives to link science with public policy and practice in the field of IDRM, which has influenced the creation of a new General Law on IDRM and Civil Protection and sought to transform the current National Civil Protection System into an IDRM System.

It is also worth highlighting an interdisciplinary article co-authored by global leaders in disaster risk reduction from 14 countries, published in the prestigious journal *Nature*. Likewise, she is a co-author of a chapter in the most recent IPCC report (2022) and in the United Nations Global Assessment Report on Disaster Risk Reduction (2022), the most important publication produced by the United Nations Office for Disaster Risk Reduction. Furthermore, she was the leader of the Regional Science and Technology Advisory Group for Disaster Risk Reduction in the Americas and the Caribbean (RSTAG Americas), in charge of preparing the publication Integrated Disaster Risk Management in the Americas and the Caribbean: insights for a new scientific and technological-based regional agenda.

As a pioneer in IDRM, she has consolidated research at UNAM in Mexico, Latin America, and the Caribbean (LAC), and in interdisciplinary and transdisciplinary work groups focused on disaster risk reduction. The significance of her work lies in the integrated research approach she has developed and applied to disaster risk, helping to understand the generic and specific impacts of the hazards to which society is exposed. These efforts have improved the understanding of these hazards from a dynamic point of view -especially regarding landslides- and have also increased social awareness of the importance and need to implement disaster risk reduction strategies based on understanding the root causes, identifying and addressing the disaster risk drivers, and therefore the integrated management of the territory.

She has been enthusiastically involved in teaching undergraduate and postgraduate courses. She has taught more than 160 courses at the undergraduate and postgraduate levels at UNAM, as well as extracurricular lessons at the national and international levels. She has directed 52 theses by first-, master's-, and doctoral-level students from Mexico and LAC. Training students to shape a better generation of decision-makers and practitioners is one of her main challenges; several former students have become well-recognized young leaders.

Her commitment to fostering collaboration and knowledge sharing has enabled her to assume a range of motivating leadership roles and strategic positions within the international scientific community. She is a member of the Mexican Academy of Sciences; the Organization for Women in Science for the Developing World (TWAS, Trieste, Italy); the Scientific Leadership Council of the International Mountain Research Initiative (Switzerland); and the Geo-Hazards Scientific Committee of UNESCO's International Geoscience Programme. She also serves as a member of the Scientific Committee of the World Weather Research Programme (WWRP) of the World Meteorological Organization, the Science and Technology Advisory Group for the Americas and the Caribbean (RSTAG) of the United Nations Office for Disaster Risk Reduction (UNDRR-ROAMC), and as a Fellow of the International Science Council (ISC). Since 2025, she has been a member of the Scientific Committee of Deep-time Digital Earth and Chair of the ISC GeoUnions Standing Committee on Disaster Risk Reduction (ISC-GU-SC-DRR). In addition, she is currently a Lead Author for the IPCC Seventh Assessment Report (AR7).

She was President of the Mexican Society of Geomorphology, Vice President of the International Geographical Union, the International Consortium on Landslides, the International Association of Geomorphologists, and the Scientific Committee of the Program for Integrated Research on Disaster Risk of the International Science Council. Former member of the Committee on Scientific Planning and Review of the former International Council for Science (ICSU, Paris). She was also President of the Academic Council of the Pan-American Centre for Geographical Studies and Research, of the Pan-American Institute of Geography and History, coordinator of the Geographical Education Committee of the Geography Commission of the same institute, and Chairwoman of the Committee for Disaster Risk Reduction of the Regional Office for LAC of the International Science Council (ISC-ROLAC).

Professor Alcántara-Ayala has been an active member of the Board of Directors and the Advisory Board of the Global Alliance of Disaster Research Institutes (GADRI), Kyoto, Japan, and the International Consortium on Landslides (ICL), Kyoto, Japan, where she currently chairs the International Programme of Landslides (IPL) Evaluation Committee.

She has been the recipient of several prestigious awards, among them are: the 3rd Evelyn Pruitt Lecture 2005, awarded by the Department of Geography and Anthropology, Louisiana State University, USA; TWAS Young Affiliate Fellow 2009 and Award for Young Scientists from Latin America and the Caribbean 2011, both from the Academy of Sciences for the Developing World; the Research Award for Young Scientists 2012 from the Mexican Academy of Sciences; the "José Antonio Alzate" Professional Merit Scroll, awarded by the Illustrious and Benemérita Mexican Society of Geography and Statistics of the State of Mexico in 2016; the Sergey Soloviev Medal 2016, from the European Union of Geosciences; in 2018, the Sor Juana Inés de la Cruz recognition granted by UNAM; 2022, *Praeveni et Missionis* Award, Mexican Association of Professionals in Risk Management and Civil Protection; the Academy of Sciences for the Developing World Award, TWAS, in Social Sciences in 2022; the International Science Council Fellow (2023); and the Varnes Medal awarded by the International Consortium on Landslides, in 2023.

Her research is internationally cutting-edge. From a geography perspective, in addition to generating knowledge per se, it seeks to integrate science and society's experience to co-produce knowledge and its essential application in public policy and Integrated Disaster Risk Management practice.

The work of Professor Alcántara has invigorated the highly commendable role of geography as a strategy for interhuman communication and development in Mexico, Latin America, and the Caribbean through the language of understanding and integrated management of the territory to reduce disaster risk.

From Signals to Meaning: Risk Understanding at the Heart of Early Warning and Preparedness

Why Warnings Only Work When They Are Understood

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Abstract

Early Warning Systems (EWS) have advanced rapidly in hazard monitoring, forecasting, and alert dissemination, underpinning global ambitions such as the WMO-led Early Warnings for All (EW4All) initiative. Yet persistent and, in many contexts, rising disaster losses demonstrate that timely warnings alone do not guarantee effective risk reduction. This contribution argues that early warning must be accompanied by early understanding—an understanding of how risk is produced, differentiated, and governed within specific social, institutional, and territorial contexts. Drawing on integrated disaster risk research and social science perspectives, the paper advances the concept of articulated, people-centred early warning systems, in which physical and social sciences, governance arrangements, and community knowledge are actively connected rather than operating in parallel. Within this framing, risk communication is understood as a locally grounded process of sense-making and interaction, rather than the linear transmission of alerts. Persistent gaps in articulation across scientific domains, policy scales, and societal actors continue to constrain the translation of warnings into meaningful and timely action, particularly among populations facing structural vulnerability. By reframing EWS as socio-technical systems embedded in ongoing processes of risk creation and risk reduction, this perspective contributes to EW4All's vision by strengthening the relevance, inclusivity, and effectiveness of people-centred early warning as a foundation for sustainable disaster risk reduction.