ANNUAL REPORT 2022

GADRI

Global Alliance of
Disaster Research Institutes

GLOBAL ALLIANCE OF DISASTER RESEARCH INSTITUTES

Global Alliance of Disaster

GADRI have made its mandate to actively support the implementation of the Sendai Framework for Disaster Risk Reduction Agenda 2015-2030 adopted by the Third UN World Conference for DRR in Sendai, Japan and endorsed by the United Nations General Assembly during the same year of 2015 as its establishment.

The Global Alliance of Disaster Research Institutes (GADRI) is a collaborative platform for engaging, discussion, sharing knowledge and promoting networks on topics related to disaster risk reduction and resilience to disasters. It was established as an outcome of the 2nd Global Summit held in March 2015 which was organized and initiated by the Disaster Prevention Research Institute (DPRI), Kyoto University. Since then, GADRI Secretariat is headquartered at its host institute, DPRI, Kyoto University, Kyoto, Japan.

It works as a catalyst for bringing together institutions engaged in disaster risk reduction and resilience to disasters. GADRI membership is free and non-binding. Currently it has exceeded over 200 member institutions within 54 states and economies.
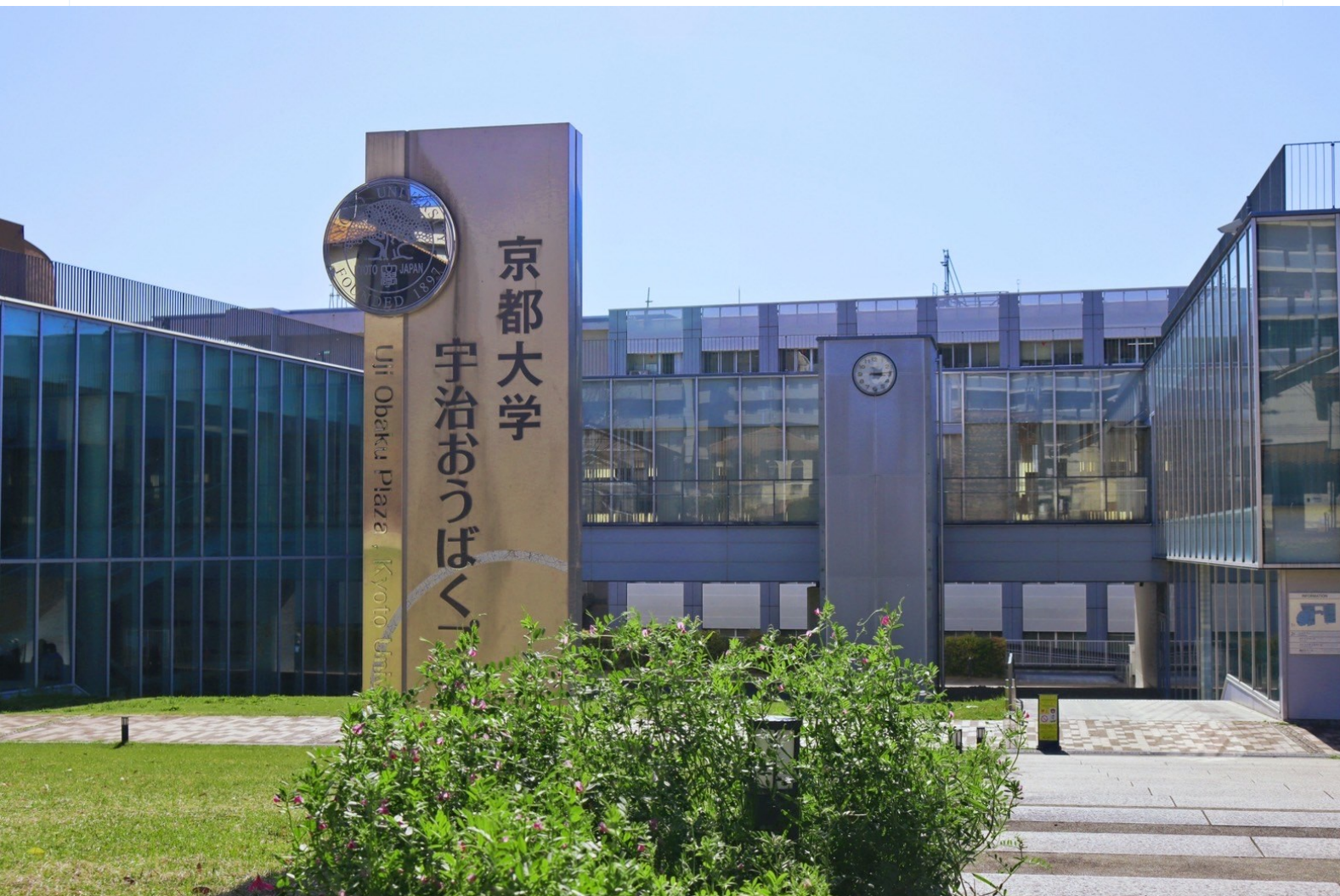
GADRI Secretariat is hosted by the Disaster Prevention Research Institute (DPRI), Kyoto University, Kyoto, Japan

Research Institutes (GADRI)

The regional alliances of GADRI actively promote its goals and objectives. Currently, there are four regional alliances:

- North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI);

- South Asia Alliance of Disaster Research Institutes (SADRI);

- African Alliance of Disaster Research Institutes (AADRI); and

- United Kingdom Alliance of Disaster Research (UKADR)

Recently, GADRI formed five Committees of GADRI to implement its five broad objectives. In addition, at its biennial Global Summits series, GADRI members report their research activities and achievements in fu-lfilment of the goals set out in the Science and Technology Roadmap for the implementation of the priority areas of the Sendai Framework Agenda. GADRI continue to work in close cooperation with UNDRR and its agendas.

- GADRI Committee on Networking

- GADRI Committee on Science and Technology (S&T) Roadmap

- GADRI Committee on Institutional Capacity Building

- GADRI Committee on Data and Information Sharing

- GADRI Committee on Advocacy

The 5th Global Summit of GADRI: Engaging Sciences with Action was held virtually and intercontinentally from 31st August to 1st September 2021. The Summit focused on the necessary influence of global alliance building and the importance of its regional alliances. Outcomes and the results of the deliberations of disasters research was brought to the UN Climate Change Conference of the Parties (COP26) held in the UK in November 2021. Based on the achievements of the 5th Global Summit, GADRI also contributed to the Seventh UN Global Platform of Disaster Risk Reduction: "From Risk to Resilience: Towards Sustainable Development for All in a COVID-19 Transformed World" held in Indonesia in May 2022 through the thematic session 15: Early Warning and Early Action.

GADRI continue to focus its attention to global concerns such as SDGs, climate change, disaster risk reduction and resilience to disaster and continue to find science and evidence-based implementable solutions.

For further details on GADRI, please visit the webpage - http://gadri.net/summit/.

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Message from the Secretary-General, GADRI

Dear Members of GADRI,

First of all, I want to thank all of you who sent information to complete the GADRI Annual Report 2022. We are very happy to see the progress in your research activities.

Looking back, 2022 brought forth many welcoming changes, from relaxing of COVID-19 restrictions at home and abroad; and even with some countries even opening borders. Many of you must have been busy with a many activities and especially travel related activities too.

GADRI Secretariat continued to work along with its agenda and would like to share with you a few of the activities covered by the Secretariat especially in 2022:

- Continued with the quarterly meetings of the Board of Directors of GADRI.

- Formation of the five Committees of GADRI to work specifically towards the objectives of GADRI outlined in the Charter of GADRI

- Initiation of a database on the Collection of the World Disaster Databases – a project under GADRI Committee on Networking

- Progressing towards the 6th Global Summit of GADRI: Towards GADRI Objectives of Achieving a Sustainable Disaster-Resilient World to be held at DPRI, Kyoto University, Uji Campus, Kyoto, Japan from 15 to 17 March 2023. This will be an in-person meeting only. As we are going to have this meeting after a four year, we are hoping to see many faces in Uji, Kyoto, Japan in March 2023.

- Planning to hold the GADRI Side Event on the Sendai Midterm Review – contributions by Members of GADRI on 14 March 2023.

- Under the Disaster and Risk Research: GADRI Book Series, three books were published:

- Publication of the Proceedings of the 3rd Global Summit of GADRI

- Publication of the Ecosystem Based Disaster and Climate Resilience

- Publication of the Proceedings of the 4th Global Summit of GADRI

- GADRI Secretariat was visited by the Director-General Stephen Quest, European Commission-Joint Research Centre and his colleagues, Italy in October 2023.

- Secretary-General of GADRI participated at the UNDRR meeting on Regional STAG in November 2022.

- Continuing to collect papers from various authors for the Proceedings of the 5th Global Summit of GADRI

- GADRI Actions – published the Spring, Summer and December 2022 editions of the GADRI newsletters

- GADDRI Prospectus – a work-in-progress to collect and update institute data

We are also reaching out to you with multiple messages to get your inputs for the 6th Global Summit of GADRI. These messages cover the GADRI survey, calling abstracts for the Poster and the Networking with Institutes session, early bird registrations, and excursions. Do take advantage of this opportunity which has come after four long years, to meet with each other. The Summit cannot be a successful event without your participation and contributions. We count on you and look forward to seeing you in March 2023.

As always, we will continue to work closely with you and keep in touch with you too.

Yours sincerely,

Hirokazu Tatano

Hirokazu Tatano

Secretary-General, GADRI; and Professor, DPRI, Kyoto University, Japan

GADRI Vision

To deepen the understanding of disasters and find implementable solutions to achieve disaster resilience, by integrating knowledge and technologies from around the world.

GADRI Objectives

- To support the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030

- To establish a global research network that promotes and engages disaster research.

- To provide a research roadmap, with plans that help facilitate the organization of disaster research groups.

- To promote capacity building and development of disaster research institutes and enhances researcher and student exchange.

- To promote exchange and sharing of data and information for scientific research across the globe.

- To serve as an advocacy organization presenting evidence-based approaches that influence decision-making processes.

GADRI Activities

- Planning and organization of regionally or globally collaborative disaster risk research initiatives

- Formation of international research groups to investigate current global disasters, and implement new research methodologies for disaster risk reduction and implementation

- Establishment of an international network for timely communication related to research on disasters

- Organization of conferences, workshops and meetings

- Dissemination and sharing of information, publications, reports, data and other research outputs

- Facilitation of rapid reconnaissance field surveys following disasters

- Preparation of GADRI news releases, policy recommendations, news bulletins, research reports, and other publications.

# Disaster and Risk Research: GADRI Book Series

Disaster and Risk Research: GADRI Book Series is published under the auspices of the Global Alliance of Disaster Research Institutes (GADRI). The global status of disaster research reflects the major strides made in the disaster sciences. These volumes present the forefront of disaster research, including key scientific findings, methodologies, policy recommendations and case studies. Whilst disaster risk needs to be managed in an integrated manner, persistently isolated applications of knowledge, practice and policy are falling short of ensuring disaster-resilient societies.

Responding to this deficit calls for measurement, tools, techniques and institutional structures that can realistically support comprehensive risk assessment and management across multiple hazard landscape. As such, disaster research is now faced with a multi-disciplinary, multi-stakeholder challenge. Contributions to this series therefore address many varied and critical opportunities to advance the subject area. A cross-cutting vision shared across the Disaster and Risk Research volumes is to improve the future of scientific and technological guidance with clearly identifiable roadmaps to ensure human safety and security.

https://www.springer.com/
series/16177

Published Books
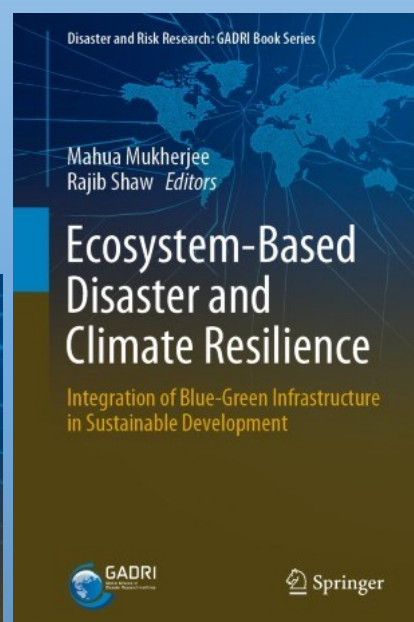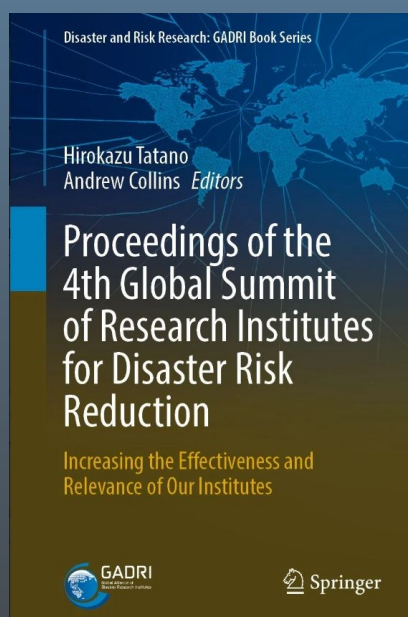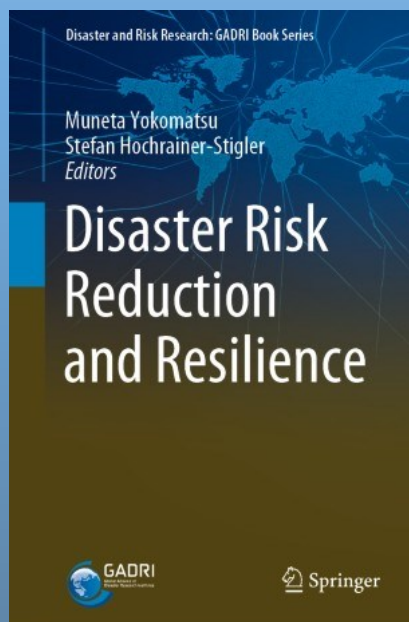
GADRI works closely with the UNDRR

GADRI has contributed to the Science and Technology Advisory Group (STAG); and continue to support the Regional-STAG. GADRI Members also supported the Expert Group on the Global Risk Assessment Framework (GRAF). GADRI was elected as a member of the Expert Group on the Global Risk Assessment Framework (GRAF) which was established as an important global initiative to support the implementation of the Sendai Framework Agenda for 2015-2030.

During the 7th Session of the Global Platform for Disaster Risk Reduction (GP22) held in Bali, Indonesia in May 2022; together with its members, GADRI supported the TS15: Early Warning Early Action part of the GP22.

Further information at: https://globalplatform.undrr.org/

Global Summits of GADRI

The Global Summits series of GADRI provide unique platform for members to get together to exchange latest research activities, challenges and gaps; encourage interactive communication among young scientists and researchers; promote collaborative research agendas, and institutional capacity building opportunities and researcher/student exchange programmes. Through the Global Summits of GADRI, the members of the GADRI are invited to present latest important research outcomes, and sharing information on plans for implementation of their research projects, and identification and improvement of gaps between academic research and societal cognizant for resilience to disaster and recovery.
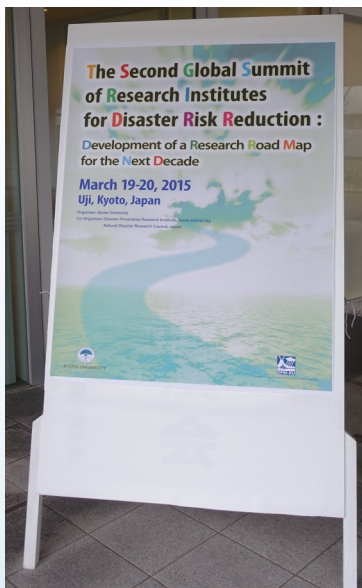
First Global Summit of Research Institutes for Disaster Risk Reduction: Exploring New Paradigms of Natural Disaster Research Based on the Lessons Learned from Great Natural Disasters, 24 to 25 November 2011, DPRI, Kyoto University, Kyoto Japan

The catastrophic consequences of the Great East Japan Earthquake and Tsunami which devastated Japan in March 2011, have brought to focus the importance to reassess the existing practices and management for disaster risk reduction, disaster prevention and preparedness planning. The massive tsunami was historical in terms of its height and the area destroyed by it. Lessons learned from this event as well as others around the world, show the importance of interdisciplinary research approaches to address in-situ approaches to disaster prevention and preparedness and research gaps.

The Disaster Prevention Research Institute (DPRI), Kyoto University organised the First Global Summit of Research Institutes for Disaster Risk Reduction at its premises in Uji Campus, Kyoto, Japan from 24 to 25 November 2011 paving an opportunity for all research institutes specialising in disaster risk reduction to join together to reflect on these challenges and explore new paradigms for DRR.

The main outcome of this Summit which brought together 135 participants in 52 research institutes from 14 economies around the world, working in disaster risk reduction and management, proposed the establishment of an international forum of disaster research fostered by DPRI, Kyoto University.

Second Global Summit of Research Institutes for Disaster Risk Reduction: Development of a Research Road Map for the Next Decade, 19 to 20 March 2015, DPRI, Kyoto University, Kyoto, Japan

The recommendation from the First Global Summit was further endorsed by the 190 participants in 83 institutes from 21 economies that participated at the Second Global Summit of Research Institutes for Disaster Risk Reduction: Development of a Research Road Map for the Next Decade that took place at DPRI, Kyoto University from 19-20 March 2015. The Second Global Summit was held soon after the UN World Conference on Disaster Risk Reduction March 2015.

The outcomes of the Second Global Summit of GADRI included the drafting of a Resolution by all the participating organizations with the purpose of sharing knowledge and promoting collaboration on topics related to disaster risk reduction (DRR) and resilience to disasters, as well as to provide support to the UNISDR Sendai Framework and its goals towards DRR. The Resolution was approved by all the participants in the Second Global Summit. The second most important outcome was the establishment of the "Global Alliance of Disaster Research Institutes (GADRI)". DPRI was designated as the GADRI Secretariat, and Prof. Hirokazu Tatano was appointed as its Secretary-General of GADRI.

Third Global Summit of Research Institutes for Disaster Risk Reduction: Expanding the Platform for Bridging Science and Policy Making DPRI, 19 to 21 March 2019, Kyoto University, Kyoto, Japan

The Third Global Summit of GADRI under the theme of Expanding the Platform for Bridging Science and Policy Making from 19 to 21 March 2017, Kyoto, Japan with 251 participants in 102 institutes from 38 economies from around the world. The Summit brought together representatives from research institutes involved in DRR research with the objectives: to serve as an advocate for key research policy statements that are in line with real, evidenced-based disaster research needs; to carry out a more detailed assessment of key research challenges and to identify priority research areas; to identify pioneering scientific initiatives to effectively reduce the gaps between science and practice in disaster risk reduction activities; to share and build on achievements, and outcomes of past and ongoing GADRI Projects addressing research gaps; and to foster links between local and international organizations and their programs through the GADRI network.

One of the major outcomes of this Summit was the establishment of the Disaster and Risk Research: GADRI Book Series with Springer Nature.

Another outcome of the Third Global Summit of GADRI, a questionnaire survey was conducted to Evaluate Current Research Status and Identify Most Important Future Research Themes. Over 50 Member institutes of GADRI participated in the survey. The results were discussed during the Group Discussion sessions of the Third Global Summit of GADRI. Later the recommendations were published in the Proceedings of the Third Global Summit of GADRI under the Disaster and Risk Research: GADRI Book Series.
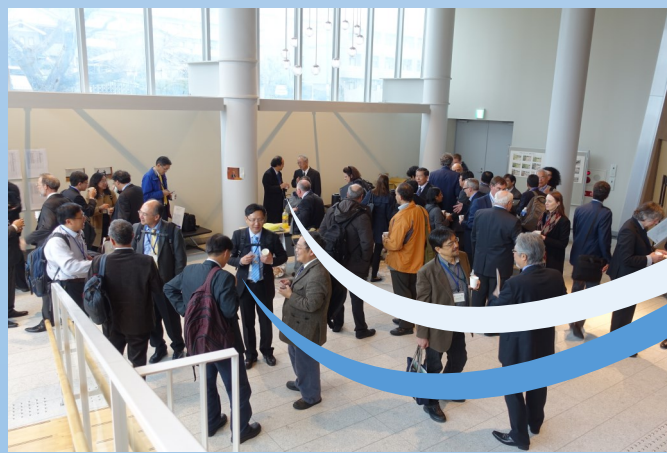
Fourth Global Summit of Research Institutes for Disaster Risk Reduction: Increasing the Effectiveness and Relevance of Our Institutes, 13 to 15 March 2019, DPRI, Kyoto University, Kyoto, Japan

The Fourth Global Summit of GADRI under the theme of Increasing the Effectiveness and Relevance of our Institutes was organised in March 2019 at DPRI, Kyoto University, Japan. It was attended by 246 participants within 107 institutes representing 33 economies around the world. The Fourth Global Summit of GADRI explored GADRI Contributions to the 2016 Science & Technology Roadmap; and how best could GADRI promote SFDRR 2030 agenda?; SDGs and Climate change and adaptation - what engagement mechanisms and research linkages are needed to influence research directions among policy makers, governments, localities, media, etc.?; The Tokyo Statement 2017 and the SFDRR Agenda 2030.; and Research Funding - Where are the funding for disaster risk reduction activities coming from and are they invested to right causes and areas that are most needed.

This session of the summit contributed, especially to the contextualisation of the Science and Technology Roadmap. Its recommendations were submitted to the UNDRR Global Platform for DRR in May 2019 in Geneva, Switzerland. The Proceedings of the Fourth Global Summit of GADRI was published under the Disaster and Risk Research: GADRI Book Series.

Fifth Global Summit of GADRI: Engaging Sciences with Action, Online and Intercontinental, 31 August to 1 September 2021

The Fifth Global Summit of GADRI: Engaging Sciences with Action was initially sponsored by the European Commission, Joint Research Centre, Italy; Disaster and Development Network, Northumbria University, New Castle upon Tyne, UK; and the Mid Sweden University, Sweden, and was planned to be held at the European Commission, Joint Research Centre, Ispra, Italy in March 2021. It was interrupted by the ongoing COVID-19 global pandemic, and the conference was held online. GADRI Secretariat was able to mobilise full and dedicated support from its regional alliances and the conference was held across continents and travelled around the world within 28 hours.

The Americas session covered by North and South America discussed Multidisciplinary Modelling Progress and the Role of Community Engagement in Resilience Planning while Asia and Oceania session listened to Engaging Sciences with Action: Voices from Asia and Oceania; and the Europe Session with Africa and the Middle East engaged in Exploring Solutions to Bridge the Gaps for Implementation of Science in Action. The conference brought 91 specialists in various disciplines including the session on young scientists and was logged-in via zoom by over 600 participants from 77 economies.

The 5th Global Summit of GADRI specifically focused on Climate Change and Adaptation and shared its recommendations with the UN COP26 held in Glasgow, UK in November 2021 through the UK Research and Innovation.

The Proceedings of the 5th Global Summit of GADRI is expected to be published under Disaster and Risk Research: GADRI Book Series.

Members of the GADRI Board of Directors 2020-2026

	Name	Term	Institute
Europe and Africa			
1	Dr. Zita Sebesvari	1 April 2020 to 31 March 2024	United Nations University, Institute for Environment and Human Security (UNU-EHS), Bonn, Germany
2	Prof. Peter Sammonds Prof. David Alexander	1 April 2020 to 31 March 2024	Institute for Risk and Disaster Reduction (IRDR), University College London, UK
3	Dr. Kaushal Keraminiyage	1 April 2022 to 31 March 2026	Research Centre for Disaster Resilience, University of Salford, UK
Asia and Oceania			
5	Prof. Gretchen Kalonji	1 April 2020 to 31 March 2024	IDMR, Sichuan University, Chengdu. China
6	Prof. Toshio Koike	1 April 2020 to 31 March 2024	International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO, Tsukuba, Japan
7	Prof. Yuichi Ono	1 April 2022 to 31 March 2026	International Research Institute of Disaster Science (IRIDeS), Tohoku University, Japan
8	Mr. Bill Ho (Director) Dr. Sunil Prashar	1 April 2022 to 31 March 2026	Asian Disaster Preparedness Center (ADPC), Thailand
Americas			
9	Prof. Paul Kovacs	1 April 2018 to 31 March 20224	Institute for Catastrophic Loss Reduction, Western University, Canada
10	Prof. John van de Lindt	1 April 2020 to 31 March 2024	Center for Risk-Based Community Resilience Planning, Colorado State University, USA
11	Ms. Sandra Sotomonte	1 April 2022 to 31 March 2026	Unidad Nacional para la Gestión del Riesgo de Desastres de Colombia-UNGRD, Colombia
12	Prof. James Kendra	1 April 2022 to 31 March 2026	Disaster Research Center, University of Delaware, USA
GADRI Secretariat			
13	Prof. Hirokazu Tatano	Secretary-General	DPRI, Kyoto University, Kyoto, Japan

Regional Alliance

1.	Prof. Desmond Manatsa	African Alliance of Disaster Research Institutes (AADRI), Bindura University of Science Education, Zimbabwe
1.	Prof. Andrew Collins Co-chair UKADR	UK Alliance of Disaster Research (UKADR), Disaster and Development Network (DDN), Northumbria University, UK
2.	Prof. Lori Peek	North American Alliance for Hazards and Disaster Research Institutes (NAAHDRI), Natural Hazards Center (NHC), University of Colorado, Boulder, USA
3.	Prof. Mahua Mukherjee	South Asian Alliance of Disaster Research Institutes (SAADRI), IIT, Roorkee, India
4.	Prof. Toshio Koike	Japan Science Council

Courtesy Visit by Stephen Quest, the Director-General of the Joint Research Centre (JRC) of the European Commission

Mr. Stephen Quest, the Director-General of the Joint Research Centre (JRC) of the European Commission and his colleagues Ms. Sabine Henzler, Director of Strategy and Ms. PASECINIC Liliana, Deputy Head of Unit paid a courtesy visit to the Disaster Prevention Research Institute (DPRI) of the Kyoto University, Uji Campus. They received a warm welcome from Prof. Eiichi Nakakita, Director, DPRI; Prof. Ryosuke Uzuoka, Vice-Director, DPRI; and Prof. Hirokazu Tatano, Secretary☐General, Global Alliance of Disaster Research Institutes (GADRI) and Professor, DPRI. EC-JRC has an Agreement of Cooperation with DPRI, Kyoto University since 2011.

They had fruitful discussions on future collaborative activities especially on disaster risk reduction. The Director-General Stephen Quest assured Prof. Tatano that EC-JRC will be represented at the planned 6th Global Summit of GADRI to be held at DPRI from 15 to 17 March 2023.
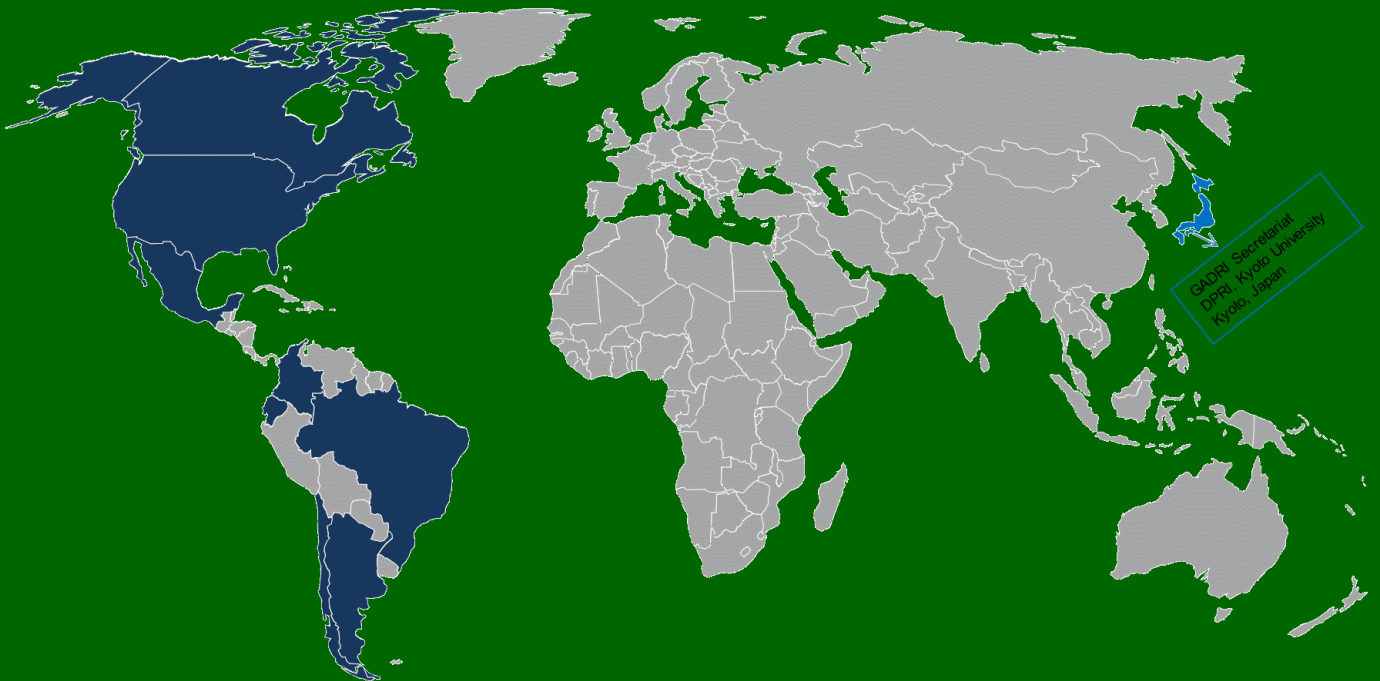

From L: Ruosuke Uzuoka, PASENIC Liliana, Sabine Henzler, Stephen Quest, Eiichi Nakakita, and Hirokazu Tatano
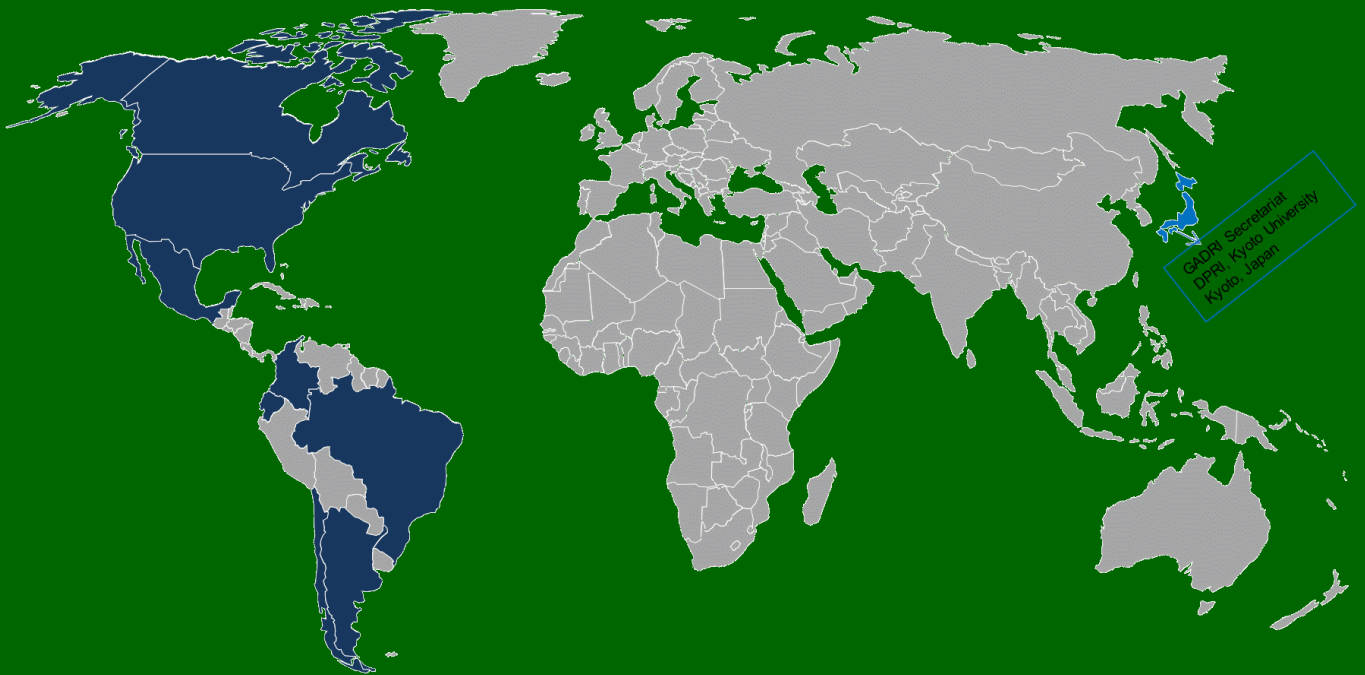
Keeping in touch with members

Americas

GADRI Secretariat
DPRI, Kyoto University
Kyoto, Japan

Americas

GADRI Secretariat
DPRI, Kyoto University
Kyoto, Japan

Americas—Members

Argentina	Environment and Natural Resources Research Program (PIRNA), Instituto de Geografía "Romualdo Ardissone", Facultad de Filosofía y Letras, Universidad de Buenos Aires
Brazil	Department of Civil Engineering, Centre for Technology and Natural Resources, Federal University of Campina Grande
Brazil	Instituto de Pesuisas Hidraulicas (IPH), Universidade Federal do Rio Grande do Sul (UFRGS)
Canada	The Institute for Catastrophic Loss Reduction (ICLR), Western University
Chile	Centro Nacional de Investigacion par la Gestion de Desastres Naturales (CIGIDEN)
Colombia	Department of Chemical Engineering, Universidad de los Andes
Colombia	National Unit for Disaster Risk Management in Colombia (NGRD) (Unidad Nacional para la Gestión del Riesgo de Desastres de Colombia-UNGRD)
Colombia	Seismological and Geophysical Observatory of the Southwest (Observatorio Sismológico y Geofísico del Suroccidente (OSSO)), Valle University (Universidad del Valle)
Ecuador	Pacific International Center for Disaster Risk Reduction (PIC-DRR), Escuela Superior Politechnica del Litoral
Mexico	Institute of Geography, National Autonomous University of Mexico (UNAM)
Mexico	Structures Laboratory, University of Michoacan
Mexico	Research Institute of Risk Management, University of Michoacan
USA	American Society of Civil Engineers (ASCE)
USA	Center for Emergency Management and Homeland Security, Arizona State University (ASU)
USA	Pacific Earthquake Engineering Research Center (PEER), University of California, Berkeley
USA	Resilient Communities Research Institute (RCRI), College of Architecture and Environmental Design, California Polytechnic State University
USA	Natural Hazards Center (NHC), University of Colorado Boulder
USA	Center for Risk-Based Community Resilience Planning, Colorado State University
USA	Disaster Research Center, University of Delaware
USA	Wind and Hurricane Impact Research Laboratory (WHIRL), Florida Institute of Technology (FIT)
USA	Center for Wind Hazard and Infrastructure Performance, Texas Tech
USA	Dept. of Business Information Technology, Virginia Tech
USA	Program on Population Impact, Recovery and Resilience (PiR2), College of Global Public Health, New York University
USA	Nevada Seismological Laboratory, University of Nevada
USA	Global Resilience Institute, Northeastern University
USA	Coastal Resilience Center (CRC), University of North Carolina at Chapel Hill (UNC)
USA	Advanced Radar Research Center, University of Oklahoma
USA	Center for Infrastructure, Transportation, and the Environment (CITE), Rensselaer Polytechnic Institute (RPI)
USA	Department of Industrial and Systems Engineering, Rensselaer Polytechnic Institute (RPI)
USA	Southern California Earthquake Center (SCEC)
USA	Center for Risk and Economic Analysis of Terrorism Events (CREATE), University of Southern California
	...d Reduction and Recovery Center (HRRC), Texas A&M University (TAMU)
USA	Geologic H...ards Science Center, U.S. Geological Survey
USA	Department of Environmental Studies, Resilience Institute, Western Washington University

Federal University of Campina Grande（UFCG), Brazil

https://portal.ufcg.edu.br/

The Federal University of Campina Grande (UFCG) conducts studies, research, and intervention in environmental disasters in a broad sense, spanning several areas. This is partly motivated by the institution's location in the semiarid region of Brazil, highly populated and socially and economically vulnerable to environmental hazards, such as droughts, desertification, land degradation, flash floods, and health vulnerability, leading to social inequality. Our present interests are in understanding local and regional needs and the social aspects of Disaster Risk Reduction (DRR). Among such activities, we highlight two nationwide research and outreach networks in which UFCG's researchers have had strong participation during 2022.

The National Graduate Program in Water Resources Regulation and Management (ProfAgua) includes 14 universities in all regions of Brazil. At UFCG, a particular emphasis is on the regulation and management of water resources for DRR. Every year, practitioners and professionals in water-related fields are enrolled in this Master's Program, producing new insights, theories, technologies, and processes for better water regulation and management in their daily professional activities. This year, one of the research outcomes was a survey and analysis of the natural disasters in the State of Paraíba, Brazil, during the ten years between 2010 and 2020. Droughts are the major disaster, followed by inundations, and then by coastal erosion. Preparedness actions at the local level, along with federal- and state-level public policies and funding, are necessary to reduce their impacts.

Prof. Carlos de Oliveira Galvao

E-mail: carlos.galvao@ufcg.edu.br

Students, faculty members, and researchers of the National Graduate Program in Water Resources Regulation and Management at the IAHR Latin-American Hydraulics Congress, held at Iguaçu Falls, Brazil, November 2022

The Metropolis Observatory is a national network spanning the country, focusing on the right to the city (https://www.observatoriodasmetropoles.net.br/). At UFCG, in 2022 we have done research and outreach activities on the climate emergency, inundations, and urban settlements, in particular at informal and precarious settlements. This year, the main national initiative of the Observatory was to produce a set of 17 books bringing critical surveys of the reality and challenges of several Brazilian cities (http://reformaurbanadireitoacidade.net/livros/). This collection is primarily targeted to the community-rooted social movements, and also to the working groups preparing the action plans of the new Brazilian Government, democratically elected in October 2022. UFCG led one of the books, focusing on the cities of Campina Grande and João Pessoa. The questions of social classes, gender, race, and sexuality were addressed towards more inclusive, just, and safe cities, also considering the disasters' perspectives.

UFCG regularly runs initiatives at the community level in its seven campuses in the State of Paraíba. One of them is the organic-waste composting network, at Pombal municipality (https://www.instagram.com/rcc_ccta/). Schools' students and teachers take part in workshops, hands-on training, and laboratory analysis. Such a network promotes citizenship, environmental sustainability, and land degradation in a desertification-prone region. Another initiative is the partnership with the Brazilian Sustainable Cities Platform (https://www.cidadessustentaveis.org.br/), towards accelerating the implementation of the Sustainable Development Goals at the municipal level. Workshops are held to discuss strategies for achieving local sustainable development, through effective communication and participative processes. Politicians, educators, researchers, businesses, social workers, and other local agents are the participants.

Books by the Metropolis Observatory Network of the collection "Urban reform and the right to the city". http://reformaurbanadireitoacidade.net/livros/

Activities of the UFCG's organic-waste composting network.

Workshop at Sumé city, towards accelerating the implementation of the SDGs at the municipal level.

Instituto de Pesquisas Hidraulicas (IPH), Federal University of Rio Grande do Sul（UFRGS), Brazil

https://www.ufrgs.br/iph/

training course "Natural Disaster Risk Reduction in the Extreme South of Santa Catarina state

A few of Master's and PhD students in the Graduate Program of Water Resources and Environmental Sanitation (PPGRHSA) of IPH of Federal University of Rio Grande do Sul (UFRGS) organized one commemorative and scientific seminar (on-line mode) "Student Seminar on Water Sciences" on March 22nd (World Water Day). (https://www.ufrgs.br/iph/noticias/iii-seminario-discente-em-ciencias-das-aguas-sdca/)

Catarina (UFSC), carried out a training course on "Natural Disaster Risk Reduction in the Extreme South of Santa Catarina state" (24 hours). This course was conducted to 30 social assistants from 10 city-halls. The course consisted of two-days theory work and a field trip.

During the period April 6th to 7th, 2022, members of the Research Group on Natural Disasters (GPDEN) of IPH/UFRGS, together with members of Laboratory of Water, Forest and Energy (HidroFEN) of Federal University of Santa
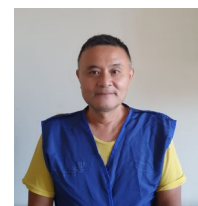
Prof. Masato Kobiyama

E-mail: masato.kobiyama@ufrgs.br

During the period August 17th to 19th, 2022, members of GPDEN, together with members of HidroFEN/UFSC, carried out the another training course "Natural Disaster Risk Reduction in the Extreme South of Santa Catarina state" (20 hours). This course was held by the Geopark "Caminhos dos Canions do Sul" (https://canionsdosul.org/) registered by UNESCO in 2022, and was conducted for mountain guides who work in several canyons of the regions. In the field work study part, some methods to observe mass movements were taught.

During the period September 12th to 16th, 2022, the GPDEN organized one in-person event "VI Hydrogeomorphological Modeling Course for Risk Mapping" (40 hours) with 30 participants who were civil defense officers, environmental protections officers, university lecturers, scientists, etc. This course addressed hydrogeomorphological modeling (SHALSTAB, KANAKO-2D, HEC-RAS, HAC-HMS etc.) in order to computationally represent floods, mass movements and associated processes. From this, elaboration of hazard/risk maps for floods and mass movements was carried out.

The course had one-day field trips to several basins where mass movements and floods have recently occurred. The objective of this course was to teach techniques as well as to construct a network of disasters managers and researcher in Brazil https://www.ufrgs.br/gpden/wordpress/?page_id=2018

On November 3rd, the list of most influential researchers in the world in 2021, prepared by Stanford University (USA), was published by Elsevier: https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw

Among the most influential scientists throughout their careers till 2021, Dr. Robin T. Clarke (former professor of IPH) was listed. During his working at the IPH, he contributed to stochastic hydrology at the world-wide level.

the organizers of Natural Disaster Risk Reduction in the extreme south of Santa Catarina state, with members of Geopark

Institute for Catastrophic Loss Reduction, Canada

https://www.iclr.org

The Institute presented the ICLR Resilience in Recovery award to the Mayor of Calgary for the City's build back better program implemented following a devastating hailstorm in 2020.

The ICLR Resilience in Recovery team supported the recovery of Lytton, Calgary and Barrie following major loss events.

The Institute published its 100th case study of Canadian communities successfully adapting to climate extremes.

ICLR published its 10th Mind your Business report giving disaster protection advice to small business.

ICLR published recommendations for resilient new residential construction for hazards that include extreme rainfall, severe wind, wildfire and hail.

The Institute has developed a tool to prepare public infrastructure for climate change through the PIEVC program.

A new promotional video about the Institute for Catastrophic Loss Reduction, who we are and what we do. https://youtu.be/fuxfWUwcXN8

Profiled publications

- Fire following earthquake in the Vancouver region Prepared for the Institute for Catastrophic Loss Reduction By Charles Scawthorn, S.E. November 2020

- chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.iclr.org/wp-content/uploads/2020/11/Vancouver-fire-following-earthquake-E.pdf

- Mind Your Business - https://www.iclr.org/commercial-insurer/

- Commercial lines risk reduction - https://www.iclr.org/small-business/

- Mind your business commercial bulletins - chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.iclr.org/wp-content/uploads/2022/04/ICLR-Commercial-Bulletin_Nov-21-2.pdf

- Our Flipboard Magazines - **https://flipboard.com/@iclrresearch/fault-lines-**

Visit out website for further details.

Prof. Paul Kovacs

Executive Director

E-mail: pkovacs@iclr.org

Centro de Investigación para la Gestión Integrada del Riesgo de Desastres (CIGIDEN), Chile

https://www.cigiden.cl/

"Challenges in critical infrastructure resilience to Chile" seminar

Seminar organized by lines 3 and 5 of the center. FONDEF project presentation

In 2022, the CIGIDEN researchers, together with their administrative team and the communications unit, returned 100% on-site, after the Covid-19 pandemic. This meant to return to organize seminars, exhibitions and visit coastal communities exposed to risks in different places of Chile.

In this sense, the promotion of the technical-scientific bases for a new coastal law for Chile had several events throughout the year and we actively participated in the Science Festival in Santiago and Puerto de Ideas in Antofagasta, besides taking our sample of satellite gigantographs to Valparaíso and Concepción.

We would like to highlight the fact that we have received financing for an additional year and will later apply for financing for another 10 years.

1. SIGMA project seminar: Maipo river basin multi-hazard map.

Closing seminar of the FONDEF 19i10021 SIGMA project called "Maipo river basin multi-hazard map", carried by a multidisciplinary research team from CIGIDEN, UCN and UC, which insightfully studies the Maipo river basin from the mountain range - passing by San José- to the coast where this river's mouth locates.

More info
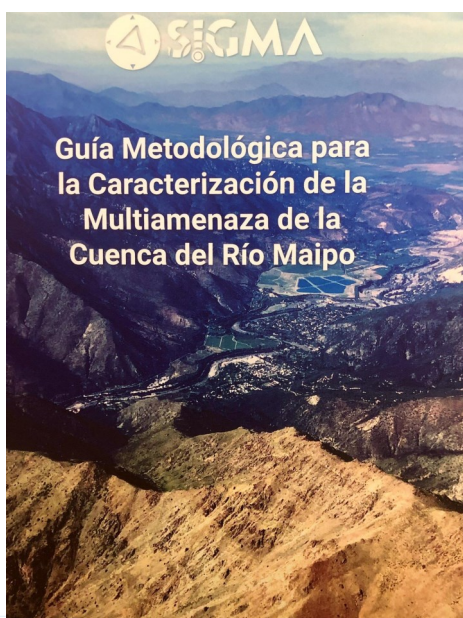
Dr. Rodrigo Cienfuegos
Director
E-mail: director@cigiden.cl

2. "From the sky: Chile's disasters on picture".

Exhibition gathering satellite images and areas of the main disasters in Chile, obtained from the historical record of the Air force's Aerial Photogrammetric service (SAF by its initials in Spanish)

More info

3. Puerto Ideas Festival: Animated series "Kay kay, getting to know the tsunami risk".

Premiere of the cartoon series "KayKay", created by line 6: citizen governance.

Watch the all the episodes here

4. Disastrous discussions: transdisciplinary meetings

Online discussion series organized by the CIGIDEN's research line of "disaster culture and risk governance", where specialists of different fields (science, humanities, and arts) were invited to discuss the varied dimensions of disasters. Watch here all the disussions

5. **Exhibition *Desartes* #1: ALLUVIUM**

Exhibition of the CIGIDEN's L4 Art and Disasters unit –DESARTES, including artworks of Sebastian Riffo (paintings), Ignacio Gutierrez with Nicolas Briceño (Sound installation called "it's coming down the ravine") and Charco collective ("A year in Atacama" intervention record), along with the presence of 1993 Macul ravine's alluvium researchers Valentina Acuña (historian) and Leila Juzam (anthropologist). This exhibit explores the alluviums phenomenon from the arts.

Watch "Alluviums" here

 Know Desartes project here

6. International symposium: "Coastal governance and its implications: Launching the preliminary draft of a coastal law for Chile."

To honor World Oceans day, June 8, on Wednesday. During this activity, CIGIDEN and SECOS researcher and Coast observatory director Carolina Martinez, along with a group of lawyers, presented a regulation proposal – the preliminary draft of a coastal law for Chile.

Watch the symposium here

7. **"Ecologies of the disaster" book launch.**

A book that addresses different ways of thinking about disasters through a practice involving varied disciplines. "Ecologies of the disaster."

Watch this launch here

8. **Education and scientific dissemination fair: ecosystems and coastal risks in Maule**

Geohub platform launch, in addition to workshops and informative stands, to inform the community about the different projects and themes addressed by the organizations, such as research centers regarding ecosystems and disaster risks.

Read an article about this activity here

9. Policy papers launch: "Indigenous women and climate action: recommendations for risks reduction" and "Collective mapping as a participatory methodology for the study of risks in communal urban planning: a proposal for Chile".

The series of public policy documents Policy Papers CIGIDEN, aims to translate the research carried out at the FONDAP research center of excellence on Disaster Risk Management, in short texts strategically directed to public policy, towards decision makers. In this way we seek to generate an impact on our society that translates into making Chile a more resilient country to natural hazards.

Link to Policy papers
Watch this launch here
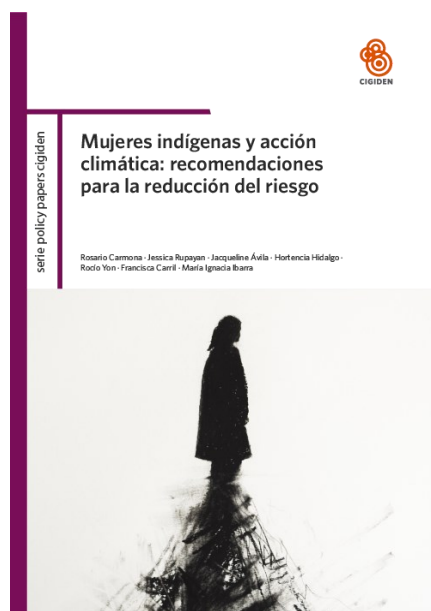
10. International symposium– "Resilient development: science and public policy for disaster risk management"

In the framework of the tenth anniversary of our research center, we held a new International Seminar with the participation of EPICentre UCL co-director, Tizziana Rosetto, as keynote speaker.

The objective of this meeting was to present the most important milestones of our FONDAP center over ten years, to share the experience of forming a research center around our natural hazards, anthropogenic and socio-natural disasters, and to reflect from scientific evidence on the guidelines and public policies for the resilient development of our country and the world.

Link to CIGIDEN 10º anniversary

11. "Towards a coastal law for Chile" seminar

Public activity in Navidad commune, alongside the regional government and the local municipality on the need for a participatory coastal law in Chile.

Link to the seminar

12. GEObook launch– "Toward a coastal law for Chile: basics for a integrated management of coastal areas"

"Towards a coastal law for Chile" seminar. Presentation of the techno-scientific basis for a new coastal law in Chile.

Link to the event

Link to GEObook

13. "Collective mapping as a participatory methodology for the study of risks in communal urban planning: a proposal for Chile" policy paper launch flyer:

14. The Chilean Association of Engineers awarded our principal investigator, Juan Carlos de la Llera, with the Gestión 2022 award.

Pacific International Center for Disaster Risk Reduction, Ecuador

www.cip-rrd.espol.edu.ec

Centro Internacional del
Pacífico para la Reducción del Riesgo de Desatres
espol

Photo: reduction building up local committees and brigades that are certified by the rules of the national risk management authority.

CIP-RRD has been working on the design of early warning systems (EWS), mainly for floods with local-government co-production. During 2022, the Duran City EWS' started its implementation phase. Duran is a medium size city (about 250k inhabitants) with chronic floods, which would be incremented under the current climate change scenario, thus the importance of having such a system. The difference among other EWS is that besides the technological part, the monitoring, alert and response, the system includes community members as 'voluntary environmental monitors', who report to the Disaster Risk Management unit of the Duran Municipality when flooding threshold in specific neighborhoods no cover by instruments, have been reached. Also, through funding under consultancy of the World Food Program the CIP-RRD has trained 14 community brigades

and committees for disaster risk management in several parts of Ecuador to increase citizen resilience to natural hazards.

We also work with the Pan-American Health Organization a GUIDE to be applied in EMERGENCY situations that provides guidance on the process of adapting public health programs and actions in territories and populations in vulnerable situations. Aimed at the technical teams and decision makers of the countries.

Prof. Maria del Pilar Cornejo-Rodríguez

Director

E-mail: pcornejo@espol.edu.ec

But most probable our best task during 2022 was to work out and propose a body of articles for the Disaster Risk Management Ecuadorian law proposed to the National Assembly, that would secure funding for the National Disaster Risk Management System. We expect the Law to be approved by mid-2023.

Regarding publications, the center had six publications on Scopus/WOS, and one book chapter

1. Cornejo-Rodriguez, M.d.P. Ecuador and the 2015–16 El Niño. In: Glantz, M.H. (eds) El Niño Ready Nations and Disaster Risk Reduction. Disaster Studies and Management. Springer, Cham. https://doi.org/10.1007/978-3-030-86503-0_18

2. Delgado, E. J., Cabezas, X., Martin-Barreiro, C., Leiva, V., & Rojas, F. (2022). An equity-based optimization model to solve the location problem for healthcare centers applied to hospital beds and COVID-19 vaccination. Mathematics, 10(11) doi:10.3390/math10111825

3. Montenegro, M., Campozano, L., Urdiales-Flores, D., Maisincho, L., Serrano-Vincenti, S., & Borbor-Cordova, M. J. (2022). Assessment of the impact of higher temperatures due to climate change on the mortality risk indexes in ecuador until 2070. Frontiers in Earth Science, 9 doi:10.3389/feart.2021.794602

4. Ormaza-González, F. I., Espinoza-Celi, M. E., & Roa-López, H. M. (2022). Did schwabe cycles 19–24 influence the ENSO events, PDO, and AMO indexes in the pacific and atlantic oceans? Global and Planetary Change, 217 doi:10.1016/j.gloplacha.2022.103928

5. Rincon, G., Morantes Quintana, G., Gonzalez, A., Buitrago, Y., Gonzalez, J. C., Molina, C., & Jones, B. (2022). PM2.5 exceedances and source appointment as inputs for an early warning system. Environmental Geochemistry and Health, 44(12), 4569-4593. doi:10.1007/s10653-021-01189-2

6. Rincon, G., Morantes, G., Roa-López, H., Cornejo-Rodriguez, M. P., Jones, B., & Cremades, L. V. (2022). Spatio-temporal statistical analysis of PM1 and PM2.5 concentrations and their key influencing factors at guayaquil city, ecuador. Stochastic Environmental Research and Risk Assessment, doi:10.1007/s00477-022-02310-2

7. Saltos-Andrade, I., Ramírez-Ruiz, N., Chuez-Cedeño, M., Martillo-Bustamante, C., Andrade-García, G., Cedeño-Oviedo, J., & Cervantes-Bernabé, E. (2022). Evaluation of port infrastructure in the face of wave agitation and climate change, applying numerical models. case study: Manta port terminal, ecuador. Paper presented at the Proceedings of the LACCEI International Multi-Conference for Engineering, Education and Technology, 2022-July doi:10.18687/LACCEI2022.1.1.96 Retrieved from www.scopus.com

The Director of CIP-RRD was recognized as Resilience Ambassador at the Dutch 4TU.DeSIRE Program (Designing Systems for informed Resilience Engineering) (https://www.4tu.nl/resilience/about-us/our-people/partners-external-community-people/Pilar-Cornejo/)

One of CIP-RRD researchers, Dr. Professor Mercy Borbor, was leading author of the climate change mitigation policy chapter of the AR6 IPCC.

CIP-RRD jointly with the Faculty of Maritime Engineering and Marine Sciences generated a citizen science program named OLE, for observations of oceanic and meteorological variables, right at the sea side, with the fisherman community (http://www.cip-rrd.espol.edu.ec/ole).

Pacific Earthquake Engineering Research Center (PEER)
University of California, Berkeley, USA
https://peer.berkeley.edu/

50th Anniversary Celebration of UC Berkeley Shaking Table, June 24, 2022

- PEER contributed to the reconnaissance of several hazards in 2022 including: (1) the 14-15 January 2022 Tonga Volcanic Eruption and Tsunami, (2) 22 June 2022, Afghanistan, Mw 5.9 Earthquake, (3) 2 July 2022, Iran, Mw 6.0 Earthquake Sequence, (4) 27 July 2022, Philippines, Mw 7.0 Earthquake, (5) September 18, 2022, Taiwan, Mw 6.9 Earthquake, (6) September 19, 2022, Mexico, Mw 7.6 Earthquake, (7) November 21 2022, Indonesia, Mw 5.6 Earthquake, and (8) 23 November 2023, Duzce, Turkey Earthquake.

- PEER initiated and expanded collaborations with several local and global disaster/hazard/ reconnaissance focused organizations, including CalOES (California Governor's Office of Emergency Services), SPUR (San Francisco Bay Area Planning and Urban Research Association), EEFIT (Earthquake Engineering Field Investigation Team), and IAEE (International Association for Earthquake Engineering).

- Four (4) projects and three (3) workshops started in 2022 with funding from PEER's TSRP program. The TSRP currently has over 20 active projects. PEER Bridge program currently has 8 active projects.

- PEER celebrated the 50th Anniversary of the UC Berkeley shaking table on June 24, 2022, at the Earthquake Simulator Laboratory facility at Richmond Field Station. Over 80 researchers, practitioners, former and current students attended the event to commemorate the impact of the table on the field of earthquake engineering.

Prof. Khalid M. Mosalam
Director
E-mail: mosalam@berkeley.edu

- PEER Researchers' Workshop featuring presentations on all active projects was held on September 19 & 20 in hybrid format with participation from the PEER community.

- The OpenSRA project made substantial progress in 2022 with the release of the first version of the open-source seismic risk assessment software tool for natural gas storage and pipeline systems.

- PEER committees were active in 2022. The Institutional Board (IB) convened under the leadership of Prof. Sashi Kunnath in 2022 and now has several new members from the core institutions. The Research Committee (RC) was revamped and started a careful evaluation of PEER's research priorities. Most importantly, the PEER Student Committee (PSC) developed a new structure of subcommittees and is actively reaching all core institution students.

- PEER started issuing Digital Object Identifiers (DOIs) for reports in 2022 and issued 5 reports on research conducted by the funded projects. Some of the reports have received over 700 views in just a few months. PEER Reports are organized in a searchable page.

PEER organized a blind prediction contest for predicting the experimental results obtained from a Shaking Table test campaign carried out at the UC Berkeley shaking table, in collaboration with the University of Trento, Italy. The experimental tests, performed on a steel Moment Resisting Frame, pursued the aim of physically demonstrating the effectiveness of a novel device for seismic action mitigation, called Impact Mass Damper (IMD). Several teams participated in the contest and some of the teams achieved successful predictions of the response of this new system.

PEER Researchers 'Workshop, September 2022

Natural Hazards Center
University of Colorado, Boulder, USA
https://hazards.colorado.edu/
https://converge.colorado.edu/

The Natural Hazards Center at the University of Colorado Boulder serves as the U.S. National Science Foundation-designated information clearinghouse for the societal dimensions of hazards and disasters. The mission of the Center is to:

- Translate and share hazards and disaster research and information;

- Build connections between researchers, nonprofit and private sector professionals, the media, policy makers, and local, state, and federal officials;

- Advance social science and interdisciplinary knowledge, with a special emphasis on the most vulnerable populations and places; and

- Train and mentor a diverse next generation of hazards and disaster professionals.

The team at the Natural Hazards Center led several initiatives during the reporting period including:

- Served as the Secretariat for the North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI). https://naahdri.org/

- Maintained a global map and list of university-based hazards and disaster research centers and published the data associated with the map and list. See: https://hazards.colorado.edu/resources/research-centers

- Hosted the 47th annual Natural Hazards Research and Applications Workshop, which involved more than 750 researchers, local/state/federal practitioners, policymakers, private and non-profit sector representatives, journalists, and students. The theme of the 2022 Workshop was "Changing Climates: Equity and Adaptation in a Warming World." https://hazards.colorado.edu/workshop/2022

- Co-facilitated the annual Researchers Meeting, which involved more than 350 hazards and disaster researchers from across the U.S. and around the world. The theme of the 2022 Researchers Meeting was "Back to the Field? Hazards and Disaster Research Following the Pandemic." https://hazards.colorado.edu/workshop/2022/researchers-meeting/overview

- Hosted the monthly Making Mitigation Work webinar series. https://hazards.colorado.edu/training/webinars/making-mitigation-work

- Publishing the *Research Counts* series https://hazards.colorado.edu/news/research-counts

- Publishing *Disaster Research—News You Can Use.* https://hazards.colorado.edu/disaster-research/current

- Hosted the Disaster Grads list serve for undergraduate and graduate students in the hazards and disaster field. https://hazards.colorado.edu/signup

- Published and hosted webinars for two new CONVERGE Training Modules: "Reciprocity in Hazards and Disaster Research" and "Public Health Implications of Hazards and Disaster Research." https://converge.colorado.edu/resources/training-modules

- Continued to add to the CONVERGE Training Modules Assignment Bank, which now also includes an introductory webinar. https://converge.colorado.edu/resources/training-modules/assignment-bank/

- Released additional Annotated Bibliographies through CONVERGE. https://converge.colorado.edu/resources/training-modules/annotated-bibliographies/

- Published "Extreme Events Research Check Sheets Series." https://converge.colorado.edu/resources/check-sheets/. Includes an introductory webinar.

Prof. Lori Peek

Director, Natural Hazards Center,
Principal Investigator CONVERGE,
Professor, Dept. Sociology,
University oif Colorado Boulder

E-mail: Lori.Peek@colorado.edu

- Maintained database of resources by CONVERGE Data Ambassadors (https://converge.colorado.edu/data/data-ambassadors/) and hosted webinar introducing this service: "Publish Your Data! Learn How to Use DesignSafe and Meet the CONVERGE Data Ambassadors" (https://converge.colorado.edu/webinars/publish-your-data/)

- In 2021, Director Lori Peek was appointed by U.S. President Joseph R. Biden and approved by the U.S. Senate to serve on the Board of Directors of the National Institute of Building Sciences; in 2022 she continued in this appointment serving the "public interest of the nation."

Researchers affiliated with the Natural Hazards Center and the CONVERGE facility produced the following books and journal article publications in 2022:

2022   Erikson, Kai and Lori Peek. *The Continuing Storm: Learning from Katrina.* Austin: University of Texas Press.

2022   Adams, Rachel Marie, Candace Evans, Amy Wolkin, Tracy Thomas, and Lori Peek. "Social Vulnerability and Disasters: Development and Evaluation of a CONVERGE Training Module for Researchers and Practitioners." *Disaster Prevention and Management* 31(6): 13-29, https://www.emerald.com/insight/content/doi/10.1108/DPM-04-2021-0131/full/html.

2022   Adams, Rachel M., Jennifer Tobin, Lori Peek, Jolie Breeden, Sara McBride, and Robert de Groot. "The Generational Gap: Children, Adults, and Protective Actions in Response to Earthquakes." *Australasian Journal of Disaster and Trauma Studies* 26(2): 67-82.

2022   Bostrom, Ann, Sara K. McBride, Julia S. Becker, James D. Goltz, Robert-Michael de Groot, Lori Peek, Brian Terbush, and Maximilian Dixon. "Great Expectations for Earthquake Early Warnings on the United States West Coast." *International Journal of Disaster Risk Reduction* 82, https://doi.org/10.1016/j.ijdrr.2022.103296.

2022   Maggioni, Andrea, Jose A. Gonzales-Zamora, Alessandra Maggioni, Lori Peek, Samantha A. McLaughlin, Ulrich von Both, Marieke Emonts, Zelde Espinel, and James M. Shultz. "Cascading Risks for Preventable Infectious Diseases in Children and Adolescents During the 2022 Invasion of Ukraine." *International Journal of Environmental Research and Public Health* 19(12): 7005, https://doi.org/10.3390/ijerph19127005.

2022   McBride, Sara K., Hollie Smith, Meredith Morgoch, Danielle Sumy, Mariah Jenkins, Lori Peek, Ann Bostrom, Dare Baldwin, Elizabeth Reddy, Robert M. de Groot, Julia S. Becker, David M. Johnston, and Michele M. Wood. "Evidence-Based Guidelines for Protective Actions and Earthquake Early Warning Systems." *Geophysics* 87(1): WA77, https://doi.org/10.1190/geo2021-0222.1.

2022   Peek, Lori. "A New System for Disaster Research." *American Scientist* 110(4): 226-231, https://www.americanscientist.org/article/a-new-system-for-disaster-research.

2022   Shultz, James, Lori Peek, and Sandro Galea. "Advances in Estimating Mortality Associated with Tropical Cyclones in the US." *Journal of the American Medical Association (JAMA)* 327(10): 929-931, https://jamanetwork.com/journals/jama/article-abstract/2789676.

2022   Wu, Haorui, Lori Peek, Mason Clay Matthews, and Nicole Mattson. "Cultural Competence for Hazards and Disaster Researchers: Framework and Training Module." *Natural Hazards Review* 23(1), https://doi.org/10.1061/(ASCE)NH.1527-6996.0000536.

2022   Peek, Lori. Review of *Earthquake Children: Building Resilience from the Ruins of Tokyo* by Janet Borland. *International Journal of Mass Emergencies and Disasters* 40(2): 205-208.

Researchers affiliated with the Natural Hazards Center and the CONVERGE facility produced the following data publications, reports, online publications, and training materials in 2022:

2022   Adams, Rachel, Lori Peek, Jennifer Tobin, Jolie Breeden, Meghan Mordy, Sara McBride, and Robert de Groot. "2022 ShakeAlert Earthquake Early Warning and Schools Survey," in *ShakeAlert Earthquake Early Warning and Schools in the United States*. DesignSafe-CI. https://doi.org/10.17603/ds2-09yf-w512.

2022   Peek, Lori, Jessica Austin, and Heather Champeau. "2020 Social Science Extreme Events Research (SSEER) Network," in *Social Science Extreme Events Research (SSEER) Network Data, Survey Instrument, and Annual Census.* DesignSafe-CI. https://doi.org/10.17603/ds2-arw3-9z86.

2022   Peek, Lori, Heather Champeau, and Jessica Austin. "2021 Social Science Extreme Events Research (SSEER) Network," in *Social Science Extreme Events Research (SSEER) Network Data, Survey Instrument, and Annual Census.* DesignSafe-CI. https://doi.org/10.17603/ds2-htk5-9w67.

2022   Peek, Lori, Mason Mathews, Jessica Austin, and Heather Champeau. "2019 Social Science Extreme Events Research (SSEER) Network," in *Social Science Extreme Events Research (SSEER) Network Data, Survey Instrument, and Annual Census.* DesignSafe-CI. https://doi.org/10.17603/ds2-tkjx-rf45.

2022   Peek, Lori, Mason Mathews, Emmanuelle Hines, Haorui Wu, Jessica Austin, and Heather Champeau. "2018 Social Science Extreme Events Research (SSEER) Network," in *Social Science Extreme Events Research (SSEER) Network Data, Survey Instrument, and Annual Census.* DesignSafe-CI. https://doi.org/10.17603/ds2-2qc4-fh48.

2022   Austin, Jessica, Heather Champeau, and Lori Peek. 2022. "2021 Social Science Extreme Events Research (SSEER) Census," in *Social Science Extreme Events Research (SSEER) Network Data, Survey Instrument, and Annual Census.* DesignSafe-CI.

2022   Champeau, Heather, Jessica Austin, and Lori Peek. "2020 Social Science Extreme Events Research (SSEER) Census," in *Social Science Extreme Events Research (SSEER) Network Data, Survey Instrument, and Annual Census.* DesignSafe-CI. https://doi.org/10.17603/ds2-v0xj-gw06.

2022   Peek, Lori, Heather Champeau, and Jessica Austin. "2019 Social Science Extreme Events Research (SSEER) Census," in *Social Science Extreme Events Research (SSEER) Network Data, Survey Instrument, and Annual Census.* DesignSafe-CI. https://doi.org/10.17603/ds2-t0k5-3v04.

2022   Adams, Rachel, Candace Evans, and Lori Peek. "Identifying the Public Health Implications of Disaster Research." *CONVERGE Extreme Events Research Check Sheets Series.* DesignSafe-CI. https://doi.org/10.17603/ds2-81k9-j684.

2022   Hansen, Alexa, Courtney Welton-Mitchell, Rachel M. Adams, Candace M. Evans, and Lori Peek. Public Health Implications of Hazards and Disaster Research. *CONVERGE Training Modules.* Boulder, CO: Natural Hazards Center, University of Colorado Boulder. https://converge.colorado.edu/resources/training-modules.

2022   West, Jocelyn, Heather Champeau, Jessica Austin, Candace M. Evans, Rachel M. Adams, and Lori Peek. Reciprocity in Hazards and Disaster Research. *CONVERGE Training Modules.* Boulder, CO: Natural Hazards Center, University of Colorado Boulder. https://converge.colorado.edu/resources/training-modules.

Major active grants and contracts at the Natural Hazards Center include:

2018-23   Lori Peek, Principal Investigator, "CONVERGE: Coordinated Social Science, Engineering, and Interdisciplinary Extreme Events Reconnaissance Research." Funded by the National Science Foundation, Award #1841338. ($4,528,384)

2017-23   Lori Peek, Principal Investigator, "A Clearinghouse on Natural Hazards Applications." Funded by the National Science Foundation, Award #1635593. ($7,439,116)

2022-23   Lori Peek, Principal Investigator, "NSF INTERN." Funded by the National Science Foundation, Supplement to Award #1841338. ($38,238)
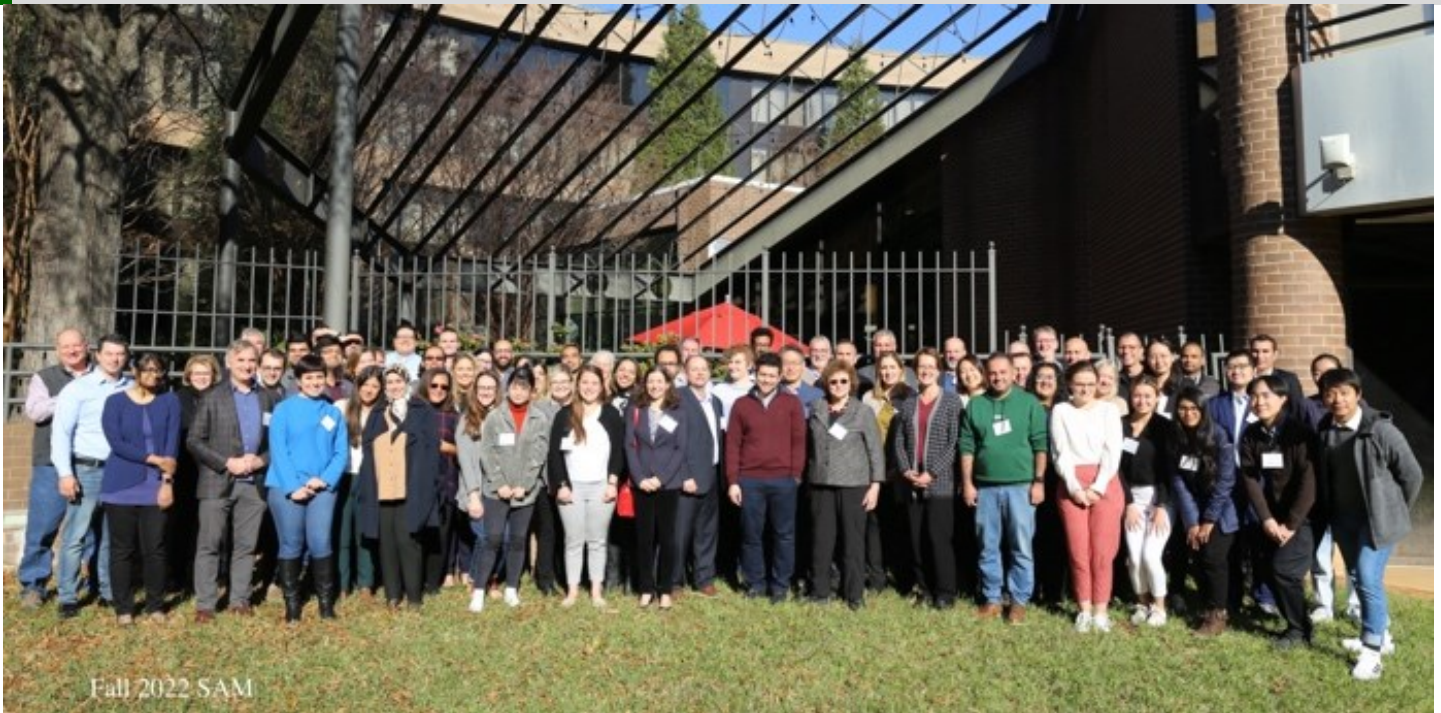
2021-23   Lori Peek, Principal Investigator, "Reducing Social Vulnerability in Disaster: An Assessment of What Works." Funded by the Margaret A. Cargill Philanthropies. ($421,820)

Center for Risk-Based Community Resilience Planning
Colorado State University, USA
http://resilience.colostate.edu

NIST CoE Semi-Annual Meeting in November 2022

In the past 6 years, the center has laid out a distinct strategy and set in motion how to best market IN-CORE to technical and community users. The goal of this marketing plan is to increase the awareness of IN-CORE's models, NIST playbook, and guidebooks to help cities conduct risk analysis with state-of-the-art decision-making tools created with deep and validated scientific research.

The business development committee is in the process of creating the IN-CORE Foundation so that a large number of users can attain IN-CORE. The foundation will offer scientific consultation, app customization for communities, planning support and training as well as hosting services. Along with the IN-CORE Foundation, the CoE Directors and NCSA are working under an NSF POSE project that enables verification of the ability to perform "what if" scenarios for long-term quantitative planning for policy decisions at the community level.

IN-CORE can provide science-based validated tools that communities need to make risk and resilience-informed policy decisions. This includes the ability to quantify the effect of a policy decision at the community level on the population and local economy over time, rather than only direct damage and loss.

Prof. John W. van de Lindt
Co-Director
E-mail: jwv@colostate.edu

Development of IN-CORE Platform:

A major release IN-CORE v3.5 was delivered, along with interim releases 3.2 and 3.6. These releases included new versions of all components with updated IN-CORE documentation, example Jupyter notebooks and new notebooks for all new analyses. The milestone release included two example notebooks for the MMSA testbed. New data including fragilities, hazards and infrastructure data are released as part of the IN-CORE releases and documented in the incore-data-release. A PyPi package was published to enable pip install of the library as an alternative to Conda. Detailed release changes by component can be found at https://incore.ncsa.illinois.edu. Each component of IN-CORE is managed under its own versioning.

- IN-CORE Science and Data Integration:

A Scientific Integration Committee meets bi-weekly to focus on Science and Data Integration, standardization, and implementation in IN-CORE. IN-CORE technical sessions are held monthly with the objective of increasing the base of IN-CORE users within the CoE, providing technical assistance for IN-CORE users, highlighting the type of research being conducted with IN-CORE, and providing a forum for IN-CORE updates. Presentations during this period have included: "Multi-Objective Mitigation Optimization for Improving Community Resilience Using IN-CORE", "Housing Value Recovery Model", and "Multiplying the Impact of Community Resilience Efforts through Data Curation and Publishing" (DesignSafe).

- Coordination of Community Metrics Development:

Core Metrics were further developed for the four stability areas of Population, Economic, Physical Services and Social Services, including incorporation of functionality. The summary table of the core metrics, data sources, references, whether Python code has been developed, and state of incorporation into IN-CORE has been further developed and made available on Confluence for general project use. Analysis of economic stability core metrics was extended (e.g., both cross sectional and time series methods utilized) and is nearing completion. The draft of the core metric document is over 75% complete.

- IN-CORE Modeling for Community Engagement:

The CoE subtask team has been meeting regularly with participants from the community engagement team to design the IN-CORE web application for Joplin, Salt Lake City (SLC), and Galveston. An alpha version of the Joplin App was developed and enhanced during this reporting period. Population dislocation and economic stability metrics were incorporated for demonstration to the communities. Development began for the Salt Lake City and Galveston Apps, and will be demonstrated at a future community workshop. Workshops held during this period focused on presenting the science and data models that go into IN-CORE and provide the output for the Apps. Discussions were held with the Monterey County community partner to discuss their needs and additional meetings amongst the project team are underway.

The team engaged with stakeholders and user groups in the first cohort partner communities to collect input about their needs for using IN-CORE in decision making. Input was recorded in reports for each partner community. The capabilities of different IN-CORE models were presented, and opportunities explored for application to resilience planning in each community. Based on the results from community workshops, a report was developed covering the gaps in resilience metrics and IN-CORE models for informing community decisions. A detailed action plan was developed for follow up and coordination based on the workshop discussions and takeaways for each partner community. Additional feedback was obtained and reviewed from the partner community stakeholders about user group candidates and the most likely departments and positions to use or make decisions based on IN-CORE models outputs and scenarios. The fitness of suggested user group candidates was evaluated with the goal to focus on conversations with a few key stakeholders within each community. Based on the input gathered at the workshops, a report was developed of the resilience priority areas, metrics and analysis questions that different IN-CORE models can potentially answer.

IN-CORE Outreach and Sustainability:

An NSF proposal was written and funded for $300K through NSF's Pathways to Develop Open Source Ecosystems (POSE) program. This is a Phase I project which serves essentially as a planning grant to better define and establish the open source community. A project abstract is included as an appendix to this report.

Presentations and other meetings were given/held with the following entities: (1) Reinsurance Association of America; (2) City of Colorado Springs; (3) Liberty Mutual Insurance; (4)Seoul National University; (5) Kyungbuk National University (KNU); (6) Keimyung University; (7) KISTI - S. Korea Supercomputing Center; (8) Ulsan National Institute of Science and Technology; (9) Athens PPT's (Plenary & Special Session at the International Conference on Hazards and Infrastructure), (10) U.S. National Conference on Earthquake Engineering (Panel Session), (11) Insurance Sector Climate Dialogue Group, 12) CA Seismic Safety Commission, (13) Francis Bouchard Insurance Industry Lunch Discussion, (14) Aaron Parker, Emergency Response Division, (15) NOAA, (16) Office of American State - OAS, (17) Defense Logistics Agency. Several of these have led to potential IN-CORE use and further exploration is in progress.

NIST CoE Semi-Annual Meeting in November 2022

A Community Marketing Plan has been developed and is being finalized which focuses on the community use aspect of IN-CORE and less on the scientific user community like the POSE project. The goal is to increase the awareness of IN-CORE models and NIST playbook to help cities with decision-making for natural hazard risks. Most communities do not know that IN-CORE exists nor the inter-dependencies and solutions that IN-CORE can provide. CoE staff have identified six categories for campaigns for the 2022-2023 Fiscal Year. The plan clearly identifies target markets, goals, strategies, and methods on how to operationalize efforts to optimize getting the message out to large and small communities.

- The marketing plan has identified 6 campaigns:

1) Product & Program Awareness (PR), 2) FEMA Integration, 3) Continuous Improvement, 4) Product Development with Pilots, 5) Community User Groups and 6) Partnership Development. The work undertaken with our Pilot Communities is bringing together cohorts to gain "feedback" to refine IN-CORE for ease of use by communities. These cohorts will be learning in small groups of practitioners – Planners, GIS, and engineers of pilot communities. We are working with the communities of Salt Lake City, Monterey County, Galveston, Joplin and a handful of testbeds.

The main goal of working with pilot communities is to ensure the usefulness and usability of IN-CORE by local jurisdictions. To gain an understanding as to whether we have fully addressed the "problem" and met the needs of jurisdictions for Disaster Risk Reduction and providing the integrated decision tool that communities need. This past year, we have held seven workshops. We have created the workshops so that these can be replicated and so that the draw together NIST Playbook, Guidebooks, and IN-CORE.

We have simultaneously monitored metrics, statistics and have been learning a great deal about how communities will use IN-CORE as an integrated decision-making tool. Our engagement with pilot communities as well as the workshop details will be available to all communities.

Publications:

- Sutley, E., S. Hamideh, J. Helgeson, M. Dillard, J.W. van de Lindt, W. G. Peacock, J. Mitrani-Reiser, S. Crawford, T. Do, O. Nofal, T. Johnson, M. Watson, J. Weigand, J. Loerzel, N. Rosenheim, D. Gu, J. F. Fung. (2021). Community Resilience-Focused Technical Investigation of the 2016 Lumberton, North Carolina Flood: Community Impact and Recovery Following Successive Flood Events. Sutley, E., Hamideh S. and Helgeson J. (eds). National Institute of Standards and Technology (NIST SP 1230) **doi.org/10.6028/NIST.SP.1230-3**.

The current notebook is a **WORK-IN-PROGRESS** that consists of the following modules:

https://incore.ncsa.illinois.edu/doc/incore/notebooks/Galveston_testbed/
Galveston_testbed.html

**Global Resilience Institute
at Northeastern University**

Global Resilience Institute
Northeastern University, USA
https://globalresilience.northeastern.edu/

Events

- Flyn: Hosted a Discussion and Panel Event in Nov. 2022 for:

- *Next Steps for Critical Infrastructure and Cyber Security: A Conversation with CISA Executive Director Brandon Wales*

- American Geophysical Union Fall Meeting 2022

- Flynn: Panelist for Event

- Russia's Invasion of Ukraine: Implications for Global Politics After a Year of War

- Flynn: Tensar InterAxion Global Conference 2022

- 2022 Costal Estuarine Summit

- Flynn: SERDP Nice Workshop 2022 virtual

- Series of virtual presentations about the results of the UCAR COMET project:

    ι. NOAA OWP All Hands Meeting (May 18th)

    ιι. FEMA partners (Jun. 1st)

    ιιι. GRI webinar (June 29th)

    ιϖ. NOAA Hydro Leadership (Oct. 17th)

- Kristin Raub attended and presented (virtually) at the Frontiers in Hydrology conference (June 19 - 24th) on the results of the UCAR COMET project.

- Kristin Raub and Josh Laufer attended and created/moderated a panel at the Restore America's Estuaries Coastal & Estuarine Summit in New Orleans, LA (Dec. 4 - 8, 2022). Panel consisted of Josh Laufer (GRI; co-PI on COMET and CIROH projects), Brian Cosgrove (NOAA), Brenna Sweetman (NOAA), and David Vallee (NOAA).

- Kristin Raub attended and presented (in-person, oral talk) at the AGU Fall Meeting in Chicago, IL, Dec. 11 - 14. Presented on the results of COMET and CIROH.

Research

- **Raub, K.B.** & Laufer, J. 2023. Assessment of the National Water Model's current and potential role in community resilience planning: A case study analysis. *Climate Services*, in review.

- **Raub, K.B.**, Panikkar, B., Platter, H., and O'Mara, E. 2023. Incorporation of justice concerns within coastal resilience plans across eleven U.S. cities. *Journal of Climate Resilience and Climate Justice*, (forthcoming).

Awarded Funded Research Work:

- NASA ROSES: Leveraging Earth Observation Data to Support Environmental Justice: A Puerto Rico Case Study

- SERDP: Networked Infrastructure Under Compound Extremes (NICE)

- NOAA: An Analysis and Demonstration of the National Water Model's Applicability to Community Resilience Part 2

- NOAA: An Analysis and Demonstration of the National Water Model's Applicability to Community Resilience Part 1

Reports:
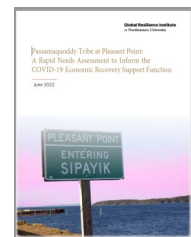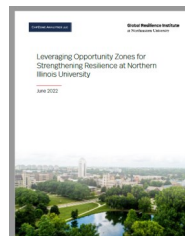
Dr. Stephen Flynn

Professor and Founding Director

E-mail: s.flynn@northeastern.edu

From building back better and designing financial incentives to developing nature-inspired systems and equitable social capital, resilience strategies need to be multifaceted and interdisciplinary. Northeastern University has responded to these threats by investing in global resilience over the last several years. Based on the foundations laid by the founding director Prof. Stephen Flynn, the Global Resilience Institute (GRI) continues to lead new and important convergence research across colleges and disciplines.

Global Resilience Institute, founded by Professor Steve Flynn, and currently co-directed by Professors Auroop Ganguly and Daniel Aldrich, continues to advance its global and national reputation and thought leadership through the development of multi-faculty research products as well as growing investments in novel interdisciplinary capabilities for responding to strategic opportunities. The GRI is further developing and sharpening the "Global" aspect of GRI by building a base for sustained "North-North," "North-South" and "South-South" collaborations in the resilience space with NU-GRI as a major global resilience hub. Finally, reflecting the entrepreneurial approach across the campus, the Global Resilience Institute will serve as a startup launchpad by leveraging NU-based and/or NU affiliated (including NU alum) companies, the structure of NU's Center for Research Innovation (CRI), and NU connections with the private and public sector as well as government laboratories and federal agencies.

Funded projects:

- Terrorism and international business: Building financial resilience

- Coastal flooding prediction and mitigation:
- Integrating high-fidelity computer models with field observations

Interrogating resilience:

- An analysis of inequality and vulnerability in pre-Hurricane Maria Puerto Rico

- How Museums are Undertaking Preservation Tactics in the Face of Climate Change

  https://globalresilience.northeastern.edu/ how-museums-are-undertaking- preservation-tactics-in-the-face-of-climate- change/
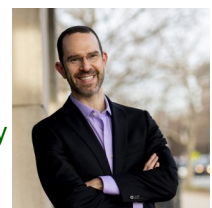
- How a Cherokee Leader Ensured His People's Language Survived

  https://globalresilience.northeastern.edu/ how-a-cherokee-leader-ensured-his- peoples-language-

Profs. Daniel Aldrich & Auroop Ganguly

Co-Directors

E-mail: d.aldrich@northeastern.edu

University of Oklahoma
Advanced Radar Research Center (OU, ARRC), USA
https://arrc.ou.edu

1. FY2022 with funding from NSF, NOAA, NASA, DARPA, ONR, AFRL, private industry, and others.

2. The University of Oklahoma (ARRC) and research universities in France have signed a memorandum of understanding to facilitate cooperation between scientists to advance observations and studies of the atmosphere and radar technologies in May 2022.

3. The University of Oklahoma signed a memorandum of understanding between the School of Engineering from the National University of Asunción in Paraguay (FIUNA) and the ARRC in April 2022.

4. The ARRC hosted an annual workshop with participants from research sponsors, Strategic Partner Consortium (SPARC) members, and charitable donors to the ARRC.

5. ARRC mobile radars participated in a number of large field campaigns such as the NSF-supported ESCAPE (a photo is attached), the NASA-supported IMPACTS, etc.

6. ARRC mobile radars have been actively involved in many outreach activities. A photo of RaXPol demonstrating to nearly 200 third graders and kindergarteners from Alexander Elementary in Albany, Ohio through a collaborative effort, is provided below.

7. ARRC hosted a student-led virtual workshop to plan a field experiment with the NSF CIF RaXPol mobile radar in Florida on August 24 from 2-5 CT

Prof. Tian-you Yu
Director of Operations
E-mail: tyu@ou.edu

8 ARRC faculty and students have received a number of national and international recognition and awards.

- Dr. Robert Palmer was named Education Innovator of the Year by 405 Business Magazine.

- Dr. Nathan Goodman was recognized by Elsevier list of Top 2% Scientists.

- Dr. David Bodine received 2022 American Meteorological Society (AMS) Outstanding Early Career Award.

- Dr. Jorge Salazar Cerreno was honored recently with the maximum distinction of Doctor Honoris Causa by the Universidad Antenor Orrego in Peru.

- ARRC/SoM Postdoctoral Fellow, Yagmur Derin, was awarded the International Precipitation Working Group Early Career Scientist Award - First Prize for outstanding presentation/poster 2022!

- ARRC/ECE graduate students, Cesar Salazar and Yoon-SL Kim, took top honors for best student paper presentations at the 2022 IEEE International Symposium on Phased Array Systems and Technology (PAST) held in Boston, MA, Oct..

- ARRC/ECE Ph.D. student, Cesar Salazar, won the best student paper award at the 11th European Conference on Radar in Meteorology and Hydrology, held in Locarno, Switzerland.

- ARRC/ECE M.S. student, Jonathan Knowles, was awarded the 3rd place for student paper competition in the 22nd IEEE Wireless and Microwave Technology Conference (WAMICON) in Clearwater, Florida.

- ARRC/ECE students, Elizabeth Joyce, Shane Flandermeyer, and Clayton Blosser, received the prestigious National Science Foundation Graduate Research Fellowship (GRFP).

Rensselaer Politechnic Institute, Center for Infrastructure, Transportation, and the Environment, USA

https://www.cite.rpi.edu/

In 2020, the team conducted a large-scale international data collection effort to capture the effect of the Covid-19 pandemic on households' purchasing patterns. In 2022, the team continued researching various aspects related to such data collection efforts. First, the team assessed the efficacy of general appeals to consumers to donate any excess facemasks that they may have purchased during the pandemic. This work, entitled "On the Willingness to Donate "Panic Bought" Supplies: A Novel Form of Freight Demand Management," was submitted for publication.

Second, the team investigated the underlying motivations influencing purchasing pattern changes. One of the objectives has been to identify mechanisms to mitigate panic buying. To this end, the team proposed freight demand management programs to reduce the amount of panic buying. This work, entitled "The Role and Potential of Trusted Change Agents and Freight Demand Management in Mitigating "Panic Buying" Shortages," was submitted for publication. A second objective has been assessing the impact of purchasing patterns changes on households' inventories. As part of this objective, the team focused on the interconnection between the shortages experienced during the beginning of the COVID-19 pandemic, the changes in purchasing behaviors in response to the crisis, and the households' inventory levels in Latin American countries. A manuscript for this work is currently being finalized.

Third, the team investigated the potential of trusted change agents to induce consumers to limit panic buying purchases in crisis environments in the United States. A manuscript for this work is currently being finalized.

Besides the pandemic-related research, the team also published an article entitled "Reducing material convergence in disaster environments: The potential of trusted change agents" [1]. This article discusses how to use of freight demand management strategies to reduce the amount of material convergence in disaster environments.

The team has been sharing the research results on various venues, including the 2022 Transportation Research Board Annual Meeting.

Publications

- [1] Holguín-Veras, J., T. Encarnación, L. N. van Wassenhove, S. Pokharel, V. Cantillo, J. Amaya, T. Wachtendorf and J. Rilling, 2022. Reducing Material Convergence in Disaster Environments: The Potential of Trusted Change Agents. Transportation Research Part E: Logistics and Transportation Review 162, 1-23, https://doi.org/10.1016/j.tre.2022.102736

Dr. José Holguín-Veras, William H. Hart Professor, and Director of the Center for Infrastructure, Transportation, and the Environment; and the Volvo Research and Educational Foundations (VREF) Center of Excellence on Sustainable Urban Freight Systems at the Rensselaer Polytechnic Institute
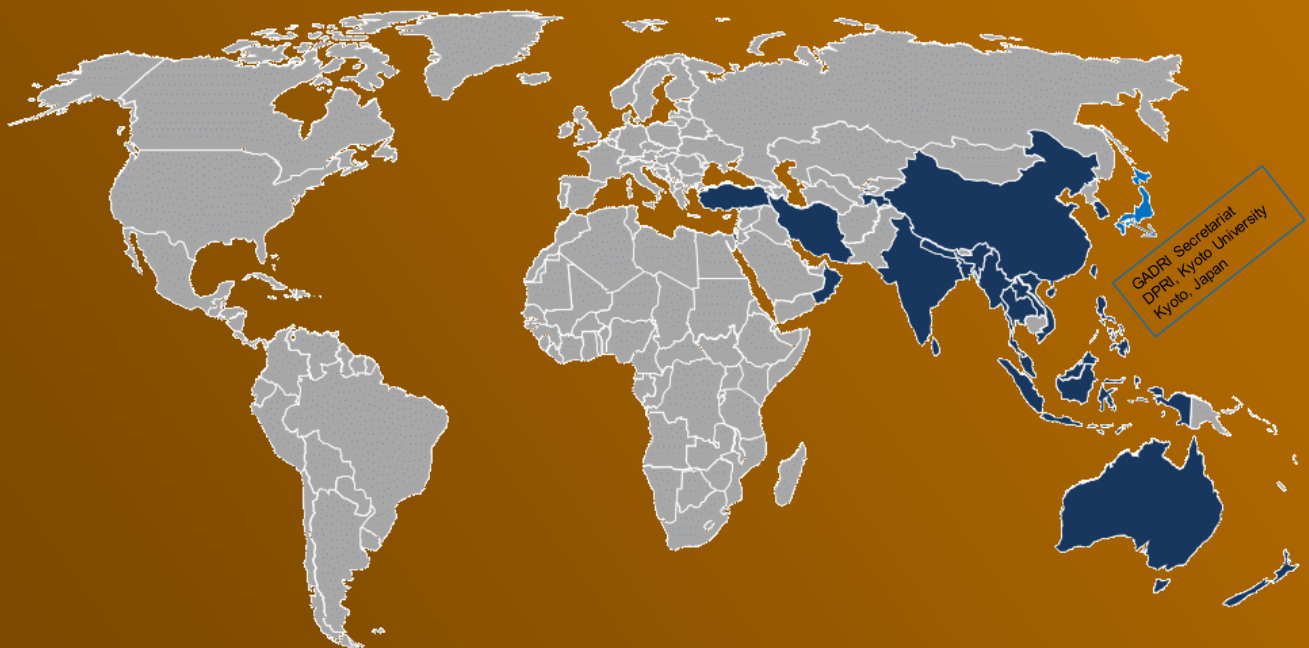
Prof. José Holguín-Veras

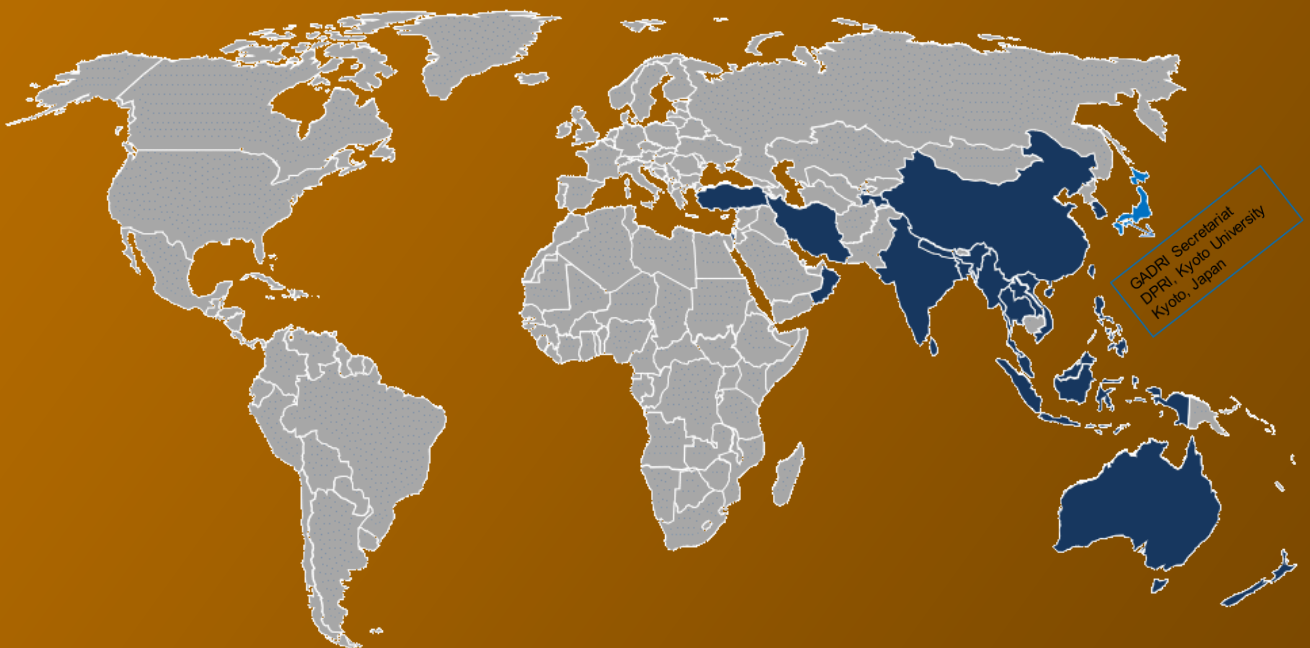W.H. Hart Professor

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Asia

Japan and Oceania

GADRI Secretariat
DPRI, Kyoto University
Kyoto, Japan

Asia

Japan and Oceania

GADRI Secretariat
DPRI, Kyoto University
Kyoto, Japan

Asia — Members

Bangladesh	Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET)
Bangladesh	Department of Meteorology, University of Dhaka
China	Center for Energy and Environmental Policy Research (CEEP), Beijing Institute of Technology (BIT)
China	Integrated Risk Governance Project (IRG-Project), State Key Lab of Earth Surface Processes and Resource Ecology (ESPRE), Beijing Normal University
China	School of Environmental Science and Engineering, Chang'an University
China	Institute of Tibetan Plateau Research, Chinese Academy of Sciences (ITPCAS)
China	Disaster Risk Reduction Knowledge Service of International Knowledge Centre for Engineering Sciences and Technology under the auspices of UNESCO (IKCEST-DRR) Chinese Academy of Sciences
China	Beijing National Earth Observatory, China Earthquake Administration (CEA)
China	State Key Laboratory of Geo-hazards Prevention and Geo-environment Protection (SKLGP), Chengdu University of Technology
China	Key Laboratory of Coastal Disaster and Defence (KLCDD), Hohai University
China	Natural Disaster Research Institute, Northeast Normal University
China	College of Engineering, Ocean University of China
China	College of Architecture and Environment, Sichuan University (SCU)
China	Institute for Disaster Management and Reconstruction (IDMR), Sichuan University
China	State Key Laboratory of Hydraulics and Mountain River Engineering (SKLH), Sichuan University
China	Shanghai Institute of Disaster Prevention and Relief, Tongji University
China	China Research Center for Emergency Management (CCEM), Wuhan University of Technology
Hong Kong, China	Hong Kong Academy of Medicine, Hong Kong Jockey Club, Disaster Preparedness and Response Institute (HKJCDPRI)
India	Centurion University of Technology and Management (CUTM)
India	Department of Geography, Delhi School of Economics, University of Delhi
India	Disaster Mitigation and Management Centre (DMMC), Uttarakhand Secretariat
India	Humanities and Social Sciences Department, Indian Institute of Technology Bombay (IITB)
India	Research & Development, Indian Institute of Technology Gandhinagar (IITG)
India	Center of Excellence in Disaster Mitigation & Management, Indian Institute of Technology Roorkee (IITR)
India	nce of Disaster Research Institutes (SAADRI), Indian Institute of Technology Roorkee (IITR)
India	Jindal School of Liberal Arts and Humanities, O.P. Jindal Global University
India	School of Ecology and Environment Studies, Nalanda University
India	School of Planning and Architecture (SPA), Delhi

Indonesia	Brawijaya University
Indonesia	Gadjah Mada University, Faculty of Engineering
Indonesia	Geological Agency (GA), Ministry of Energy and Mineral Resources of the Republic of Indonesia
Indonesia	JASA TIRTA I Public Corporation
Indonesia	Research Center for Disaster Mitigation, Institut Teknologi Bandung (ITB)
Iran	International Institute of Earthquake Engineering and Seismology (IIEES)
Iran	Natural Disasters Research Institute (NDRI)
Iran	Soil Conservation and Watershed Management Research Institute (SCWMRI), Agricultural Research, Education and Extension Organization
Iran	Department of Environmental Science, Faculty of Natural Resources, University of Tehran
Israel	Institute of Earth Sciences, The Hebrew University of Jerusalem (HUJ)
Israel	National Knowledge and Research Center for Emergency Readiness, University of Haifa
Korea	International Water Resources Research Institute, Chungnam National University
Korea	Department of Disaster Prevention & Safety Engineering, Kangwon National University
Korea	Seoul National University
Korea	School of Urban & Environmental Engineering, Ulsan National Institute of Science and Technology
Lao PDR	Asia Research Center, National University of Laos (ARC-NUOL)
Lao PDR	Disaster Risk Reduction Division, Department of Climate Change (DCC), Ministry of Natural Resource and Environment
Malaysia	Institute for Environment and Development (LESTARI), University of Kebangsaan Malaysia
Malaysia	Center for Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM), Universiti Kebangsaan Malaysia (UKM)
Malaysia	Universiti Sains Malaysia (USM)
Malaysia	Universiti Tenaga National (UNITEN)
Malaysia	Centre for Coastal and Ocean Engineering (COEI), Universiti Technologi Malaysia (UTM)
Malaysia	Centre for Environmental Sustainability and Water Security (IPASA), Research Institute for Sustainable Environment, Universiti Technologi Malaysia (UTM)
Malaysia	Malaysia Japan International Institute of Technology (MJIIT), Universiti Technologi Malaysia (UTM)
Malaysia	Disaster Management Institute (DMI), Universiti Utara Malaysia (UUM)
Myanmar	Emergency Operations Centre, Department of Disaster Management
Nepal	International Centre for Integrated Mountain Development (ICIMOD)
Nepal	Institute of Engineering, Tribhuvan University
Oman	German University of Technology in Oman (GUTech)
Pakistan	Center for Disaster Management (CDM), University of Management and Technology
Pakistan	University of Peshawar

Philippines	PEMSEA Resource Facility, Partnerships in Environmental Management for Seas of East Asia
Philippines	Disaster Risk Management Unit, Graduate School of Business, Philippine School of Business Administration (PSBA)
Philippines	National Hydraulic Research Center, National Engineering Center, University of the Philippines, Diliman Campus
Philippines	University of the Philippines Resilience Centre (UPRI)
Philippines	Philippine Society of Emergency Medical Technicians
Singapore	Institute of Catastrophe Risk Management, Nanyang Technological University
Sri Lanka	Central Engineering Consultancy Bureau (CECB)
Sri Lanka	Center for Urban Water (CUrW)
Sri Lanka	National Building Research Organisation (NBRO)
Sri Lanka	Sri Lanka Institute of Information Technology (SLIIT)
Chinese Taipei	National Center for Research on Earthquake Engineering (NCREE), National Applied Research Laboratories
Chinese Taipei	Taiwan Typhoon and Flood Research Institute (TTFRI), National Applied Research Laboratories
Chinese Taipei	Disaster Prevention Research Center (DPRC), National Cheng-Kung University (NCKU)
Chinese Taipei	Tainan Hydraulics Laboratory (THL), National Cheng Kung University (NCKU)
Chinese Taipei	National Science and Technology Center for Disaster Reduction (NCDR)
Chinese Taipei	Center for Weather Climate and Disaster Research (WCDR), National Taiwan University
Tajikistan	Mountain Societies Research Institute (MSRI), University of Central Asia
Thailand	Global Environmental Studies/Management, Asian Disaster Preparedness Center (ADPC)
Thailand	Disaster Preparedness, Mitigation and Management (DPMM), Asian Institute of Technology (AIT)
Thailand	Disaster and Risk Management Information Systems Research Group (DRMIS), Chulalongkorn University
Turkey	Observatory and Earthquake Research Institute, Bogazici University
Vietnam	Department of Geo-Environment, VietNam National University (VNU), Hanoi

IRG-Project, State Key Lab of Earth Surface Processes and Resource Ecology (ESPRE), Beijing Normal University China

http://irg.bnu.edu.cn

The third International Symposium on Green Development and Integrated Risk Governance: 50 Years Review of the United Nations Conference on the Human

Conference:

- *Green Development and Integrated Risk Governance, coorganized with Davos Global Risk Forum (China, June 2022)*

The third International Symposium on Green Development and Integrated Risk Governance: 50 Years Review of the United Nations Conference on the Human Environment was held in June, 2022. IRG Project was of the co-organizers. This conference is a concluding international symposium co-hosted by Beijing Normal University, Zhuhai City and Davos Global Risk Forum in accordance with the tripartite agreement, following the first international seminar held in 2017. More than 150 experts and scholars from Switzerland, France, Denmark, Japan, the United States and other countries, leaders of relevant departments in Zhuhai and executives of enterprises participated in this seminar online, including Liu Yanhua, the former Vice Minister of Science and Technology of China, Shi Peijun, the President of Qinghai Normal University, Ammann, the President of Davos Global Risk Forum.

Training workshop:

- "ThinkShop" on Early Warning and on Deltas during the Cairo Water Week

(CWW) October 16-19, 2022

The fifth Cairo Water Week (CWW2022) was held in Cairo, Egypt, October 16-19, 2022. IRG project member was invited to the "ThinkShop" on Early Warning and on Deltas.

Proposals:

- Highlands to Oceans (H2O): Anticipatory Governance of Hydroclimatic Regime Shifts in the Transboundary Indus and Mekong River Basins. ($1.6M) USA

- Disaster Chains and Risk Reduction in Great Bay Area. ($2M) China

- Capacity Building for Climate Change Disclosure in China. ($150K) GiZ

- Tipping Points in Africa. ($500K) UNEP-CNNSF

Prof. YE Qian
E-mail: qianye@bnu.edu.cn

Papers:

- Flores, Elaine C., et al. "A healthy planet for a healthy mind." One Earth 5.4 (2022): 307-310.

- Kelman, Ilan, and Aaron Clark-Ginsberg. "An Urban Governance Framework for Including Environmental Migrants in Sustainable Cities." Climate 10.8 (2022): 121.

- McGreevy, Steven R., et al. "Sustainable agrifood systems for a post-growth world." Nature sustainability (2022): 1-7.

- Dai, Jiadong, et al. "Effects of efflorescence and subflorescence by different salts on soil physical properties and aeolian erosion." CATENA 215 (2022): 106323.

- Hu, Ziying, et al. "Analysis of Spatial and Temporal Variations of the Near-Surface Wind Regime and Their Influencing Factors in the Badain Jaran Desert, China." Atmosphere 13.8 (2022): 1316.

- Liu, Tian, Peijun Shi, and Jian Fang. "Spatiotemporal variation in global floods with different affected areas and the contribution of influencing factors to flood-induced mortality (1985–2019)." Natural Hazards 111.3 (2022): 2601-2625.

- Tang, Jiting, et al. "Typhoon Risk Perception: A Case Study of Typhoon Lekima in China." International Journal of Disaster Risk Science 13.2 (2022): 261-274.

- Zhang, Zhengtao, et al. "Economic Ripple Effects of Individual Disasters and Disaster Clusters." International Journal of Disaster Risk Science (2022): 1-14.

- Chen, Shuo, et al. "Improving Spatial Disaggregation of Crop Yield by Incorporating Machine Learning with Multisource Data: A Case Study of Chinese Maize Yield." Remote Sensing 14.10 (2022): 2340.

- Wu, Jingyan, et al. "How effective are community‑based disaster reduction strategies? Evidence from the largest‑scale program so far." Risk analysis (2022).

- Yu, Peixin, et al. "Global pattern of ecosystem respiration

- tendencies and its implications on terrestrial carbon sink potential." Earth's Future 10.8 (2022): e2022EF002703.

- Fang, Jiayi, et al. "Benefits of subsidence control for coastal flooding in China." Nature Communications 13.1 (2022): 1-9.

- Han, Qinmei, et al. "Web‑Based Data to Quantify Meteorological and Geographical Effects on Heat Stroke: Case Study in China." GeoHealth 6.8 (2022): e2022GH000587.

- He, Yan, et al. "Substantial increase of compound droughts and heatwaves in wheat growing seasons worldwide." International Journal of Climatology 42.10 (2022): 5038-5054.

- He, Yan, et al. "Increased probability and severity of compound dry and hot growing seasons over world's major croplands." Science of The Total Environment 824 (2022): 153885.

- Jia, Wei, et al. "Monitoring Rock Desert Formation Caused by Ice–Snow Melting in the Qinghai-Tibet Plateau Using an Optimized Remote Sensing Technique: A Case Study of Yushu Prefecture." Remote Sensing 14.3 (2022): 570.

- Lin, Degen, et al. "Measuring Compound Soil Erosion by Wind and Water in the Eastern Agro–Pastoral Ecotone of Northern China." Sustainability 14.10 (2022): 6272.

- Sun, Shao, et al. "Evolution of future precipitation extremes: Viewpoint of climate change classification." International Journal of Climatology 42.2 (2022): 1220-1230.

- Ye, Tao, et al. "Reducing livestock snow disaster risk in the Qinghai–Tibetan Plateau due to warming and socioeconomic development." Science of The Total Environment 813 (2022): 151869.
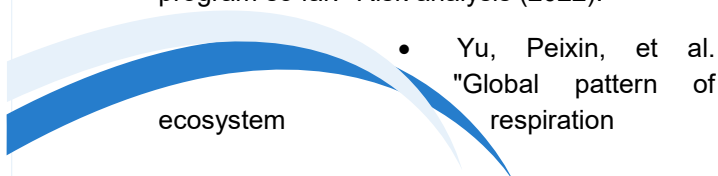
Institute of Tibetan Plateau Research
Chinese Academy of Sciences (ITPCAS), China
http://www.itpcas.ac.cn

In 2020, Professor Ma Yaoming and his group members published "A long-term (2005–2016) dataset of hourly integrated land–atmosphere interaction observations on the Tibetan Plateau" at ESSD. After that, the first three-dimensional observation network platform of atmospheric water and heat on the Tibetan Plateau （TPEITORP） will be built in 2021. The platform can provide continuous observation data and decision-making basis for weather monitoring and prediction, disaster weather warning and climate environment prediction on the Tibetan Plateau and surrounding areas. The above observation data and platforms have a substantial role in promoting disaster prediction and early warning. By the end of 2022, the published data has been cited more than 35 times in articles published in BAMS, ESSD, JGR, JH and other magazines. And have a good communication with DPRI. Prof. Ling Bai and Prof. James Mori developed new seismic data processing techniques to study source processes associated with the 2021 glacier collapse in the Yarlung Tsangpo Grand Canyon, southeastern Tibetan Plateau. Massive slope failures often occur along the Himalayan orogenic belt, where the Indian plate subducts beneath the Eurasian plate. On March 22, 2021, a slope failure hazard occurred at the Grand Canyon section of the Yarlung Tsangpo River, eastern Himalayan syntaxis, and blocked the river leading to a water level rise of over 10 m. We conducted an analysis of the seismic waveforms recorded by broadband seismic stations which we deployed around the Grand Canyon.

Previously there were only a few seismic stations in the study area because of the harsh natural environment. All these stations are located outside of the Grand Canyon with distances greater than 60 km from this glacier collapse event. From 2015 we deployed broadband seismic stations along the Grand Canyon and improved the stations with automatic waveform transmission in 2019 to study the mechanisms of earthquakes and landslides, along with clarifying deep structures of the continental collision zone.

These stations are located at distances of 5-65 km from the deposit area with good azimuthal coverage. The recorded waveform data contain information about the source processes without the complex propagation effects that would be included in records at farther distances.

These seismograms showed emergent onsets with a total duration of approximately 300 s and corroborated their origination as a glacier collapse along the remote Sedongpu basin. Based on direct measurements of seismic energy and an empirical distance attenuation function, we estimated the volume to be approximately $50 \times 10^6 \, \mathrm{m}^3$. The source process was interpreted as a single force with three possible stages: progressive coherent block fracturing, mass flow through the Sedongpu basin with downslope acceleration-deceleration-stable motions, and continuous flow along the river after the formation of a temporary dam at the outlet basin.

Glaciers along the Yarlung Tsangpo Grand Canyon show accelerated erosion and retreat with a substantial decrease in snow coverage due to global warming. Large amounts of glacial moraine that have accumulated in the Sedongpu basin provide an abundant debris source for subsequent river blocking events. Earthquakes in adjacent areas may also cause more debris to flow.

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Therefore, the Yarlung Tsangpo Grand Canyon area is highly deformed and can easily lose stability under longtime glacier erosion and freeze‑thaw weathering. The 2021 event is one of the largest events that has occurred along the Yarlung Tsangpo River in recent decades and caused a rapid water level rise of over 10 m. Therefore, determining source parameters such as volume, velocity, and run-out distance is important for understanding the landslide process and evaluating hazards for future glacial instabilities in this region of the Himalayas.

Awards：

- Ling Bai, Wiley Open Science Excellent Author

Ongoing research grant projects:

- International research project supported by CAS, International team on the study of crustal and mantle structure beneath the Himalayan Orogenic belt and its shallow response, Primary investigators: Prof. Bai, Prof. Mori (No. GJTD-2019-04), 2020.01.01~2022.12.31.

Publications:

- Bai, L., Jiang, Y., Mori, J., 2022. Source processes associated with the 2021 glacier collapse in the Yarlung Tsangpo Grand Canyon, southeastern Tibetan Plateau. Landslides doi: 0.1007/s10346-022-02002-6.

- Liu, L., M.Menenti, Yaoming Ma*, W.Ma, 2022, Improved parameterization of snow albedo in WRF + Noah: Methodology based on a severe snow event on the Tibetan Plateau, Advances in Atmospheric Sciences, doi:10.1007/s00376-022-1232-1.

- Yaoming Ma*,Weiqiang Ma*,H.Dai，L.Zhang, F.Sun，J. Zhang, N.Yao，J.He， Z. Bai,Y. Xuan,Y.Zhan，Y.Yuan，C.Yang，W. Sun，P.Zhao, M.Ding, K.Zhu，J.Hu，Bian Bazhuga, Bai Juepingcuo, Z.Ma, R. Qingnima, Suo Langwangdui, Yang Zong, H.Wen, 2022, Earth summit mission 2022: Scientific expedition and research on Mt. Qomolangma helps reveal the synergy between westerly winds and monsoon and the resulting climatic and environmental effects, Advances in Atmospheric Sciences, doi: 10.1007/s00376-022-2166-3.

- Yaoming Ma*, B. Wang*, X. Chen, LZhong, Z.Hu, W.Ma, C.Han, M.Li, 2022, Strengthening the three-dimensional comprehensive observation system of multi-layer interaction on the Tibetan Plateau to cope with the warming and wetting trend, Atmospheric and Oceanic Science Letters,15, 100224 doi:10.1016/j.aosl.2022.100224.

Ling Bai · Yong Jiang · James Mori

Source processes associated with the 2021 glacier collapse in the Yarlung Tsangpo Grand Canyon, southeastern Tibetan Plateau

Abstract Massive slope failures often occur along the Himalayan orogenic belt, where the Indian plate subducts beneath the Eurasian plate. On March 22, 2021, a slope failure hazard occurred at the Grand Canyon section of the Yarlung Tsangpo River, eastern Himalayan syntaxis, and blocked the river leading to a water level rise of over 10 m. We conducted an analysis of the seismic waveforms recorded by broadband seismic stations which we deployed around the Grand Canyon. These seismograms showed emergent onsets with a total duration of approximately 300 s and corroborated their [interpreta]tion as a glacier collapse along the remote Sedongpu basin. [From] measurements of seismic energy and an empiri-cal distance [attenua]tion function, we estimated the volume to be approximately 50 × 1[0⁶ m]³. The source process was interpreted as a single force with three [proba]ble stages: progressive coherent block fracturing, mass flow thro[ugh] the Sedongpu basin with downslope acceleration-deceleration-stabl[e] motions, and continuous flow along the river after the formation of a temporary dam at the outlet basin.

Keywords Tibetan Plateau · Glacier collapse · Seismic observation · Source process

the source parameters and debris flow processes. Field investigations of the deposits after the event revealed that the debris flows contained a large amount of ice, suggesting that they were triggered by the collapse of glaciers originating in the upper portion of the Sedongpu basin (Zhao et al. 2022).

The Yarlung Tsangpo River was blocked by the debris flow, and this caused a water level rise of over 10 m. Figure 2 shows Sentinel-2A/B satellite images provided by the European Space Agency before (February 22, 2021) and after (April 28, 2021) the event. The source areas are heavily covered in clouds, and the satellite images are blurry for most of the time. The white-dotted curve area around the outlet basin is drawn based on the outline of the river blocking deposit fan after the event. Comparison of the satellite images around the outlet basin demonstrates that an extended river blocking deposit fan is revealed though the post-event images though it was taken 1 month after the event.
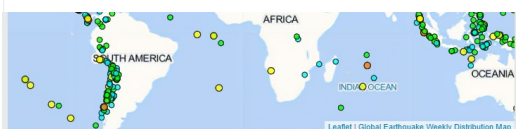
Glacier collapses tend to occur in remote areas, and the dynamic processes are largely unknown. In this study, we analyzed seismic signals recorded by local broadband seismic stations we deployed along the Grand Canyon (Fig. 1a). The seismic stations are located within several tens of kilometers from the glacier collapse, provid-ing a good data set to investigate the nature of the mass move-

Disaster Risk Reduction Knowledge Service of International Knowledge Centre for Engineering Sciences and Technology under the auspices of UNESCO, Chinese Academy of Sciences (IKCEST-DRR), China

http://drr.ikcest.org

Disaster Risk Reduction Knowledge Service of International Knowledge Centre for Engineering Sciences and Technology under the auspices of UNESCO (IKCEST-DRR) was founded in 2016. It is committed to formulating global disaster metadata standards and establishing a global meta-database for disasters by consolidating the data from different kinds of disasters; integrating cross-disciplinary, cross-field, and cross-region disaster data resources and providing knowledge service applications on line; and carrying out education, training, and technology exchange on disaster risk reduction.

The overall progress in 2022 is listed below:

1. The Disaster Risk Reduction Knowledge Service System completed 2.27 million pieces of data. These included 279 disaster science databases (datasets), 31,116 pieces of global disaster metadata, 1,562 disaster maps, 100 training videos, 370,800 pieces of disaster literature metadata, and 22 knowledge service applications. Link: https://drr.ikcest.org

2. The number of user visits to IKCEST-DRR in 2022 presented steady growth, amounting to 447,000 by the end of December, with a total of 282,700 users throughout the year, of which international users averagely accounted for 59.74%, mainly from the United States, India, the Philippines, the UK and Canada, the top 5 countries for overseas visits.

3. Based on the highly cited literature and hotspot literature, the key issues and hotspot issues of research in the field of disaster risk reduction are extracted, to form "Scientific and Technological Research Trend Report in the Field of Disaster Risk Reduction——Bibliometric analysis of global disaster risk reduction literature and the influence of Chinese research in 2021", which provides services to policy makers and provides Disaster Risk Reduction Unit and Science, Technology and Innovation Policy Section, Natural Sciences Sector, UNESCO with the latest intelligence results. Link：https://drr.ikcest.org/report/r0cdf

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4. Carry out emergency remote sensing monitoring and data sharing for flood disaster reduction in Pakistan. Since mid-June 2022, many parts of Pakistan have suffered from heavy rainfall and flooding. In response to the emergency needs, IKCEST-DRR quickly organized data rectification and processing in the disaster areas and carried out data sharing services. (1) Complete the processing of 70 GB of data in 3 major categories and 21 minor categories, including basic remote sensing images, DEM, permanent water system distribution, water system distribution during flood, 10m land cover, GDP, population, climate zone, soil, transportation, dam and reservoir distribution, irrigation network. 2) Using Sentinel-1 and water body index method, we quickly obtained the distribution of waters before, during and after the disaster in the whole territory, and combined with multi-source remote sensing data, we obtained the extraction of roads, farmlands and buildings range affected by this flood. (3) Rapidly develop data sharing system and provide services. As of December 31, the total number of services was 3,068 and the data download was 280.45 GB. In total, 8 briefings and flash reports were provided to CPJRC, and 1 briefing was provided to IKCEST. The data and report results were reported to Ministry of Foreign Affairs by the Department of International Cooperation of the Chinese Academy of Engineering (CAE). This service provides data, technology and methodological support for disaster prevention and mitigation in China-Pakistan Economic Corridor. Link: https://drr.ikcest.org/knowledge_service/cpec.html

5. On November 20-24, 2022, the International Training Workshop on Resource & Environment Scientific Data Sharing and Disaster Risk Reduction Knowledge Service along the Belt and Road was successfully held online. Organized by IKCEST-DRR. This workshop attracted 200 trainees from 40 countries including Pakistan, Russia, Mongolia, Nigeria, Bangladesh, Nepal, Ghana, Sudan, Egypt, Indonesia, Ethiopia, Iran, Kenya, Peru, Yemen, Albania, Algeria, Myanmar, and South Africa. The workshop involved 27 lectures around topics such as "Data sharing platform architecture and technologies", "Data governance and processing standards and technologies", "Big data support the regional sustainable development practices", "Disaster risk reduction knowledge service applications" and "International cooperation on disaster risk and reduction", aiming to establish a resource & environment data sharing system, provide data basis for international cooperation and research, and improve regional disaster risk reduction and sustainable development capabilities. Link: https://drr.ikcest.org/training/training202210.html

6. On December 12, 2022, the Sixth International Workshop for Disaster Risk Reduction Knowledge Service, organized by IKCEST-DRR, was held online. The theme of the workshop was "Open Science and Disaster Risk Reduction Action". The workshop was webcasted live globally. The Global Disaster Data Master Directory (GDMD) system, which is expected to provide a platform on disaster risk reduction to support the UNESCO Recommendation on Open Science, was launched for the first time at the workshop. Link: https://drr.ikcest.org/meeting/meeting202212.html

7. Award-winning collection of photography, painting and video works on disaster risk reduction was carried out. On May 12, 2022, IKCEST-DRR carried out award-winning collection of photography, painting and video works to commemorate China's 14th National Disaster Prevention and Mitigation Day.

Link: https://drr.ikcest.org/collect_work/upload

Online Lecture by Mr. Soichiro Yasukawa, National Sciences Sector, UNESCO
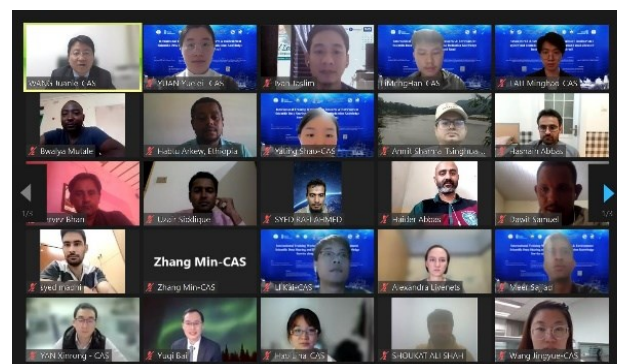
Group Photo

Award-winning Collection of Photography, Painting and Video Works on Disaster Risk Reduction organized by IKCEST-DRR

(1) A monograph published

Wang Juanle, Bu Kun, Yang Fei. Disaster Risk Reduction Knowledge Service System [M]. Beijing: Science Press, 2022

Cover of Disaster Risk Reduction Knowledge Service System

IKCEST-DRR won the Outstanding Case Award in the appraisal of active push service cases by China Knowledge Center for Engineering Sciences and Technology in 2022, which was issued in January 2023

Outstanding Case Award for Active Push Service of China Knowledge Center for Engineering Sciences

(3) 10 academic papers published

- Han, X.; Wang, J*. Modelling and Analyzing the Semantic Evolution of Social Media User Behaviors During Disaster Events: A Case Study of COVID-19. ISPRS Int. J. Geo-Inf. 2022, 11, 373.https://doi.org/10.3390/ijgi11070373

- Zhang, M.;Wang, J*. Global Flood Disaster Research Graph Analysis Based on Literature Mining. Appl. Sci. 2022, 12, 3066. https://doi.org/10.3390/app12063066

- Zhou, Y.;Wang, J. *; Grigorieva, E.; Li, K. Dissecting theMutual Response of Potential Evapotranspiration with Vegetation Cover/Land Use over Heilongjiang River Basin, China. Water 2022, 14, 814. https://doi.org/10.3390/w14050814

- Zhou, Y. Z., Wang, J. L., Li, K. Dataset of effective temperature sum in the Sino-Russian cross border region of Heilongjiang River Basin (2002-2020) [J]. Journal of Global Change Data & Discovery, 2022, 6(3): 471–482. https://doi.org/10.3974/geodp.2022.03.18. https://cstr.escience.org.cn/CSTR:20146.14.2022.03.18.

- Juanle Wang, Haishuo Wei, Kai Cheng, Yating Shao, Jinyi Yao, Yuxin Wu, Xuehua Han,

(2) Two awards

IKCEST-DRR won the Second Prize for Active Push Services of China Knowledge Center for Engineering Sciences and Technology for 2022, which was issued in January 2023.

- Altansukh Ochir, Davaadorj Davaasuren, Sonomdagva Chonokhuu, Yezhi Zhou, Min Zhang, Xiaoming Cao, Mengxu Gao, Junxiang Zhu, Yifan Li, updatable dataset revealing decade changes in land cover types in Mongolia[J]. figshare, 2022, https://doi.org/10.6084/m9.figshare.14390912.v1.

- Sajjad, M.M.;Wang, J.;Abbas, H.; Ullah, I.; Khan, R.; Ali, F.Impact of Climate and Land-Use Change on Groundwater Resources,Study of Faisalabad District, Pakistan.Atmosphere 2022, 13, 1097. https://doi.org/10.3390/atmos13071097

- Xinrong Yan, Juanle Wang, Xiaotong Liu, Hongyu Zhao, Yuxin Wu, Mining the drivers of forest cover change in the upper Indus Valley, high Asia region from 1990 to 2020,Ecological Indicators, Volume 144,2022,109566,ISSN 1470-160X,https://doi.org/10.1016/j.ecolind.2022.109566.

- Yan, X.; Wang, J. The Forest Change Footprint of the Upper Indus Valley, from 1990 to 2020. Remote Sens. 2022, 14, 744. https://doi.org/10.3390/rs14030744

- Zhang, M.; Wang, J. Trend Analysis of Global Disaster Education Research Based on Scientific Knowledge Graphs. Sustainability 2022, 14, 1492.https://doi.org/10.3390/su14031492

- HONG Mengmeng, WANG Juanle, HAN Baomin. 2022. Spatial and Temporal Pattern Changes and Driving Forces: Analysis of Salinization in the Yellow River Delta from 2015 to 2020. Journal of Resources and Ecology, 13(5): 786–796.

College of Architecture and Environment
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http://www.acem.scu.edu.cn/index.htm

1. Post-earthquake investigation of Luding Earthquake

A 6.8-magnitude earthquake occurred on Sep. 5, 2022, in Luding, Sichuan, China. After Consultation with the local authority department, Prof. Kaoshan Dai organized a post-earthquake investigation with his research group members. This investigation collected rich information on the damage to the conventional structural systems and base isolation systems, which provides valuable first-hand data for the teaching and scientific research of earthquake resistance and disaster prevention of building structures.

(https://acem.scu.edu.cn/info/1004/10993.htm)

2. Special Symposium of EASEC-17 - Seismic Resilient Structures

An online special symposium on "Seismic Resilient Structures" will be organized and chaired by Prof. Songye Zhu（The Hong Kong Polytechnic University）, Prof. Ying Zhou (Tongji University), and Prof. Bin Wang (Sichuan University) on June 28, 2022, SGT 13:30 – 18:45 (EASEC-17). There are 14 lectures in this session.

(https://www.cebinwang.com/post/special-easec-17-seismic-resilient-symposium-of-structures)

3. Prof. Bin Wang visits the University of Patras

Prof. Bin Wang visits the Steel Structures Research and Design Group of the University of Patras, Greece. The research work is supported by the European Commission through a Marie Skłodowska-Curie Actions Fellowship.

(https://www.cebinwang.com/post/dr-wang-visits-the-university-of-patras)

4. Special Issue of Shape Memory Alloys (SMAs) for Structural Engineering

Prof. Elyas Ghafoori (Leibniz University Hannover), Prof. Bassem Andrawes (University of Illinois at Urbana-Champaign), and Prof. Bin Wang (Sichuan University) organized this Special Issue in Engineering Structures. This Special Issue has collected 30 high-quality research articles that can be categorized into three different groups: material and mechanical behavior of SMAs, shape memory effect of SMAs for prestressing and strengthening of structures, and SMA-based devices for energy dissipation and self-centering earthquake-resilient structures.

(https://www.sciencedirect.com/journal/engineering-structures/special-issue/10M2P1PZ45T)

Prof. Kaoshan Dai
Chair
E-mail: kdai@scu.edu.cn

Institute for Disaster Management and Reconstruction, Sichuan University (SCU), China

http://www.idmr.scu.edu.cn/index.htm

Monitoring equipment installed by IDMR in Lushan County

In 2022, with a generous donation from the Hong Kong Jockey Club, IDMR officially started the construction of a third major building. The total construction area is about 8400 square meters, and the new building will include 16 advanced laboratories, mainly covering the fields of geological disasters, water-related disasters, post-disaster environmental management, urban disasters and resilience, disaster information systems and emergency response.

IDMR has continued to develop its "Sichuan Provincial Emergency Management Department-Sichuan University Comprehensive Disaster Reduction Research Center". The center is a provincial key lab established under the leadership of IDMR and with the collaboration of multiple other colleges and schools at Sichuan University in 2021. This year the center has upgraded its Integrated DRR Information Service Platform, by expanding its disaster database and enhancing functions such as disaster emergency monitoring and response. The

Center collaborated closely with the province on response to multiple disasters in Sichuan in 2022 and is engaged deeply with provincial authorities on comprehensive risk mapping in our province.

IDMR has successfully developed and tested new technologies for geological disaster early warning based on vibration monitoring. The new technology has been installed and applied in demonstration areas in Sichuan Province, such as Lushan County of Ya'an City and Xide County of Liangshan Prefecture.

Prof. Gretchen Kalonji
Dean
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IDMR team in Lushan after a 6.1 earthquake in June 2022

IDMR team in Luding after a 6.8 earthquake in September 2022

Entrusted by the Sichuan Provincial Committee of Disaster Reduction, IDMR has actively organized efforts to participate in the relief work after earthquakes and mountain torrents, including the 6.1 Lushan Earthquake on June 1 and 6.8 Luding Earthquake on September 5. Professors and students of IDMR visited disaster area for many times, supporting the smooth development of the earthquake loss assessment and reconstruction work in the disaster areas. As a result, IDMR has submitted several decision-making consultation reports based on the investigations to the provincial government as scientific advice.

IDMR successfully hosted or co-organized many international conferences in 2022, including. the "International Scientific Symposium on Disaster Risk Reduction and Sustainable Development: In Memory of the Wenchuan Earthquake of May 12, 2008". IDMR in 2022 co-organized multiple other conferences, including: the 4th World Science and Technology Development Forum (http://wstdf.melinked.com/#/home), International Conference on Multi-Hazard Early Warning System (MHEWS) (http://www.schkh.gov.cn/index.php), the 6th International Workshop for Disaster Risk Reduction Knowledge Service (https://drr.ikcest.org/meeting/meeting202212.html).

IDMR continued to focus on its leadership work with international alliances, including with the High-Level Experts and Leaders Panel on Waters and Disasters (HELP https://www.wateranddisaster.org/), for which we host the Secretariat of the Alliance of Alliances on Research and Education on Water and Disasters (the AoA); the International Research Center on Big Data for the Sustainable Development Goals (CBAS http://www.cbas.ac.cn/en/), with other initiatives associated with the Chinese Academy of Sciences, particularly the Alliance of International Science Organizations on Disaster Risk Reduction (ANSO-DRR), (http://www.anso-drr.com/) and with UNESCO. We also continued to work closely with the U-INSPIRE Alliance, on the roles of youth and young professionals in disaster research (https://uinspirealliance.org/). Notable activities in 2022 include the meeting of the G20 in Bali, at which, together with the Indonesian government and our HELP colleagues, IDMR contributed to a "Special Session for G20 leaders on 'Building Back Stronger from Impacts of COVID-19, Climate Change, and Disasters – Actions towards Quality Society'" (https://www.wateranddisaster.org/help-message-to-g20-leaders-launched-in-bali/). IDMR also chaired a "High-level Panel Discussion 2: Nusantara - sustainable and resilient new capital of Indonesia" (https://media.un.org/en/asset/k1s/k1s7608swz). Working with Indonesian colleagues, and with other international partners, on the exciting initiative of this new capital city will remain a high priority for IDMR for 2023.

Prof. Gretchen Kalonji hosting a high-level panel discussion at the HELP G20 Special Event, Bali Indonesia, November 11, 2022

In terms of talent development at IDMR, we were successful in attracting several new faculty members to join our institute: 2 at the Associate Professor level and 3 at the Postdoctoral Level. Their expertise ranges from flood and drought disaster risk management to emergency evacuation management, to post-disaster water quality remediation,

Continuing to develop our research-based interdisciplinary disaster sciences curriculum was a major focus of IDMR in 2022. We continued to refine our Master's and PhD programs in "Safety Science and Disaster Reduction. In parallel we made progress in our 3-year research-based undergraduate innovation class, a program open to all majors at Sichuan University., in which students work in teams on various interdisciplinary challenges, ranging from disaster health sciences to earth sciences, to water, disaster and culture, to post-disaster environmental management. We also continued to develop our disaster nursing master program in collaboration with the Hong Kong Polytechnic University, the only program of its type in China – 40 masters students were enrolled in this program in 2022. In addition, we continued to develop our work on short-term disaster training programs as part of our responsibility of hosting the Chinese Ministry of Education's National Training Base for Youth Education on Disaster Risk Reduction and Emergency Management.

Centre of Excellence in Disaster Mitigation and Management (CoEDMM), IIT, Roorkee, India

http://www.iitr.ac.in

The Centre of Excellence in Disaster Mitigation and Management (CoEDMM) Indian Institute of Technology Roorkee was awarded with seven research projects during the year 2022 on *Development of a Prototype Territorial Early Warning System for Precipitation Induced Sediment Disasters (i.e. Landslides and Debris Flows)* (~US$ 45000) PI: Prof. S. Srikrishnan-Core Faculty CoEDMM, *Avalanche Hazard Zoning and Forecasting of Snow Avalanche using the Machine and Deep Learning Approaches* (~US$ 45000) PI: Prof. Ajanta Goswami-Joint Faculty CoEDMM, *An Early Warning System to Improve Adaptive Capabilities and Resilience of Vulnerable Himalayan Communities to Extreme Rainfall and Flooding* (~US$ 43000) PI: Prof. Sumit Sen-Head & Joint Faculty CoEDMM, *Development of Resilience Programs for Six States of NE Region of India and Himachal Pradesh* (~US$ 43000) PI: Prof. Subir Sen-Joint Faculty CoEDMM, *Improved Representation of Surface Layer Parameterizations in Weather Research and Forecasting model* (~US$ 42000), *LENS: Longitudinal Survey for Natural Hazards* (~US$ 9000) PI: Prof. Roopam Shukla-Core Faculty CoEDMM, and *Low Carbon building project* (~ US$ 6000) PI: Prof. Harshit Lakra-Joint Faculty CoEDMM.

Prof. Anil Gourishetty, Joint Faculty, CoEDMM was awarded *Sanskritvrati award* by the Central Sanskrit University, New Delhi, India. Prof. B. K. Maheshwari, Joint Faculty, CoEDMM was awarded the prestigious *John Booker Medal,* the third highest accolade of the International Association of Computer Methods and Advances in Geomechanics (IACMAG). Prof. Kamal Jain Joint Faculty, CoEDMM and his student team was awarded *Best Concept + Best Prototype* in the Vivo Ignite Science and Innovation award

ceremony. Prof. Piyush Srivastava was awarded a *visiting research fellow position* at the University of Leeds, UK. Prof. Roopam Shukla has been appointed as the *Editor of Community Science Journal*.

Prof. B.K. Maheshwari Joint Faculty CoEDMM, and Dr. R.K. Bhandari, Ex- Visiting Faculty, CoEDMM and Member-Convenor of Disaster Management Committee (G6 for term 2018-21) of the Indian Road Congress (IRC) published a *SPECIAL REPORT "STATE OF THE ART: DESIGN OF SAFER HIGHWAYS BASED ON LESSONS FROM PAST EARTHQUAKES"* during the 81st Annual Session of IRC held at Lucknow on October 8, 2022 in the presence of the Union Minister for Road Transport & Highways and the Chief Minister of Uttar Pradesh.

Mr. Sudhanshu Dixit was awarded the prestigious *Prime Minister's Research Fellows (PMRF) Scheme.* Ms. Annie Singla PhD student of the Centre received the *EGU student award* at EGU 2022. Mr. Akshat Vashistha was awarded the *AGU 2022 student travel grant*.

Prof. Sumi Sen
Director

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The Centre hosted events i.e., **Disaster Management Knowledge Frontiers** (Seminar Series), **Disaster Management Action Frontiers** (International Field Expeditions), **Prof. Jai Krishna Memorial Lecture (JKML)**, and **Forecasting and Early Warning of Extreme Events and Disasters** (FORESEED 2022).

The Centre organized a special session in **IDRiM 2022** titled *"Resilience and risk management dialogue among stakeholders for science-informed resilience planning in the Himalayan Mountains"*.

Prof Mahua Mukherjee, Joint Faculty and Ex-Head CoEDMM participated in the **Asia Pacific Ministerial Conference for Disaster Risk Reduction (APMCDRR)** Brisbane, Australia, held on 19-23 September 2022. *Click here* for a detailed report.

Prof S. Srikrishnan and Dr Pankaj Kumar, CoEDMM, IIT Roorkee presented in the **10th IDRiM Café Talk**, titled **"Early Warning System and South Asia Disaster Scenario"** on 31 October 2022.
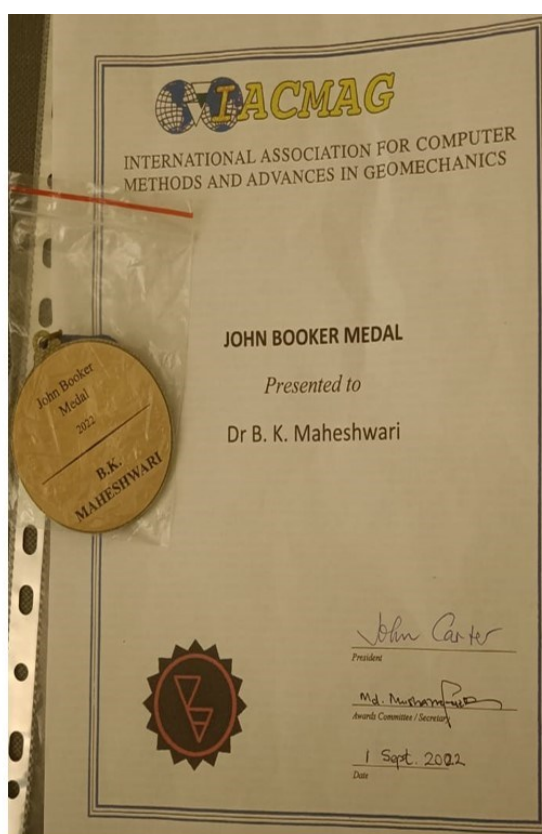
Prof. B. K. Maheshwari, Joint Faculty, CoEDMM IIT Roorkee was awarded the prestigious **John Booker Medal,** the third highest accolade of the International Association of Computer Methods and Advances in Geomechanics (IACMAG)

South Asia Alliance of Disaster Research Institutes (SAADRI), India

https://www.saadri.net/

Figure 1 Low Carbon Building Project, January- March 2022

1. SAADRI-UKADR meeting, 18 January 2022

The SAADRI-UKADR meeting was held on a virtual platform on 18th January 2022. The Meeting provided an opportunity to understand the basic structure of working of the two Alliances-

- Common ground finding: Institutional partners, Focus on knowledge products, Adaptation Research, Implementation Science, and Sendai Framework are some of the common areas found

- Motivating activities of the UKADR- Influence on government policies, International Research focus, Strong Partner Universities, Champions in subject areas

- Motivating activities of the SAADRI- attracting local experts to address regional needs; cascading hazard, 5 Working Groups with specific focus areas

- Areas to Collaborate through MoU:

    - Cross-learning on areas like Influencing government on Policy and implementation; and Working Group formation

    - Working towards instituting an umbrella SAADRI-UKADR Fellowship Program which will provide exchange opportunities to Disaster managers, early-career and other researchers, policymakers, etc.

    - Action Research collaborations among SAADRI-UKADR members

    - Curriculum development to bring interest among the young population in DRR.

2. Low Carbon building project, January- March 2022

Low Carbon building project held at IIT Roorkee is a combined initiative of the South Asian Alliance of Disaster Resilient Infrastructure (SAADRI), the Centre of Excellence in Disaster Mitigation and Management (COEDMM), and the Department of Architecture and Planning (DAP), IIT Roorkee.

The Project became part of a global initiative under the Women of the World (WoW) gender grant and is a collaborative initiative undertaken by women students, alumni of architecture, design, and related professions of various institutions to build zero-carbon bamboo buildings.

Globally the partners of the Project on a zero-carbon bamboo building are BRAC University Bangladesh, Heritage Foundation Pakistan, and the University of Glasgow, UK. Twenty-five schools and organizations across the globe including IIT Roorkee have participated in this event.

3. Participation in the 4th Asia Pacific Science Technology Conference, 07 - 08, April 2022.

SAADRI participated and co-organized Technical Session 4: Cities, Climate Change, and Critical infrastructure in the 4th Asia Pacific Science Technology Conference for Disaster Risk Reduction (APSTCDRR 2022) held in Manila, Philippines from 07th to 08th, Apr 2022.

4. Asia Pacific Ministerial Conference for Disaster Risk Reduction (APMCDRR), 19-23 September 2022.

Members from SAADRI participated in the Asia Pacific Ministerial Conference for Disaster Risk Reduction (APMCDRR) Brisbane, Australia, held on 19-23 September 2022.

Prof. Mahua Mukherjee

Secretary-General

E-mail: saadri@iitr.ac.in

mahuafap@iitr.ac.in

Professor Rajib Shaw- SAADRI Board Member, Dr Amod Dixit –Lead Coordinator for SAADRI Working Group I, Dr. Shobha Poudel- Deputy Lead Coordinator of SAADRI Working Group V Member, many SAADRI well-wishers, and Regional and Global experts and disaster managers participated in the same.

- Participation in the "Science and Technology Stakeholder Meeting"

- Working Session: Scaling up, scaling out and scaling deep: Innovations in Disaster Risk Management

Link for detailed report: https://saadri.net/public/forms/40723_SAADRI%20at%20APMCDRR%20Brisbane.pdf

5. Journal article published, 20 September 2022

The first journal article from SAADRI's collaboration titled "Nature-Based Resilience: Experiences of Five Cities from South Asia" was developed by 'WG V: Nature-Based Resilience (NbR)' and published in the International Journal of Environmental Research and Public Health, on 20 September 2022.

Article pdf Link: https://saadri.net/public/forms/47430_Journal%20publication_Nature-Based%20Resilience_Experiences%20of%20Five%20Cities%20from%20South%20Asia.pdf

6. Disaster Management Action Frontiers, 10 -13 October 2022.

SAADRI along with the Centre of Excellence in Disaster Management, IIT Roorkee organized Disaster Management Action Frontiers, 10th October 2022 – 13th October 2022.

- **Field Expeditions**: In-situ observation and understanding of different types of landslides in and around Tehri.

- **A panel discussion** on "Action Frontiers of WGs of SAADRI" was organized in which the five Lead

Coordinators from the five Working Groups of SAADRI were the panelists.

Website: https://iitr.ac.in/iddrr2022/

## 7. SAADRI Second BoD meeting, 19 November 2022

The second Board of Directors (BoD) meeting (online) of the SAADRI was held on 19 November 2022 (Saturday) at 03:30 IST.

- Establishing a membership fee was suggested and the proposed Fees are INR 4000 (US 50$) for Individual members and INR 1000 (US 15$) for Student members were agreed upon by the members.

- The initiative of society registration of SAADRI under the Societies of Registration Act, 1860 was welcomed by the members.

- The SAADRI Young Professional Platform (YPP) was introduced to the members. This is a platform for young professionals to include innovative approaches in SAADRI's activities.

- The proposal for a new Working Group – WG VI – titled 'Climate Change Impact on Environment and Health' was approved by the BoD members.

- Proposal for the Constitution of SAADRI Executive Committee (SEC) was approved. The executive committee will be an implementation committee that will be dealing with policy matters, international relations, funds, and campaigns and put them before the BoD.

    The BoD members decided on the development of a quarterly SAADRI Newsletter.

8. Critical Writing Workshop, 13 December 2022

A Critical Writing Workshop for Young Professionals in the field of Disaster Management was held online on 13 December 2022 at 8:30 am (IST). The workshop was co-organized by SAADRI, U-INSPIRE Alliance, BRIN (National Research and Innovation Agency of Indonesia), and Keio University- India Japan lab. The workshop was aimed at capacity building of Young Disaster Management Professionals.
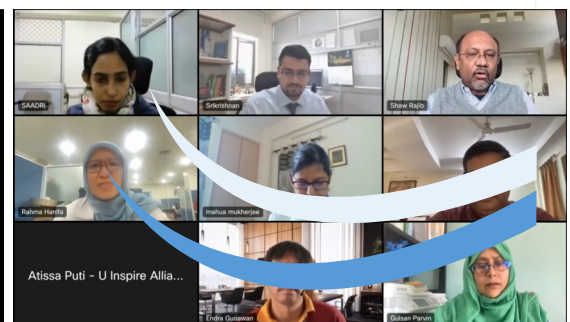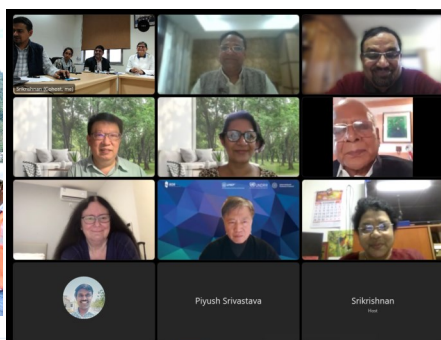
International Institute of Earthquake Engineering and Seismology (IIEES)
Iran

http://ww.iiees.ac.ir/en/
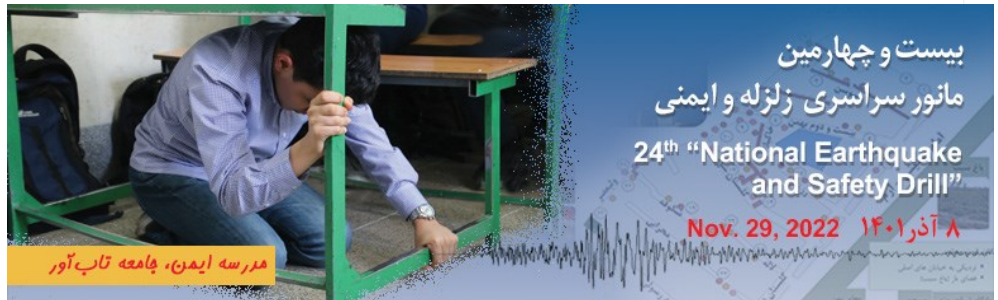
In 2022, the following activities were undertaken:

- Organization of workshop on Urban Resilience through Applied Systems Analysis in cooperation with IIASA and INSF

- Organizing 24th National Earthquake and Safety Drill;

- Design of emergency and temporary shelter standards for Iran;

- Disaster preparedness and response capacity-building for women and vulnerable groups;

- Practical Guidelines for CBOs and NGOs' Participation in Disaster Risk Management;

- Comprehensive earthquake preparedness education plan for children with special needs and disabilities;

- Modeling of earthquake resilience in urban fabrics;

- Development of IEES building fragility functions for Iranian buildings

- Development of resilient model for the electric grid and thermal power plants.

- Developing earthquake fatality estimation model for Iran;

- Earthquake risk–management model for historic commercial urban fabrics;

- Developing probabilistic earthquake loss model;

- Design of earthquake insurance pool model and toolbox

- Development of system model for safe and affordable housing;

- Study of flood triggered landslides in Iran;
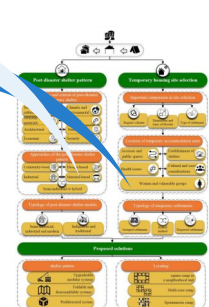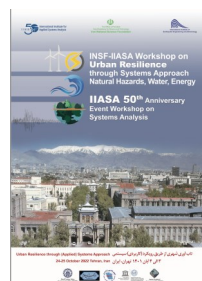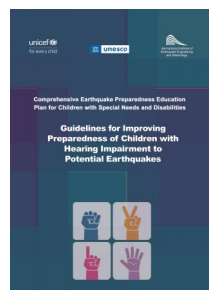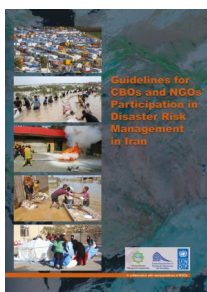
Prof. Mohsen Ghafory-Ashtiany

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International Institute of Earthquake Engineering and Seismology (IIEES)
Iran
http://ww.iiees.ac.ir/en/

Regional Education and Research Center on Earthquake Risk Management and Resilience for West and Central Asia under the auspices of UNESCO

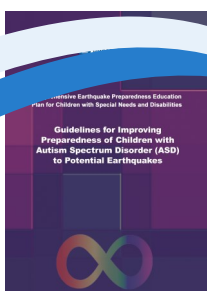The countries located in West and Central Asia have been, throughout their history, exposed to devastating natural hazards with geophysical or hydro-metrological origins. Of most important perils that have affected these countries over the past decades, earthquakes could be distinguished. In order to respond and enhance the degree of preparedness for the impacts of earthquakes, different measures have been taken into account by national and local governments by now. However, there are still many activities that should be addressed for capacity building in these countries for earthquake risk mitigation and management.

To assist the countries in the region for Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM), the "Regional Education and Research Center on Earthquake Risk Management and Resilience for West and Central Asia under the auspices of UNESCO" was officially established in November 2022, after long-term national and international procedures. In this line, during 2021 and 2022, a feasibility study carried out by the Center to evaluate the needs of member states for developing regional earthquake monitoring systems (REMS) and Quick Damage and Loss Estimation (QD&LE). This is a priority activity for improving the emergency response. QD&LE by providing an initial estimation of fatalities and severity of damages helps the disaster management authorities to appropriately allocate available resources. This issue has significant impact on reducing the number of deaths and secondary damages especially in the first 24 hours after the event (The Golden Time). For instance after the 1999, Kocaeli, Turkey earthquake, the central government was not aware of the severity and scale of the damage until several hours after the event. In Rudbar-Manjil 1990, Iran earthquake, the search and rescue teams were unaware about the most affected sites for some days, due to initial false information provided regarding epicenter of the event and difficulties in identification of damaged area. These issues caused further casualties and irreversible socio-economic consequences. Similar issues are reported about Bam, Iran Earthquake (2003), Spitak, Armenia Earthquake (1988), Ashgabat, Turkmenistan Earthquake (1948) and many other events.
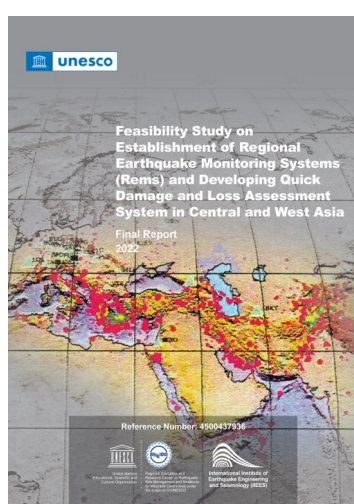
Assoc. Prof. Kambod Amini
Hosseini
E-mail: kamini@iiees.ac.ir

In that study, some research institutes from Armenia, Afghanistan, Azerbaijan, Cyprus, Iran, Jordan, Lebanon, Pakistan and Turkey were participated. Within the framework of that study, the creation of a cloud-based platform for collection and analysis of data was considered to facilitate a deeper understanding of risk and speedier and more efficient targeting of beneficiaries in the disaster affected areas. The results of that project were published to shows the existing gaps and outline the future plans to address the needs.

In addition, two regional workshops and some bilateral meetings were also organized in 2022. The main goals of the workshops and meetings can be summarized as follows:

- Strengthening collaborations among the relevant institutions in the region to prepare

necessary plans for reducing earthquake casualties and damages;

- Needs assessment for disaster risk mitigation and management in the region and prioritize the necessary interventions;

- Sharing knowledge and experiences for DRM and DRR to prepare a platform on capacity building in the region.

In 2023, considering the official start for the activities of the Center, it is expected that the Center implements more researches and educational programs in the region. In this context, several workshops and training courses are planned to be organize by presence of relevant institutions in Iran and other countries.

Natural Disasters Research Institute (NDRI) Iran

http://www.en.ndri.ac.ir
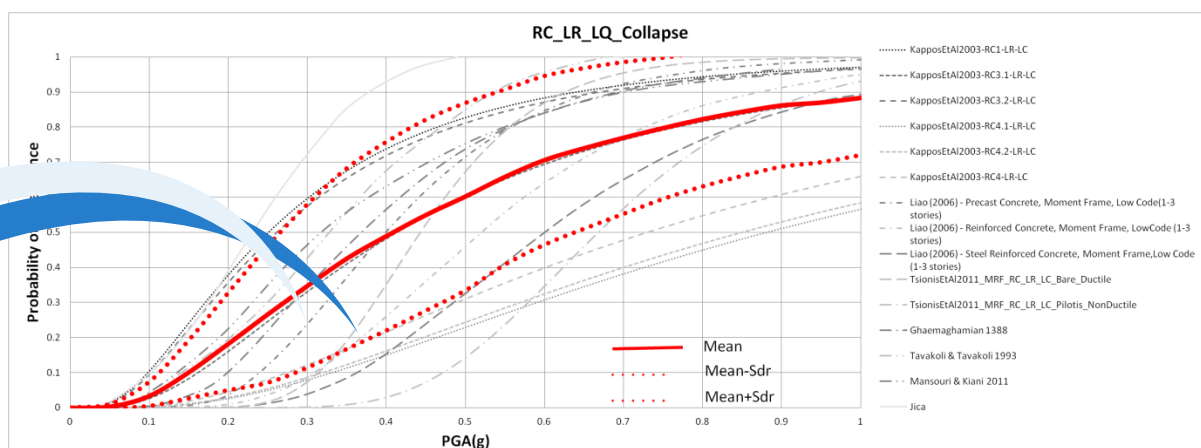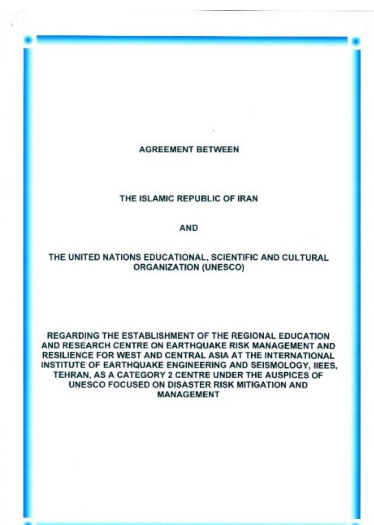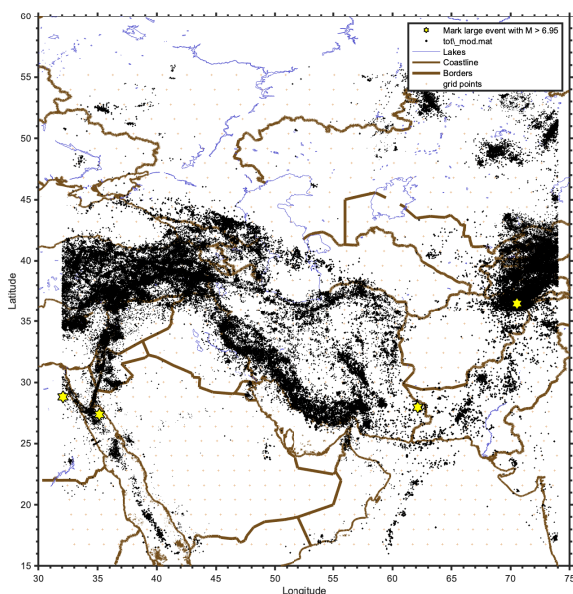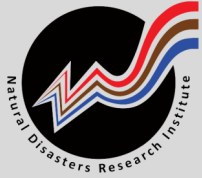
In 2022, Natural Disasters Research Institute (NDRI) mainly emphasized expanding international cooperation with UN offices and international institutes. The NDRI actively participated in the IMIRA (Iranian Multisector Initial Rapid Assessment) Draft Committee and the meetings of the UN Sustainable Development Framework, UNSDCF (2023-2027). Moreover, The Secretariat of the National Platform for Disaster Risk Reduction in the Islamic Republic of Iran was established in the NDRI.

1-MoU between NDRI and UNOCHA-ROMENA

This memorandum of understanding was signed in coordination with the Ministry of Foreign Affairs of the Islamic Republic of Iran during the Earthquake Preparedness Exercise on June 20, 2022, in the presence of members of the United Nations Disaster Management Group, United Ntions Agencies, Ministry of Foreign Affairs, Ministry of Health and Medical Education, National Disaster Management Organization, Red Crescent Society of the Islamic Republic of Iran, Tehran Disaster Prevention and Management Organization, Natural Disaster Prevention and Disaster Research Institute and the United Nations Resident Coordinator for Iran Mr. Priesner.

This Memorandum of Understanding aims to provide a framework for joint scientific, educational, and executive cooperation and determine specific working arrangements between the parties to establish an official communication channel for effective cooperation on common disaster management preparedness and emergency response issues.

(https://en.ndri.ac.ir/MoU-OCHA-ROMENA-NDRI)

2- International Day for Disaster Risk Reduction

A special meeting on International Day for Disaster Risk Reduction was held on October 12, 2022.

According to this year's tagline of International Day, Reza Roozbahani, research deputy of the Water Research Institute, outlined the national flood monitoring and forecasting systems. At first, while enumerating the importance of water and then providing statistics on floods in the country, he expressed: In recent years, the combined use of structural and non-structural methods to manage and reduce flood risks has been expanded in many countries of the world. Flood management and control are carried out in three main sections: pre-warning and preparedness before flooding, coping during the occurrence, and reconstruction and rehabilitation after flooding. In the pre-warning and preparedness stage before flooding, flood prediction and warning, one of the high-performance non-structural methods, plays an essential role in informing human societies before flooding.

(https://en.ndri.ac.ir/IDDRR-2022-meeting)

3- the National Platform for Disaster Risk Reduction of Iran

The first meeting of the National Platform for Disaster Risk Reduction of the Islamic Republic of Iran was held in 2022, headed by Mohammad Hassan Nami, Head of National Disaster Management Organization (NDMO), with the subject of raising the national Platform's code and organizational Structure, and discussions on the establishment of specialized committees in the NDRI were held.

The head of NDRI and UNESCO Chair in Disaster Management described the draft of the code and organizational structure of the National Platform and expressed that the draft structure has been revised according to the country's disaster management law approved in 2019 and has been amended by the objectives of the National Strategy Document and the opinions obtained from a group of experts.

(https://en.ndri.ac.ir/national-assembly-for-disaster-risk-reduction-04)

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4- Disaster Management plans for Tehran

Regarding the preparation of disaster management plans for Tehran with the responsibility of Tehran Municipality, in December of 2022, the agreement (contract) between the heads, deputies, and managers of Tehran Disaster Mitigation and Management Organization (TDMMO) and the NDRI was signed to develop three disaster management plans including a disaster risk reduction plan for 5 priority hazards, preparedness and response plan and reconstruction and rehabilitation plan of Tehran.

(https://ndri.ac.ir/Tehran-DM-Planning-02)

5-Joint webinar with Pavia University, Italy

The training course "Risk management in Italy & the civil protection plan of Pavia province" was held on November 29, 2022 by the NDRI and Urban Planning Laboratory (UPLAB)-Pavia University, with the presentation of Professor Roberto De Lotto (Director of the UPLAB) and Dr. Elisabetta Venco (Fellow Researcher at the UPLAB). It was highlighted that the city is a system, and it is a complex system.

(https://en.ndri.ac.ir/unesco-chair-Lecture-26-news)
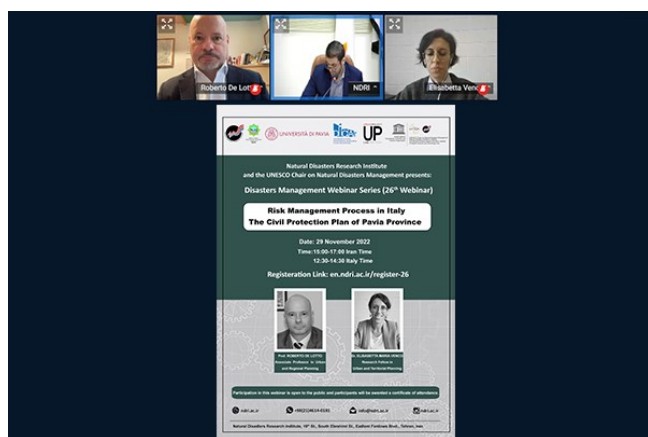
Joint webinar with Pavia University, Italy

International Day for Disaster Risk Reduction

National Platform for Disaster Risk Reduction of Iran

Israel National Knowledge and Research Center for Emergency Readiness
University of Haifa, Israel
http://www.muchanut.haifa.ac.il

The National Knowledge and Research Center for Emergency Preparedness was established in January 2018 with 90 researchers divided among 8 disciplinary research teams: Law; Public Policy; Social Science; Public Health and Emergency Medicine; Welfare and Social Work; Engineering, Technology and Planning; Risk Assessment and Management; and Environment. The research at the Center in 2022 focused on projects in the aftermath and lessons learned from COVID-19:

- Continued research on the Impact of COVID-19 on Well-being in Israel

- The role of local authorities and the way they coped with the challenges of the pandemic

- Answering a request from the National Emergency Management Agency, the Center is preparing a literature review and summary of national plans and programs for mitigating outcomes of heat waves and floods

- Measuring resilience: indicator-based tool for measuring regional resilience in localities in Israel (focused on population under security threat in the Gaza strip) for the Prime Minister's Office

- A new project started in 2023: Regulatory and Policy Frameworks for a Mid and Long-term Recovery after a Major Earthquake

As in previous years, the Center holds weekly seminar talks (most are in Hebrew), all are streamlined on Facebook, recorded and uploaded to YouTube.

A full list of the talks is available on our website here: https://muchanut.haifa.ac.il/index.php/en/events

Webinar presenting the latest research at the Center:

Evaluating the Success of Local Authorities in Israel in Minimizing the Impact of COVID-19 (Prof. Itai Beeri)

Dr. Michal Ben Gal
Research Coordinator
E-mail: bmichal@geo.haifa.ac.il

2021-2022 selected publications:

- Feitelson, E., Plaut, P., Salzberger, E., Shmueli, D., Altshuler, A., Ben-Gal, M., Israel, F., Rein-Sapir, Y. & Zaychik, D. (2022). The Effects of COVID-19 on Wellbeing: Evidence from Israel. *Sustainability*, 14(7), 3750.

- Feitelson, E., Plaut, P., Salzberger, E., Shmueli, D., Altshuler, A., Amir, S., & Ben-Gal, M. (2022). Learning from Others' Disasters? A Comparative Study of SARS/MERS and COVID-19 Responses in Five Polities. *International Journal of Disaster Risk Reduction*, 74, 102913.

- Lewin, A.C., Shamai, M. & Novikov, S. Surviving in Crisis Mode: The Effect of Material Hardship and Social Support on Emotional Wellbeing Among People in Poverty During COVID-19. *Soc Indic Res* (2022). https://doi.org/10.1007/s11205-022-03011-7

- Mizrahi, S., Ben-Eliyahu, A., Cohen, N., Hertz, U., Miller-Mor, R., Mishor, F. & Vigoda-Gadot, E. (2022). Public management during a crisis: when are citizens willing to contribute to institutional emergency preparedness? *Public Management Review,* 1-25. DOI: 10.1080/14719037.2022.2042727

- Mizrahi, S., Vigoda☐Gadot, E., & Cohen, N. (2021). How well do they manage a crisis? The government's effectiveness during the Covid☐19 pandemic. *Public Administration Review*, *81*(6), 1120-1130

- Negev, M., Zohar, M., & Paz, S. (2022). Multidimensional hazards, vulnerabilities, and perceived risks regarding climate change and Covid-19 at the city level: An empirical study from Haifa, Israel. *Urban Climate*, *43*, 101146.

- Newman Cohen, A. & Fishhendler, I. (2022). An archetype for insurance thresholds for extreme natural events in the agricultural sector. *Climate Risk Management*, 36, 100434.

- Vigoda-Gadot, E., Mizrahi, S., Cohen, N. et al. (2023). Citizens' reactions to global crises: a longitudinal study during the COVID-19 pandemic in Israel. SN Soc Sci 3, 24 https://doi.org/10.1007/s43545-023-00610-0

- Zohar, M. (2021). Geolocating tweets via spatial inspection of information inferred from tweet meta-fields. *International Journal of Applied Earth Observation and Geoinformation*, 105, 102593. https://doi.org/10.1016/j.jag.2021.102593
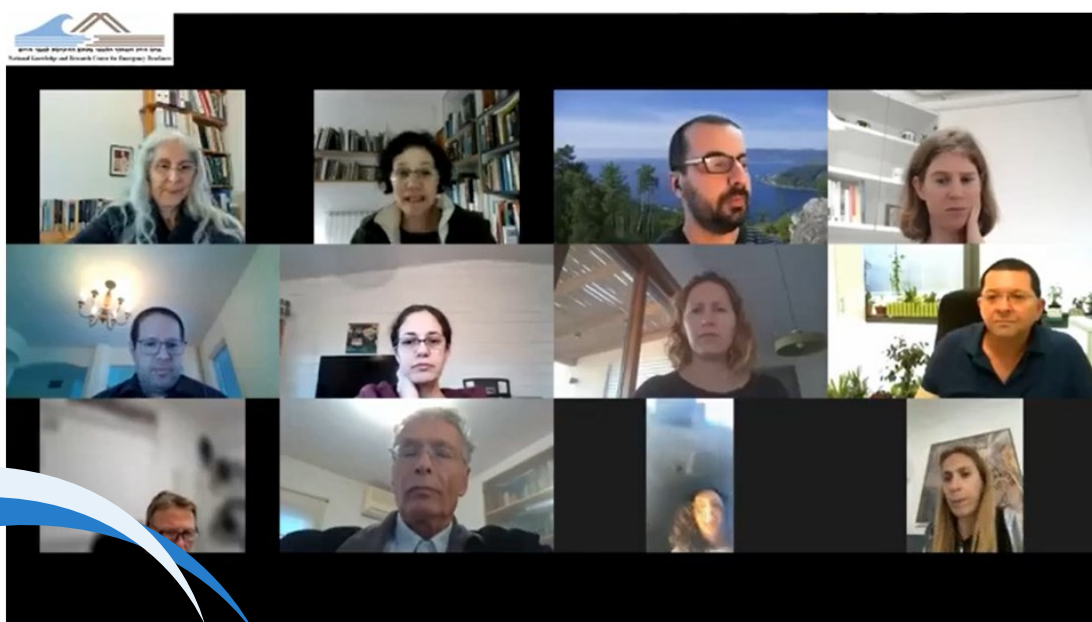
Department of Climate Change

Ministry of Natural Resource and Environment, Lao PDR

http://www.monre.gov.la/home/

Lao PDR is a landlocked country location in Southeast Asia, bordering with China, Myanmar, Thailand, Vietnam and Cambodia. The total area covers approximately 236,800 Km^2, comprising a wide range of natural resources and ecosystems within varying levels of elevation. The country is about 6,2% mountains topography of the total land area, but the western border largely flow along the Mekong River basin.

This is also central for agriculture economic production because of the fertility of the river valleys.

Due to the Tropical Typhoon setting in every year, the country is also exposed to a range of disaster hazard such as droughts, flood, storm, extreme weather, earthquake and epidemics. In 2022 there were more tropical storms and typhoons, drought and flood in many part of country. Hence, the Flood and flat flood cases were more affected to the livelihood and economic especially in southern and northern parts. In terms of climate change the estimated projections for temperature rise is on increase of 1 to 2 degrees and precipitation is likely to increase by 10 to 30% (DMH report in 2022). However, the country has not been considered to be a significant contributor to the on-going change, rather quite the contrary, and the widespread forests are important carbon sinks in the region. Yet, Lao PDR is expected to be among the most heavily affected by climate change.

Nowadays, the National risk profile of Lao PDR has identified seven major hazards which include storm, flood, drought, landslide, earthquake, epidemic and unexploded. Therefore the Lao Government is seeing significant to urgent update system for hydro-meteorological to be helping information to identify on hazards and climate change, exposure, Socio economic vulnerability, future of disaster risk, include to disaster risk reduction and climate change adaptation. Base in practice and implementation for disaster risk reduction and climate change the Lao government is following commitment the Sendai framework for DRR (UNSDR) and Paris Agreement for Climate Change (UNFCC). At the moment Lao Government had understood the both framework and recommendation that must be integrated into each period on the National Social and Economic Development to be ensure in policy, law, legislations, strategy, planning and implementing.

Challenges

As the pace of climate change increases, country across the globe will have to increase funding and efforts to adequately mitigate the climate change impacts and to avoid the worst case scenarios. Sustaining agriculture and wellbeing of people in Lao PDR will form challenges by mid-century unless adequate mitigation strategies for water scarcity and agriculture production are identified. Also center urban area of city should be concerning on flood risk and climate change.

While the country is pursuing green economic growth, Lao PDR also aimed to ensure that development intervention and profit oriented activities will not increase pressure on land, water, environment and natural resource. However, limiting tradeoff between development gains and DRR and climate resilience is anticipated as key challenge for the years to come. While this seems to be contradicting with the land control and monitor development form disaster risk perspective has to be formulated and strictly applied with tools such as land use zoning, spatial planning, EIA integrated Strategic Environment Assessment as well as sustainable resource management.

For DRR remains unexplored. Untapped potential of ecological function for flood and drought risk reduction could be given more attention government has a unique role to play in facilitating consultative and people participatory process combining technically sound practices wisdom and way of life for the utmost benefit of immediate communities and vulnerable populations.

Ms. Ms. Sonephet PHOSALATH

Director

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Field survey at Baling

Condition of Kupang river

Damaged crops

In this 2022 report, the Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia (UKM) reports 2 selected activities, as below:

(a) Field Survey at Baling

On July 4, 2022, a debris and mud flood occurred in several villages located along the Kupang river near Baling, state of Kedah, Malaysia. A report by the Ministry of Energy and Natural Resources (KeTSA) Malaysia states that the flood claimed three lives and destroyed a total of 17 houses. The flood also affected the local community in which they lost about RM25.91 million of their property. In this regard, a total of six researchers from LESTARI, led by Assoc. Prof. Dr. Saiful Arif Abdullah had conducted a field survey to the area on 23-27 September 2022. Other LESTARI researchers involved were Assoc.Prof. Dr. Sharina Abdul Halim, Assoc. Prof. Dr. Tanot Unjah, Dr. Rospidah Ghazali, Dr. Nordiana Mohd Idris and Dr. Lim Chouan Sian.

The objective of this field survey is to understand the current situation of the affected area and the impact on the villagers in terms of their well-being due to the flood. The survey includes direct observation at the site, interviews with the villagers and discussions with the local authorities. Based on the survey, it was found that the impact is very significant to the landscape of the affected areas along the Kupang river and the villagers in terms of their well-being and survival. The landscape along the riverbank has completely changed from the original state. Many areas of the agricultural crops or small farms have been destroyed. Through the interview, the villagers stated that the situation has affected their source of income. They also emphasized the need for the short- and long-term measures to deal and mitigate the situation. With these findings LESTARI will build a scientific basis in dealing with and improving the current situation in the area by publishing a technical report that to be shared with related stakeholders especially the local authorities.

Assoc. Prof. ChM Dr. Goh Choo Ta

Director

E-mail: gohchoota@ukm.edu.my

(b) Publication related to Technological Disaster

The Occupational Safety and Health (Control of Industrial Major Accident Hazards) Regulations 1996 (also known as CIMAH 1996) in Malaysia was gazzeted to prevent occurrence of major accidents hazards. Due to international and national initiatives, such as development of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) and the gazettement of Occupational Safety and Health (Classification, Labelling and Safety Data Sheets of Hazardous Chemicals) Regulations 2013 (also known as CLASS 2013), it is timey to revise CIMAH 1996. In this regard, Department of Occupational Safety and Health Malaysia (DOSH) has awarded a project to UKM Pakarunding, where the project aims to evaluate and determine (i) indicative criteria and threshold quantities; and (ii) list of hazardous substances and threshold quantities, that may cause major accidents. The approaches adopted in the project include the desktop review, conduct surveys among the competent persons for CIMAH 1996, major hazard installations (MHIs) and non-major hazard installations (NMHIs), analyse chemical accidents that occurred in Malaysia and other countries, conduct quantitative risk assessment (QRA) and stakeholder consultation workshops. Selected findings from project were published in Process Safety and Environmental Protection, with the article title "Prevention of technological disasters: Adoption of indicative criteria associated with GHS in regulating major accident hazards". The article can be accessed via the URL below (not open access): https://www.sciencedirect.com/science/article/abs/pii/S0957582022003202

Field survey at Baling

Photos by SA Abdullah

Interview session with the villages

(b) Publication related to Technological Disaster

Damaged house in one of the affected villages

Screenshot from Science Direct, Elsevier

Contents lists available at ScienceDirect

Process Safety and Environmental Protection

journal homepage: www.elsevier.com/locate/psep

Prevention of technological disasters: Adoption of indicative criteria associated with GHS in regulating major accident hazards

Goh Choo Ta[a,*], Noorazman bin Soud[b], Kasman bin Nasir[b], Fairuz Anwar bin Abdullah[b], Masli Irwan Rosli[c], Darman Nordin[c], Jarinah Mohd Ali[c], Syazwani Binti Mohd Fadzil[d], Nurul Izzaty Binti Hassan[e], Siti Zubaidah Hasan[c], Mohd Sobri Takriff[c,f], Mardiana bt. Abdul Latif[b]

Certificate of Appreciation
Sekalung Penghargaan

Prof. ChM. Dato' Dr. Mazlin bin Mokhtar

on retirement as

Director and Principal Fellow
Institute for Environment and Development (LESTARI)
The National University of Malaysia

26 May 2022

Congratulations to Professor Dato' ChM Dr, Mazlin Mokhtar on his retirement of. On May 25, 2022, a ceremony took place at the Putrajaya Palm Garden Hotel organized by the Institute for Environment and Development (LESTARI). All LESTARI employees, former LESTARI Directors, and former LESTARI Deputy Directors were present for the celebration. The ceremony featured performances by LESTARI employees, multimedia screenings, and lucky draws.

Prof. Dr. Mazlin Mokhtar served UKM for 37 years including as Director of LESTARI 2005-2013 & 2019-2022; Deputy Vice Chancellor for Research and Innovation Affairs 2014-2017; Founding Director of Centre for Public & International Relations (PUSPA) 2001-2004; and Lecturer at UKM Sabah Campus in Kota Kinabalu, Sabah 1988-1996.

Currently, Prof. Mazlin Mokhtar, is serving as the Deputy Head (Research), United Nations Sustainable Development Solutions Network - Asia Headquarters (UN SDSN-Asia) at Sunway University, Malaysia. Prof. Mazlin is also the Chairman of the Environment Committee of Academy of Sciences Malaysia (ASM); Member of Malaysia's Environmental Quality Act's Appeal Board; and Nomination Committee of the Merdeka Awards (Environment Category); and

Advisory Council Member of Society of Certified Professionals (SCRP) Malaysia.

He was the Chairman of Malaysia's Environmental Quality Council 2015-2018, Chairman of government appointed committee reviewing the Lynas Rare Earth operations 2018; Chair of Task Force 2019-2021 on Advocacy, Awareness & Capacity Building (AACB) of Malaysia's Water Sector Transformation 2040 under Economic Planning Unit of Prime Minister's Department; and Deputy Chairman of National Committee for SOP on Bauxite Mining and Exportation 2019; & International Atomic Energy Agency (IAEA) Research Fellow at the Marine Environment Laboratory in Monte Carlo, Monaco in 1993. He was the longest serving member of Malaysia's UNDP (United Nations Development Programme) GEF (Global Environment Facility) SGP (Small Grants' Programme) National Steering Committee.
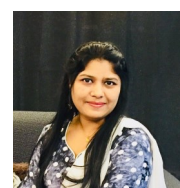
Dr. Lubna Alam
Fellow/Senior Lecturer
E-mail: lubna@ukm.edu.my

Prof. Mazlin was the winner of the Langkawi Award 2018; and recipient of 2010 best social science FRGS award by Ministry of Higher Education for his research on national chemicals management. He was a member of the Advisory Committee of National River Care Fund 2014-2022; and WWF Malaysia's Board of Trustees 2014-2018. He had also been entrusted to lead several multidisciplinary research projects sponsored by numerous national and international entities via integrated and holistic approaches for sustainable development, including in important geographical areas such as Langkawi the Jewel of Kedah cum UNESCO's Global Geopark; UNESCO's APFAST & MUCP, and HELP IHP Programs in Langkawi, Langat River Basin; and Putrajaya Lakes.

Prof. Mazlin was one of the founding professors of the United Nations University (UNU)'s 2010-2015 international training course titled "Building Resilience to Climate and Ecosystem's Change (BRCC)" led by

Professor Tekeuchi and Dr Srikantha Herath, based at UNU Tokyo and conducted via partnership with several renowned universities including University of Tokyo, Kyoto University, Ritsumeikan University, Universiti Kebangsaan Malaysia, Vietnam National University, Universitas Gadja Mada of Indonesia, Yeungnam National University of Korea, Perediniya University of Sri Lanka, University of The Philippines, and Asian Institute of Technology. Mazlin was also Leader of the Environmental Risk Management group of the JSPS VCC's and JSPS Asian Core Programs 2000-2015; and Leader for UKM in the Global Alliance of Disaster Research Institutes (GADRI) network for Disaster Risk Reduction (DRR) headquartered at DPRI of Kyoto University since 2015."

Director and Former Director of LESTARI UKM welcomed Prof. Mazlin

Speech of Appreciation by Professor Mazlin

Special performances honouring Prof. Mazlin by LESTARI members

Group Photo LES-

University of Peshawar

Pakistan

ttp://www.uop.edu.pk/
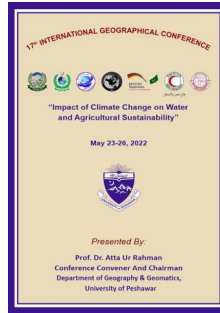
Achievements in 2022 include:

1. **President,** Pakistan Geographical Association

2. **Professor**, Department of Geography and Geomatics

3. **Chairman**, Department of Geography and Geomatics

4. **Co-Convener**, Advanced Studies & Research Board, Sub-Committee-II

5. **Convener:** International Conference organized: 1

6. **Convener:** National Symposium: 1

7. **Convener:** Training Workshop: 2

8. **Convener:** Seminar: 5

9. **PhD** Produced: 3

10. **MS/MPhil** Produced: 10

11. **Convener:** Exhibition: 1

12. MoU Signed: 1

13. Conference/Seminar/workshop attended as resource person: 13

Research Publications (2022):

1. Papers Published in Journals: 14

2. Book Chapters Published: 4

- Citations: 332

Prof. Atta-ur-Rahman

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Disaster Risk Management (DRM) Unit, Graduate School of Business (GSB), Philippine School of Business Administration (PSBA) – Manila Philippines

https://www.psba.edu

The Disaster Risk Management (DRM) Unit, Graduate School of Business (GSB), Philippine School of Business Administration (PSBA), Manila participated as one of the partner in organizing and holding the International Seminar with a theme of "Disaster Risk Financing awareness towards Disaster and Climate Change Resiliency" on March 06, 2022 at the Department of City and Regional Planning, University of Engineering, Lahore, Pakistan. Prof. Dr. Tabassam Raza represented

the PSBA chaired one of the technical sessions of the seminar. He also participated as one of the Resource Speaker during the seminar.

The main objective of the International Seminar was to contribute to make our society resilient by providing a stage in disaster risk financing. It also aimed to foster closer ties among diversified participants and provide an avenue to share thoughts and exchange of ideas on how business organizations and its members can contribute more meaningfully to resolve disaster-related challenges faced and opportunities gained by Public Private Partnership. Further, it was the intention of this seminar to encourage governments and private sectors including academia and business community to adopt sustainable Inclusive Financial Mechanism by integrating the poor at the core of risk management.

Specifically, the seminar aimed to:

- Seek fundamental awareness regarding Disaster Risk Financing as an important part of Disaster Risk Management Plan and make it a policy priority.

- Have knowledge about on-ground realities and challenges faced by the institutional agencies and organizations regarding disaster risk financing.

- Provide knowledge on how to drive capital towards sustainable climate change

- Raise awareness and thereby understanding of the impact of disaster on economic stability of a nation.

Prof. Dr. Tabassam participated as one of the Winter School Meeting Chair & Coordinator during the winter school/conference on "Planning in Germany and Pakistan: Responding to Challenges of Climate Change through Intercultural Dialogue". The winter school was organized by the Department of City and Regional Planning, University of Engineering & Technology, from 17th to 23rd of December 2022. The aimed aims to start and stimulate dialogue between the students and young academics from Germany and the higher education institutes in Pakistan.

Prof. Tabassam Raza

Director, DRM Unit & Dean, External Education, GSB

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Mountain Societies Research Institute (MSRI)

University of Central Asia (UCA), Tajikistan

https://ucentralasia.org/schools/graduate-school-of-development/mountain-societies-research-institute

Snow avalanches and debris flows impacting agricultural fields and villages in northern Afghanistan.

Mountain Societies Research Institute (MSRI) applies scientific expertise to study complex earth surface and environmental processes that affect mountain societies of Central Asia. MSRI's transdisciplinary research focuses on improving livelihoods, managing natural resources, mitigating the effects of natural hazards and climate change, and building community resilience in these challenging environments. As part of MSRI's research for development program, we conduct training sessions related to climate change, disaster risk reduction, and sustainable natural resources management. Headquartered at University of Central Asia's (UCA) Khorog campus in Tajikistan, MSRI staff also teach classes at the undergraduate Earth and Environmental Sciences Department. MSRI also has a significant presence in Bishkek, Kyrgyzstan at UCA's main administrative office.

During 2022, MSRI contributed significantly to better understanding of natural hazards and disaster mitigation in the greater Central Asian region. Relevant research projects included examining climate change impacts in the Panj-Amu River basin of northern Afghanistan, assessing changes in cryosphere water sources (snow, glacier, and permafrost) on water supplies and hazards in the Pamir (Tajikistan and northern Afghanistan) and Tien Shan (Kyrgyzstan and Kazakhstan), evaluating the impacts of snow avalanches along roads in Tajikistan, assessing sources and transport of sediments into the Vakhsh River basin of Tajikistan, assessing the extent and sources of air pollution exacerbated by a warming climate in Bishkek, Kyrgyzstan, evaluating climate change effects on water resources in Kyrgyzstan, down-scaling climate data across Central Asia, and addressing the food security crisis in poor mountain regions through a broader lens that includes hazard impacts and climate change. These projects are supported by various donors and funding agencies,
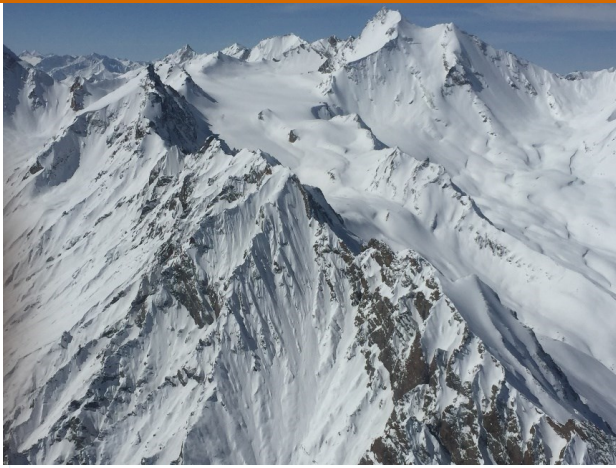

Prof. Roy Sidle
Director

E-mail: roy.sidle@uncentralasia.org

Water sources in the cryosphere of the high Pamir, Tajikistan

including World Food Programme, World Bank, USAID, Aga Khan Foundation, IDRC (Canada), Critical Ecosystem Partnership Fund, and Japan Meteorological Organization, among others. MSRI also closely collaborates with the Ministry of Emergency Situations of Kyrgyzstan, Aga Khan Agency for Habitat, and Mountain Societies Development Support Programme.

Because snow avalanches cause disasters in the region every year, MSRI developed a unique algorithm that can easily be applied in remote mountain regions to assess the frequency of avalanche deposits. This open-access script, named Snow Avalanche Frequency Estimation (SAFE), maps all large avalanche deposits that occurred over the last 33 years using Landsat archives across wide spatial scales. SAFE is the first to automatically map avalanches at such scales to support decision-making for disaster mitigation. The model is freely available and is easily accessed as it is implemented in Google Engine. The initial research that supported the development of SAFE was through our Afghan Climate Change Project funded by AKF and USAID. Further development and implementation of SAFE is underway supported by grants from the World Bank and World Food Programme. SAFE informs decision-makers responsible for weather monitoring, as well as villages and road and energy maintenance operations in high mountain regions. This research was published in 2022 in *The Cryosphere* (https://tc.copernicus.org/articles/16/3295/2022/) and appeared as a Research Highlight in *Nature* in September 2022 (https://doi.org/10.1038/d41586-022-02772-y). The Google Engine script for SAFE can be readily accessed the following link: link: https://zenodo.org/record/6973757#.Y-22Dx_P13h To evaluate global climate models in Kyrgyzstan, MSRI analyzed the relationship between tree growth and hydrometeorological features. Hydrometeorological data are reconstructed using dendrochronology and machine learning to bias-correct climate models in northern Tien Shan in collaboration with the Government of Kyrgyzstan. Results were published in

the journal Water (https://www.mdpi.com/2073-4441/14/15/2297).

As part of in an international project funded by USAID to assist governmental agencies in Central Asia to better assess their needs for water monitoring, MSRI synthesized detailed water, climate, and cryosphere data and interviewed key agencies in Tajikistan, Kyrgyzstan and Kazakhstan to understand their current strengths and challenges and identify ways to improve water monitoring equipment, data management, and collaboration. These agencies are interested but need capacity to utilize advanced remote sensing applications for water and hazard monitoring. In these challenging mountainous environments, MSRI is employing remote sensing technologies and have recently completed an assessment of temporal and spatial trends precipitation and temperature across the Pamir region of Tajikistan and northern Afghanistan to address future water issues and drought occurrence. We currently have a paper in review on this topic in *Nature Water*. As a follow-up of an IDRC (Canada)-funded project, MSRI worked with dispersed faculty members from Bamyan University, Afghanistan topublish a paper in *Water* on water sources and quality of drinking water supplies in central Bamyan (https://www.mdpi.com/2073-4441/14/19/3060). This was the first international publication on this topic in this poor region.

Dr. Erkin Isaev received an award to conduct research on climate downscaling across Central Asia with Japan Meteorological Agency for a 2-month period during late 2022. One paper is now in preparation from this research. Professor Sidle was awarded a Distinguished Professorship to conduct research at Tokyo University of Agriculture and Technology and has contributed to the submission of several jointly authored papers and developed plans for research collaborations in Central Asia.
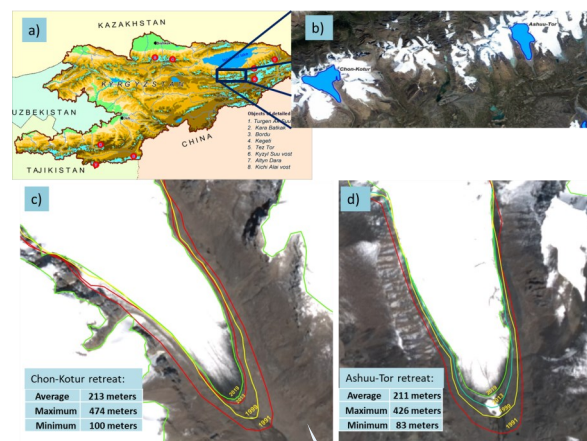
Glacial retreat at two sites in Kyrgyzstan's Tien Shan documented by Sentinel-2 satellite images.

National Science and Technology Center for Disaster Reduction (NCDR), Chinese Taipei

https://www.ncdr.nat.gov.tw/

National Science and Technology Center for Disaster Reduction (NCDR), Tzu Chi Foundation (Tzu Chi), and International Cooperation and Development Fund (TaiwanICDF) co- organized the International Training Workshop - Youth Leadership Camp on Disaster Risk Management from 15 to 17 January, 2022.

NCDR has held the International Training Workshop since 2005. Each year, the organizer designs the different diverse & inclusive themed focusing on the most pressing issues to meet global or regional demands, to provide scientific based disaster risk reduction training in order to promote regional capacity building.

Through scenario simulations to hands-on operations, the 2022 workshop aims at capacity building for HA/DR in case of earthquake scenario, and the training courses focused on the planning and practice of the humanitarian assistance with seismic technology,

invited undergraduate, graduate or post-graduate international and domestic students majoring in disaster management or relevant disciplines who are enthusiastic fast learners with high mobility and genuine creativity. There were 44 participants attending this meaningful workshop, who are from 16 countries, including Belize, Eswatini, Haiti, Indonesia, Iran, Malawi, Malaysia, Myanmar, Peru, Tanzania, the Philippines, Saint Lucia, the United States, Vietnam, Saint Vincent and the Grenadines, and Taiwan.

Ms. Kiri Ke Hui Chen

Assistant Researcher

E-mail: khc@ncdr.nat.gov.tw

In order to inspire the participants' imagination, activeness and executive power, the workshop was designed to the major three parts: Keynote Speech, HA/DR Best Practices, Planning and Operation. Prof. Tan Sri Dr. Jemilah Mahmood MD FRCOG MOG, Executive Director, Sunway Centre for Planetary Health of Sunway University, CEO Po-Wen Yen, Tzu Chi Charity Foundation, and Director Joseph Martin, Center for Excellence in Disaster Management and Humanitarian Assistance (CFE-DM) delivered their impressive speeches to the participants on-site as well as the audience from all of the world by live streaming.

To encourage all participants could be more involved in understanding the disaster scene and the actual assistance situation, in the opening session, three panelists from Tzu Chi were invited to share their experiences of on-site disaster relief, and had interactive discussion with all participants.

Based on the magnitude 6.9 earthquake scenario in Kathmandu Nepal, the participants practiced to organize a team and coordinate several mission group to carry out the tasks that included to set up an emergency shelter, practice the HA/DR technologies, and plan for a temporary shelter camp. Besides building the temporary shelter for the victims, all participants needed to prepare hot meals for relief teams, provided clean water and lighting, and managed the hygiene and sanitation.

Though the real practice and team work, participants could learn the decision making to deliver feasible solutions and allocate resources for coping with challenges, streamlining the data, photo and information collected for situation assessment on cross-cutting issues for integrated communications, mobilizing the tangible and intangible resources for emergency preparedness, integrating team efforts on the scenario simulation for operations, and delivering effective and efficient operation.

This was the second international training event that NCDR corroborated with Tzu Chi and TaiwanICDF, and it was an innovative "Cross-boundary Synergies" event that connected the science and technology of disaster reduction, disaster relief, humanitarian assistance and international initiative.

Asian Disaster Preparedness Center (ADPC)
Thailand
https://www.adpc.net

Climate Adaptation and Resilience for South Asia

A partnership between ADPC, RIMES and the World Bank to support informed decision-making for protecting development gains

Asian Disaster Preparedness Center (ADPC) is an autonomous international organization for cooperation in and implementation of disaster risk reduction and building climate resilience in Asia and the Pacific. It was established in 1986 as a regional disaster preparedness center (DMC) in Asian Institute of Technology (AIT) in Bangkok, Thailand. It has grown its activities over the past three decades and in 2005, ADPC's international Charter was signed by nine founding member countries: Bangladesh, Cambodia, China, India, Nepal, Pakistan, Philippines, Sri Lanka and Thailand. The Charter was put into effect in 2018 through the ratification by all the founding members. As of January 2020, ADPC is operating as an autonomous international organization governed by the Board of Trustees.

The vision of ADPC is "safer communities and sustainable development through disaster risk reduction" and its geographical remit is Asia and the Pacific. In the current context it provides an excellent mechanism to address existing and the emerging negative impacts of natural hazard and climate change, continue to support global initiatives on

climate resilience, urban resilience, making humanitarian response to disasters more effective and give support and direction for recovery and rehabilitation, building back better.

Here are some flagship programs being implemented by ADPC:

The "Climate Adaptation and Resilience (CARE) for South Asia" project is supporting the region in building resilience to climate change by improving the availability of regional data and knowledge, developing guidelines, tools and capacities, and promoting climate-resilient decisions, policies and investments across key sectors. (https://www.careforsouthasia.info/)

Dr. Bill Ho
Director, Academy
E-mail: bill@adpc.net

Through a unique partnership between the U.S. Agency for International Development (USAID) and the U.S. National Aeronautics and Space Agency (NASA), SERVIR-SEA is harnessing such space technology and open data to help address development challenges related to a changing climate. SERVIR-SEA works in partnership with leading regional organizations to help the seven countries in the Southeast ASIA Region use information provided by Earth observing satellites and geospatial technologies to manage climate risks. The region includes Cambodia, Indonesia, Lao PDR, Myanmar, Philippines, Thailand and Vietnam. (https://servir.adpc.net/)

The Asian Preparedness Partnership (APP) is a unique multi-stakeholder regional partnership established by its founding member countries which include Cambodia, Myanmar, Pakistan, Philippines, Nepal, and Sri Lanka. Formed in 2017 with technical and secretariat support from the Asian Disaster Preparedness Center (ADPC) as well as assistance from the Bill & Melinda Gates Foundation (the Foundation) and the United States Agency for International Development Bureau for Humanitarian Assistance (USAID BHA), its goal is to achieve "safer and well-prepared communities through locally led disaster risk management (DRM) actions, so that disaster impacts on at-risk communities of Asia will be reduced".

APP strives to improve stakeholder coordination and dialogue between governments, local humanitarian organization networks, and the private sector to enhance capacities through partnerships, knowledge resources, training, and networking opportunities. The APP serves as a network of networks connecting these key local actors who are working on emergency response and disaster risk management at the national and sub-national levels for a more coordinated and effective response at the time of disaster. It promotes locally-led disaster preparedness, response, and recovery actions through improved coordination mechanisms, strengthened humanitarian leadership, training, and capacity development, systems transformation, innovation, South-South learning and knowledge exchange, and regional cooperation. (https://app.adpc.net/)

Protection against Lightning and Electric Fire Safety Standard Handbook

APP/National Disaster Risk Reduction Centre (NDRC)
March 2022
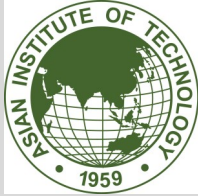
Asian Institute of Technology (AIT) Thailand
https://www.ait.ac.th
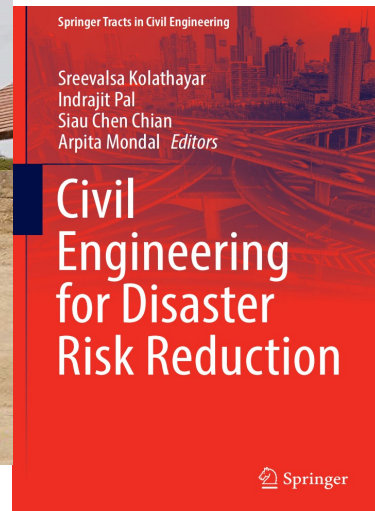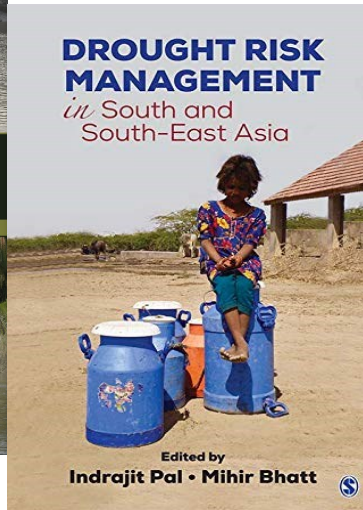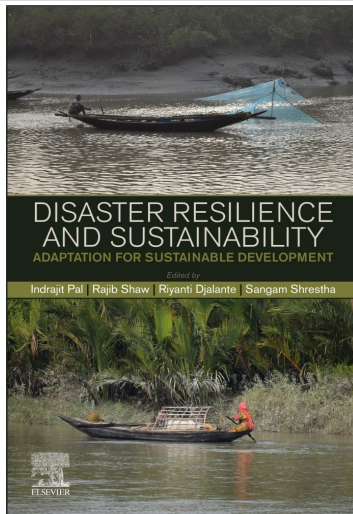
Disaster Preparedness, Mitigation and Management (DPMM) at Asian Institute of Technology, Thailand is regularly contributing to DRR higher education through it's Regular Certificate, Master, Professional-Master and Doctoral program. Apart from the regular courses significant projects and publications are listed as follows,

2020-2022—Research Projects:

- Title: "**Living Deltas Hub**", Year: 2019 – 2024, Location: Bangladesh, India, Vietnam , Position Held: Co-Investigator.

- Title: "**Integrated Assessment of SDGs Using Big Earth Observation Data for Bangkok Metropolitan Region (BMR)",** Year: 2020 – 2023, Location: Bangkok, Thailand, Position Held: Co-Principal Investigator

- Title: "**Risk perception and implication on risk governance for dual disasters Cyclone Amphan and COVID-19 in Kolkata Metropolitan Area (KMA)**", Year: 2020 – 2021, Location: India, Position Held: Principal Investigator,

- Title: "**Disaster Education for integrating SFDRR and SDG in Asia**", Year: 2020 – 2021, Location: Japan, Thailand, Indonesia, Client: ProSPER.Net, Japan (United Nations University, Tokyo, Japan), Position Held: Principal Investigator

- Title: "**Multi-hazard Risk Indexing of Coastal**

Critical Infrastructure: A Case Study of Thailand" Year: 2021 – 2022, Location: Thailand, Client: CDRI, Position Held: Project Lead

- Title: "**Capacity building for measuring multi-hazard livelihood security and resilience in the Lower Mekong Basin**", Year: 2021 – 2022, Location: Thailand, Cambodia, Vietnam, Client: APN, Japan, Position Held: Project Lead

- Title: "**Climate Resilient Infrastructure for Social Transformation and Adaptation (CRISTA)"-** Climate Innovation Challenge, Year: 2021 – 2022, Location: Bangladesh, Nepal, Client: ADPC / World Bank, Position Held: Project Lead

Dr. Indrajit Pal

Associate Professor and Chair

E-mail: indrajit-pal@ait.ac.th

Books:

- **Pal, I**., & Bhatt, M. (Eds.). (2020). *Drought Risk Management in South and South-East Asia*. Sage Publications Pvt. Limited.

- Shrestha, S., Djalante, R., Shaw, R., & **Pal, I**. (Eds.). (2021). *Disaster resilience and sustainability: Adaptation for sustainable development*. Elsevier.

- Kolathayar, S. (2022). *Civil Engineering for Disaster Risk Reduction*. **I. Pal**, S. C. Chian, & A. Mondal (Eds.). Springer.

- Kolathayar, S., Ghosh, C., Adhikari, B. R., **Pal, I**., Mondal, A., Prisco, M., ... & Wang, C. M. (2022). *Resilient Infrastructure*. Springer Singapore.

- **Pal, I**., & Kolathayar, S. (2022). *Sustainable Cities and Resilience*. Springer Singapore.

- Izumi, T., **Pal, I**., & Shaw, R. (Eds.). (2022). *Safety and Resilience of Higher Educational Institutions: Considerations for a Post-COVID-19 Pandemic Analysis*. Springer Nature.

- Shaw, R., & **Pal, I**. (2022). *Pandemic Risk, Response, and Resilience: COVID-19 Responses in Cities Around the World*. Elsevier.

- **Pal, I**., Shaw, R., Ichinose, T., & Oda, T. (Eds.). (2022). *Proceedings of the 2nd International Symposium on Disaster Resilience and Sustainable Development: Volume 1-Multi-hazard Vulnerability, Climate Change and Resilience Building* (Vol. 283). Springer Nature.

- **Pal, I**., Kolathayar, S., Islam, S. T., Mukhopadhyay, A., & Ahmed, I. (Eds.). (2022). *Proceedings of the 2nd International Symposium on Disaster Resilience and Sustainable Development: Volume 2-Disaster Risk Science and Technology* (Vol. 294). Springer Nature.

Japan

GADRI Secretariat
DPRI, Kyoto University
Kyoto, Japan
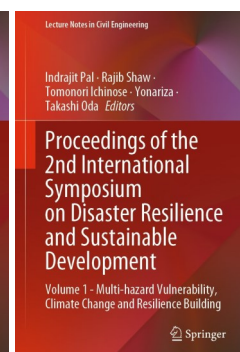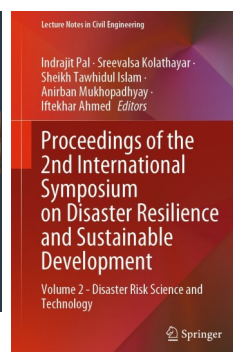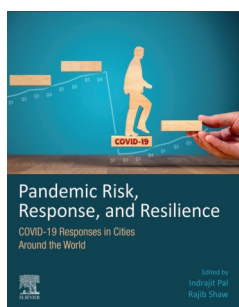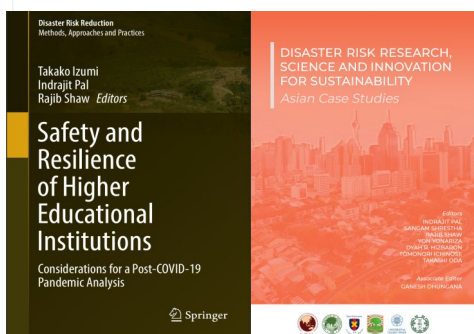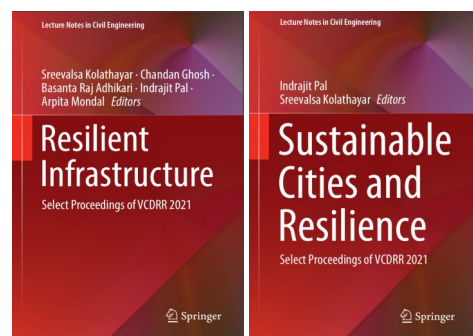
Japan

GADRI Secretariat
DPRI, Kyoto University
Kyoto, Japan

Japan

Research Center for Potential Development of Disaster Prevention, Akita University
Asian Disaster Reduction Center (ADRC)
Center for Disaster Management Informatics Research, Ehime University
International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO
International Consortium on Landslides (ICL)
Crisis & Security Management Research Center, Kagawa University
Research and Education Center for Natural Hazards, Kagoshima University
Institute of Nature and Environmental Technology, Kanazawa University
Research Center for Social Safety Science, Faculty of Safety Science, Kansai University
Center for Disaster Countermeasures (CDC), The University of Kita Kyushu
Research Center for Urban Safety and Security (RCUSS), Kobe University
Implementation Research and Education System Center for Reducing Disaster Risk (IRESC), Kumamoto University
Institute of Disaster Area Revitalization, Regrowth and Governance (IDiARRG), Research Institute for Disaster Area Reconstruction, Kwansei Gakuin University
Disaster Prevention Research Institute (DPRI), Kyoto University
Graduate School of Global Environmental Studies (GSGES), Kyoto University
Disaster Risk Reduction Research Center, Faculty of Engineering, Kyushu University
Research Institute for Applied Mechanics (RIAM), Kyushu University
Center of Environmental Science and Disaster Mitigation for Advanced Research (CEDAR), Muroran Institute of Technology
Advanced Disaster Prevention Engineering Center (ADPEC), Nagoya Institute of Technology
Disaster Mitigation Research Center (DMRC), Nagoya University
National Research Institute for Earth Science and Disaster Resilience (NIED)
Research Institute for Natural Hazards & Disaster Recovery, Niigata University
Research Initiative for Natural Disaster Prevention of Oil and Gas Spill in Industrial Parks, Graduate School of Engineering, Osaka University
Graduate School of Human Sciences, Faculty of Human Sciences, Osaka University
Frontier Research Center for Natural Disaster Mitigation, Ritsumeikan University
Institute of Disaster Mitigation for Urban Cultural Heritage (R-DMUCH), Ritsumeikan University
Disaster Prevention Research Center for Island Regions, University of the Ryukyus
International Research Institute of Disaster Science (IRIDeS), Tohoku University
Center for Urban Earthquake Engineering (CUEE), Tokyo Institute of Technology
Earthquake Research Institute (ERI), The University of Tokyo

Asian Disaster Reduction Center (ADRC)

Japan

https://www.adrc.asia/

Asian Disaster Reduction Center was engaged in many activities during the year 2022. One of the high-lights is the report published on the Eruption of the Hunga Tonga-Hunga Ha'apaivolcano (Tonga), 15 January 2022 with JAXA,and Sentinel Asia teams.

Eruption of the Hunga Tonga-Hunga Ha'apai volcano (Tonga), 15 January 2022

The volcanic ash and the tsunami accompanying the eruption of the submarine volcano, Hunga Tonga-Hunga Ha'apai, located north of the main island of Tonga (GLIDE No. VO-2022-000005-TON) caused great damages to houses and serious shortage of drinking water in Tonga. Tsunami damages have also been reported in other Pacific countries.

ADRC as the secretariat of the Sentinel Asia Project, a project aiming for utilization of space technology for DRR, requested emergency observation to assess the damage in Tonga, which is the center of the damage, and to collect the latest information of the situation.

Asian Disaster Reduction Center, 22 Jan. 2022

[Ref.] Sentinel Asia project
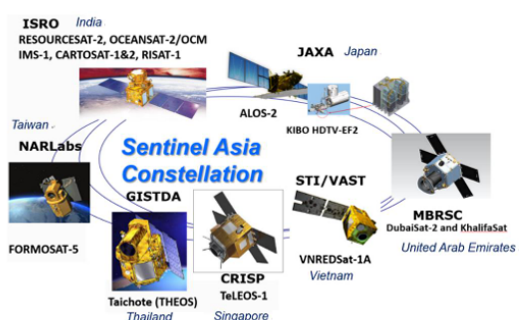
- In the event of a disaster, it is important to be able to quickly assess the disaster area for emergency response. Earth observation satellites effectively serve this purpose by analysing the disaster area and providing those data to the local community.

- ADRC continues to participate in the Sentinel Asia project, which was launched in 2006 with an objective of establishing a disaster risk management system in Asia utilizing the satellite images. ADRC functions as the focal point to receive emergency observation request in the framework of the Sentinel Asia.

- Upon receiving a request, ADRC decides whether the request is appropriate and whether the emergency observation should be implemented mainly by assessing the damages and casualties.

- Based on its own judgement, ADRC will forward the request to space agencies that participate in the Sentinel Asia Project, namely: ISRO (India), JAXA (Japan), GISTDA (Thailand), NARL (Taiwan), CRISP (Singapore), and MBRSC (United Arab Emirates).

Asian Disaster Reduction Center, 22 Jan. 2022

Further information: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.adrc.asia/publications/disaster_report/pdf/2022/Eruption_of_the_Hunga_Tonga-Hunga_Haapai_01.pdf

Dr. Shiomi Yumi

Senior Researcher

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Center for Disaster Management Informatics Research, Ehime University, Japan

http://www.cdmir.jp

Most of the center activities, both in education and research, were focused on local disaster-related issues and nearly all of them were conducted and published in Japanese only. The following is a list of major activities conducted by the center.

1. Bōsai-shi Distinguished Service Award received by Ehime University Bōsai Leaders' Club (2022.7.6)

2. Four-time *Bōsai-shi* (i.e, Disaster expert) training workshops in collaboration with Matsuyama City targeting the college students and local residents of Matsuyama City (2022.8-11).

3. *Bōsai-shi Kōshien* (i.e., Disaster experts national convention) Grand Prize received by the Ehime University Bōsai Leaders' Club and UR Resilience Prize received by Junior Bōsai Leaders' Club, both under the center management (2022.3.17)

4. Seminar on Pre-disaster Reconstruction Plan for Nankai Trough Earthquake (2022.4.8)

5. Seminar on My Timeline Usage and Saving Life from Large-scale Rain-induced Disasters (2022.5.10)

6. Seminar on Disaster Responsive New Technology, New Construction Methods, and Human Resource Development (2022.7.5)

7. Disaster Symposium on Saving Life from Large-scale Natural Disasters (2022.12.5)

(Details of the above activities are available here and here.)

- Annual report of the center (in Japanese) (2022.6)
- Proceedings of the Seminar on Disaster Responsive New Technology, New Construction Methods, and Human Resource Development (2022.7.5) (Link) (in Japanese)

Prof. Netra Prakash Bhandary
E-mail: netra@ehime-u.ac.jp

Center for Disaster Countermeasures (CDC)
The University of Kitakyushu, Japan

http://www.env.kitakyu-u.ac.jp/ja/shoubou/

Center for Disaster Countermeasures has helped organizing a lecture course in the University of Kitakyushu for sharing knowledge of local DRR experts with students from various disciplines since 2015. In 2022, the students from Kita Kyushu College, National Institute of Technology joined the course.

The lecture course featured a one-day student workshop on DRR organized by the Kitakyushu City government. Our students gathered one place, watched a plenary video presentation by Prof. Katada Toshitaka, the University of Tokyo. Then the students joined a workshop for reviewing shelter operation from a perspective of LGBTQ citizens. A singer and leader of the LGBTQ movement in the Kitakyushu Area, Rose san facilitated discussion.

Workshop for Students held on 1 May 2022
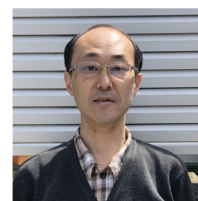
Prof. Takaaki Kato
E-mail: tkato@kitakyu-u.ac.jp

Program of the Course offered in 2022

	Topics	Providers
1	Introduction	Prof. Kato Takaaki, University of Kitakyushu
2	Emergency exercise	Prof. Kato Takaaki
3	Meteorology and earthquake	Crisis Management Department, Kitakyushu City
4	Flood prevention	Construction Bureau, Kitakyushu City
5	Disaster prevention and firefighters	Fire and Disaster Management Bureau, Kitakyushu City
6	School education and DRR	Board of Education, Kitakyushu City
7	Coping with disaster stress	Public Health and Welfare Bureau, Kitakyushu City
8	Earthquake resistant architecture	Prof. Kido Masae, University of Kitakyushu
9	Gender issues in DRR	Prof. Ninomiya Masato, University of Kitakyushu
10	Firefighting innovation through government-academics-business cooperation	Prof. Uezu Kazuya, University of Kitakyushu
11	Emergency management and DRR in Kitakyushu	Crisis Management Department, Kitakyushu City
12	Student volunteers	Prof. Murae Fumitoshi, University of Kitakyushu
13	Stakeholder involvement in DRR	Mr. Mochizuki Bun, and Prof. Murae Fumitoshi

International Centre for Water Hazard and Risk Management under the auspices of UNESCO (ICHARM), Japan

http://www.icharm.pwri.go.jp/

Special Lecture given by Dr. Johannes Cullmann, the director for Water and Cryosphere of the World Meteorological Organization

Online follow-up seminar for all the graduate of the ICHARM master's and Ph.D. Programs

One and a half years after the establishment, ICHARM launched the Disaster Management Policy Program (master's program) in October 2007. Three years later, in October 2010, the Disaster Management Doctoral Program started. As of September 2021, 157 students completed the master's program, and 15 students the Ph.D. program. They are active as leaders in water-related disaster risk reduction at their workplaces and communities in 37 countries, mainly in Asia, Africa, and Latin America. On February 25, 2022, a follow-up seminar was held online, inviting all graduates. Over 100 participants were present, including 80 graduates and ICHARM staff involved in the educational programs. The seminar consisted of three special lectures, two sessions of Focus Group Discussion, and General Sharing to share the discussion results with all participants. The participants agreed that opportunities like follow-up seminars are very important to strengthen cooperation among the graduates and improve each other's skills.

Prof. Toshio Koike

Executive Director

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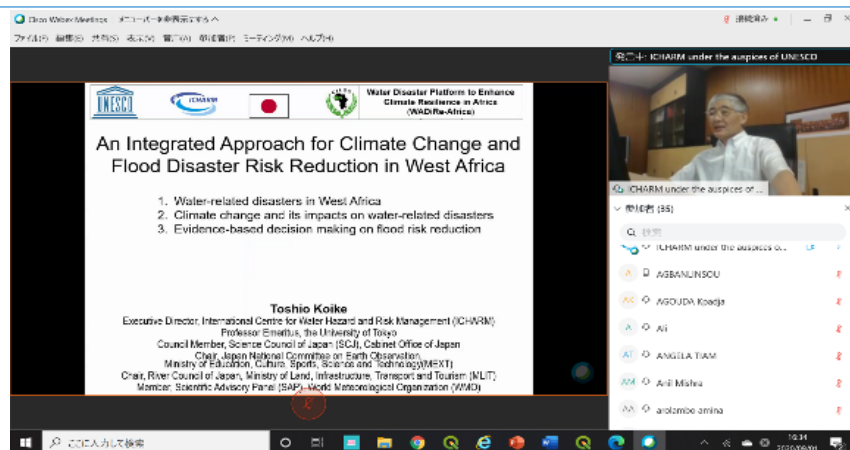
E-learning Training Course

UNESCO project, "Water Disaster Platform to Enhance Climate Resilience in Africa" (WADiRe-Africa)

In collaboration with the UNESCO-IHP and the AGRHYMET in West Africa, ICHARM established the FEWS in the Niger and Volta River basins in West Africa. ICHARM also conducted e-learning capacity building training for local staff to become able to utilize the FEWS for disaster response. The training was held from August 2020 to February 2021. Two types of training courses were conducted for representatives from 11 countries located in either river basin.

One was the "Expert Training" and the other "Training of Trainers (ToT)," which was a more advanced course targeted at those who had completed the Expert Training. The Expert Training was held four times, which 197 out of 288 participants completed. The Training of Trainers was held twice, which 30 out of 44 participants completed.

Myanmar-Agriculture development support project: Technical support in flood simulation for downstream areas of the Swa Chaung Dam

In August 2018, a spillway concrete weir of the Swa Chaung Dam, located about 60 km south of Naypyidaw, the capital of Myanmar, failed and caused large-scale flooding downstream, which damaged more than 80 villages and forced more than 60,000 people to evacuate and be displaced. The World Bank decided that ICHARM provide technical support to simulate the flooding in the downstream area at the time of the Swa Chaung Dam failure. By using the bias-corrected GSMaP data sets and the polarization information of satellite SAR data, an integrated modeling system developed by ICHARM successfully reproduced dam failure flooding. Risk assessment was performed using this system by simulating events of different scales, such as 1/200, 1/1000, and probable maximum rainfall. The resulting information was provided for local experts to plan disaster prevention measures and crisis management downstream of

the dam. A manual was also created to describe these series of methods for their application to other areas with dams.
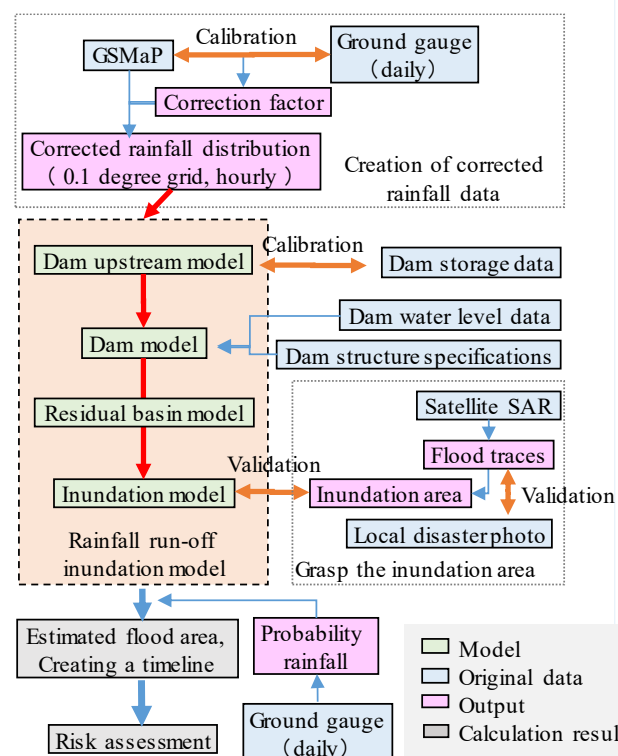
Typhoons Impacts in Japan in 2022

Typhoons, tropical cyclones in the western North Pacific, are significant meteorological hazards in East and Southeast Asia including Japan. This article, report the impacts of typhoons in Japan in 2022.

The figures below show the temporal changes of the number of typhoon occurrences (upper panel) and the strongest typhoons (lower panel).
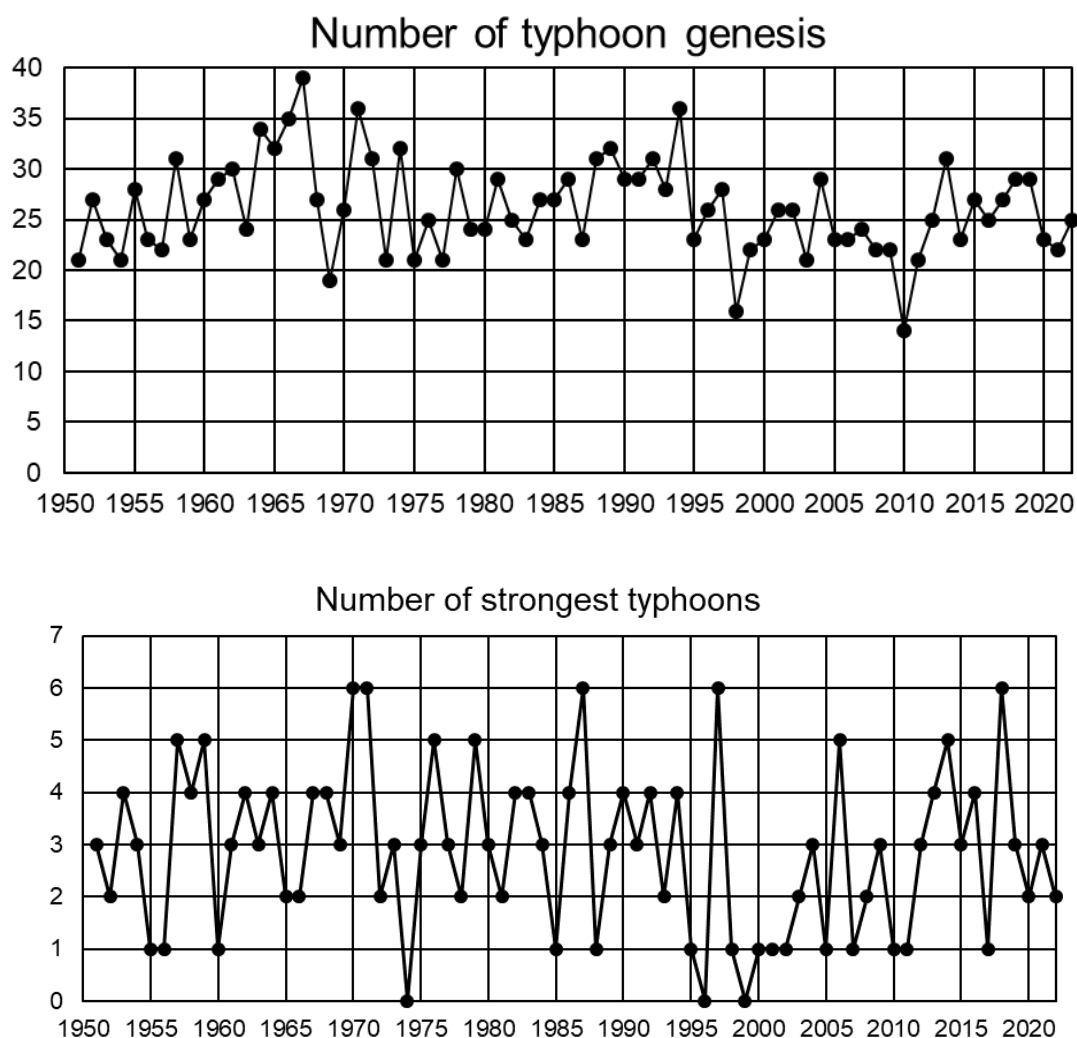
Tetsuya Takemi

Professor

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The strongest typhoons are those having the lifetime minimum surface pressure of 920 hPa or lower. The both numbers indicate that the typhoon activity in 2022 (as of December 13th, 2022) is nearly normal.

The number of the landfalling typhoons in Japan in 2022 is 3, which also indicates that the 2022 condition is quite normal. One of the strongest typhoons in 2022, Hinnamnor, the 11th typhoon which occurred in late August to early September, was anticipated to spawn significant impacts in western Japan.

Owing to an early warning and preparedness of the public as well as the typhoon track shifted off the coast of western Japan, the number of confirmed deaths was 0. Also, Hinnamnor rapidly weakened than expected, as it approached the Japanese islands and moved northward. Well-preparedness to this extreme typhoon was considered to have work positively.

In September, there were two tmore yphoons that have significant impacts: Typhoon Nanmadol, the 14th typhoon, and Talas, the 15th typhoon.

- Nanmadol reached its maximum intensity of the minimum surface central pressure being 910 hPa nad the maximum surface wind being 54 m/s, which is the strongest typhoon in this season, and caused heavy rainfalls and strong winds on the Pacific side of the Japanese islands. Five people were dead, and more than 100 were injured. It should be emphasized that the number of casualties and the damages to daily lives and social-economic activity were not so disastrous as compared with the impacts due to the recent strongest typhoons such as Jebi (2018), Faxai (2019), and Hagibis (2019).

- On the other hand, Talas did not reach a

tropical cyclone intensity, but caused heavy rainfalls mainly, with record-breaking daily rainfall at several places, in the central part of Japan. Fortunately, the number of the casualties was limited to 12.

Considering that the recent extreme typhoons and resulting heavy rainfalls/strong winds have caused disastrous damages, the typhoon impacts in 2022 seem to be not so damaging.

This may be partly due to the improvement of weather forecasting and information dissemination.

Also important is the adequate responses of the public agencies and local governments to the weather forecasting and information.

Another important point is that general public becomes more prepared to and aware of the impacts of extreme weather and typhoons based on the recent experiences of the recent heavy rainfalls and damaging typhoons.

Disaster Prevention Research Institute (DPRI)
Kyoto University, Japan
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Open Campus Day at DPRI, Uji Campus, Kyoto University, Japan
October 2022

It is Open Campus Day at the Disaster Prevention Research Institute (DPRI), Uji Campus, Kyoto University, Japan, 22 and 23 October 2022. This time, after three years of online session, it is opened to the public.

Days leading up to the event were days of spring cleaning. A touch of aesthetics to laboratories to the exteriors of the building to the landscaping. Three days prior to event, three working hours in the afternoon are allocated when everyone is required to go out, and clean the surrounding area, pick up all sort of garbage, remove weeds, sweep up the pavements, and make it spick-and-span prior to opening the doors to the public in the preceding weekend.

This year, there was added attention and hustle and bustle as the President of the Kyoto University will visit DPRI and interested in learning about the work carried out by our talented researchers, especially the young professionals.

The President, Prof. Nagahiro Minato, took his term of office as the President of the Kyoto University in October 2020. This was his irst time to visit the DPRI facilities.

On Saturday, 22 October 2022, Prof. Minato was welcomed to the DPRI and received by the DPRI Director Prof. Eiichi Nakakita, and Prof. Hirokazu Tatano, Secretary-General, the Global Alliance of Disaster Research Institutes (GADRI); and Head, Social Systems for Disaster Risk Governance, DPRI; and other faculty members of DPRI.

Prof. Minato delivered a keynote speech at the Kihada Hall, Oubaku Plaza.

have continued to investigate the impact of major disasters on corporate production activities. With regard to the economic damage to the east Japan earthquake in 2011, we successfully made a model to be replicated the impact. In addition to the discussion on the challenges towards reducing disaster risks, I would like to share my knowledge gained during this research.

Prof. Minato's speech was followed by a presentation by Prof. Hirokazu Tatano on the "Economic analysis of disasters: what we leared from past research".

Abstract of Prof. Tatano's address:

Since the Niigata Chuetsu Earthquake in 2004, we

Prof. Minato moved on to site visit the Wood Working Shop, Xylarium, Research Institute for Sustainable Humanoshere (RISH) which was founded in 1980 where there are collections of wood samples which are "botanically authenticated, and some corresponding to herbarium specimens".

Public members participated in various games and exercises organised by the faculty of DPRI.
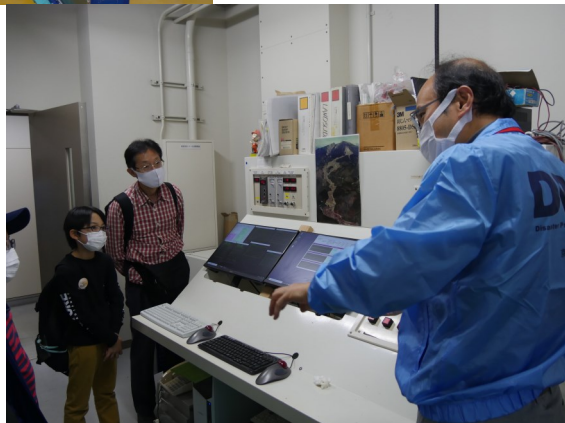
Prof. Minato attended presentations by DPRI faculty at the Wood Composite Hall (RISH). The presentations were paraded by young and upcoming researchers which included many females too.

There were various activities orgaised by the DPRI Ujigawa Open Laboratory too.
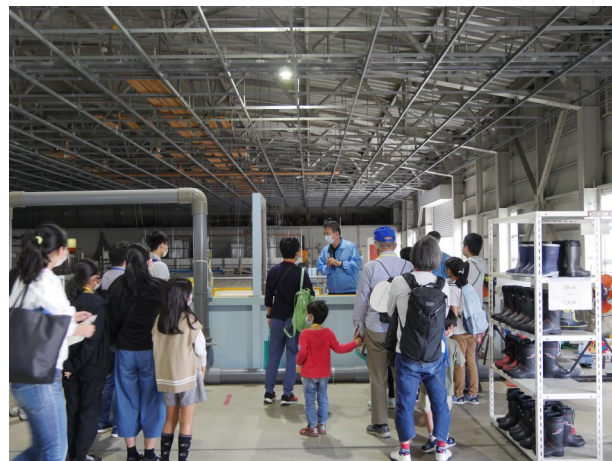
Prof. Minato proceeded to visit the DPRI Ujigawa Open Laboratory too.

Disaster Prevention Research Institute (DPRI)
Kyoto University, Japan
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Press Release – Flood Control Timeline of Disaster Base Hospitals

This article appeared at the DPRI, Kyoto University website. https://www.dpri.kyoto-u.ac.jp/news_en/16159/
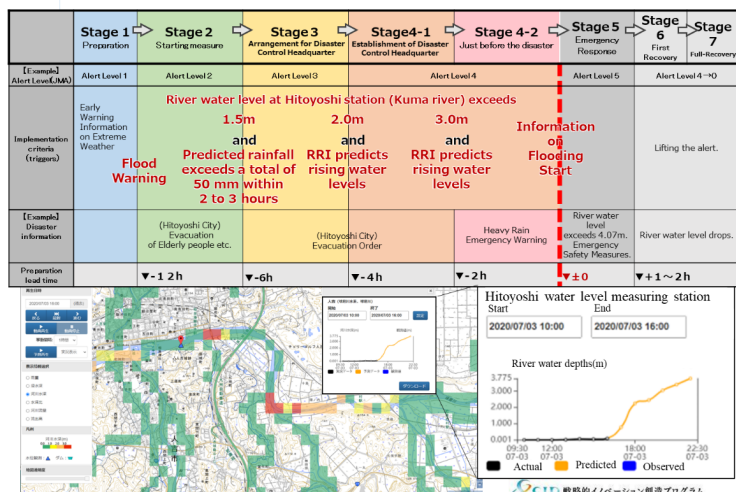
System image of the nationwide Rainfall-Runoff-Inundation (RRI) model (Simulation of the flood event of July 2020)

- Prof. Tetsuya Sumi, and Associate Professor Takahiro Sayama of Disaster Prevention Research Institute (DPRI), Kyoto University;

- Shimizu Corporation (President Kazuyuki Inoue); and

- Hitoyoshi Medical Center (Hospital Director Masami Kimura)

According to the report issued by the Disaster Prevention Research Institute (DPRI), Kyoto University on 2 April 2022, 34% of medical institutions designated for infectious diseases nationwide are positioned in flood potential areas due to heavy rainfall once in a thousand years, and 26% of them are located in the area even with once every 100 to 200 year floods. The report details the survey conducted on the flooding of the Kuma River in Kumamoto Prefecture and the Hitoyoshi Medical Center.

Prof. Tetsuya Sumi, and Associate Professor Takahiro Sayama of Disaster Prevention Research Institute (DPRI), Kyoto University, Shimizu Corporation (President Kazuyuki Inoue), and Hitoyoshi Medical Center (Hospital Director Masami Kimura) have developed a timeline for flood management and verified its effectiveness by conducting a disaster

prevention training at the Hitoyoshi Medical Center on 6 May 2022.

The timeline is designed to evaluate flood risk based on the actual conditions of hospital architecture and facilities, and organizes necessary disaster response operations and implementation criteria (triggers) as well as coordination methods among staff members. It specifies to execute them in chronological order according to the seven disaster stages.

In addition to public weather information, the most important implementation decisions are based on data from the nation-wide RRI Model, which was developed by DPRI as part of the Strategic Innovation Promotion Program (SIP) of the Cabinet Office. It is expected that the activity will become a new framework for disaster risk reduction plans in the flood timeline of hospitals in the future.

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Article on Climate-fuelled wave patterns pose an erosion risk for developing countries

By Prof. Nobuhito Mori et.al.

Published in The Conversation in June 2022

Changes in wave power of westerly wave climate

Pw (kW/m)
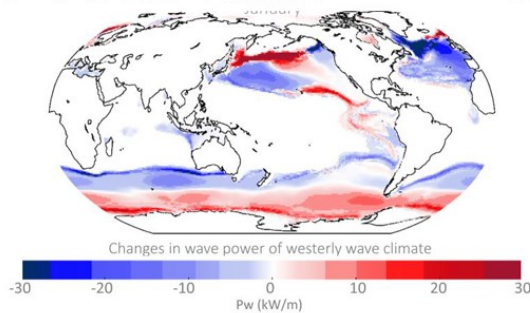
Odériz, I., Mori, N., Shimura, T., Webb, A., Silva, R., Mortlock, T. R., (2022).Dataset for Transitional Wave Climate Regions on Continental and Polar Coasts in a Warming World. Nature Climate Change

Article on "Climate-fuelled wave patterns pose an erosion risk for developing countries" by Prof. Nobuhito Mori et.al. was published in The Conversation in June 2022.

In addition to sea level rise and coastal climate change due to global warming, there is a risk that the coastal environment will change significantly due to changes in global wave characteristics. Therefore, predicting future changes in waves is important for adapting to coastal climate change.

Previous studies have shown that waves can be classified into several global wave climate types. This study analysed future ocean waves climate reproduced by global climate models used by IPCC, and revealed the types of waves and regional hotspots that are susceptible to global warming.

With warming, the power of waves in the polar regions and the Southern Ocean increases, and the frequency of waves propagating from the east on the coasts located in the western part of the ocean such as the Pacific Ocean, and the wave climate propagating from the south on the eastern coast.

In Japan, it was predicted that the frequency of wave climate types propagating from the west in high latitudes would increase. In addition to rising sea levels, this will further intensify the effects of warming in coastal areas and will be a factor in changing coastal environment.

The results of this research are expected to expand into future changes and adaptation measures for coastal vulnerability due to global warming, especially changes in beaches and marine ecosystems.

The results of this research were published online in the international academic journal "Nature Climate Change" on June 16, 2022.

This information was published at DPRI, Kyoto University website.

- 地球温暖化により変わる波浪—温暖化に伴う波浪変化リスクの高い沿岸域を解明—［京都大学］

- 地球温暖化により変わる波浪 —温暖化に伴う波浪変化リスクの高い沿岸域を解明—［京都大学・プレスリリース本文］

- Climate-fuelled wave patterns pose an erosion risk for developing countries [The Conversation; 本件の解説記事]

- https://www.dpri.kyoto-u.ac.jp/news_en/16584/

Prof. Nobuhito Mori

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Disaster Prevention Research Institute (DPRI)
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http://www.dpri.kyoto-u.ac.jp/en/

Volcanic Eruption Expected to Help Economy in Iceland

By Prof. James Mori

(Professor Emeritus, Disaster Prevention Research Institute (DPRI), Kyoto University, Japan

A short report on the volcanic eruption in Iceland by Prof. James Mori after his visit to the volcano site in Iceland on 12 August 2022.

The Icelandic volcano Fagradalsfjall in the Meradalir valley began a strong lava eruption on 3 August 2022. The volcano is located in an unpopulated area so it is not causing any local damage. Also, the levels of ash emissions are relatively low, so it is not disrupting airline traffic, as Eyjafjallajökull did in 2010. On the contrary, there is the hope that the eruption will be good for the Iceland economy by attracting many tourists. The volcano is located about 1 hour drive from the largest city of Reykjavik and because of the type of effusive eruption, people can walk quite close to the volcano relatively safely. This is providing a rare opportunity for people to have a close encounter with an erupting volcano.

The hike passes the large lava flow (dark gray rocks) from the 2021 eruption.

The activity in March to September 2021 was similar to the current eruption, but in a slightly different location. The volcano attracted several hundred thousand Icelandic and foreign observers. However, because of the travel restrictions due to the Covid pandemic, there were relatively few foreign visitors. This year with the improved health conditions, Iceland is hoping that the presently erupting volcano will attract more foreign tourists.

The volcano viewpoint is about a 2 hour hike from the parking lot.

This photo shows the first part of the trail which is easy to walk. The path is very good because it also leads to the site of the 2021 eruption last year. During that time, the condition of the trail was greatly improved.

The 2nd half of the hike to the 2022 eruption is more difficult with lots of rocks and no clear path. It is not recommended for small children or people not in good physical condition. However, to encourage visitors, they are currently working to improve the path and every day the portion of the trail that is in good condition is being extended.

Prof. Emeritus James Mori

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This is the current main vent which opened on 3 August 2022 as part of a 360 meter long fissure eruption. The eruption is presently no longer a fissure eruption, but concentrated from this one main vent and a spatter cone is being built up. The black rocks are new lava which flowed out during the past 9 days.

At the close distance where the people are sitting in the photo, you can feel the heat and hear the sounds of the lava fountaining. The temperature of the erupting lava is over 1000 ℃.

Since the eruptive style is mainly an effusive lava eruption with relatively low explosive activity, it seems fairly safe to observe at close distances of less than 1 km. Of course, volcanoes are always dangerous and a sudden large explosion or a sudden change in the location of the vent is possible.

The physical and volcanic conditions here are unique and enable people to approach close to an erupting volcano.

This is another photo of the current lava fountaining.

The eruption last year in 2021 lasted for 6 months from March to September. The Iceland tourist industry is hoping that the 2022 eruption will also last for a similar or longer duration and attract many foreign visitors.

Video of the erupting lava taken on 12 August 2022.

https://youtu.be/IWPjhpn63uM

Institute of Disaster Area Revitalization, Regrowth and Governance, Kwansei Gakuin University, Japan

https://www.kwansei.ac.jp/fukkou/about/index_en.html

Institute organizes various study groups for discussing the following issues. Each group cooperates with academics, government officers, and NGO/NPO workers for cross sectoral learning.

Project activities;

During 2022, the institute continued to implement following research activities.

- International comparative study on disaster recovery and revitalization policies.

- International study group on sustainable regional revitalization since 2020. Recovery from catastrophic disasters need a long-term, sustained community effort. It is important to pass on the experience of past major disasters as systematic wisdom and knowledge, and to conduct policy research to prepare for future major disasters. The group brought together researchers, practitioners, and administrators from Japan and abroad for exchanging knowledge.

- Study group on revitalization and housing support.

In Japan, The Nankai Trough earthquake is expected to occur in the near future. The study group conducted a questionnaire survey of the residents of Kushimoto, Wakayama Prefecture on pre-reconstruction measures.

Events;

- An annual network meeting and forum

The institute organized an annual network meeting of disaster-affected areas in Japan from January 8-9, 2022. The theme was: There are various types of "recovery and revitalization knowledge" which emerge after a disaster. They serve as a useful policy and help us to design a new social system for supporting the affected people who are struggling in this disaster-prone country. These valuable pieces of knowledge, however, tend to be shared only within the affected area, and often fails to transfer to other areas. We organize a network meeting once a year to mutually share these lessons from various disaster affected areas in Japan.

- International symposium and joint study group on the theme of "Thinking about new collaboration in East Asia" is held every year. On February 18, 2021, a study group was held jointly with Hope Bridge Korea Disaster Relief Association and 4·16 foundation in Korea, entitled " Sharing 'Reconstruction knowledge about 4.16 Ferry Sewol Tragedy."

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Institute of Disaster Mitigation for Urban Cultural Heritage (R-DMUCH), Ritsumeikan University Japan

http://www.r-dmuch.jp/en/
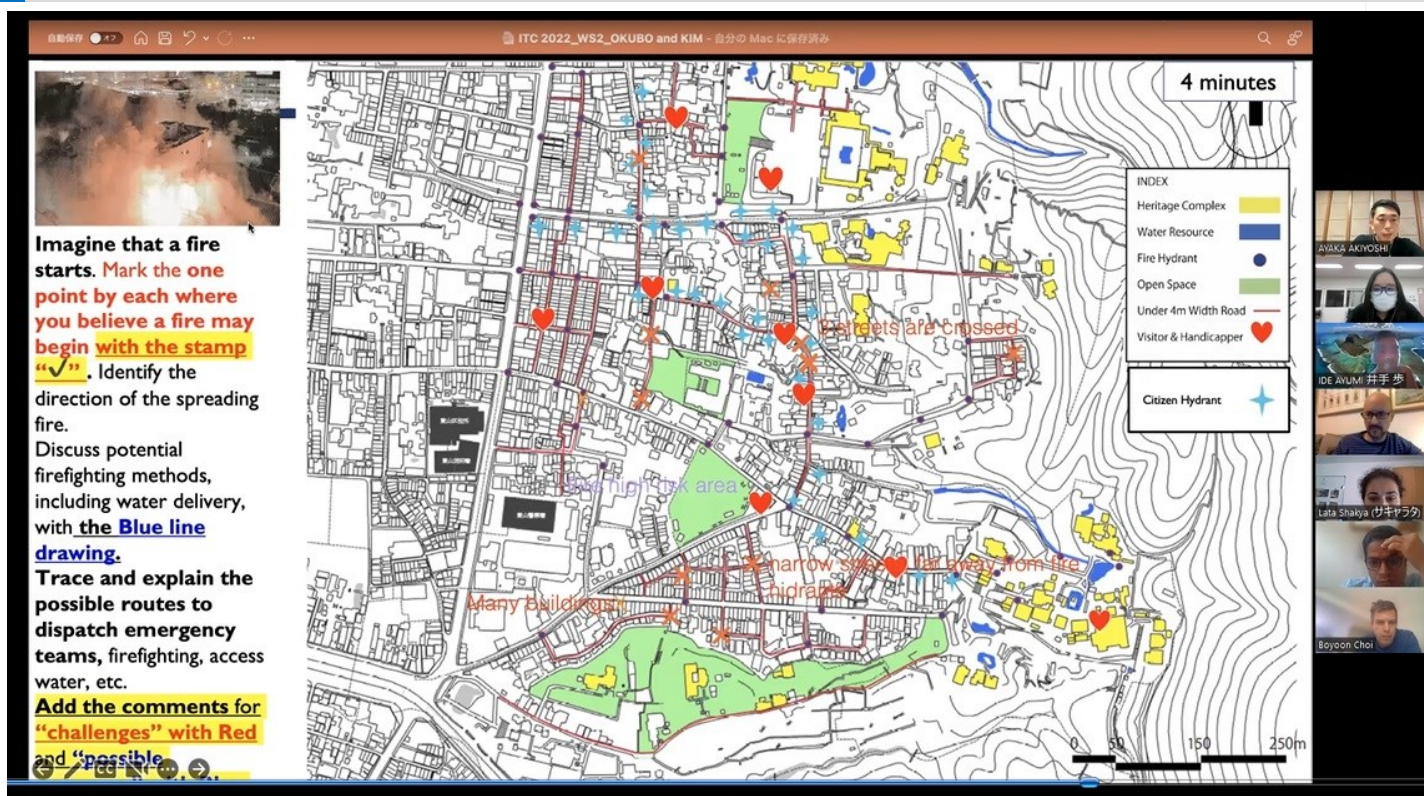
Pic1 Workshop on Disaster imagination game

The Institute of Disaster Mitigation for Urban Cultural Heritage at Ritsumeikan University (R-DMUCH) has been acting as a focal point for organizing international research, training and information network in the field of cultural heritage risk management and disaster mitigation. The UNESCO Chair Programme on Cultural Heritage and Risk Management – 16th INTERNATIONAL TRAINING COURSE (ITC) on DISASTER RISK MANAGEMENT of CULTURAL HERITAGE 2022 was successfully held for eight weeks from 18th August to 13th October 2022. This year's course had fifteen participants and six associated observers. These participants and observers were from Australia, Canada, Chile, Croatia, Cuba, Egypt, Ethiopia, Guatemala, India, Iran, Italy, Lebanon, Nepal, New Zealand, Portugal, Puerto Rico, Republic of Mauritius, Romania, Taiwan ROC, Turkey, United Kingdom and United States of America. They were selected through a competitive selection process which had 63 applicants from various regions of the world.

This year's participants had diverse backgrounds, including cultural heritage managers, disaster risk management experts, decision-makers, and government officials involved in cultural heritage conservation and disaster management.

There were lectures from faculty members of Ritsumeikan University and members of ICCROM .

Prof. Kazumasa Hanaoka
Director
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Also, experts from institutions such as the Agency for Cultural Affair, Kyoto City Fire Department, Kyoto National Museum , Cultural Heritage disaster Risk Management Center, ICHCAP, UNDRR, Loughborough University, Edge Hill University, Potsdam University, University of Exeter, Sapienza University of Rome, Miyagi University, Kathmandu Valley Preservation Trust, Cultural Heritage without Borders, Natural Disasters Research Institute, INAH, the National Library of Latvia, INTACH Kashmir Chapter and Croatian Conservation Institute gave lectures, conducted workshops, and provided critical knowledge and guidance. During the course, the trainees gained a deepened understanding of various aspects of disaster risk management of cultural heritage. This year featured examples of best practices and innovative initiatives in Japan as well as particular issues and lessons learned from the field of cultural heritage conservation and disaster risk management in other nations.

This year the theme of ITC was: Traditional knowledge for disaster risk management of cultural heritage. The examples included in the course span the government level, community-based disaster mitigation efforts by neighborhood associations, and disaster response to recovery and reconstruction planning. In addition, to focus on traditional knowledge for Disaster risk management, the case studies from various countries were introduced such as Kozagawa Town, Fukuchiyama of Japan, Patan of Nepal and Assam of India. The course included a separate panel discussion on the topic with a number of international experts to understand various perspectives and to develop a comprehensive understanding of traditional knowledge for disaster risk management.

It was challenging for us to conduct online course this year too. This year, we have created two original videos of Japanese townhouses from Kozagawa Town and Fukuchiyama which show traditional dwelling culture to prevent/mitigate water flood disaster.

The live sessions for ITC were held twice a week for two hours each. We set a theme for each week, with lectures and discussions on the first day, and related workshops on the second day of every week. Pre-recorded lectures were provided before the live sessions. Additionally, we conducted mentoring/ feedback sessions where participants could have time to discuss what they had learned that week with core lecturers and develop their individual case study projects. Through these sessions, participants were able to advance their pilot projects. The final outcomes of the participant's work will be published in proceedings at the end of this fiscal year.

The online training course is organized by the Institute of Disaster Mitigation for Urban Cultural Heritage, Ritsumeikan University in collaboration with ICCROM, contributed by UNESCO, ICOM & ICOMOS/ICORP, and relevant institutions of the government of Japan. We will continue these outreach activities and dissemination of our research outcomes to the international society.
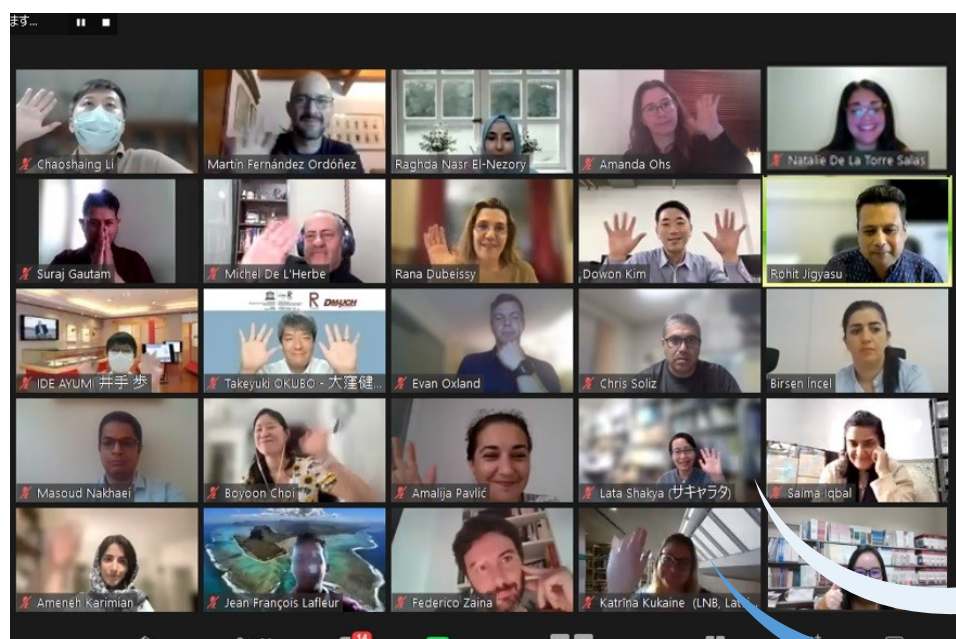
Pic2 Participants and some of the resource persons of the training

International Research Institute of Disaster Science (IRIDeS), Tohoku University, Japan

http://www.r-dmuch.jp/en/

Disaster Digital Twin for National Resilience

Establishing Co-creation Center for Disaster Resilience

In April 2022, the International Research Institute of Disaster Science, Tohoku University founded the "Co-creation Center for Disaster Resilience" which aims to co-create disaster resilience, the ability of societies and social systems to respond promptly and effectively to natural disasters and exploiting lessons in the future disaster management.

Consisting of four research areas; "Quantifying disaster resilience," "Human resilience," "Curation of disaster information," and "Practice of co-creation," we will conduct collaborative research on identifying disaster processes as both natural and social phenomena and seeking ways to enhance our resilience with the "emergence of collective intelligence" thorough our flag-ship project of "Disaster Digital Twin for National Resilience".

Disaster Digital Twin for National Resilience

"Disaster Digital twin (DDT)" is the fusion of data-interpretation-inference, to capture the real physical world from various sensors and simulations, creating a copy (or twin) in the virtual world (on a computer), running simulations with the copied data to find out optimal solutions for enhancing disaster resilience, and provide the insights into the physical world's policy or decision. AI (Artificial Intelligence) is one of the key elements of DDT but the goal is a deployment of a mixed-initiative of human and machine (computer) systems as the emergence of collective intelligence. We believe that it emerged from the convergence of disaster science research from multiple disciplines with a deep understanding of physical and social systems.
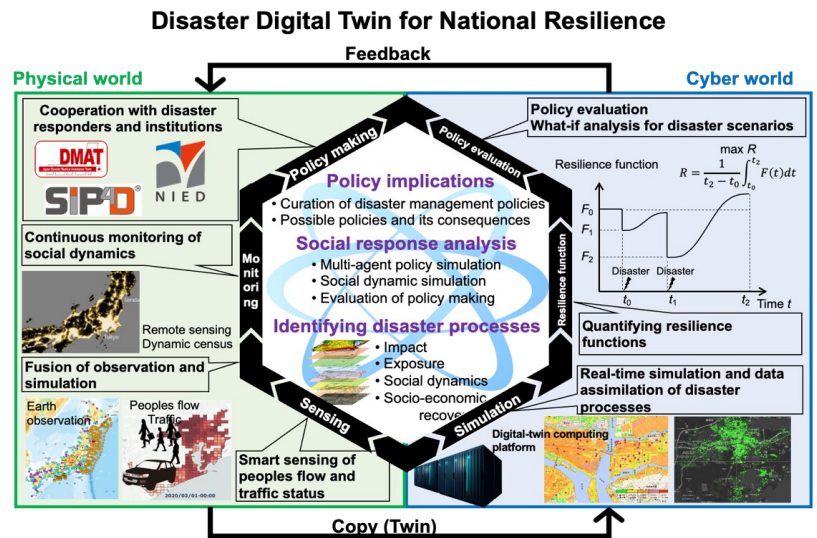
Prof. Shunichi Koshimura
E-mail: koshimura@irides.tohoku.ac.jp

Earthquake Research Institute (ERI)
The University of Tokyo, Japan

http://www.eri.u-tokyo.ac.jp/en/
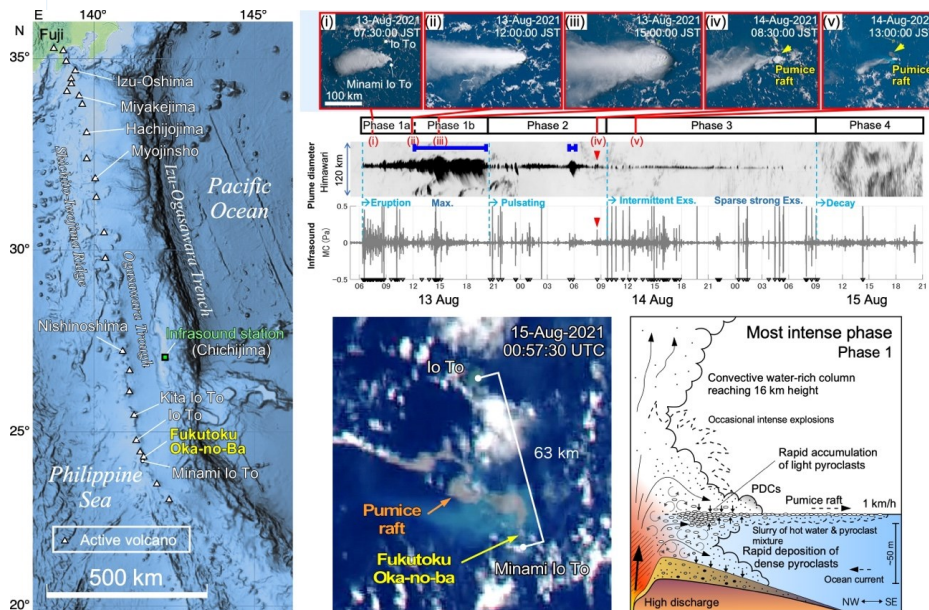
The mission of Earthquake Research Institute, the University of Tokyo, since its beginning in 1925, is to promote scientific research on earthquakes and volcanic eruptions and to develop methods for mitigating related disasters. To achieve this goal, about 80 faculty members with other staff of ERI conduct wide variety of research such as studies on the basis of geophysical observations in Japan and abroad, structure and dynamics of the Earth's interior which drive earthquakes and volcanic eruptions, multidisciplinary research of science and literature on historical earthquakes with Historiographical Institute, real-time delivery and analysis of large amount of seismic data using Science Information Network, earthquake hazard assessment by merging big data and high performance computation.

Regarding the international collaboration, ERI has signed agreements with about 20 foreign organizations, and conducts or participates collaborative research projects such as International Muography Cooperative Research Organization, Next generation Neutrino Science Organization, international marine geophysical observation networks such as Pacific Array. ERI invites foreign researchers as visiting faculty or researcher, educates graduate or internship students from countries outside Japan, and organizes international summer schools for both undergraduate and graduate students. In normal year before COVID-19 pandemic, more than 100 international researchers and students studied in ERI.

Research achievements of ERI in 2022 include the elucidation of the eruptive process of the shallow-sea explosive eruption that occurred at Fukutoku-Oka-no-Ba volcano in the Ogasawara Islands in August 2021. This eruption caused damage to coastal infrastructures in and around the Japanese archipelago for more than a year by pumice rafts. We investigated the surface phenomena, the eruption style transition, and their impact by remote observation, including satellite and infrasound monitoring, modeling, and geochemical analysis. The results showed that the heat and mass transport during eruptions in the shallow sea was strongly influenced by the atmosphere-ocean boundary and that the parameters determining plume height and material transport significantly differ from those of terrestrial eruptions. This research highlights the importance of external water on eruption dynamics and contributes to a better understanding of explosive volcanism in the ocean.

Article on this research: Seawater-magma interactions sustained the high column during the 2021 phreatomagmatic eruption of Fukutoku-Oka-no-Ba; https://www.nature.com/articles/s43247-022-00594-4

Prof. Kenji Satake
Director
E-mail: director@eri.u-tokyo.ac.jp

Oceania
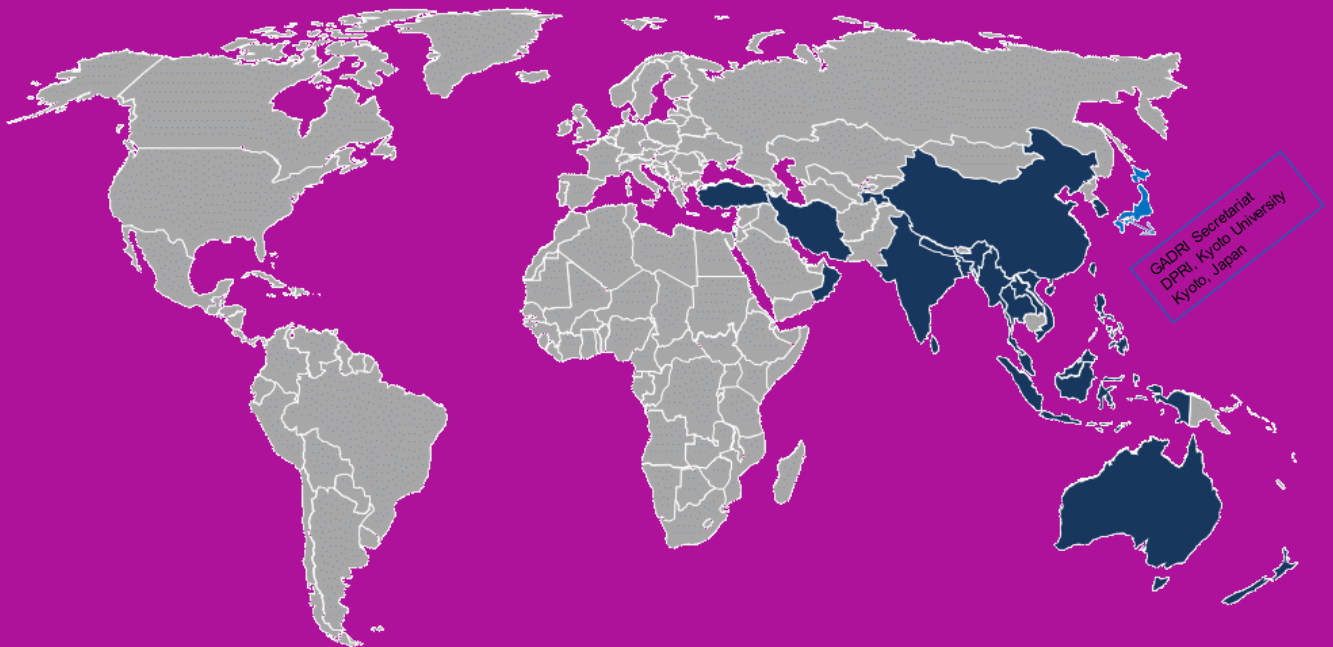
Oceania
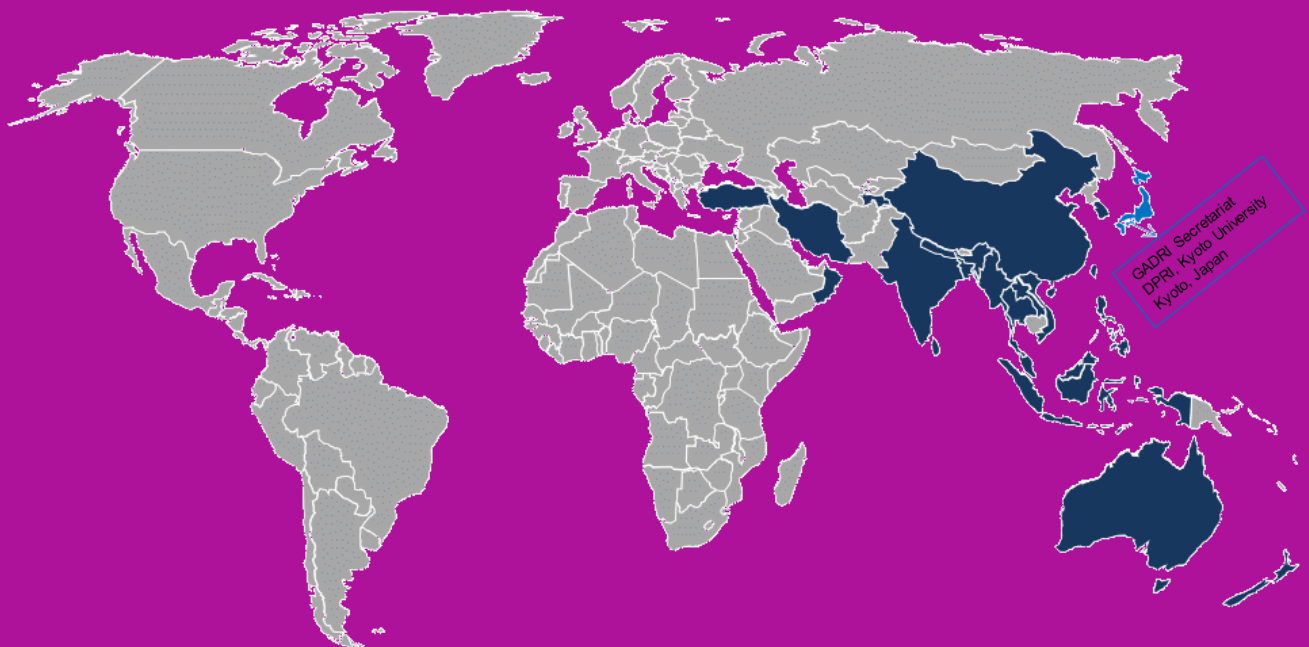
Australia	Fenner School of Environment & Society, Australian National University (ANU)
Australia	College of Health & Human Sciences, Charles Darwin University
Australia	Humanitarian, Emergency and Disaster Management, College of Indigenous Futures, Arts and Society, Charles Darwin University
Australia	Centre for Disaster Studies, College of Science and Engineering, James Cook University
Australia	Centre for Infrastructure Performance and Reliability, School of Engineering, The University of Newcastle
Australia	Sustainability Research Centre, University of Sunshine Coast
Australia	Science and Engineering Faculty, Queensland University of Technology
Australia	Humanitarian & Development Research Initiative (HADRI), School of Social Sciences and Psychology, Western Sydney University
Australia	School pf Earth and Environmental Sciences (SMAH), University of Wollongong
New Zealand	GNS Science

Centre for Disaster Studies (CDS)
James Cook University, Australia
https://www.jcu.edu.au/centre-for-disaster-studies

In 2022 the Centre for Disaster Studies has been involved in a number of diverse research projects and initiatives based on local risk awareness, preparedness, knowledge, inclusive practice and community behavior. Following extensive flooding, bushfires and other natural hazards in Australia over the year the research emphasis remains on developing a greater understanding of community for improved proactive planning and resilience. With travel and conference opportunities limited by COVID, extensive engagement with local stakeholders, government, media and emergency management agencies continues to enable the translation of research into practice.

Delivery of bushfire preparedness report to Queensland Rural Fire Services

Dr. Yetta Gurtner
Coordinator
E-mail: yetta.gurtner@jcu.edu.au

Publications

- Gurtner, Y. (2022) Townsville Bushfire Preparedness Case Study: Understanding local peri-urban communities. *Centre for Disaster Studies*, James Cook University.

- King David (2022) Hearing Minority Voices: Institutional Discrimination Towards LGBTQ in Disaster and Recovery. *Journal of Extreme Events*, Vol. 8, No. 4

- King, J., Gurtner, Y., Devine, S., Leggat, P., Swinbourne, A &Franklin, R (2022) Enhancing Awareness and Use of Personal Protective Equipment in Community Disaster Recovery [Conference Presentation]. *Safety 2022* 27-30 November Adelaide.

- MacLean, V. & Gurtner, Y. (2022) "Tornadoes in Australia: are we prepared." *Australian Journal of Emergency Management* Vol 37 (3) pp. 25-28

- Schwartz, S.C. (2022). Preventive Search and Rescue: Learning from the experts. [Conference Presentation]. *Disaster and Emergency Management Conference*. RACV, Gold Coast, Australia

PhD student and local State Emergency Service group leader puts search and rescue theory into practice

GNS Science
New Zealand

https://www.gns.cri.nz/

GNS Science is a New Zealand Government-owned research organisation that unlocks environmental, social, cultural, and economic benefits through its works across four science themes. They are - Natural Hazards and Risks; Environment and Climate, Energy Futures; and Land and Marine Geoscience. GNS Science employs 450 staff at five sites in New Zealand and we can draw on a heritage of 150 years of excellence in Earth sciences.

With New Zealand sitting astride an active plate boundary, GNS Science has a national leadership role for monitoring and research on the causes, risks, and impacts of geological hazards.

We have extensive scientific knowledge in Earth processes, and globally and nationally recognised expertise in hazard and risk modelling, forecasting socio-economic impacts of events, and system modelling of consequences and resilience options. We apply our social science capability to increase community resilience, improve risk communication and develop tools for hazard preparedness.

Natural hazards and their consequences are part of the 'DNA' of New Zealand. Increasingly the risks imposed by earthquakes, volcanoes, tsunami and landslides are compounded by weather events and the additional stresses of climate change. At the same time, the impacts of hazard events are intensifying through population growth, urbanisation, and business vulnerabilities of fast-moving consumer goods and just-in-time supply chains. Risk is increasing and New Zealand's ability to manage future impacts from natural hazards is

being tested.

Through its GeoNet project, GNS Science operates a national network of instruments to monitor earthquakes, tsunami, volcanoes, and landslides. This world-class operation is paired with our National Geohazards Monitoring Centre, which provides 24/7 active monitoring of New Zealand's geological hazards.

Our research aims to generate critical scientific knowledge for the benefit of New Zealand and drive its uptake and use to improve resilience to natural hazards at national, regional, business, community and individual levels. Our five outcome-oriented programmes span the full value chain of information, from underpinning knowledge to better understanding New Zealand's natural hazards, through to risk management options to help communities mitigate their destructive effects and advise on policy and regulation.

We are currently revising and updating our National Seismic Hazard Model which assesses the likelihood and strength of earthquake shaking occurring in various parts of New Zealand over given time spans. We are also part of a cross-government initiative that is deploying 12 DART buoys to the north and east of New Zealand. They are significantly boosting New Zealand's end-to-end arrangements for monitoring and detecting tsunamis and issuing warnings about them.

Dr. Gill Jolly
Director
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We are also developing the capability to forecast the likely location and size of earthquake and rainfall-induced landslides to provide rapid information for responding agencies and infrastructure operators.

For volcanoes, we are working with our university partners to assess a technique that uses computer analysis of volcanic earthquakes to assess the risk of an eruption. The technique could potentially be a useful addition to our volcano monitoring toolbox.

The technique is not accurate enough yet to give a firm prediction of an eruption happening at a particular time, nor do it indicate the size or potential impact. But it remains under active evaluation
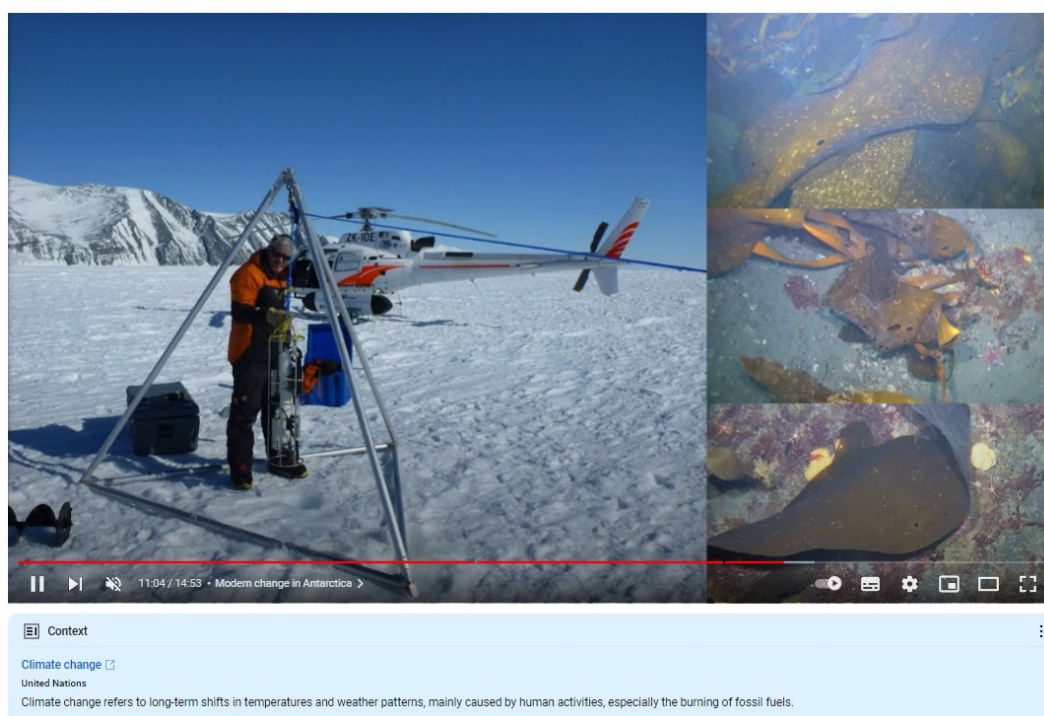
Screen shot from Dr. Gary Wilson's YouTube talk on the—The Ice cube at the bottom of the planter—TEDxScotBase—https://www.youtube.com/watch?v=rnKB7TNcmGI

Europe
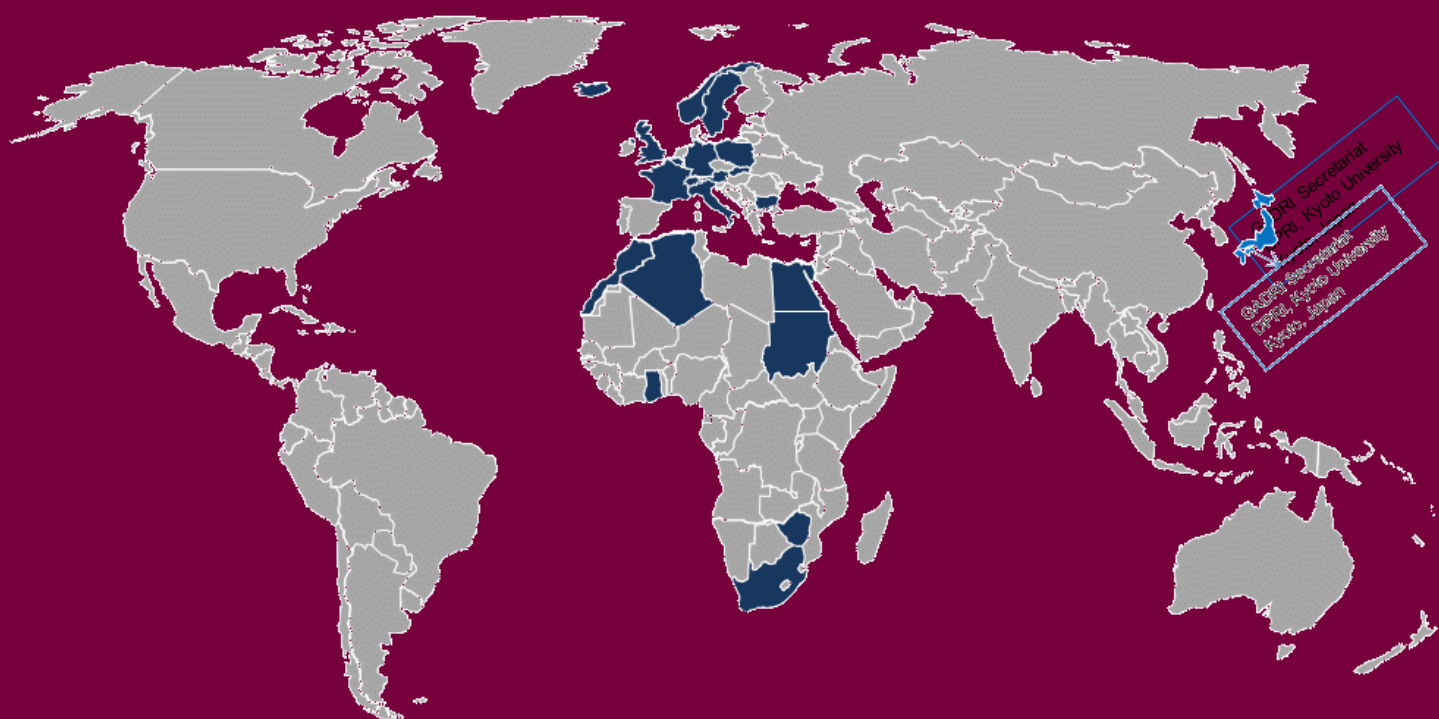
Austria	Center for Digital Safety and Security, Austrian Institute of Technology (AIT)
Austria	Disaster Competence Network Austria (DCNA)
Austria	International Institute for Applied Systems Analysis, (IIASA)
Belgium	One Health Platform
Bulgaria	Department of Information Technologies and Communications, University of National and World Economy (UNWE)
France	BRGM (Bureau de Recherches Geologiques et Minieres)
France	Council of Europe
France	Institut Des Sciences de la Terre (ISTerre), Grenoble University
Germany	Center for Disaster Management and Risk Reduction Technology (CEDIM)
Germany	Disaster Research Unit, Department of Social and Political Sciences, Freie University Berlin
Germany	Institute for Advanced Sustainability Studies (IASS)
Germany	United Nations University, Institute for Environment and Human Security (UNU-EHS)
Iceland	Earthquake Engineering Research Centre, University of Iceland
Italy	European Commission, Joint Research Centre (JRC)
Italy	Department of Earth Sciences, University of Florence (Universita degli Studi di Firenze)
Italy	GEM Foundation
Poland	The Main School of Fire (SGSP)
Slovakia	Faculty of Security Engineering, University of Zilina
Sweden	Stockholm Environment Institute (SEI)
Sweden	Risk and Crisis Research Centre (RCRC), Mid Sweden University
Switzerland	Global Risk Forum GRF Davos
Switzerland	Faculty of Geosciences and the Environment, University of Lausanne
UK	Bournemouth University Disaster Management Centre (BUDMC)
UK	British Geological Survey
UK	Cabot Institute, University of Bristol
UK	Evidence Aid
UK	School of Business, Dept. Management, Innovation and Technology Division, University of Leicester
UK	Institute for Risk and Disaster Reduction (IRDR), University College of London
UK	Loughborough Water Engineering Group (LWEG), School of Architecture, Building and Civil Engineering, Loughborough University
UK	Global Disaster Resilience Centre, School of Art Design and Architecture, University of Huddersfield
UK	Disaster and Development Network (DDN), Department of Geography, Northumbria University
UK	Overseas Development Institute (ODI)
UK	...ic Health, Global Disaster Risk Reduction (GDRR), UK Health Security Agency (formerly Public Health England (PHE))
UK	Centre for Disaster Resilience, University of Salford
UK	Swansea University

Austrian Institute of Technology (AIT)
Austria
https://dcna.at/index.php/en/home.html

Throughout 2022 AIT conducted and started several research projects in the field of disaster risk management.

STAMINA (European Project)

Information exchange in the public safety domain has been a research focus of AIT over the last couple of years. To support pandemic management, Stamina aims to provide a more resilient and effective information exchange between stakeholders in pandemic management, including different types of data from heterogeneous sensors such as drone mounted, wearable sensors to obtain a comprehensive, timely and accurate overview on the situation at hand

AITs own Emergency-Map-Tool (EMT) was enhanced and deployed as a Common Operational Picture (COP) tool across stakeholders in pandemic management, both on national and international level. Varying applications by different end users in several countries encompassing Austria, Slovenia, Romania, the Netherlands and Spain demonstrated that the EMT is capable to fulfil the requirement for a flexible COP tool allowing the provision of a multitude of information.

The focus of the EMT is set on the provision of information on the geo-referenced availability of resources such as ambulances or hospital beds. This information can be enriched by additional data such as prediction on the future availability of resources in varying pandemic settings.

Link: https://stamina-project.eu/

INEGMA-E² (European Project)

Evaluation plays a crucial role in civil protection exercises. It is used to document good practices and shortcomings which ensure training exercises reflect the changing needs and priorities of the civil protection community. Evaluation discovers and promotes what response units in the EU and beyond are capable of, when it comes to managing disasters.

INEGMA-E2 builds a standardised approach to independent evaluation and aims to reach a new level of evaluation that meets the high standards for documenting, replicating, and establishing goals. The projects focuses on:

- developing a strong and versatile evaluation methodology to address the range of exercises

- exploring the existing tools used for data collection throughout the exercises

- creating an international pool of evaluators which can be accessed by all relevant institutions.

Connecting the methodology, tools and network will contribute to setting new standards for exercise evaluation and ensuring a pool of competent evaluation experts. INEGMA-E2 will connect specialists in exercise evaluation through the Union Civil Protection Knowledge Network.

AIT contributes by identifying user requirements of exercise evaluation staff and developing an online platform to match planned EU civil protection exercises with competent evaluators.

Link: https://civil-protection-knowledge-network.europa.eu/projects/inegma-e2

Mr. Bernhard Bürger
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MEASURE (National Project)

Exercises not only play a key role in educating and training first responders, they also provide a great opportunity to check their effectiveness.

Usually, evaluators monitor exercise participants and record their impressions on checklists and questionnaires. Despite the high expenditure of resources in the evaluation, results are hardly comparable and biased by default, as the evaluators can only record their subjective impressions.

With MEASURE (Monitoring Exercises using AI-Support for Reliable Evaluation), AIT coordinates a national project, that sets the goal to develop an intelligent, technical support tool for easier planning, implementation and evaluation of exercise scenarios for emergency services. This tool enables faster, more objective evaluation and more individualized feedback with higher validity.

With an integrated development of sensors, data modelling mechanisms and artificial intelligence, it provides technical support for the observation during the exercise as well as subsequent evaluation afterwards. In this manner the tool facilitates sustainable objective comparison and thus, at best, enables emergency services to improve. The interaction of the individual project partner organizations ensures user-oriented technology development and insight into application processes for science and technology.

Link: https://www.linkedin.com/showcase/measure-monitoring-exercises-using-ai-support-for-reliable-evaluation/

AI4Trees (National Project)

With AI4Trees AIT contributes towards disaster risk reduction.

By monitoring tree growth, health status and carbon sequestration are analysed and conclusions about the effects of changing climatic circumstances are drawn.

The project aims at a unique modelling approach for tree growth. Machine learning is enabled by the availability of detailed long-time datasets on ecological and climatic parameters through an extensive forest monitoring network in Austria respectively all over Europe. Within the network, growth data is available on different time scales allowing studying different aspects of growth dynamics: physiological tree processes and interactions between growth and climate variables can be analysed using hourly single tree growth data; stand characteristics gathered every couple of years on the other hand provide information on long-term tree development and carbon sequestration.

Another important part of the project is the integration of airborne and terrestrial laser scanning in order to obtain detailed information on the studied tree stands. Combined with satellite derived parameters a model will be developed that can map both high- and low-frequency sampled features for growth modelling. Furthermore, using AI with an explainable error analysis module, growth parameters can be identified, aiding researchers in developing and planning monitoring setups for different research questions.

Link: https://ai4trees-project.at/

Disaster Competence Network Austria (DCNA)
Austria
www.dcna.at

Science and research play an essential role in disaster prevention and building resilient systems. The transfer of scientific knowledge into practice, as well as continuous collaboration with experts from civil protection authorities, response organizations and industry are crucial to address all stages of disaster risk management and preventing hazards from turning into disasters.

The Disaster Competence Network Austria (DCNA) looks back on a highly successful year in pushing this exchange between experts of different areas. We've contributed to more than 20 national and international research projects that include research on disaster robotics (RoboMOLE, RoboNav, UAV Rescue, KI-SecAssist, EASIER), cross-border risk assessment (BORIS), civil protection exercise evaluation (INEGMA-E²), forest fires (TREEADS), and many more.

We've also launched our podcast called "Wissenschaft im Einsatz" [Science on Mission] that highlights the work of expert's various areas of disaster risk management (e.g. natural hazards, critical infrastructure and CBRNE) and transfers their knowledge into easy-to-understand bits of information. For the moment, the podcast is only available in German.

One highlight of the past year was our conference on disaster research and disaster management: From October 13th to 14th, 170 researchers, practitioners, and policy makers met at the University of Innsbruck to focus on this vital discourse at the Disaster Research Days 2022. In these two days, participants were invited to present and discuss state of the art knowledge, exchange ideas, and jointly advance all aspects of disaster risk management.

Dr. Christian Resch

Managing Director

E-mail: office@dcna.at

This yearly event, organized by the Disaster Competence Network Austria, has become a beacon of disaster research and aims at transferring knowledge and technology from science to practice and vice versa. This transfer was also one of the first prominently debated topics in the opening panel discussion that brought together representatives from the Austrian Federal Ministry of Education, Science and Research, the Tyrolean Government, the Austrian Red Cross and the Austrian Fire Fighting Association.

All in all, more than 50 contributions were presented in seven thematic sessions as well as an elevator pitch session. These sessions included the latest research results on natural hazards such as flood, rockfall, avalanche, and earthquake risk, but also the protection of critical infrastructure, and the use of new technologies in civil protection. Moreover, the event discussed state of the art science on transboundary risk and infectious diseases as well as risk and crisis communication. A very current topic was discussed vividly: scientific skepticism, as it draws parallels to challenges faced in disaster risk management.

The consensus of the event: continued cooperation between science, research and disaster management professionals, increased activities in education and training to support innovation in civil protection and targeted communication channels to facilitate bridging science, research and practice.

Christian Resch on DRD22: "The event once again made it evident, that is indispensable to have translation channels, such as the Disaster Research Days, in which state of the art knowledge can be discussed at the same level of understanding. And on the other hand, how crucial it is, that civil protection organizations continue to expand their innovation literacy, which only is possible through continued cooperation with science and research."

In 2023, Disaster Competence Network Austria will continue its efforts, conducting the Disaster Research Days from 12th-13th of October 2023, as international event, focusing on cross-border aspects in civil protection and initiating a national conference "Fachtagung Katastrophenforschung" from 11th-12th of September 2023, in Leoben, Austria to strengthen the translation from science to practice and to celebrate five years as national knowledge network.

Links and references

- Projects: https://dcna.at/index.php/en/running-projects.html

- Podcast: https://dcna.at/index.php/en/podcast.html

- Disaster Research Days: https://dcna.at/index.php/en/disaster-research-days-2022.html

Science Research Center for Disaster Risk Reduction (SRCDRR), University of National and World Economy (UNWE), Bulgaria

http://www.unwe.bg/en/

The **SCRDRR** continues the work on two R&D Projects in 2022:

1. **SMART RISK MANAGEMENT FOR BUSINESS FROM ADVERSE EVENTS AND NATURAL DISASTERS**, (2021-2024), funded by the National Science Fund of Bulgaria

The project develops an innovative methodology for integrated risk assessment, which includes new and modified classical and smart methods and models. Each method and model is adapted to the specifics of the specific business at the level of economic sector and individual company, taking into account the specific impacts of potential adverse events and natural disasters in the specific region.

The main result of the project will be the developed general framework for smart risk management of adverse events and natural disasters based on an innovative methodology for integrated risk assessment. Smart risk management takes into account the following important factors: the interaction between various adverse events and natural disasters, as well as their mutual impact on business; the negative consequences on the business, both in terms of material damages and intangible losses, and the lost revenues and benefits; the vulnerability, resilience and adaptability of the specific business to the disturbances caused by the observed natural hazards.

2. **DEVELOPMENT AND USE OF ARTIFICIAL INTELLIGENCE IN EDUCATION AND THE ECONOMY** (2021-2024) funded by the University of National and World Economy

The project has an extensive research and application area with a special focus is on the application of the Artificial Intelligence in disaster risk reduction, in combination with complementary technologies, such as 5G and XR.

The **SRCDRR** organized the virtual *12th INTERNATIONAL CONFERENCE ON APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGY AND STATISTICS IN ECONOMY AND EDUCATION*

(ICAICTSEE-2022), December 2 – 3rd, 2022, UNWE, http://icaictsee.unwe.bg/. The conference was coorganized together with 20 international universities and it is officially registered as an International Federation for Information Processing (IFIP, https://ifip.org/) event. The conference covered topics, such as Biomedicine, Big Data, IoT, Cloud Computing, Mobile Computing, BI, AI, XR, etc. More than 60 papers were presented.

The SRCDRR, as a member, took part in the Annual meeting of CONRIS.eu (Cooperation Network for Risk, Safety & Security Studies), held in the Avans University of Applied Sciences, 's-Hertogenbosch, the Netherlands, July 1 – 2, 2022. Main topics were different aspects of risk and security developments in practice and their application, as well as expanding the network activity and attracting new partners.

The SRCDRR director, prof. Velev, took part in the launching event of the Resilience Platform - RESILab^{ex} - Enhancing the Resilience to Disasters for Sustainable Development - a project co-financed under Venezia Guilia Regional funds (L.R.18/2011) - CEI-FVG operative programme 756/2021. The SRCDRR has become a member of the RESILab^{ex}. The event took place at the International Centre for Mechanical Sciences (CISM) at the University of Udine, Italy, October 24 - 25, 2022.

Prof. Dimiter Velev

Director

E-mail: dgvelev@unwe.bg

The Director of **SRCDRR**, Prof. Dr. Dimiter Velev, took part as a keynote speaker in 6 international conferences and events during 2022, mostly of them conducted online due to the still ongoing COVID-19 pandemic. The topics covered different aspects of the application of advanced ICT in disaster risk management.
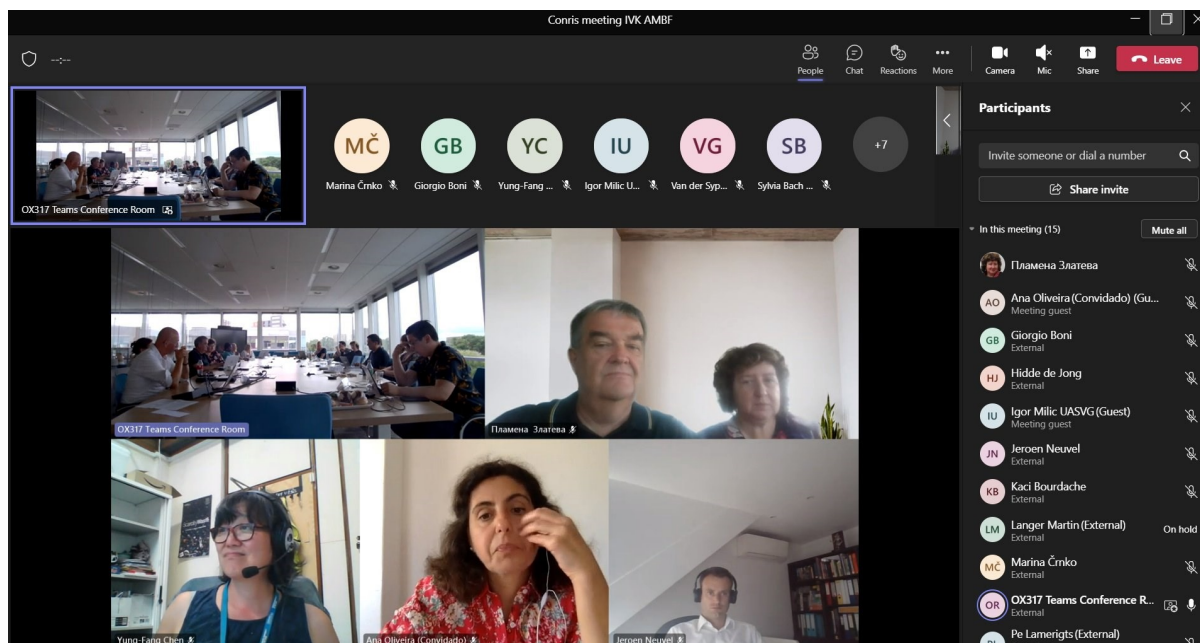
SCRDRR in the annual meeting of CONRIS.eu
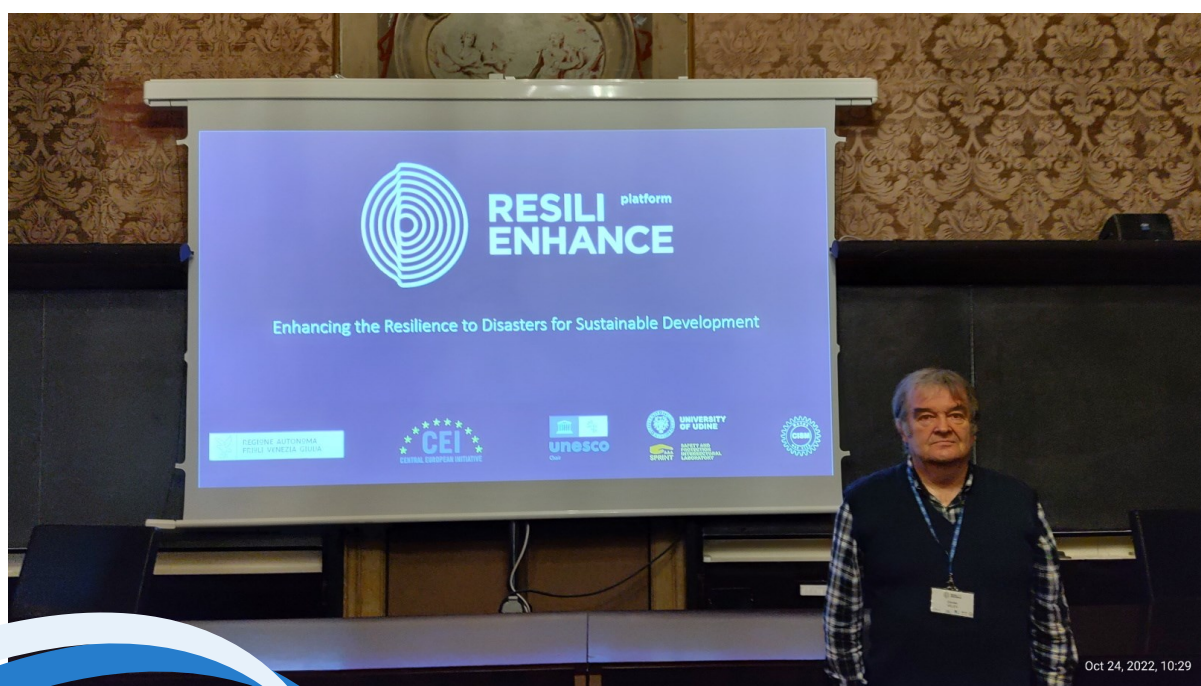
The launching event of the Resilience Platform - RESILab[ex]

Center for Disaster Management and Risk Reduction Technology (CEDIM)
Germany
http://www.cedim.de/english

The Center for Disaster Management and Risk Reduction Technology (CEDIM) is an interdisciplinary research center in the fields of disaster and resilience research that celebrated its 20th anniversary in 2021.

As part of its **near-real time Forensic Disaster Analysis (FDA)**, CEDIM investigates the dynamics and interrelations of disasters, identifies major risk drivers, estimates the impact (damage, fatalities, displaced), and infers implications for disaster mitigation. In 2022, CEDIM produced several reports on hazards and disasters around the world. A major topic was a comprehensive and interdisciplinary follow-up study of the severe July 2021 flooding in central Europe, one of the major disasters in Europe in the last half century (Mohr et al., 2023; Ludwig et al., 2022). Within the framework of a multi-disciplinary assessment, the complex interactions of different process were investigated, ranging from meteorological peculiarities to hydrological conditions and hydro-morphological processes and feedbacks to inundated areas (see Figure) to the impacts on assets, infrastructure, and environment. In addition, we investigated how FDA analysis may help in the early response stage of disaster management. Based on long-term rainfall and runoff data, the event was put in the historical context; using high-resolution model simulations, we estimated how climate change aggravated the dimensions of the flooding and thus the impact.

CEDIM's current research focus program, which provides funding for PhD students, is on "Impacts of heat waves and droughts in Central Europe on society, economy, and ecology" and currently addressing the following topics:

- Capturing the effects of drought and heat waves on forests in Central Europe;

- Perception of hot spells in public spaces: Discrepancy of measurement and subjective perception in a societal context;

- Impact of recent and future drought events on river discharge and fluvial transport sector for the Rhine River in Germany;

- Potential and feasibility study on the extension of the use of reservoirs in the federal State of Baden-Württemberg (SW Germany) for real-time management of heat, drought and flood.

The new real-world lab ERNIE (Real-time decisions in the presence of risky ignorance in the impact prediction of extreme events) including a tandem of two professorships is currently being established at KIT in close collaboration with CEDIM. ERNIE focuses on forecasts and analyses of the impact of short-term extreme events as well as long-term climate changes and their interactions with society, economy, and the environment in urban areas. The way society deals with risks and uncertainties is of particular importance here.

As part of the BMBF CLIENT II project DAMAST (Dams and Induced Seismicity Technologies for Risk Reduction), CEDIM has developed a new concept for an AI-based early warning system that provides the dam or hydropower plant operator with short- and medium-term risk forecasts in the context of extreme precipitation events, thus enabling appropriate measures to be taken in good time to maintain safe operations (CEDIM - About CEDIM - News archive - since 2017 (kit.edu).

Prof. Dr. Michael Kunz
CEDIM Spokesperson
E-mail: info@cedim.de

After more than 2 years of COVID-19 data collection, analyzes, and illustrations, CEDIM / Risklayer decided to terminated their Corona Dashboard in March 2022. The highly granulated data were used by various media, agencies, and politicians for their decisions (CEDIM - About CEDIM - News archive - since 2017 (kit.edu)).

From May 30 to June 2, 2022, CEDIM together with the KIT spin-off Risklayer were invited by KIT to present their work on disaster research at the Hannover Messe, one of the largest industrial fairs worldwide (CEDIM - About CEDIM - News archive - since 2017 (kit.edu)). KIT's startup Risklayer models and analyzes these risks and identifies the solutions to reduce them.

In October 2022, CEDIM celebrated its 20th anniversary with a scientific lecture event.

The CEDIM news page can be found here: CEDIM - About CEDIM - News archive - since 2017 (kit.edu); the updated CEDIM flyer is here: Flyer_CEDIM_2022_english_web.pdf (kit.edu)

References:

- *Mohr, S., Ehret, U., Kunz, M., Ludwig, P., Caldas-Alvarez, A., Daniell, J. E., Ehmele, F., Feldmann, H., Franca, M. J., Gattke, C., Hundhausen, M., Knippertz, P., Küpfer, K., Mühr, B., Pinto, J. G., Quinting, J., Schäfer, A. M., Scheibel, M., Seidel, F., and Wisotzky, C.: A multi-disciplinary analysis of the exceptional flood event of July 2021 in central Europe – Part 1: Event description and analysis, Nat. Hazards Earth Syst. Sci., 23, 525–551, https://doi.org/10.5194/nhess-23-525-2023, 2023.*

- *Ludwig, P., Ehmele, F., Franca, M. J., Mohr, S., Caldas-Alvarez, A., Daniell, J. E., Ehret, U., Feldmann, H., Hundhausen, M., Knippertz, P., Küpfer, K., Kunz, M., Mühr, B., Pinto, J. G., Quinting, J., Schäfer, A. M., Seidel, F., and Wisotzky, C.: A multi-disciplinary analysis of the exceptional flood event of July 2021 in central Europe. Part 2: Historical context and relation to climate change, Nat. Hazards Earth Syst. Sci. Discuss. [preprint], https://doi.org/10.5194/nhess-2022-225, in revision, 2022.*
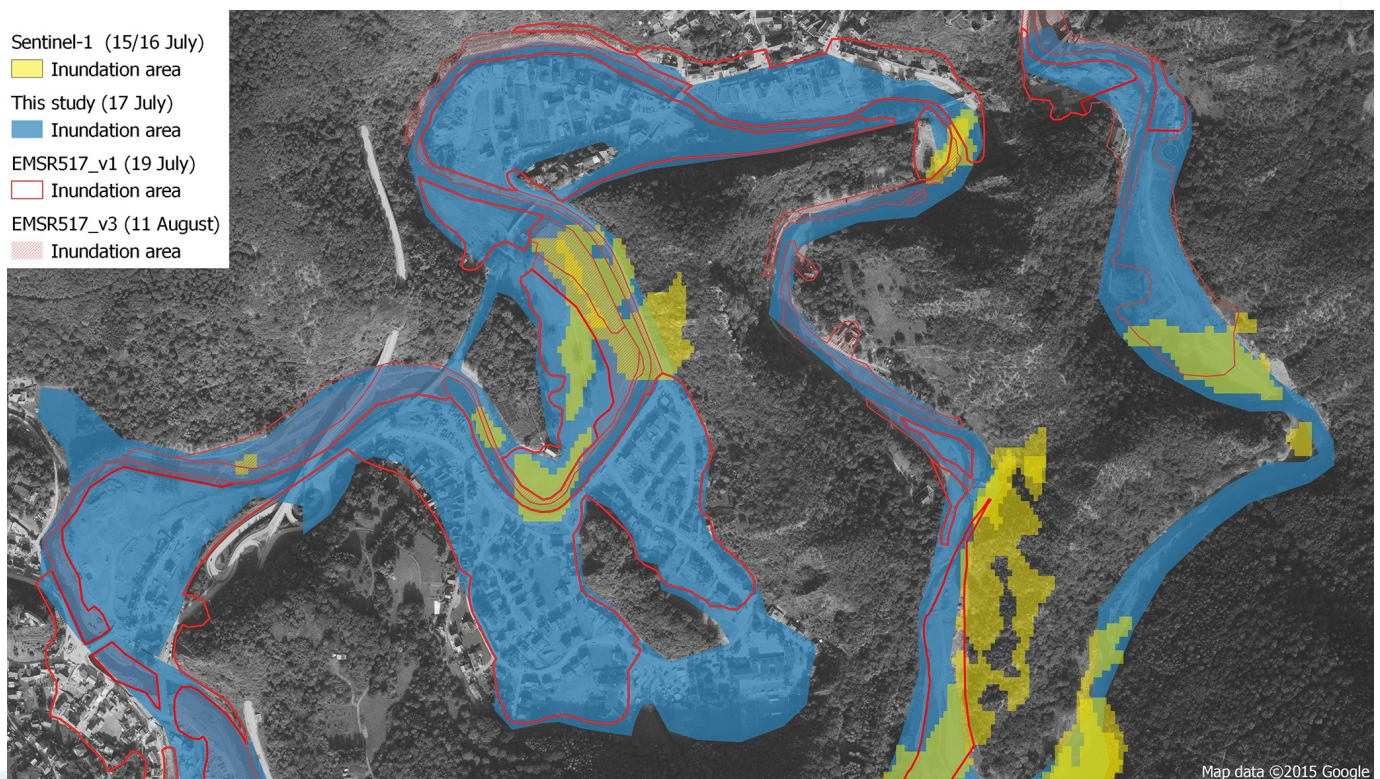
Comparison of the inundation area (municipality of Altenahr): based on CEDIM results (in blue) and other available products (source: Mohr et al., 2023).

Institute for Advanced Sustainability Studies (IASS), Germany

https://www.iass-potsdam.de/en

The research group Systemic Risks aims to identify common structural features of systemic risks such as climate change. The objective is to develop inclusive and sustainable governance approaches for systemic risk. Systemic risks are characterised by:

- a high degree of complexity;

- cross-border effects (cascading effects);

- stochastic cause-effect relationships

- non-linear development and tipping points;

- long periods of stability following by the rapid collapse of entire systems as tipping points are reached;

- (often) attenuated risk perception and a lack of adequate policy instruments to manage them.

Due to these characteristics, systemic risks are overextending established risk management and create new, unsolved challenges for policymaking in risk assessment and risk governance. The group addresses these challenges of systemic risk from different disciplinary and sectoral perspectives.

Pia-Johanna Schweizer contributes to the Joint ISO/ TC 262 - ISO/TC 292 JWG1 "Managing emerging risks" by the International Organization for Standardization. She is Co-speaker of the DKN Future Earth working group "Consistent technology risk profiles for transitioning to sustainable low carbon emission scenarios (RiskTransScens)" (https://www.dkn-future-earth.org/activities/working_groups/107372/index.php.en).

Third-Party Projects Starting in 2022

10/2022 – 9/2026 *DIRECTED* – DIsaster Resilience for Extreme ClimaTe Events providing interoperable Data, models, communication and governance funded by Horizon Europe Framework Programme of the European Union under Grant Agreement No. 101073978, Pia-Johanna Schweizer is Principal Investigator of work package 3 "Governance".

2/2022 – 1/2025 *REAL DEAL* – Reshaping European Advances towards green Leadership Through Deliberative Approaches and Learning funded by Horizon 2020 Framework Programme of the European Union under Grant Agreement No. 101037071, Pia-Johanna Schweizer is Principal Investigator of work package 1 "State-of-the-art assessment of deliberative and participatory approaches relevant to the European Green Deal"

Dr. Pia-Johanna Schweizer
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Publications

- Juhola, S., Filatova, T., Hochrainer-Stigler, S., Mechler, R., Scheffran, J., & **Schweizer, P.-J.** (2022). Social tipping points and adaptation limits in the context of systemic risk: Concepts, models and governance. *Frontiers in Climate*, 4. https://doi.org/10.3389/fclim.2022.1009234

- Singh, S. J., Huang, T., Nagabhatla, N., **Schweizer, P.-J.**, Eckelman, M., Verschuur, J., & Soman, R. (2022). Socio-metabolic risk and tipping points on islands. *Environmental Research Letters*, *17*(6), 065009. https://doi.org/10.1088/1748-9326/ac6f6c

- Besley, J. C., & **Schweizer, P.-J.** (2022). Risk Researchers' Views About the Goal of Trying to Ensure Policymakers Consider Scientific Evidence. *Risk Analysis*, *42*(4), 786–798. https://doi.org/10.1111/risa.13813

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Johanna Schweizer received the 2022 Presidential Merit Award from the Society of Risk Analysis.

IASS Bids Farewell to Scientific Director Prof. Ortwin Renn

The following article by <u>Dr. Bianca Schröder</u>, Press and Communications Officer, IASS, Potsdam, appeared on IASS webpage on 19 December 2022. Bianca kindly permitted GADRI to use the excerpts from the article and sent the photos too.

As 2022 draws to a close, the IASS bids farewell to Ortwin Renn, one of the Institute's two scientific directors, who will retire at the end of the year. At a joyful and moving celebration, staff at the IASS paid tribute to Renn's achievements as an outstanding researcher and leader.

Ortwin Renn joined the IASS in February 2016 after a <u>long and successful career as a scientist and university lecturer.</u>

Six of the Institute's research group leaders also lauded Renn's contribution to the IASS in their speeches. In their view, Ortwin Renn was "an enabler, a leader, and a very decent human being," "one of the few people in science who is incredibly successful and yet so nice," "an insanely great director," and "a gifted leader who allowed us great creative freedom and always helped us when we needed it." The team that led preparations for the evaluation described Renn as a "unshakable bastion of patience and resolve". He was "always responsive to everyone" and "proposed compromises without watering down the issues at stake".

For his part, Ortwin Renn had warm words of gratitude for the staff of the IASS. He expressed his sentiments by reciting the opening lines from Hermann Hesse's poem "Stages" (Stufen). "As every flower fades and as all youth / Departs, so life at every stage / So every virtue, so our grasp of truth / Blooms in its day and may not last forever." (Translated by Richard and Clara Winston in: The Glass Bead Game) And while Renn may be retiring, he will continue to actively cooperate with the IASS - operating under its new name "Research Institute For Sustainability – Helmholtz Centre Potsdam" (RIFS).
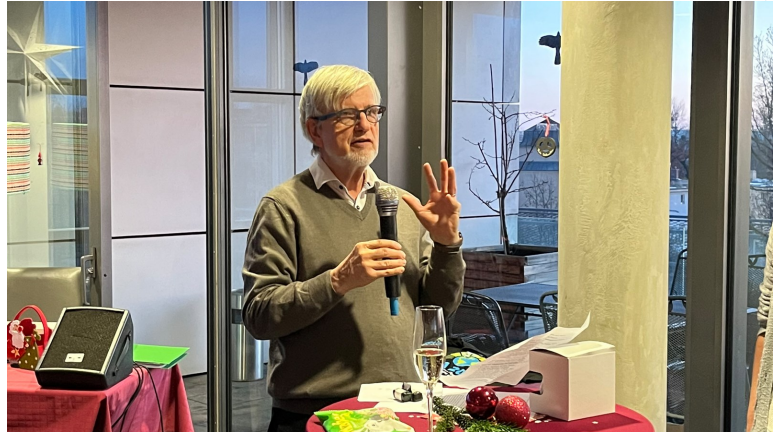
Full article:

https://www.rifs-potsdam.de/en/news/iass-bids-farewell-scientific-director-ortwin-renn

Prof. Ortwin Renn will maintain his affiliation with the IASS in his retirement.

Mark Lawrence *left) prepared his own version of Billy Joel's "Piano Man" which he sang and accompanied on the guitar and piano.

European Commission
Joint Research Centre, Italy

https://ec.europa.ei/jrc/en
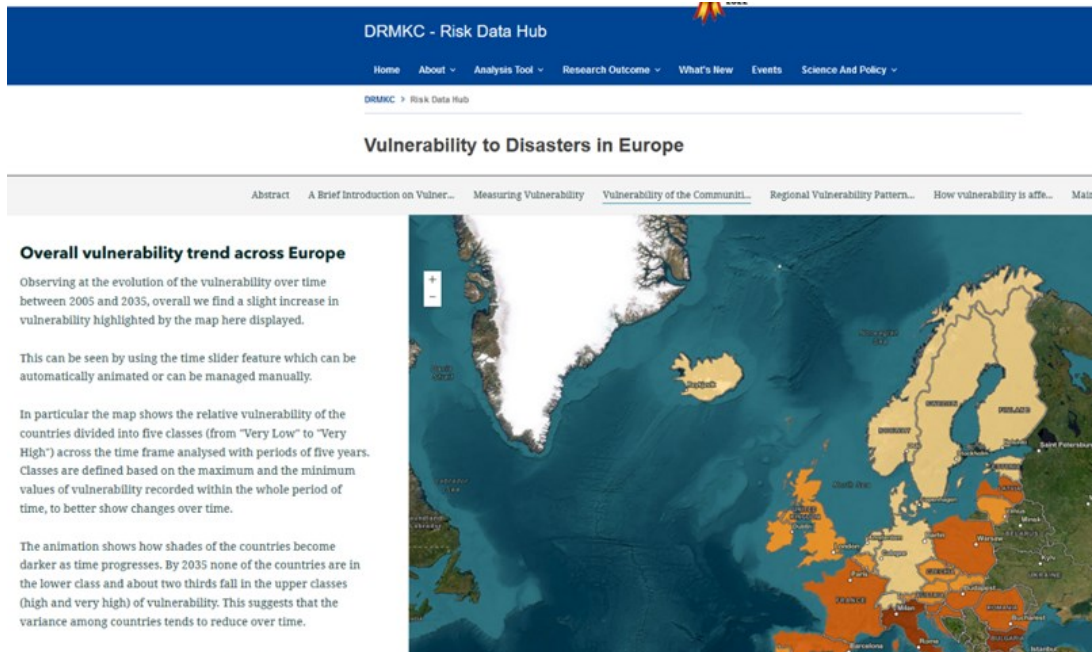
Vulnerability to Disasters in Europe, Risk Data Hub Story Map © 2022 EU

We are proud to share that the Disaster Risk Management unit of the European Commission's Joint Research Centre has been involved in several projects throughout 2022.

Our unit hosts the Disaster Risk Management Knowledge Centre, which is the Science Pillar of the Civil Protection Knowledge Network. The team added new functionalities to the Risk Data Hub, a GIS platform of European wide risk data that now has an interactive storymap. Another great project we actively contributed to was the INFORM suite of quantitative, analytical products to support decision-making on humanitarian crises and disasters – it now has a Climate Change Risk Index.

The team has also been leading the Epidemic Intelligence from the Open Source project, which was awarded for its valuable impact during the Paris Peace Forum in 2022. It aims to bring together public health authorities worldwide for early detection and monitoring of public health risks.

Dr. Tom De Groeve

Deputy Head, Disster Risk Management Unit

E-mail: tom.de-groeve@ec.europa.eu

It's not easy to name our key highlight of the year, but the DRMKC Annual Seminar in Paris was certainly among them. Co-hosted with the French Ministry of Interior and co-organised by DG ECHO, the participants shared best practices and challenges across areas like risk communication, disaster resilience goals monitoring and DRM science operationalisation. Other events we we're glad to have joined or organised include the European Civil Protection Forum, the Global Conflict Risk Index workshop or COP27 Side Event on "Data and systems for understanding and acting on current and future risks".

6th DRMKC Annual Seminar has been recorded and can be watched via https:// drmkc.jrc.ec.europa.eu/events-news/drmkc-annual-seminars/6th-drmkc-annual-seminar © 2022 EU

Every year our team summarizes the main Disaster Risk Management Science Knowledge Publications produced internally. On the side of the Copernicus Emergency Management Service (CEMS), reports produced by the European and Global Drought Observatories on the drought situation in Europe – but also in East Africa or China – added invaluable information on the need to mitigate and adapt to drought and climate change as a whole.
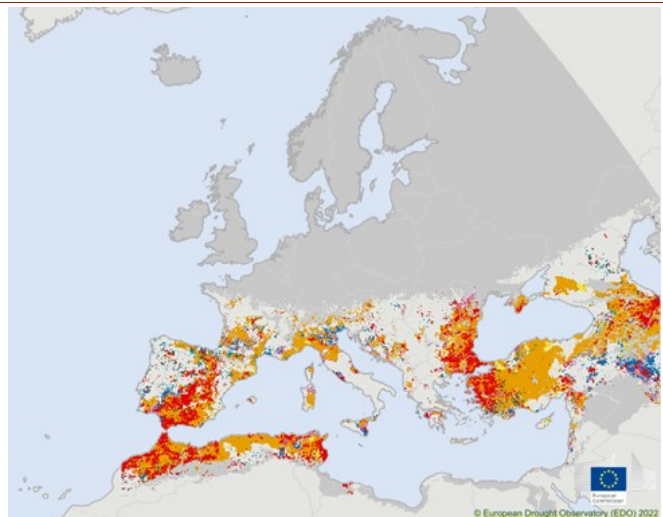
The Combined Drought Indicator map shows that 11% of the EU territory was in Warning conditions and 6% was in Alert conditions during the 1st ten-day period of December 2022.
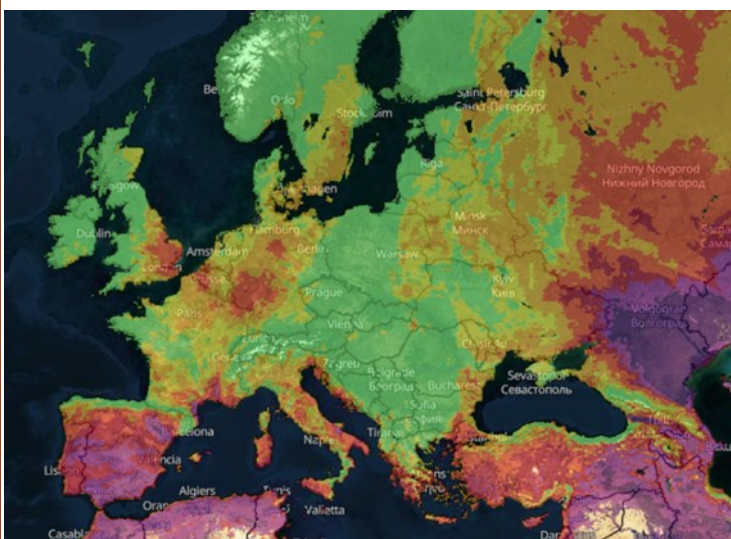
Moreover, data from the European Forest Fires System (EFFIS) also allowed producing a report at Pan-European level analyzing the wildfire situation in 2021 and looking at the 2022 season, as well as a Pan-European wildfire risk assessment. Through the Global Wildfire Information System (GWIS), the JRC has also been providing support to wildfire communities in the Amazon region through the provision of timely information on wildfire danger and impacts, supporting EU efforts to reduce deforestation and forest degradation by wildfires in the Amazon region and Latin America.

EFFIS Current Situation Viewer, pictured above for 22 August 2022, provides up-to-date fire danger information in the region. EFFIS © 2022 EU

Going beyond scientific publications, the underline new aerial component of CEMS used for the first time this year allowed the service to support the aftermath of the Ischia (Italy) mudflow emergency with unprecedented precision. The mapping service has also been activated for several other emergencies like multiple wildfires during summer, the floods in Australia and Pakistan or the volcanic eruption in Tonga.

Another example of disaster-related work delivered by the JRC is the degree of urbanisation (DEGURBA) training to help countries worldwide delineate cities, towns, suburbs and rural areas - with unprecedented accuracy since June 2022.

Among other purposes, it can help identify settlements located in disaster-prone regions – more susceptible to flooding or wildfires – and hence support disaster risk management activities. These urban performances significantly impact the implementation and monitoring of all the global development agendas and, in particular, the New Urban Agenda and the SDG 11.
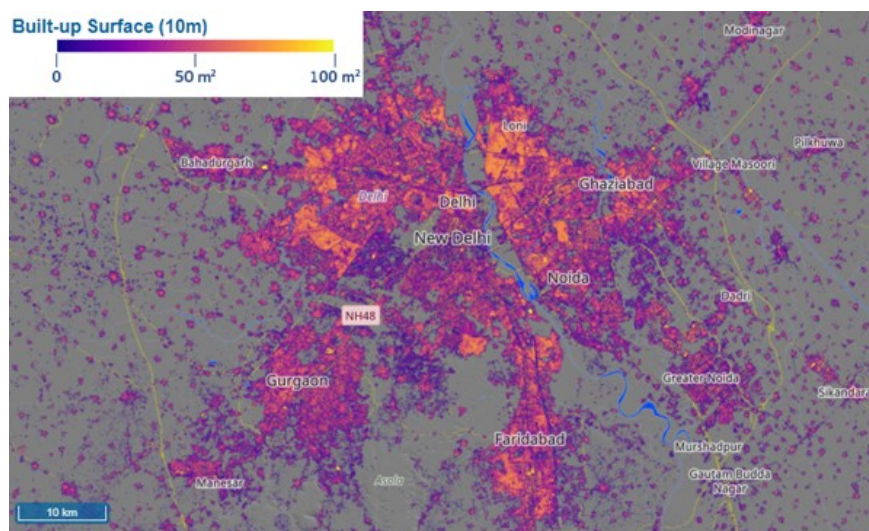
GHSL built-up surface fraction at 10 m resolution in the area of Delhi (India). GHS-BUILT-S year 2020

Finally, we cannot forget the important work on Natech. The JRC published new technical guidance on Natech risk management as well as the RAPID-N tool for analyzing and mapping the risk of natural hazard impacts on industrial sites. We also revamped the eNATECH database which provides access to the eNATECH database is public and free, and registered users can introduce their own accident data to increase the pool of information available for Natech forensic analysis.

Department of Earth Sciences, Civil Protection Centre, University of Florence, Italy

https://www.unesco-geohazards.unifi.it

UNESCO Chair on Prevention and Sustainable Management of Geo-hydrological Hazards

https://www.dst.unifi.it

https://www.protezionecivile.unifi.it

Figure 1. The involvement in natural disasters risk management

The Department of Earth Sciences of the University of Florence (DST-UNIFI; https://www.dst.unifi.it) is a recognized center for international research and higher training in Italy, with an Engineering Geology group counting almost over than 60 persons among professors, researchers, technicians, post-doc fellows, PhD students, collaborators and visiting fellows. The DST-UNIFI was entitled in 2008 as a World Centre of Excellence (WCoE) by the Global Promotion Committee of International Programme on Landslides (IPL) of UNISDR. This recognition after the first triennium (2008-2011) was reaffirmed four times 2011-2014, 2014-2017, 2017-2020 and 2021-2023.

The Civil Protection Centre of the University of Florence (CPC-UNIFI) is part of the National Italian Service of Civil Protection, as it is Centre of Competence for Civil Protection in the field of geological risk prevention. It was established at the

DST-UNIFI in 2018 and is currently composed of about 20 staff members (amongst professors, researchers, technicians, administratives, and several temporary positions).

Prof. Nicola Casigli
E-mail: nicola.casagli@unifi.it

In 2022 the activities of the DST and CPC-UNIFI continued by providing the scientific support of the security of the University of Florence, by organizing dissemination and training events, and by the involvement with the National Civil Protection Service in several emergency operational activities for the technical support in the geo-hydrological hazards treating human life and infrastructures. Among these in 2022 the CPC-UNIFI was involved in several and unfortunately deadly natural disaster emergencies, from the collapse of a serac in the Marmolada glacier, the flooding of the Marche Region, landsliding and tsunami connected to the volcanic activity of Stromboli, to a debris flow at Ischia Island (Fig. 1).

The UNESCO Chair on Prevention and Sustainable Management of Geo-hydrological Hazards (UNESCO Chair - https://www.unesco-geohazards.unifi.it), funded at the DST-UNIFI in 2016, has the mission of carrying out research and development (R&D) for the prevention and management of landslides, in order to support policies and actions of risk reduction. The Chair has been signatory and promoter of the Kyoto 2020 Commitment (KLC2020) for global promotion of understanding and reducing landslide disaster risk. The Kyoto 2020 Commitment is a duty to the Sendai Landslide Partnerships 2015-2025, the Sendai Framework for Disaster Risk Reduction 2015-2030, the 2030 Agenda Sustainable Development Goals, the New Urban Agenda' and the Paris Climate Agreement. The Kyoto Commitment was preliminarily signed during the ICL-IPL conference on September 18th, 2019, at UNESCO in Paris, and definitively signed during the virtual Launching session, which was held on November 5th, 2020, with the participation of United Nations organizations and all the signatories of the Commitment. The UNESCO Chair is currently organizing the 6th World Landslide Forum, which will be held in Florence from the 14th to the 17th of November 2023. The Forum is focused on Landslide Science for Sustainable Development, as a contribution to the KLC2020. During the reporting period the Forum website (https://wlf6.org) was created and the Call for session proposal was opened. Furthermore, the UNESCO Chair keeps promoting the protection of cultural heritage threatened by geo-hydrological hazards, with special regards to UNESCO world Heritage sites and developing countries, such as Madagascar (high City of Antananarivo), Georgia (Rock cut sites of Vardzia, Uplithsikhe and David Gareja), Saudi Arabia

(AlUla Old Town, Dadan, Hegra), providing technical support, capacity building and scientific dissemination to local authorities, agencies, and research centers. In this framework the Chair carried out in September 2022 a field mission in the High City of Antananarivo (Madagascar) for assessing building vulnerability to landslides, in the framework of risk assessment activities carried out as a contribution to the Dossier of the site's enrolment in the UNESCO World Heritage List. In 2022 the Chair also concluded the World Bank-funded Project "Strengthening Financial Resilience and Accelerating Risk Reduction in Central Asia" in which was involved as leader of Task 7 "Landslide Scenario Assessment".

The DST-UNIFI, the CPC-UNIFI and the UNESCO Chair in 2022 participated to several research projects in the field of prevention and management of geo-hydrological hazards with special emphasis to landslides, subsidence, and floods, funded by several international organizations, such as ICL/IPL, EU and ECHO, ROMERO and ESMERA consortiums, European Space Agency (ESA) and European Environment Agency (EEA). The research activities carried out as a WCoE were performed in the framework of the project ATLaS (Advanced Technologies for LandSlides) project, which objective is to develop new methodologies and advanced technologies for landslide risk reduction. In this framework in 2022, 40 scientific papers were published on peer reviewed ISI international scientific journals, dealing with landslide analysis, mapping, monitoring, modelling and prediction, remote sensing, geophysics, geotechnics, volcanic flank instability, subsidence, natural risk assessment, resilience to natural disasters, hydrogeology, and environmental geology.

Global Earthquake Model (GEM) Foundation, Italy

https://www.globalquakemodel.org

Atlas 1.0 - a new and easier way of accessing seismic hazard and risk information

The year 2022 was another packed and busy year for GEM, with the release of the updated Africa Exposure Model, partnerships with RMS, Allianz and the launch of the of Atlas 1.0 - a new and easier way of accessing seismic hazard and risk information jumpstarting the first quarter and setting the tone for the rest of the year.

GEM successfully completed the USAID-supported TREQ project, delivering and sharing all the results aimed at contributing to the understanding of earthquake risk at the urban/city levels. In the project, we worked closely with local partners and scientists to develop the capacity for urban earthquake hazard and risk assessment in Latin America, and to produce training, educational and communication materials for better understanding of earthquake risk.

On the heels of the successful completion of the TREQ project, the last quarter featured the launch of a new GEM-USAID Project: Forecasting and Communicating Earthquake Hazard and Risk (FORCE). FORCE aims to strengthen the capacities and understanding of small communities to manage and respond to future earthquake risk.

GEM worked with its partners on several events covering earthquake hazard and risk research and application topics: Safehub- The Future of Catastrophe Risk Management; Geoscience Australia- The Global Earthquake Model: Achievements and Future Directions; Eigenrisk- Global Mosaic of Models - approaches in creating globally consistent earthquake hazard and risk models; EFEHR for the release of the European Seismic Hazard and Risk Models; and with a diverse team of GEM sponsors for the development and release of a new earthquake loss model for China.

The CAREC project, funded by ADB released 10 country risk profiles, where GEM, a member of the consortium of organizations that implemented the project from 2020-2022 provided the exposure and seismic vulnerability data as contributions to the development of disaster risk assessments and modeling in all Central Asia Regional Economic Cooperation Region (CAREC) countries.

Prof. John Schneider
Secretary-General
E-mail: john.schneider@globalquakemodel.org
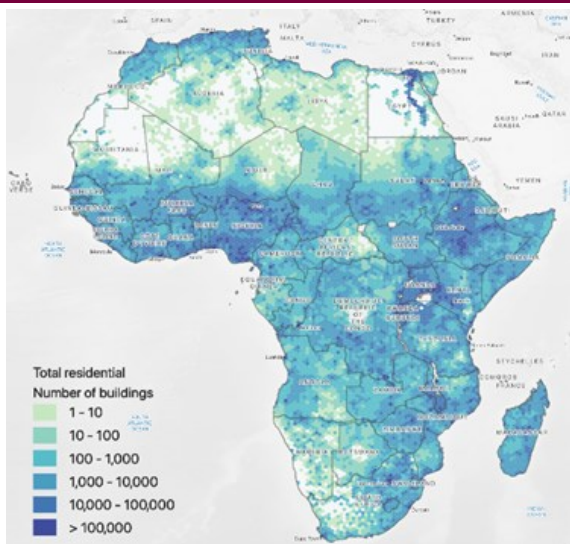
Africa Exposure: residential buildings
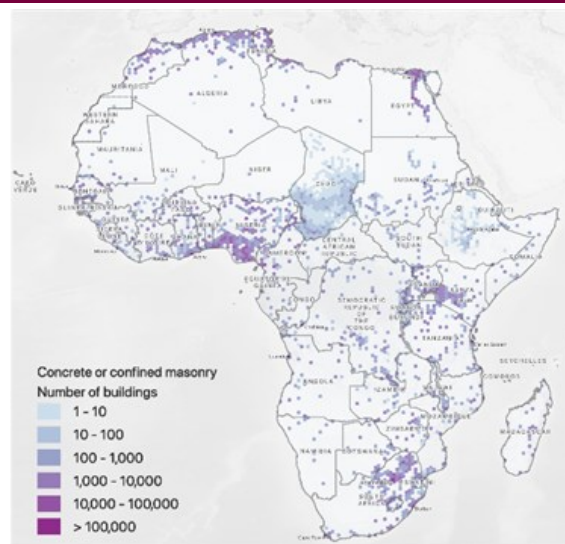
Africa Exposure: concrete masonry buildings

GEM open Products downloads crossed the 11,000 mark as of December. In addition to this milestone, GEM has updated its Products page to better serve the needs of its stakeholders. Searching for a model has been made easier with the addition of an interactive point-and-click global map.

The OpenQuake development team released versions 3.13, 3.14 and 3.15 featuring the capability to run the new European model (ESHM20); complete vectorisation of the hazardlib and performance optimisations for classical, event-based and disaggregation calculators; and optimization of point-like sources resulting in a speedup from 1.5 to 50 times, and many other performance improvements. The development team also released an online user manual to help support users with updated information about the OQ engine.

In the spirit of DRR Day, GEM shared through social media and other online platforms the seismic risk assessment reports for the cities of Cali, Quito and Santiago de los Caballeros to help increase availability of and access to disaster risk information and assessments of our stakeholders in Latin America.

The Global Resilience Index Initiative (GRII) where GEM is a founding member launched the Demonstrator at COP27. The launch of the GRII demonstrator aims to provide the initial set of people, planet and prosperity indices to guide financial decisions to scale up adaptation to natural hazard risks, particularly those affected by climate change . The GRII will be fully launched in November 2023 at COP28.

GEM released eight peer-reviewed papers on the exposure, building classification for multi-hazard risk assessment, benefit-cost analysis to support earthquake mitigation, forecasting seismic risk, risk scenarios for Latin America, and road network and hospital accessibility seismic risk assessment. See more on GEM's Publications page.

The year was capped with the official welcome at the Governing Board meeting of new partnerships with Allianz, Aon and CelsiusPro, and sponsorship renewals from Guy Carpenter/ MarshMcLennan and Willis Towers Watson to further advance collaborative risk analysis and expand earthquake and climate risk financing options through parametric insurance.

TREQ Project completion
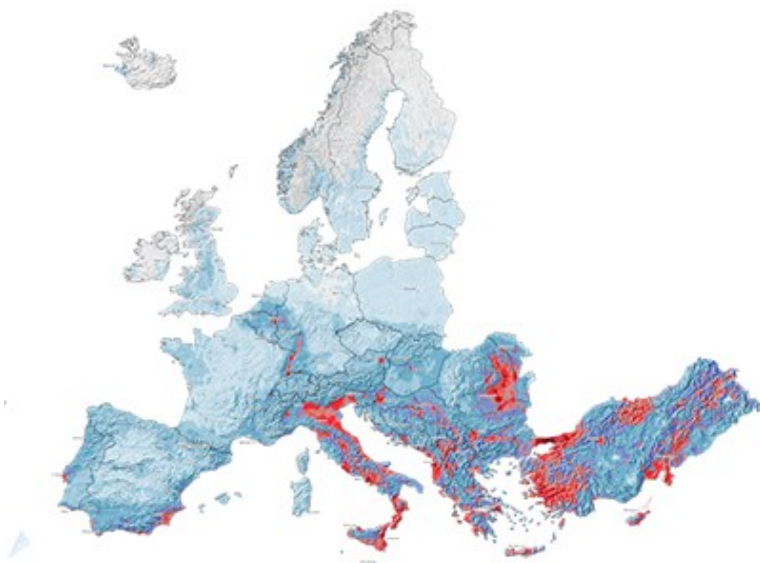
Release of the European model

GRII Demonstrator Launch

Earthquake Engineering Research Centre, University of Iceland

https://www.eerc.hi.is

UNIVERSITY OF ICELAND

EARTHQUAKE ENGINEERING RESEARCH CENTRE
FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING
Austurvegur 2A, 800, Selfoss, Iceland
Tel. +354 525 4141 e-mail: eerc.hi.is

The EERC is one of the research institutes of the Faculty of Civil and Environmental Engineering of the University of Iceland and specializes in engineering seismology and earthquake engineering related fields. It operates and maintains the Icelandic Strong Motion Network (IceSMN), which is the only country-wide strong ground motion network in Iceland. It completed a large project of structural vibration monitoring system in Iceland. The project was funded by the Icelandic Centre for Research (www.rannis.is) and resulted in extensive instrumentation of the 10 tallest structures in Iceland for monitoring their wind- and earthquake-induced vibrations. The EERC, as one of the leading investigators, received one of the most prestigious research grants in Iceland, the grant of excellence from the Icelandic Centre for Research. The grant is for a project called Seismic Risk in Iceland (SERICE), which aims at a multi-disciplinary and comprehensive study of seismic hazard, vulnerability, and risk in Iceland. Dr. Rajesh Rupakhety, director of research at the EERC, is one of the three principal investigators of the SERICE project.

Courses 2022 - 2023

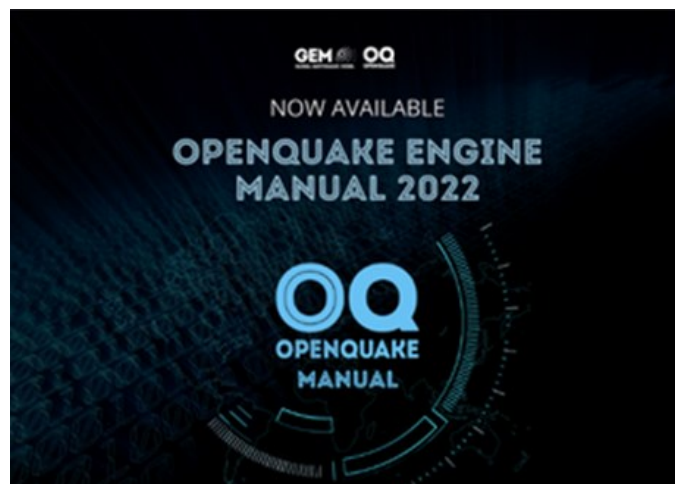- BYG401G - Computational Mechanics 1
- BYG301G - Continuum Mechanics 1

Published works 2022

- Recent Advancement in Assessment and Control of Structures under Multi-HazardApplied Sciences
- Seismic Vulnerability of Vernacular Residential Buildings in BhutanJournal of Earthquake Engineering
- Seismic Sequence Vulnerability of Low-Rise Special Moment-Resisting Frame Buildings with Brick InfillsApplied Sciences

- Seismic Fragility of Aging Elevated Water Tank with Smooth Bars Considering Soil Structure InteractionBuildings
- Comparison and modelling of building losses in South Iceland caused by different size earthquakesJournal of Building Engineering
- Seismic Fragility Analysis of Low-Rise RC Buildings with Brick Infills in High Seismic Region with Alluvial DepositsBuildings
- Optimal design and performance assessment of multiple tuned mass damper inerters to mitigate seismic pounding of adjacent buildingsJournal of Building Engineering

https://english.hi.is/staff/rajesh

Prof. Rajesh Rupakhety
E-mail: rajesh@hi.is

Nord University, NORDLAB
Norway
https://www.nord.no/en

Nord University innovation center for safety, security and preparedness collaboration (NORDLAB)

https://www.nord.no/en/about/faculties-and-centres/business-school/research-centres/nordlab/Pages/default.aspx

Activities in 2022 are listed as follows:

Research Projects;

- Research project MAREC: The inter-organizational coordination of mass rescue operations in complex environments

Associate professor Natalia Andreassen from NORDLAB at the Nord University Business School has been leading the MAREC research project since January 2018. The project, which has been studying coordination of response resources involved in mass rescue operations is now scheduled for completion late June of this year.

- Final scientific meeting of the joint research project MAREC

https://www.nord.no/en/about/faculties-and-centres/business-school/articles/Pages/MAREC-The-inter-organizational-coordination-of-mass-rescue-operations-in-complex-environments.aspx

Events and Exercises:

- Tourism Safety Exercise, onsite
- Student Barents Rescue
- ARCSAR live exercise on cruise ship on Svalbard
- Tourism Safety Seminar in Rovaniemi, hybrid

Graduate (Masters & PhD) courses, summer & field schools, online courses

- Arctic Safety courses at UNIS
- Shipping in the Arctic
- Preparedness and emergency management
- Change management and crisis management

  Emergency preparedness organizations and emergency response

- Master Course on Resilience, Risk and Crisis Management at University of Portsmouth, UK

Prof. Odd Jarl Borch
E-mail: odd.j.borch@nord.no

Mobility activities:

- Mobility in Greenland

- Mobility in The Faroe Islands

- Mobility in Svalbard

- Mobility to Finland

- Mobility to UK

- Mobility to Netherlands

Other Outreach activities:

- Andreassen, Natalia. Joint Collaboration Exercises on Arctic Safety and Security. The Arctic Magazine Shared Voices 2022

- Andreassen, Natalia; Dominguez Cainzos, Mikel. Tabletop Exercise ARCSAR TTX 2021 "OIL IN ICE". Exercise Report. : The ARCSAR project 2022

- Elvegård, Rune; Andreassen, Natalia. International cooperation with focus on marine environmental response in the Arctic. High North News 2022

- MAREC GIS map with incidents and exercises in emergency management

- MAREC GIS ONLINE: How to show data and learn from cases. Report for MAREC project

- Uarctic fundraising, thematic group

- Tourism Safety trainings for tourism entrepreneurs, Helsinki and Kuusamo

Publications:

- Multi-criteria mapping and prioritization of Arctic and North Atlantic maritime safety and security needs. European Journal of Operational Research.

Publication/Scientific Articles (Peer Reviewed):

- Taarup-Esbensen, Jacob (2022) "Managing Business Continuity in the Arctic - Experiences from Mining", Risk Analysis – An international journal, https://doi.org/10.1111/risa.14098

- Taarup-Esbensen, Jacob (2022) "Community resilience – systems and approaches in remote settlements", Progress in Disaster Science, Http://doi.org/10.1016/j.pdisas.2022.100253

- Taarup-Esbensen, Jacob & Gudemestad, Ove Tobias (2022) "Reliability in Arctic supply chains – Challenges and opportunities for industrial development in Baffin Bay and Greenland", Polar Geography https://doi.org/10.1080/1088937X.2022.2032447

- Andreassen, Natalia; Borch, Odd Jarl. International Cooperation in Emergency Response in the Arctic Sea Areas. I: Global Development in the Arctic : International Cooperation for the Future. Routledge 2022 ISBN 9781003246015

Research Reports Publications/Scientific Articles (peer reviewed) :

- ArcticRisk – Marie Skłodowska-Curie Individual Fellowships Grant number:894623

- Building resilience in the high-north, NordPlus, Nordic Council

- SECUREU: Security Risk Management in EU, Erasmus + Strategic Partnerships

- RNSARCARDS: Operationalization of radiation and SAR cooperation in radiologocal and nuclear rescue operations, financed by Nordic Nuclear Safety Research

- ARCSAR: Arctic and North Atlantic Security and Emergency Preparedness Network, EU Horison 2020

- Student Barents Rescue: Enhanced Education Capabilities Through Cooperation (SBR)

Sessions in international conferences (either onsite or online), webinars, conferences, workshops, events organized, art exhibitions :

- ESREL (European Safety and Reliability Conference), Dublin, Ireland

  NEEDS (Northern Europe Emergency and Disaster Studies Conference)

- Side-event at High North Dialogue 2022

- Side-event at Arctic Frontiers 2022

- NEON conference 2022

The Main School of Fire Service (SGSP)
Poland
https://www.sgsp.edu.pl/

Ms. Mami Mizutori, SRSG, UNDRR Opening the session of the INTERED Conference

Source: https://www.sgsp.edu.pl/?page_id=29327.

Beata Janowczyk, Polish Focal Point for UNDRR, during her presentation in the IN-TERED conference

Source: https://www.sgsp.edu.pl/?page_id=29327.

In 2022 four organizational units of the Main School of Fire Service (Szkola Glowna Sluzby Pozarniczej, SGSP) actively participated in disaster risk reduction (DRR) due to natural hazards and man-made events. There were the Institute of Safety Engineering, the Institute of Internal Security, the Faculty of Safety Engineering and Civil Protection and the Firefighting Rescue Unit of SGSP. Consequently, during the third full year of participation in GADRI, SGSP covered research, educational and operational areas of the reduction, also in the pandemic conditions and considering military conflict in Ukraine.

In the period reported, SGSP was conducting research in following international projects related to DRR aspects:

1. Integrated Technological and Information Platform for wildfire Management (SILVANUS), Horizon 2020.

2. Protection System for large gatherings of People in Religious Sites (ProSPeReS), Horizon 2020.

3. Support for social prevention in Ukraine through development of education for security for children and youths with the use of educational rooms. Module I. Polish Development Support.

Doctoral dissertations were carried out in security studies (in social sciences) and in environmental engineering, mining and power engineering (in technical sciences).

Prof. Pawel Gromek

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In relation to SILVANUS project, SGSP organized 3 online International Scientific Seminars on Preparation and Pre-Planning Activities for Wildfire Response (29 June 2022, 29 September 2022 and 15 December 2022). The seminars were focused on training scope, objectives, materials and methods as well as on specification of wildfire response training – from particular entities to cooperation, general requirements for training materials.

The main DRR event in SGSP was the International Scientific Conference on International Emergency Mechanisms and Disaster Risk Reduction (15 September 2022, in hybrid formula). The conference was under honorary patronage of The United Nations Office for Disaster Risk Reduction (UNDRR), The United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), Prime Minister of the Republic of Poland and The Main Headquarters of the State Fire Service of the Republic of Poland. Media patronages were given from Routledge (Taylor&Francis Group), Adam Marszałek Publishing Group and Firefighting Review Journal. GADRI partners made great efforts to support SGSP in organization of this event (especially The Center for Risk-Based Community Resilience Planning Colorado State University (USA), Disaster Prevention Research Institute, Kyoto University (Japan), Israel National Knowledge and Research Center for Emergency Readiness University of Haifa (Israel), Pacific International Center for Disaster Risk Reduction (Ecuador), University of Żilina (Slovak Republic)). Book entitled 'International Emergency Mechanisms and Disaster Risk Reduction. A Supplement Way to Shape National Security', which is directly related to this event, is planned to be published by Routledge in 2024.

SGSP representative, Pawel Gromek, shared his research findings in international monograph entitled 'Epidemic Risk Reduction. A Civil Protection Approach'. The book was published by Routledge and has been accessible since July 2022 (https://www.routledge.com/Epidemic-Risk-Reduction-A-Civil-Protection-Approach/Gromek/p/book/9781032181004).

SGSP, as an organizational unit of the State Fire Service, actively supported Ukrainian refugees on Ukrainian-Polish border and in refugee centers in Poland. University also helped Ukrainian emergency services as an international hub for delivering rescue equipment from European countries and entity which co-organised common scientific events.

Faculty of Security Engineering, University of Žilina Slovakia
https://www.fbi.uniza.sk/en/

1. FSE UNIZA organizes two times per year "A drop of blood" where blood donors participates. The local association of the Slovak Red Cross at the FSE and the National Transfusion Society took charge of the organization.There were 29 donors present and helped those who needed this mostly.

2. Nowadays, virtual reality, augmented reality and mixed reality are used in education in almost every field, both in companies and in universities. We had a testing day of scenarios with Microsoft HoloLens 2 that were created as part of the FightARs project that took place at the University of Žilina in Žilina. They are mainly focused on crisis management and rescue services professionals training. The Faculty of Security Engineering, University of Zilina organized the conference in cooperation with partners from Estonia, Lithuania, Germany, Cyprus and the Czech Republic. (more infos: http://fight-ar.com/sk/)

3. The Young Rescuer summer school for children aged 7-12 was also held in 2022. We welcomed 50 children and experienced an unforgettable program. They learned the basics of providing first aid, civil protection activities, forensic methods and other interesting activities. As every year, the camp went well this year as well.

4. On May 18th and 19th, 2022, the 25th edition of the international scientific conference "Solving crisis situations in a specific environment" was held on University of Žilina in Žilina under the auspices of the Rector of the University of Žilina in Žilina, Prof. Ing. Jozef JANDAČKA, PhD. The content was a presentation and discussion of current knowledge from scientific research and practical experience in solving crisis situations in companies and in public administration, as well as current questions in connection with the current security situation.

Dr. Katarina Holla

Associate Professor;

Vice-Dean, International Relations and Marketing

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Stockholm Environment Institute
Sweden
https://www.sei.org/

Here is a selection of examples of SEI's work on disaster risk related issues during the year 2022:

- Tran, M. and Boyland, M.(2022). The state of knowledge on disaster risk. *IRDR Working Paper Series*, 24 pages.

- As part of the development process for a global research agenda for risk-informed development, this paper provides context, baseline information and a 'state of knowledge' on disaster risk science.

- To read more https://www.sei.org/publications/irdr-wp-state-of-knowledge-on-dr/

- Up on the launch of the Global Assessment Report on Disaster Risk Reduction (GAR 2022), SEI researchers shared their reflections ahead of the 2022 Global Platform for DRR, and its implications for addressing emerging new risk landscapes. To read more: https://www.sei.org/perspectives/global-disaster-risk-transformative-approaches/

- Finalization of the Programme - Building resilience through inclusive and climate-adaptive disaster risk reduction in Asia-Pacific, 2018-2022. This programme aims to enhance regional cooperation on inclusive risk reduction approaches by building on good practice examples and providing scientific evidence and technical assistance on new and innovative methods, tools and practices to key actors in the region. To read more: https://www.sei.org/projects-and-tools/projects/resilience-inclusive-climate-adaptive-drr-asia-pacific/

- As part of the Adaptation without Borders (https://adaptationwithoutborders.org/) global partnership initiated by and anchored at SEI, in 2022, SEI published a major analysis tackling cascading climate risk to meet global adaption challenge, suggested potential coalitions of countries that might ignite a new era of global climate diplomacy on adaption. To read more: https://www.sei.org/perspectives/countries-tackling-climate-risks/

- A perspective on disaster risk reduction for food and security and nutrition, linking to the attendance of the Global Platform for Disaster Risk Reduction (GPDRR) 2022, which was an opportunity to discuss the need for holistic and multi-sectoral disaster risk reduction interventions on climate-triggered disaster risks and mitigate their repercussions. It provided a platform to integrate agri-food systems in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) to guarantee their resilience. To read more: https://www.sei.org/featured/disaster-risk-reduction-for-food-security-and-nutrition/

Dr. Guoyi Han
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- Project: RISKSEC 2.0 Local climate change adaptation: from risk governance to securitisation strategies? Without a proper understanding of the characteristics of local governance and society, climate change adaptation is doomed to fail, with consequent economic, environmental and human costs. Using the literatures on risk governance and securitisation, this project uncovers how climate change adaptation can be framed through risk governance thinking, with a focus on accommodating everyday risks, or through securitisation dynamics, by which extraordinary measures and particular actors are required. Read more: https://www.sei.org/projects-and-tools/projects/risksec-2-0/

- Climate policies need to be better prepared to deal with transboundary climate risks resulting from the cascading effects of both climate hazards and adaptation responses. SEI colleagues co-authored a IDDRI Blog post questioning the scientific feasibility and policy relevance of assessing transboundary climate risks. Read more: https://www.sei.org/perspectives/scientific-feasibility-policy-transboundary-climate-

risks/

- Harris, K., Lager, F., Jansen, M. K., & Benzie, M. (2022). Rising to a New Challenge: A Protocol for Case-Study Research on Transboundary Climate Risk. *Weather, Climate, and Society*, 14(3), 755-768. https://doi.org/10.1175/WCAS-D-21-0022.1

- Ghosh, A. and Raha, S. (2022). *Renewed multilateralism to alleviate chronic risks and enhance human security.*Stockholm+50 background paper series. Stockholm Environment Institute, Stockholm.

- Perspective on Ensuring gender equality is core to effective disaster risk reduction policies https://www.sei.org/perspectives/gender-equality-disaster-risk/

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Contribute to the future of development and disaster risk reduction — weTRANSFORM

Evidence Aid
United Kingdom
https://www.evidenceaid.org/

Evidence Aid has continued to expand their resources this year, thanks to the work of a core team of staff and volunteers. We continued work on our COVID evidence collection which currently includes summaries more than 600 summaries. These summaries have been routinely translated into Arabic, Chinese, French, German, Italian, Portuguese and Spanish.

In June 2021, we started working with the Pan American Health Organization on Phase 2 of the evidence collection on Resilient Health Systems with a particular focus on low and middle income countries. At the end of December 2022, this contained more than 220 summaries of systematic reviews. All summaries have been translated into French, Portuguese and Spanish. We are planning to work with them again in 2023 to create a Phase 3 of the collection.

Continuing our work from June 2021, throughout 2022, we worked with the World Health Organization, Kobe Centre to develop new materials to be included in a Knowledge Hub. The work centred around the online book 'WHO Guidance on Research Methods for Health Emergency and Disaster Risk Management'. In 2021, a small team summarised the chapters, further readings, and others brought together slideshows (some with video), podcasts and held three webinars. These materials have been uploaded to a dedicated Knowledge Hub. In 2022, we worked on expanding the number of podcasts and slideshows with video and will continue our work with them into the first part of 2023.

Ms. Claire Allen
Operations Manager
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We worked with the Florida International University (Extreme Events Institute) on a Disaster risk in informal settlements project from July – September 2022, preparing short summaries of 11 articles to assess what the project meant as a whole in terms of evidence going forward both within and outside of the Latin American and Caribbean region (where the studies were carried out). This included sections on implementation and impact. This was aimed at professionals and technicians who work in public, private and civil society sectors responsible for the design, implementation and evaluation of projects/ activities of social interest in precarious urban settlements where a high level of risk prevails in the fact of natural and

man-made hazards characterized by communities with high vulnerability and exposure. More about the project can be found here.

We were lucky to have 10 interns from McMaster University who worked to update our evidence collections on Earthquakes and Windstorms. The collection currently contains 60 summaries with more to come later in the year. The summaries are being translated into various languages.

In June 2021, we recruited Epa La Bella and Sumra Ali to work on Phase 2 of the WHO WKC project, and Cristian Mansilla, Ana Pizarro, Jane McHugh and Yasmeen Saeed to work on Phase 2 of the PAHO project. They have been supported by hard-working volunteers.

We would like to take this opportunity to thank all our interns and volunteers without whom we would not have had such a successful year.

Our Board of Trustees was delighted to welcome Xavier Bosch Capblanch, Ngoy Nsenga, Lisa Robinson and Rik Viergeve.

Institute for Risk and Disaster Reduction (IRDR)
University College London, United Kingdom
https://www.ucl.ac.uk/risk-disaster-reduction/

Photo: IRDR Global Engagement

The UCL Institute for Risk and Disaster Reduction (IRDR) was launched in 2010 with a mission from the Provost to lead transdisciplinary research, teaching and knowledge exchange in risk and disaster reduction in the UK and internationally. In those 12 years, economic globalisation has gone into retreat with increases in protectionism and economic nationalism, heightening tensions between economic blocks as Phil Mullan has pointed out (*spiked*, 7/3/22). According to the World Trade Organization, protectionist measures are now imposed on 10% of trade by G20 countries – up ten-fold since the 2008 global financial crisis. While COP-26 in many ways was a success, in other fields international co-operation is in retreat.

Coordination of a global response to the Covid-19 pandemic was largely ineffective according to a World Health Organization (WHO) report that blamed the inadequate leadership by the UN, G7 and G20. The WHO itself was embroiled in disputes over its independence and unable to lead a global response. Geopolitics stops any resolution of the Rohingya Exodus. The invasion of Ukraine by Russia may set a pattern for increasing global conflict between rival blocks. The war again has shown the weakness of international institutions to prevent it. The IRDR has increasing developed its research and public engagements in conflict and disasters, forced migration driven by conflict and environmental change, and humanitarian action.

Prof. Peter Sammonds
Director
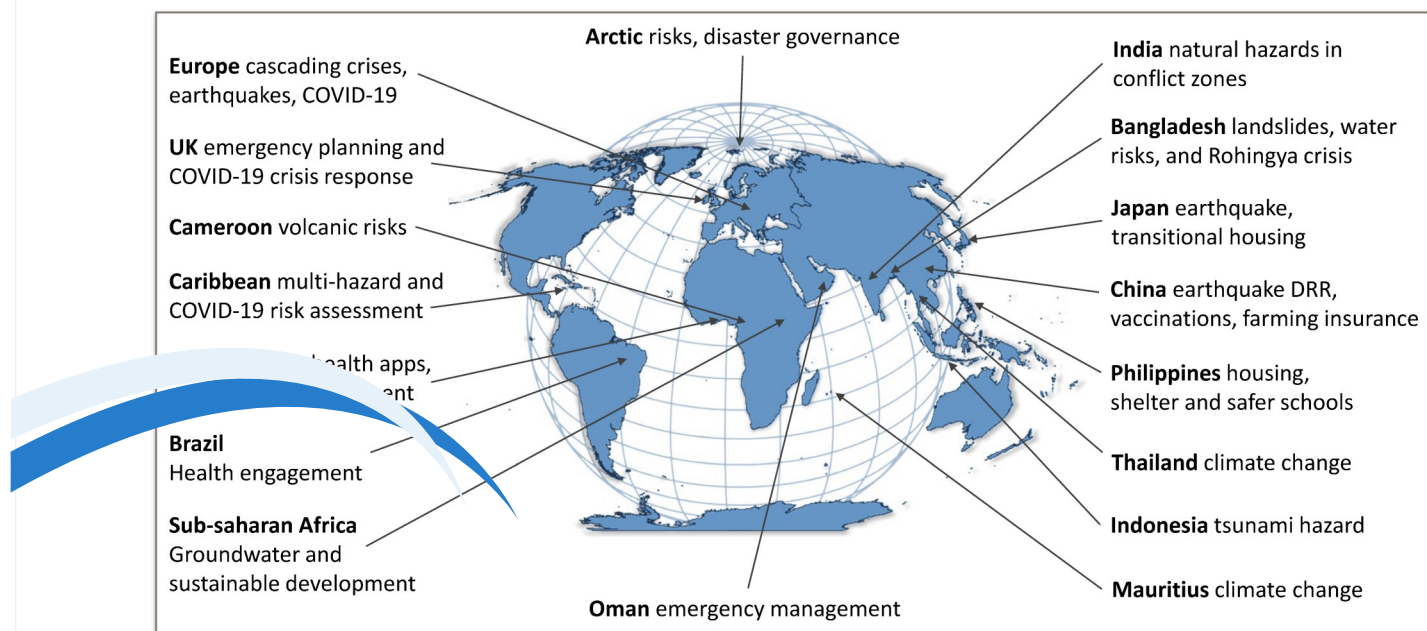E-mail: irdr-enquiries@ucl.ac.uk

So, the launch in 2021 of our Global Humanitarian Studies BSc programme, an exciting multidisciplinary programme that aims to educate and train future generations of humanitarian leaders in the theory and practice of humanitarian action, is an important step.

We believe there is a real need for such a programme. Sixty students from 24 countries joined this international and internationalist programme. With the launch of the BSc, the IRDR has gone through an unprecedented expansion. Ten academic and teaching staff joined the IRDR this year, taking us to 22 in total. But this has also been the last year with Peter Sammonds as IRDR Director, the post he has held since 2010 when we launched with a just two staff. Dr Joanna Faure Walker, our first academic appointment in 2011, took over a Head of Department in September.

- Our mission remains to develop the IRDR themed around disaster resilience, cascading crises, natural hazards, humanitarian crisis response, conflict and migration, climate change adaptation, health emergencies, and gender responsive resilience, in order to integrate education, research, innovation and enterprise for the long-term benefit of humanity. Highlights of some of the developments and achievements within the IRDR during 2021–22 include:

- Global Humanitarian Studies BSc started in September 2021 with 60 students. Half of BSc students are international students coming from 24 countries.

- In an unprecedented expansion of the IRDR, we are delighted that Mark Pelling joined as Professor for Risk and Disaster Reduction and Fatemeh Jalayer as Professor for Geophysical Hazard Risks,

Dr Philip Cunliffe has joined us as Associate Professor, Drs Sonja Ayeb-Karlsson, Roberto Gentile, Estella Carpi, Lisa Danquah, Saman Ghaffarian, Ting Sun, Yasmine Sabri, Megnaa Mehta and Aeron O'Connor as Lecturers and Victoria Maynard as Teaching Fellow. Pamila Bhatia and Afsana Begum joined us as professional service staff.

- IRDR Master's programmes continue their popularity with 90 students.

- Moved back to in-person teaching from hybrid teaching with most students returning to London.

- Professor David Alexander, Professor Ilan Kelman, Professor Maureen Fordham, Professor Mark Pelling and Dr Bayes Ahmed have been listed in the world's top 2% of scientists in their respective fields.

- Professor David Alexander completed ten months Specialist Adviser to the House of Lords Select Committee on Risk Assessment and Risk Planning.

- Launched the Warning Research Centre as a joint centre with the Department of Science and Technology Studies.

- Congratulated Claudia Sgambato, Gillian Dacey, and Justine Uyimieshi, graduating with PhDs, whilst welcoming Christiana Iliya, Ava Sullivan, Aimee Colgate, Zerong Li, Umut Lagap, Musaad Almuthaybiri, Zhu Yu, Dan Thompson and Mhari Gordon as new IRDR research students.

- More than 400 participants attended IRDR online events.

- Published over 130 peer-reviewed papers

Arctic risks, disaster governance

Europe cascading crises, earthquakes, COVID-19

UK emergency planning and COVID-19 crisis response

Cameroon volcanic risks

Caribbean multi-hazard and COVID-19 risk assessment

…ealth apps, …ent

Brazil Health engagement

Sub-saharan Africa Groundwater and sustainable development

Oman emergency management

India natural hazards in conflict zones

Bangladesh landslides, water risks, and Rohingya crisis

Japan earthquake, transitional housing

China earthquake DRR, vaccinations, farming insurance

Philippines housing, shelter and safer schools

Thailand climate change

Indonesia tsunami hazard

Mauritius climate change

Avoidable Deaths Network (ADN)
University of Leicester, United Kingdom

https://www.avoidable-deaths.net/

Picture from the RN4FR project:

Hybrid Meeting at the Regional Security System Paragon Base with Mark Boyce (Regional Security System/ Emergency Ambulance Service), Clemens Buter (Pan American Health Organisation), Frank Caswell (World Food Programme), Errol Maynard (Caribbean Association of Fire Chiefs/ Barbados Fire Service), David Byer OBE (Queen Elizabeth Hospital Emergency Ambulance Service), Nibedita Ray-Bennett (University of Leicester), Rasheed Pinder (Caribbean Disaster Emergency Management Agency), Krishna Clarke (Avoidable Deaths Network), Keisha Linton (Regional Security System), Paul Saunders (Caribbean Development Bank), Rochelle Hunte (Barbados Red Cross), Jeffrey Forde (Regional Security System) and Peterson Yearwood (Barbados Red Cross) on 04 July 2022.

The Avoidable Deaths Network (ADN) organised and delivered its debut **Symposium** on 10 December 2021 in the Caribbean region, entitled '*Integrating Disaster Risk management with Emergency Services and Defence to Reduce Avoidable Disaster Deaths*'. A key conclusion of the Symposium was to create a regional network connecting first responders operating in the Caribbean and their critical support partners, to facilitate familiarity and trust, promote interaction, and share knowledge and experience.

To assess the need for this network, ADN carried out a series of stakeholder consultations from April to July 2022 funded by the University of Leicester's Knowledge Exchange Proof of Concept Fund for the project '**Regional Network for First Responders (RN4FR)**'. Consultations revealed a strong interest from all parties in addressing capacity gaps, in particular the coordination, collaboration and communication (3C) gaps, through this network. There was a positive reception from Caribbean Disaster Emergency Management Agency, drawing on its coordination mandate, to act as the network's convener. Drawing on the ideas and perspectives gained from the consultations, a "*Roadmap*" has been prepared to realise the intentions expressed for connecting the key actors engaged in and supporting efforts to respond to disaster events in the countries and sovereign territories of the Caribbean. This will leverage the power of community to reinforce the Regional Comprehensive Disaster Management (CDM) Strategy and the Regional Response Mechanism (RRM), reduce avoidable disaster deaths, and mitigate the extent of disruption through enhanced 3Cs in the Caribbean region.

Dr Nibedita S. Ray-Bennett

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Knowledge exchange events update:

The ADN organised eight knowledge exchange special session webinars with seven partners in Iran, the Caribbean, Switzerland, Uganda, Pakistan and the UK. These events featured 43 Speakers from 42 Organisations and 798 registrants.

Publications update:

The ADN team published two Bulletins, one Newsletter & Annual Report, two Technical Reports and one Refereed Journal Article on Sendai Targets A and B https://doi.org/10.1007/s13753-022-00432-3

Outreach update:

- ADN is selected to be on UNDRR's Voluntary Commitment Platform for Sendai Framework: https://sendaicommitments.undrr.org/commitments/20211123_001

- ADN is part of the University of Leicester's newly established Institute for Environmental Futures https://le.ac.uk/research/institutes/environmental-futures

Future Leader Programme update:

The ADN's Presidents Drs Nibedita Ray-Bennett and Hideyuki Shiroshita mentored in excess of 70 interns from 10 different countries. Of these, 19 interns are **Future Leaders** (18 years of age and above) and the remainder is **Junior Champions** (10-17 years of age). The noteworthy activities undertaken by the Junior Champions are the 5th-

grade children of Hama Elementary School in the Central part of Osaka who are producing Information, Education and Communication (IEC) materials and magazines for tsunami warnings. They are furthermore raising awareness and preparedness through simulation exercises and drills with "at risk" communities to create a culture of tsunami preparedness. The noteworthy activities undertaken by the Future Leaders over a period of two years are identifying and mapping the number of colleges and universities that offer programmes related to risk, crisis, disaster management, development, and avoidable deaths in the 10 eastern states of India and exploring the feasibility of developing a network of these colleges and universities for avoidable deaths, disaster risk reduction and sustainable development.

ADN India Hub update:

Led by Orissa State Volunteers Social Worker's Association (OSVSWA)

- Distributed 1,119 packed meals across 27 villages of the Kandamahal and Nayagarh districts.

- Distributed 1,500 information, education and communication flyers on 'How to Prevent Snakebite Deaths' across 11 districts targeting more than 250,000 people.

Water Engineering and Development Centre (WEDC)
Loughborough University
United Kingdom
https://www.lboro.ac.uk/research/wedc/

In the last year, the Water Engineering and Development Centre (WEDC) of Loughborough University has continued to deliver disaster-related research projects and have been awarded several new projects related to climate change adaptation and disaster risk reduction. In these research projects, the Loughborough University researchers work with international and multi-disciplinary teams to deliver innovative research, models and tools to help society to enhance resilience to natural hazards and climate change.

The Chair will establish and sustain an integrated, interdisciplinary research, education/training, and capacity enhancement programme to co-develop, disseminate, and support implementation of informatics technology solutions for multi-hazard risk assessment and management in Low- and Middle-income Countries, thus contributing to the UN's 2030 Agenda for Sustainable Development.

Award:

UNESCO has approved the application of establishing UNESCO Chair in Informatics and Multi-hazard Risk Reduction (IMRR) at Loughborough University, with Professor Qiuhua Liang being the chairholder. The core team of the UNESCO Chair comprises a multidisciplinary team of 14 academics at different career stages.

Prof. Qiuhua Liang
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Research projects:

- National Engineered Slope Simulator, The Wolfson Foundation (Neil Dixon; Alister Smith)

- UKRI Expert call to inform the progamme on Nature-based Solutions for Equitable Climate Resilience, NERC (involving Tim Marjoribanks; Bart Hill; Lee Bosher; Qiuhua Liang; Andrew Longley; Ksenia Chmutina; Robby Soetanto)

- NERC discipline hopping grant, NERC (involving Ksenia Chmutina)

- RAEng Diversity Impact Programme Award, RAEng (involving Ksenia Chmutina)

Representative Journal publications:

- Xiong, Y., Liang, Q., Zheng, J., Stolle, J., Nistor, I., & Wang, G. (2022). A fully coupled hydrodynamic-DEM model for simulating debris dynamics and impact forces. Ocean Engineering, 255, 111468.

- Su, X., Liang, Q., & Xia, X. (2022). A new GPU-accelerated coupled discrete element and depth-averaged model for simulation of flow-like landslides. Environmental Modelling & Software, 153, 105412.

- Zhao, J., Chen, H., Liang, Q., Xia, X., Xu, J., Hoey, T., ... & Zhou, X. (2022). Large-scale flood risk assessment under different development strategies: the Luanhe River Basin in China. Sustainability Science, 17(4), 1365-1384.

- Zhao, J., & Liang, Q. (2022). Novel variable reconstruction and friction term discretisation schemes for hydrodynamic modelling of overland flow and surface water flooding. Advances in Water Resources, 163, 104187.

- Ming, X., Liang, Q., Dawson, R., Xia, X., & Hou, J. (2022). A quantitative multi-hazard risk assessment framework for compound flooding considering hazard inter-

dependencies and interactions. Journal of Hydrology, 607, 127477.

- Xing, Y., Chen, H., Liang, Q., & Ma, X. (2022). Improving the performance of city-scale hydrodynamic flood modelling through a GIS-based DEM correction method. Natural Hazards, 1-23.

- Chen, H., Zhao, J., Liang, Q., Maharjan, S. B., & Joshi, S. P. (2022). Assessing the potential impact of glacial lake outburst floods on individual objects using a high-performance hydrodynamic model and open-source data. Science of The Total Environment, 806, 151289.

- Su, X., Xia, X., Liang, Q., & Hou, J. (2022). A coupled discrete element and depth-averaged model for dynamic simulation of flow-like landslides. Computers and Geotechnics, 141, 104537.

- Chmutina, K., von Meding, J., Williams, D. A., Vickery, J., & Purdum, C. (2022). From pity to fear: security as a mechanism for (re) production of vulnerability. Disasters.

- Chmutina, K., & von Meding, J. (2022). Towards a liberatory pedagogy of disaster risk reduction among built environment educators. Disaster Prevention and Management: An International Journal.

- Chmutina, K., Cheek, W., & von Meding, J. (2022). "Critique is not a verb": is peer review stifling the dialogue in disaster scholarship?. Disaster Prevention and Management: An International Journal.

- Booth, A., Bosher, L., & Chmutina, K. (2022). The protection of crowded places from terrorist threats: does protective security advice meet the needs of security managers?. Security Journal, 1-24.

- Cheek, W., & Chmutina, K. (2022). Measuring Resilience in the Assumed City. International Journal of Disaster Risk Science, 1-13.

- Li, S., & Smith, A. (2022). Relationship between acoustic emission and energy dissipation: a DEM study of soil–structure interaction. Acta Geotechnica, 1-20.

- Wang, H., Barone, G., & Smith, A. Current and future role of data fusion and machine learning in infrastructure health monitoring. Structure and Infrastructure Engineering - Maintenance, Management, Life-Cycle Design and Performance [accepted]

- Dixon, N., Smith, A., & Pietz, M. (2022). A community-operated landslide early warning approach: Myanmar case study. Geoenvironmental Disasters, 9(1), 1-15.

- Smith, A., Barone, G., Wackrow, R., & Stanley, R. (2022). Interpretation of uplift pipeline–soil interaction behaviour using acoustic emission measurements. Canadian Geotechnical Journal, 1-13.

- Dixon N, Smith A and Pietz M (2022) A community-operated landslide early warning approach: Myanmar case study. Geoenvironmental Disasters, 9(1), 1-15.

Events

Loughborough University and the International Centre for Integrated Mountain Development (ICIMOD) organized the workshop on 18 May 2022 to disseminate findings from the UK NERC funded WeACT (Web-based Natural Dam-Burst Flood Hazard Assessment and Forecasting System) project.

Global Disaster Resilience Centre (GDRC)
University of Huddersfield, United Kingdom
http://www.hud.ac.uk/gdrc

A). Projects

GDRC has been successful with the following funded projects during 2022:

An exploratory study into nature-inspired solutions for disaster risk reduction in coastal regions

The Project is an exploratory study to better understand the state of the art and potential

application of nature inspired solutions (NIS) to reduce the impact of coastal hazards. The project outcomes will identify key research gaps in NIS for disaster risk reduction (DRR), and provide a basis for the development of future, externally funded research project proposals.

Our role: Project lead

Funder: University of Huddersfield, URF Scheme

Partnership: 12 partners from 4 countries

20 years after - then and now : An explorative study of the status of communities relocated in the aftermath of the 2004 Indian Ocean Tsunami in Sri Lanka

No other time is more appropriate to delve into the lives of relocated communities and to explore the status of their lives 20 years after the Tsunami. The study expects to collect data from selected relocation settlements in Sri Lanka by paying specific attention to areas such as the status of relocation settlements - built quality of built environment , status of the infrastructure, livelihoods, social relations, host and relocated community relations, vulnerable groups such as children, elderly and disabled, challenges and impacts created by the

relocation process and locations of the settlements, coping strategies and adaptation measures employed by the communities etc.

Our role : Joint project lead with University of Colombo, Sri Lanka

Funder: University of Huddersfield

Partnership: 6 partners from 4 countries

International Network "Connect4Resilience" - Disaster Research, Climate Crisis & Social Work

The overall aim of the Connect4Resilience Network is to connect various stakeholders from research, policy, practice, and society to:(1) better prepare and plan for future disaster(s) and crises;(2) better integrate and establish knowledge and implementation capacities for resilient and sustainable DRR planning and doing; (3) build capacity and create awareness of the role of social work and social services in disaster contexts; ND (4) foster societal transformation on various scales (SDG1, SDG5, SDG10, SDG11, SDG17).

Our role : Partner

Funder: Swiss National Science Foundation (SNF).

Partnership: 9 institutions from 14 countries

Community engagement programme on public health emergencies in the context of multi-hazards in Sri Lanka

to promote community involvement in public health emergencies (such as epidemics and pandemics) by building up networks with affected communities, CBOs and local NGOs that are closely working with the selected community groups in selected multi-hazard-prone areas in Sri Lanka.

Our role : Project lead

Funder: University of Huddersfield

Partnership: 9 institutions from 2 countries
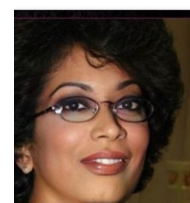
Prof. Dilanthi Amaratunga
Head
E-mail: d.amaratunga@hud.ac.uk

B) Events ; There have been a large number of events organised by GDRC during 2022. Some examples are listed below :

National event to commemorate the International Day for Disaster Risk Reduction (IDDRR) on Early warning and early action for all: Leave no one behind, Launched from Hotel Cinnamon

Lakeside, Colombo, Sri Lanka

The United Nations General Assembly has designated 13th October as the International Day for Disaster Risk Reduction (IDDRR) to promote a global culture of disaster risk reduction. It was an opportunity given to member countries to acknowledge the progress being made towards reducing disaster risk and losses in lives, health and livelihoods in line with the Sendai Framework for Disaster Risk Reduction 2015-2020. The 2022 edition of this international day focused on the objective of "substantially increasing the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030", which is the seventh and final target of the Sendai Framework under the core theme of "Early warning and Early action for all".

Organised by: Disaster Management Centre, Sri Lanka; **Days:** 13th October 2022 (Hybrid event)

Our role: event partner

International Research and Innovation Symposium on Dengue Amidst the Pandemic: Improving preparedness and response for multi-hazard scenarios – March 2022, Colombo, Sri Lanka

The main aim of this event was to discuss and debate on the impact of COVID-19 pandemic and other communicable diseases, such as dengue and malaria, and their role as part of overall multi hazard scenarios, integrating both natural and biological hazards.

Organised by: Project consortium of the UKRI/ EPSRC funded research collaboration: Improving COVID-19 and pandemic preparedness and response through the downstream of multi-hazard early warning systems, led by University of Huddersfield, UK; Ministry of Health Sri Lanka (National Dengue Control Unit, Anti Malaria Campaign, Disaster Preparedness & Response

Division); and National Science Foundation of Sri Lanka

Dates: 16-17 March 2022

Our role: Conference co-chairs (Profs. Dilanthi Amaratunga and Richard Haigh), Organising Committee (Thushara Kamalrathne, Asitha de Silva)

URL: http://pandemic-mhew.org/index.php/symposium-2022

13th International Conference on Sustainable Built Environment (ICSBE) 2022 , Kandy, Sri Lanka

ICSBE 2022's vision was to drive innovative research for tomorrow's development, to bring together experts, researchers and colleagues in the field of sustainable development, and to exchange workable concepts, innovative ideas in the line of sustainable built environment. Themes included: Sustainable construction; Urban green infrastructure & planning; Impacts of climate change; Climate risk management & mitigation; Sustainable infrastructure development & planning; Sustainable cities & villages.

Organised by: University of Peradeniya, Sri Lanka; University of Melbourne, Australia; University of Moratuwa, Sri Lanka; The Open University of Sri Lanka (OUSL); University of Ruhuna, Sri Lanka; University of Jayawardenapura, Sri Lanka and Council on Tall Buildings and Urban Habitat

Days: 16th to 18th December 2022.

Our role: event partner

URL: https://www.icsbe.org

COP27 - 27th Conference of the Parties of the UNFCCC

Egypt hosted the event in Sharm El-Sheikh, with a view to building on previous successes and paving the way for future ambition. It was an important opportunity for all stakeholders to rise to the occasion and tackle effectively the global challenge of climate change facilitated by Egypt on the African continent.

Organised by: the Government of the Arab Republic of Egypt

Dates: 6 – 20 November 2022

Role: Abhilash Panda led the Climate Financing and Infrastructure Resilience Pillars for UNDRR

URL: https://cop27.eg/ #/

Seventh Session of the Global Platform for Disaster Risk Reduction (GP2022) ; From Risk to Resilience: Towards Sustainable Development for All in a COVID-19 Transformed World

GP2022 was held under the theme "From Risk to Resilience: Towards Sustainable Development for All in a COVID-19 Transformed World" and was organised across three main sub-themes on: disaster risk governance; COVID-19 recovery; and DRR financing. The 2022 Global Platform provided a unique and timely opportunity to showcase the importance of international solidarity and cooperation, as well as to discuss ways to tackle underlying risk drivers, locally and globally, strengthen disaster risk governance, build stronger systems for managing all types of risks, and to recommit, with urgency, to accelerate progress toward the reduction of disaster risk and the achievement of the SDGs.

Organised by: UNDRR and hosted by The Government of Indonesia
Dates: 23-28 May 2022, Bali, Indonesia

Role: Abhilash Panda, organiser, moderator of the Technical Session on the Role of Anticipatory Financing for Disaster Recovery, noting that anticipatory financing is an important connector to successful humanitarian action.

URL: https://globalplatform.undrr.org

MHEWC-III: The Third Multi-Hazard Early Warning Conference

From Stock Take to Scaling Actions on Target G: Accelerating the Knowledge and Practice of Early Warning Systems for Risk Informed Resilience.

The MHEWC-III consisted of varied Sessions, Learning Events, and Receptions hosted by IN-MHEWS Partners and spread over two days. Sessions covered topics including: The state of play on early warning systems - progress on Target G and stocktake for the Sendai Framework Mid-Term Review; Status, gaps, and ways forward; High-level Panel on scaled-up action; and Public-Private engagement for early warnings. Learning Events covered topics including: The effectiveness of early warning systems; Impact-based Forecasting and Forecast-based Financing; Gender mainstreaming; Common Alerting Protocols (CAP); Words Into Action reports; and Innovation and next generation forecasting

Organised by: International Network for Multi-Hazard Early Warning Systems (IN-MHEWS)

Dates: 23-24 May, 2022, Held at the Bali International Convention Centre (BICC)

Role: Abhilash Panda - organizer

South Asian Heritage Month: Journeys of Empire

Based on our work in South Asian region, in celebrating the

South Asian Heritage Month (18th July-17th August 2022) , we organised a range of events and communications, including a research poster exhibition. Much of the exhibition was also made available online. There were 38 project posters, 12 PhD research project posters , and a Collection of role model profiles . 2022 theme was Journeys of Empire

Dialogue on Role of Disruptive Technologies in Disaster Risk Reduction

Presenters from academia discussed the use of technologies such as AI, XR, Drones and Big data in DRR while the DRR practitioners provided insights on how the IT, AI, and Big data applications are prominent as water solutions, weather solutions and in overall for DRR. Representatives from the Japanese local government and central government presented their views about the contribution and role of governance and civil society in capitalising disruptive technologies in disaster risk reduction.

Organiser: Keio University Japan. There were both on-site participants and online participants, including DRR learners and educators in Universities, as well as policymakers, and DRR practitioners in both private and public sectors

Our role: Joint workshop facilitators

Date: 1st of December, 2022, Keio University, Japan

Making Cities Resilient 2030 (MCR2030) Regional Coordination Committee – Europe Region meeting (RCC-ECA)

Taking stock of progress and partner engagement; Moving forward and planning for 2023-2024; and Engagement of the Resilience Hubs and their network in the region. Our intervention was on Disaster Risk Reduction new dimensions: COVID-19 Preparedness at local level.

Organiser: UNDRR, MCR 2030 Secretariat for Europe and Central Asia

Our role: Member and Facilitator, Professor Dilanthi Amaratunga   **Date:** 23rd November 2022

Introduction to academic publishing: Why publish, selecting a journal, publication or article type, and writing philosophy

Continuing Professional Development for the Institute of Engineers, Sri Lanka, the apex national body of engineers in Sri Lanka.

Organiser: The Institute of Engineers, Sri Lanka

Our role: Sole facilitator, Professor Dilanthi Amaratunga   **Date:** 23rd November 2022

Certificate course on Scientific Writing: Evaluation of research proposals

Continuing Professional Development for the Institute of Engineers, Sri Lanka, the apex national body of engineers in Sri Lanka.

Organiser: The Institute of Engineers, Sri Lanka

Our role: Sole facilitator, Professor Dilanthi Amaratunga   **Date:** 17th September 2022

5th International Workshop on Building Resilience in Tropical Agro-Ecosystems,

Organised by: University of Huddersfield and the University of Central Lancashire, Preston, UK

Building Resilience in Tropical Agro – ecosystems (BRITAE) project covers many prioritized areas such as Education, Agriculture, Forestry and Environment and some of these key concepts were discussed and deliberated during the workshop. https://www.britae.lk/wp-content/uploads/2022/10/Agenda.pdf

Our role: Workshop lead   **Date:** Sept 2022, University of Huddersfield, UK

Building Resilience in Tropical Agro-Ecosystems Technical visit to Scotland

Swanston Farm, The Royal Botanic Garden Edinburgh, Whitelee Wind Farm.

Our role: Site visit organizer **Date:** Sept 2022, University of Huddersfield, UK

Workshop on Inclusive Disaster Digital Education

Organiser: Lund University, Sweden. There were on-site participants as well as online participants, including DRR learners and educators in Universities. **Our role:** Facilitators for the event and a co-orgnaiser **Date:** 15th of June, 2022

Financial incentives as a strategy to promote disaster resilience of the house sector

A research collaboration event with the National Building Research Organisation (NBRO) on potential DRR based research collaboration. NBRO is the designated national focal point for landslide risk management in Sri Lanka

Organiser: National Building Research Organisation, Sri Lanka

Our role: Facilitators – Shavindree Nissanka & Professor Dilanthi Amaratunga

Date: 19th April 2022, 2.15 pm**,** National Building Research Organisation, Head Office

Tsunami Ready Community Launch Event Programme in Sri Lanka, State Ministry of Disaster Management, Sri Lanka

Indian Ocean Tsunami Ready Programme, led by the ICG/IOTWMS, encourages member states to commit to implement the UNESCO-IOC Tsunami Ready guideline and indicators.

Organiser: Disaster Management Cente, Government of Sri Lanka

Our role: Joint organiser   **Date:** 20 April 2022

Workshop on climate change and its impact on the built environment

Organized by: The University of Moratuwa, Sri Lanka

Our role: Facilitaors and joint organsiers – Professor Dilanthi Amaatunga, Dr Chamindi Malalgoda & Shavindree Nissanka, with more than 55 stakeholders representing policymakers, national and local government officials, UN organisations and NGOs in Sri Lanka who are linked to Climate Change Adaptation **Date:** 3rd March 2022, Colombo, Sri Lanka

C) key notes : In 2022, GDRC members were invited to deliver, several high profile key note speeches. Some examples are listed below:

Protecting coastal communities from the impacts of climate change

Title of the event: Universities UK International research collaboration webinar: UK-Indonesia by Prof. Richard Haigh **Organised by:** Universities UK on 8th November 2022 [Online]

Disaster trends and drivers: The role of Science and Technology in Disaster Risk Reduction, and a new agenda for the science and policy community on DRR

Prof. Dilanthi Amaratunga at the **event:** International Conference on Disaster Management (ICDM 2022) **Organised by:** University of Andalas, Padang, Indonesia from 30 September – 1st October 2022 [Online]

Challenges to Disaster Risk Reduction and Resilient Habitat Prof. Dilanthi Amaratunga

Title of the event: International conference on Challenges to Disaster Risk Reduction and Resilient Habitat **Organised in:** collaboration with N*ational Institute of Disaster Management, Government of India,*

International Geographical Union Commission on Hazard and Risk, UNDRR, Centre for Disaster Management Studies, University of Delhi, India in April 2022 [Online]

Sustainable Development Goals and the Role of Sustainable Technologies: How Technology can fast track the SDGs Prof. Dilanthi Amaratunga

Title of the event: Thrive the SDGs, Engineering and Technology **Organised by:** University of Kelaniya, Sri Lanka in March 2022 [Online]

Challenges and approaches to disaster risk reduction in the global South

Prof. Dilanthi Amaratunga

Title of the event: Natural Hazards and Disaster Risk Reduction in the East African Rift: Challenges, Methods and Policies Natural Hazards and Disaster Risk Reduction in the East African Rift: Challenges, Methods and Policies – East Arica Seismic Risk Partnership **Organised by:** University of Bristol and UKRI on 4th March 2022.

(D) Notable international roles commenced in 2022

Appointed Expert (one of the two from the UK) of UN Women - Women's Resilience to Disasters Programme—Prof. Dilanthi Amaratunga UN Women, The Women's Resilience to Disasters (WRD) programme proposes a comprehensive package to strengthen women's resilience to disasters and threats, including climate change and COVID-19. It advances women leadership and gender-responsiveness in global disaster risk reduction and climate change processes and frameworks. . It strengthens coordination across key stakeholders working to build the enabling environment for women's resilience to disasters.

Appointed leads, IOC UNESCO IOTWMS Survey to better understand local responses in tsunami warning services, evacuation, and sheltering to COVID-19 in Sri Lanka - Professor Richard Haigh & Professor Dilanthi Amaratunga

The survey also looked to understand local level uptake of the guidelines which were issued by the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) in June 2020. The survey was launched in recognition of the COVID-19 response having resulted in a shift of priorities, alterations in work patterns, processes and venues, the introduction of physical distancing, self-isolation, and quarantine measures, as

well as temporary lockdowns of entire communities. This has the potential to create ambiguity or confusion with regards to tsunami warning services and response actions like evacuation, under co- existing COVID-19 protocols. The study targeted the fourteen of Sri Lanka's twenty-five districts that are located on the coastal belt, and potentially exposed to a tsunami threat. The survey was designed and conducted by GDRC in conjunction with ICG/IOTWMS Working Group 1 Tsunami Risk, Community Awareness and Preparedness, the Institute of Technology Bandung, Indonesia, and Disaster Management Centre of Sri Lanka.

Two Members, Expert Group on Principles for Resilient Infrastructure—Professor Dilanthi Amaratunga & Professor Richard Haigh

UNDRR, University College London and the Institution of Civil Engineers. The Principles for Resilient Infrastructure are being developed to: Assist in raising awareness and setting a common basic understanding of what "resilient infrastructure" constitutes; Form the basis for planning and implementation of infrastructure projects that take resilience as a core value; Communicate the desired outcomes of national infrastructure systems to establish resilience of critical services; and, Assist the public and private sectors in making risk-informed policy and investment decisions. A handbook will be developed to allow designated Ministries in National Governments, Infrastructure Regulators, Investors and other stakeholder to implement these principles and monitor its inclusion.

E). Publications

Like with the previous years, there have been a large number of publications written by our members during 2022, including: Books and book chapters; Refereed research papers; Editorials; Conference proceedings; Vision papers, Briefing Papers, and Research reports, and are available at: https://pure.hud.ac.uk/en/organisations/global-disaster-resilience-centre

Some examples are listed below :
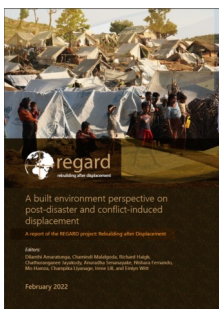
- Amaratunga, D., Malalgoda, C., Haigh, R., Jayakody, C., Senanayake, A., Fernando, N., Hamza, M., Liyanage, C., Lill, I. & Witt, E. (2022). A built environment perspective on post-disaster and conflict-induced displacement. A report of the REGARD project: Rebuilding after Displacement. ISBN: 978-1-86218-208-0. https://pure.hud.ac.uk/en/publications/a-built-environment-perspective-on-post-disaster-and-conflict-ind

- Amaratunga, D., Haigh, R. Nissanka, S. Ross, C., Conlon, M., Dissanayake, R. & Crouch, S. (2022), Rethinking Construction to Reduce Disaster Risks: A Guide for Built Environment Professionals (2022). ISBN: 978-1-86218-215-8: University of Huddersfield, UK. https://www.preventionweb.net/publication/rethinking-construction-reduce-disaster-risks-guide-built-environment-professionals

- Amaratunga, D., Haigh, R., Kamalrathne, T., Fernando, N., Jayasinghe, N., Siriwardana, C., Jayasekara, R., Herath, H., Ranaweera, P., Ariyasinghe, U., Rathnayake, S., Rupasinghe, C. & Kodithuwakku, L. (2022). Policy Brief: Current status and recommendations on the integration of pandemics within national/local DRR strategies in Sri Lanka: University of Huddersfield, UK. http://www.pandemic-mhew.org/images/2022/09/30/PolicyBriefCorona2V6.pdf

- Amaratunga, D., Haigh, R., Kamalrathne, T., Fernando, N., Jayasinghe, N., Siriwardana, C., Jayasekara, R., Herath, H., Ranaweera, P., Ariyasinghe, U., Kodithuwakku, L., Rathnayake, S. & Rupasinghe, C.(2022).A Vision Paper on the Integration of Pandemics into a Multi-Hazard Early Warning (MHEW) Environment for Sri Lanka: University of Huddersfield, UK. http://www.pandemic-mhew.org/images/2022/09/30/VisionPpaerV4.pdf

- Dissanayake, R., De Zoysa, C., Abeysinghe, S., Haigh, R., Amaratunga, D. & Perera, T. (2022), Briefing Paper: Integrating pandemic, tsunami, and

other multi-hazard preparedness into urban planning in Sri Lanka: Ministry of Rural Roads and other Infrastructure, Sri Lanka . http://www.pandemic-mhew.org/media/attachments/2023/01/11/finalurbandevpolicy.pdf

- Fernando, S., Vithanage, C., Ratnayake, J., Ranawana, C., Fernando, N., Jayasinghe, N., Haigh, R. & Amaratunga (2022), COVID 19: Economic Preparedness and Building Resilience - Ensuring Disaster Preparedness and Business Continuity: Recommendations for the Private Sector: Ceylon Chamber of Commerce, Sri Lanka. http://www.pandemic-mhew.org/images/2022/08/21/position_paper_2.pdf

- Malalgoda, C., Amaratunga, D., Haigh, R., Senanayeke, A. & Jayakodi, C. (2022) Upgrading Professional Competencies in the Built Environment to Address the Needs of Host and Displaced Communities. University of Huddersfield. A Policy Brief. https://pure.hud.ac.uk/en/publications/policy-brief-upgrading-professional-competencies-in-the-built-env

- Siriwardana, C., Jayasekara, R., Amaratunga, D., Haigh, R. & Perera, T. (2022).Preparedness Planning Associated with Systemic Risks and Actions during the COVID-19 Pandemic in Sri Lanka – Policy brief, University of Moratuwa. http://www.pandemic-mhew.org/media/attachments/2023/01/11/policypaper.pdf

We are also pleased to share the 2022 Annual Report of the Global Disaster Resilience Centre has been published, detailing our 2022 activities. This reflects the work from all our members and research collaborators.

The report can be viewed at: http://gdrc.buildresilience.org/gdrc-report-2022/

A news article about the Report is available at:

https://www.hud.ac.uk/news/2023/february/gdrc-annual-report-2022-published/

Disaster and Development Network (DDN)
Northumbria University
United Kingdom
https://www.northumbria.ac.uk/ddn

The Disaster and Development Network (DDN) spans research, enterprise and teaching orientated by the disaster management and sustainable development nexus. Operating from Northumbria University's Department of Geography and Environmental Sciences since 2000, the network engages the work of the Disaster and Development Centre (DDC)(2004-2012), Disaster and Development Postgraduate programme of study (2000-present), Disaster, Development and Sustainability (DDR) research group (2012-present), affiliated student led Disaster and Development Society (DDS)(2015-present), and an inter-Faculty Geographies of Development and Disaster (DDG) Research Excellence Framework (REF) cluster (2018-present).

The predominant effort of the DDN is to progress the knowledge and skills that engage hazards, disasters and complex emergencies from the perspective of intersecting disasters and development experiences and narratives spanning science, practice and policy environments. It is committed to delivering impact on future survivability and resilience of people and systems facing critical levels of rapid and slow onset environmental, economic, and political change. Some achievements and updates for 2021 include:

Indicative research:

Francis Massé – "Identifying and mitigating the impacts of COVID-19 on legal and sustainable wildlife trade in LMICs". This includes a new PhD Scholarship, Mridula Paul, supervised by Francis and Andrew.

Katie Oven – UKRI-NERC GCRF "Sajag-Nepal– Planning and preparedness for the mountain hazard and risk chain in Nepal". This includes one full time researcher, Amy Johnson, a PhD Researcher, Bina Limbu and new Research Fellow, Katherine Arrell.

Andrew Collins is a Co-I with the UKRI-NERC, GCRF "Tomorrow's Cities, Multi-hazard Urban Risk Transitions" research hub. This includes supervision of a PhD being conducted by Becky Richardson, focusing on "child-centred approaches to health risk communication in Nairobi primary schools" and through support to the TC Decision Support Environment in the implementation period of the project.

Prof. Andrew Collins
E-mail: andrew.collins@northumbria.ac.uk

Kevin Glynn – progressed the field research aspects of the UKRI GCRF project "Ixchel: Building understanding of the physical, cultural and socio-economic drivers of risk for strengthening resilience in the Guatemalan cordillera".

Richard Kotter - advanced new initiatives for local and external engagement alongside UK and South Asia based Emergency Services.

New collaborative research links were also established during this period, with University of Missouri USA, Farmers Voice Bangladesh and IIT-Roorkee India. The network is also active with the wider Northumbria University collaborations, including with the International Centre for Climate Change and Development (ICCCD) Bangladesh and the UK Universities Climate Network whilst continuing active with its longer standing affiliations and memberships, particularly GADRI, United Kingdom Alliance for Disaster Research (UKADR) and long term local friends and partners locally and around the world.

UK Research Excellence Framework (REF) results of May 2022 indicated an outstanding surge in Northumbria's overall research performance, including in its disaster and development field:

Northumbria University for the second time in a row achieved the highest increase in Research Power across all UK universities in this once in 7 year assessment exercise. Its submission in the Geography unit of assessment within which

its disasters research sits was ranked 2nd in the UK for research power (just below the 1st place Oxford Colleges consortia for Geography). The Geographies of Disaster and Development theme formed one of several hazards, people and environment related aspects of the submission. The performance was ranked particularly strong in terms of **Research Impact**, with the bulk of Impact Case Studies ranked '**World Leading**'. One example is the Impact Case Study centred on "Embedding a people-centred approach to health in Disaster Risk Reduction at the Local and International scales". A summary version of that impact is at: https://www.northumbria.ac.uk/research/research-impact-at-northumbria/societal-impact/new-people-centred-global-policies-prepare-communities-better-for-diasasters/

The outstanding research assessment results in this round is likely to have significantly contributed to achieving the Times Higher Education (THE) Award of UK **University of the Year**.

13th Dealing with Disasters Conference, Northumbria University 9th-10th June

Theme: Next Generation Disaster Prevention and Recovery:

The 13th conference in the series was delivered in hybrid mode there being a mix of delegates on site at Northumbria City Campus and online across multiple time zones.

The event accepted over 300 registrations from 58 countries. There were 13 sessions and 60 speakers spanning focal topics elaborating the conference theme within the current precarity of pandemic, climate and conflict. Some of the highlights included:

- Opening presentation on Day One by Sir Andrew Haines, recipient of the Tyler Prize for Environmental Achievement

- Opening presentation on Day Two by Dr Robert McFarlane OBE, DWP UK, a recent Cabinet Office lead for UK Resilience and former staff member of Northumbria's Department of Geography and Environmental Sciences and member of DDN

- A special WHO Session on Health Emergency and Disaster Risk Management (Health EDRM) involving inputs from WHO Head Office, the UK, Japan, Hong Kong, Australia, Canada, USA and Sweden.

- A session on Disaster-related Employability celebrating 22 years of Disaster Management and Sustainable Development at Northumbria, chaired by Eileen Brady from the first intake of students in 2000 and a current registrant Jacinta Lepcha with 12 inputs from former students of varied nationalities presenting on their current professional roles across the sector in Europe, Asia, Africa, America and the Caribbean.

Developments in Research and Practice based Teaching and Learning:

The **MSc Disaster Management and Sustainable Development (MSc DMSD)** established 23 years ago (2000), recruited a further 29 students in the September intake, with a high number of international students. An increasing number of the students now also select the additional work of "Advanced Practice", which increases their final credits to 240 instead of 180 and involves a 2nd year of registration. The recent overlapping pool of students for part of the year therefore became **60 registered taught postgraduate students at one time.** These recent high numbers represent a record expansion for this programme. A further **78 undergraduate students** selected disaster and development studies amongst their specialist final year option modules.

Published and media outputs:

A wide range of newly published articles in well ranked journals are available. Media engagement this year included for the BBC World Service, BBC Radio Four, Sky News and various local outlets including comment on current emergencies, a campaign on homelessness and disaster and a debate regards changing mortality data in contexts of climate related disasters. An input was also made on data and society in disaster prevention and response to the United Nations General Assembly Science Summit in Sept, 2022.

Overseas Development Institute
United Kingdom
https://www.odi.org/
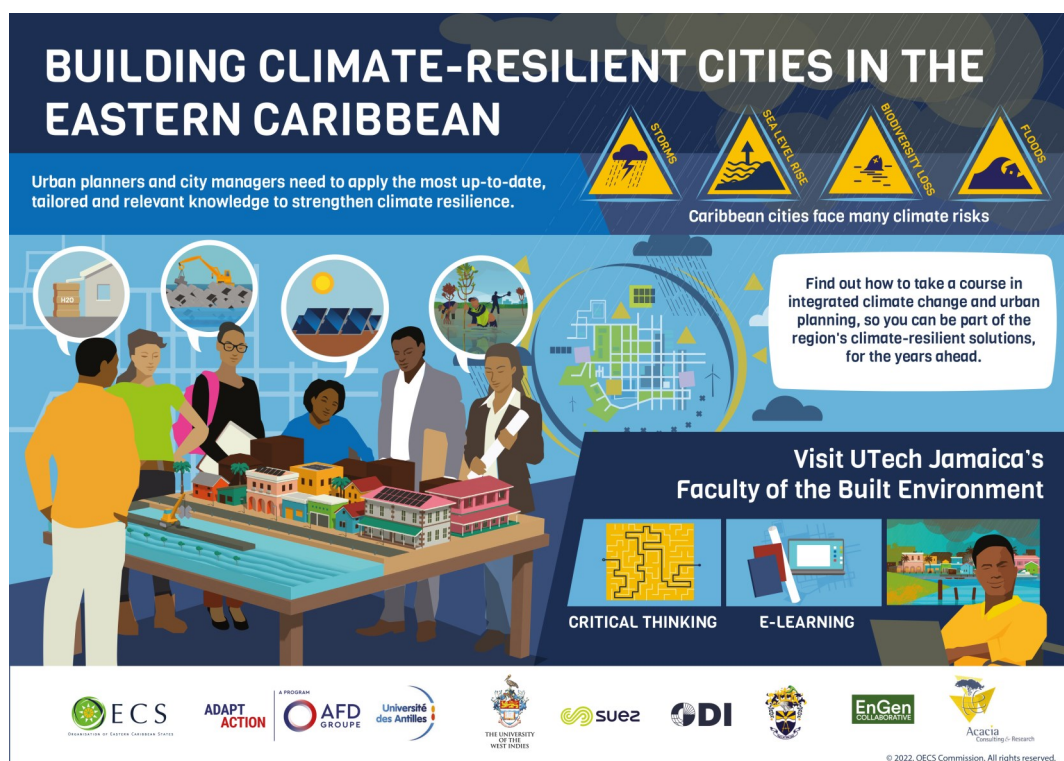
One of several events hosted by ODI at the UN climate conference COP27, on climate change adaptation in fragile and conflict-affected states.

One of a series of infographics created as part of the project to build climate-resilient cities in the Eastern Caribbean.

ODI's **Global Risks and Resilience Programme** published a range of publications, blogs, media and podcasts in 2022, including:

Publications:

- Opportunities and co-benefits of transitioning to a net-zero economy in Kyrgyzstan, Tajikistan and Uzbekistan

- Managing climate risks to protect net-zero energy goals

- Exploring the conflict blind spots in climate adaptation finance in the Sahel and Horn of Africa

- IPCC Sixth Assessment Report: factsheets for decision-makers

- Anticipatory action and disaster risk finance: Guiding the setting of humanitarian targets

- Rethinking climate-security narratives: integrating systemic disaster risk management in development

- Climate adaptation investments in conflict-affected states

- The Caribbean - a region of excellence for urban climate resilience: lifelong learning for urban planners

- Climate risk report for the Middle East and North Africa (MENA) region

- Embracing discomfort: a call to enable finance for climate-change adaptation in conflict settings

Country platforms for climate action: something borrowed, something new?

Ms. Emma Lovell
E-mail: e.lovell@odi.org.uk

Blogs:

- Operationalising the new 'Loss and Damage' fund: six questions

- COP27: adapting to a new climate reality

- Common symptoms, related cures: after climate summit, governments convene on biodiversity

- Women's economic empowerment: the missing piece in low-carbon plans and actions

- Securing Somalia's future under climate risks and natural capital depletion

- Putting food systems at the heart of climate dialogue and action

- As attention turns to Small Island Developing States at HLPF, the international community must step up its commitment

- Climate change is causing havoc worldwide – we can still limit the damage

Mixed multimedia resources:

- Building climate-resilient cities in the Eastern Caribbean through enhanced urban planning knowledge

- **Podcasts**:

- Think Change episode 15: the climate and conflict double challenge – has COP27 delivered?

- Think Change episode 14: climate loss and damage – who should pay?

Projects

- The programme continues to run numerous multi-year projects/initiatives, including:

- ODI is the research and communications lead for Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises (SPARC) (2020 – 2025), which aims to generate evidence and address knowledge gaps to build the resilience of pastoralists, agro-pastoralists and farmers in Africa and the Middle East

- Adaptation Without Borders, an ODI, SEI and IDDRI collaboration supporting policymakers and planners to more effectively identify,

assess and manage transboundary climate risks

- ODI is the knowledge management and communications lead for the Climate Ambition Support Alliance (CASA), which seeks to strengthen the capacity and support the engagement of climate-vulnerable countries in international climate negotiations

- ODI's Global China 2049 Initiative

- ODI has been leading work with GIZ on rethinking climate-security narratives and integrating systemic disaster risk management in development

- ODI is hosting Resilient and Sustainable Islands Initiative (RESI)

- Emily Wilkinson is supporting the Climate Resilience Execution Agency for Dominica (CREAD) as Chief Scientific Adviser.

Events

- ODI attended the UN climate conference COP27, where the Global Risks and Resilience team spoke in or co-organized nine events, which featured Minister-level representation from Niger, Somalia and the UK (See 'Anticipating crises and taking early action in fragile and conflict affected states'), as well as high-level representatives from international organisations including the International Committee of the Red Cross, UK Foreign and Commonwealth Office, the French Development Agency, the Stockholm Environment Institute, UN OCHA and the UN Climate Security Mechanism and the Adaptation Fund.

- ODI hosted an event, 'Pre-agreed disaster finance: The agenda that women's advocates should be influencing'.

- ODI hosted an event, 'Building resilience and employment opportunities for youth within rural economies in the Sahel'.

- ODI and the British Red Cross hosted a webinar and panel discussion on Changing climate, changing realities: migration in the Sahel, which explored how people are affected by climate change and the pressure on people to leave their homes.

- ODI attended the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) and Katie Peters chaired a meeting of senior officials on the topic of Disaster Risk Reduction in Crisis and Conflict Settings

- In Senegal, Katie Peters presented the findings of a year-long study (forthcoming) assessing the progress made in 7 Sahelian countries against the Sendai Framework for Disaster Risk Reduction and corresponding African Programme of Action.

- In a virtual 'Think Resilience' dialogue, Katie Peters presented on the topic of disaster risk governance in fragile contexts to a group of over 15 Ambassadors in New York, in a dialogue series convened by UNDRR and the Ford Foundation.

- ODI hosted a session at the World Bank Fragility Forum named 'Addressing the Compound Risks of Fragility and Climate Change'

Key media achievements:

- Rebecca Nadin was interviewed about China's climate change priorities for PBS in November: 'China pressured to reduce its carbon emissions at global climate change summit'

- Emily Wilkinson was widely quoted on loss and damage in Small Island Developing States during COP27 in November, including The Times, The Guardian.

- Olena Borodyna was interviewed for Climate Home News about the energy crisis in August; Emily Wilkinson was interviewed for the same publication about Hurricane Ian in September.

- Content from ODI researchers appeared in a number of external publications and partner websites, including Climate Home News, The Conversation, Devex, CDKN and more

Disaster Resilience Research Group
University of Salford
United Kingdom
https://www.hub.salford..ac.uk/

Year 2022 has been a remarkable year for us. We are grateful that the UK Research and Innovation Global Challenges Research Fund continues to support our investigative work into socio-technical systems that help risk-sensitive urban development. Our partners in Sri Lanka, Pakistan, and Malaysia collaborate with local stakeholders to promote participatory methods that support sustainable development plans. These strategies help build resilience against climate change's effects, which we communicate at local levels through our community engagement work.

During this year, the group has been working on strengthening its international collaborations, developing new research initiatives, conducing planned research activities, disseminating research outcomes and contributing to the academic publications. Majority of our work this year centered around two of our research projects, TRANSCEND (https://transcend-project.org.uk/) and MOBILISE (https://www.mobilise-project.org.uk/).

We have started year 2022 with a TRANSCEND Seminar: The ground reality of "success" in resettlement projects – the role of community engagement. Dr Kaushal Keraminiyage facilitated this seminar and Mr Kishan Sugathapala, Director National Building Research Organisation (NBRO), Sri Lanka and Ms Devindi Geekiyanage from the Think Lab, have presented at this seminar.

One of the highlight of year 2022 is that we have launched our Mobilise 3.0 platform (https://hub.salford.ac.uk/mobilise/) and the "Me`ga" mobile app, to strengthen the local disaster risk reduction efforts globally. MOBILISE 3.0 is a digital platform which provides users with a collaborative environment so they can build their intelligence in disaster risk reduction and, ultimately, save lives .

We worked with Kalutara District in Sri Lanka to pilot the MOBILISE digital platform and help to build climate resilience and community-based early warnings systems. Thanks to our partners, the National Building Research Organisation (NBRO) and the Kalutara District Secretariat, together we have successfully secured an innovation grant to pilot the MOBILISE platform to strengthen community-based disaster risk reduction activities. This project will help local agencies and communities to work together to build their resilience against climate-induced disasters such as landslides and floods.

Dr. Kaushal Keraminiyage
E-mail: k.p.keraminiyage@salford.ac.uk

Three "Living Labs" have been established in Kalutara (Sri Lanka), Sarawak and Selangor (Malaysia) and Peshawar (Pakistan) to implement MOBILISE and TRANSCEND project deliverables. These Living Labs will help us to test and disseminate our research outcomes to the target groups and create real world impacts.

The 'TRANSCEND Sarawak 2022' launch event was successfully concluded at the Digital Village, Kuching Sarawak. The project highlights the processes, governance,

policies, and technologies involved with disaster risk reduction that help with sensitive and transformative urban developments.

We thank our partners Universiti Teknologi Malaysia (UTM), for conducting the workshop: 'Advancing Urban Resilience and Disaster Informatics Technology' which covered our work in the Selangor region and the support systems that are in use for effective disaster management and disaster relief.

SDPI Pakistan 'Sustainable Development in Unusual Times: Building Forward Better' took place in Islamabad, Pakistan. A collaboration with the United Nations, it aims to raise awareness of Progress on the Sustainable Development Goals Agenda across the South Asia region. Our team presented two interactive workshops, which were centered around the themes of Technology for Adaptive Governance and Community Engagement for Resilience Building.

Following are some of the research training activities and seminars have been conducted by our team within 2022:

- A monthly seminar series (10 seminars) has

been delivered to strengthen the research capacity of our partner, National Building Research Organisation (NBRO), Sri Lanka.

- A two-day training event was conducted which looked at Stakeholder Initialization and Systems Thinking for Adaptive Resilience.

- A TRANSCEND seminar was conducted on Strengthening Urban Resilience in the World Heritage Sites, in collaboration with the Disaster Preparedness and Prevention Center, Malaysia -Japan International Institute of Technology (MJIIT) and Universiti Teknologi Malaysia (UTM).

- Online seminar was conducted on collaborative governance structures to facilitate stakeholder collaboration in risk-sensitive urban planning.

Following are some of the publications for year 2022:

- Dasandara M, Ingirige B, Kulatunga U, Fernando T. (2022). Climate financing barriers and strategies: the case of Sri Lanka. Journal of Financial Management of Property and Construction, doi: 10.1108/jfmpc-12-2021-0069

- Sridarran, P., Keraminiyage, K., & Amaratunga, D. (2022). Dissatisfaction after post-disaster resettlement. In Investing in Disaster Risk Reduction for Resilience (pp. 213-235). Elsevier.
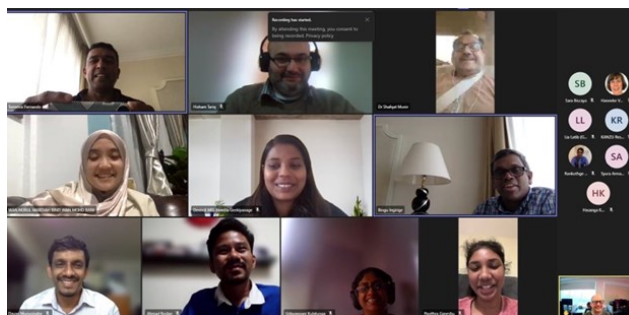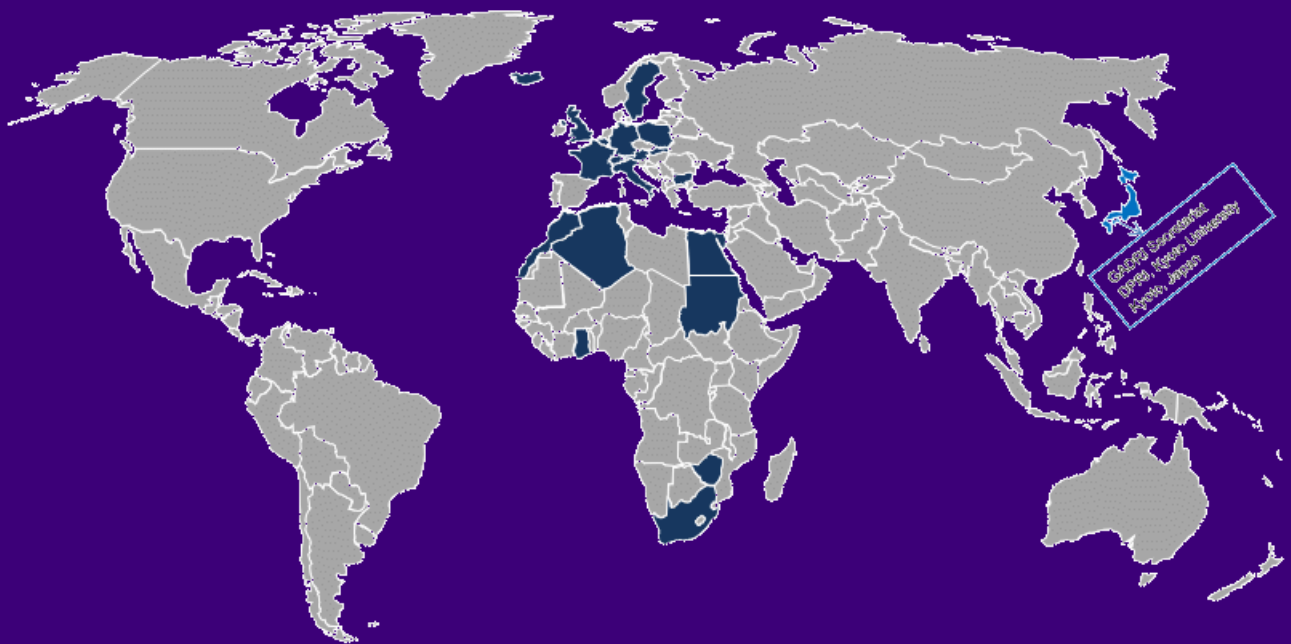
Africa
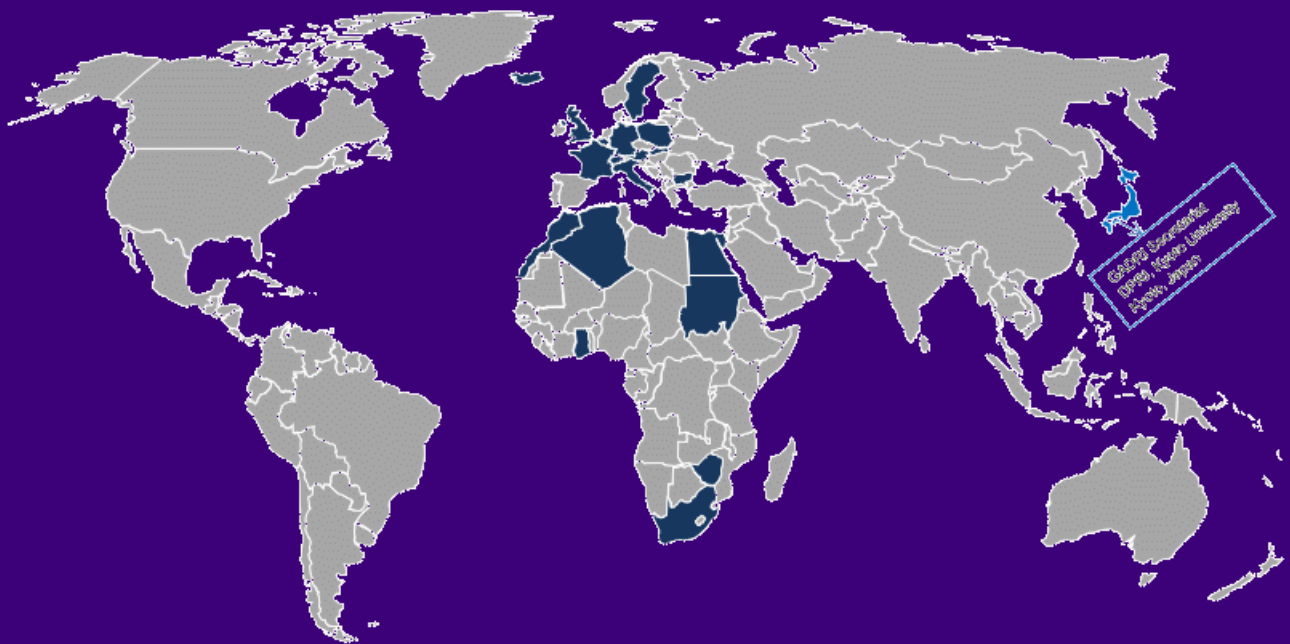
Africa

Africa

Algeria	Faculty of Civil Engineering, Built Environment Research Laboratory (LBE), University of Science & Technology Houari Boumediene (USTHB)
Egypt	Faculty of Engineering, Alexandria University
Egypt	Geology Department, Faculty of Science, Assiut University
Egypt	German University in Cairo (GUC)
Egypt	Water Resources Research Institute (WRRI), National Water Research Center（NWRC), Ministry of Water Resources and Irrigation
Ghana	University for Development Studies (UDS)
Ghana	Department of Geography & Resource Development, University of Ghana
Ghana	Hydrology and Water Resource Engineering, Water Research Institute, Council for Scientific and Industrial Research (CSIR)
Morocco	Faculty of Sciences and Technics of Mohammedia, University of Hassan II of Casablanca
South Africa	Disaster Management Training and Education Centre for Africa (DiMTEC), University of the Free State
Sudan	UNESCO Chair in Water Resources
Zimbabwe	Geography Department, Bindura University of Science Education African Alliance of Disaster Research Institutes (AADRI)

Africa Alliance for Disaster Risk Institutions (AADRI), Bindura University, Zimbabwe

https://www.aadri.org.zw/

Important Achievements

Published national books entitled:

1.Manatsa, D., Mushore, T.D., et al. (2020). Revision of Zimbabwe's Agro-Ecological Zones. ISBN 978-1-77920-535-3

2.Manatsa, D., Mushore, T.D., et al. (2020). Building Resilience to Natural Disasters in populated African Mountain Ecosystems: Case of Cyclone Idai'. TSURO Trust Research Report, ISBN 1-177925489-4

Conferences

AADRI actively contributed and participated in the 5th Global Summit of GADRI that took place virtually from the 31st August to 2 of September 202 and especially supported the regional session on Europe with Africa and the Middle East. Prof. Manatsa was a panelist of the discussion panel session 1 of Asia and Oceania; and the Europe with Africa and the Middle East. Prof. Chipo Muzenda moderated the panel discussion session four on Bridging the General Gap of the Europe with Africa and the Middle East. Further details of the 5th Global Summit of GADRI can be found at the newsletter, GADRI Actions 15 issue at GADRI website.

Projects including ongoing research grant projects:

1. World Ban funded Project: Mavhura E. Manatsa D. Manyangadze T. (2021). A Technical Assessment for updating Drought Risk Mapping in Zimbabwe SPF – Support to Zimbabwe Recovery and Resilience Grant No.: P172176. (completed)

2. World Ban funded Project: Mavhura E. Manatsa D. Manyangadze T. (2021). Institutionalization of the Combined Drought Index in Zimbabwe. SPF – Support to Zimbabwe Recovery and Resilience Grant No.: P172176. (ongoing 2022)
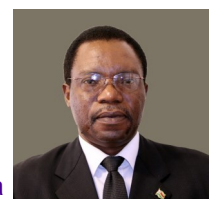
Prof. Desmond Manatsa

Acting President

Email: dmanatsa@gmail.com

Publications

- Munsaka, E., Mudavanhu, C., Sakala, L. et al. When Disaster Risk Management Systems Fail: The Case of Cyclone Idai in Chimanimani District, Zimbabwe. Int J Disaster Risk Sci 12, 689–699 (2021). https://doi.org/10.1007/s13753-021-00370-6

- Manyangadze, T., Mavhura, E., Mudavanhu, C. et al. An exploratory analysis of the spatial variation of malaria cases and associated household socio-economic factors in flood-prone areas of Mbire district, Zimbabwe. GeoJournal (2021). https://doi.org/10.1007/s10708-021-10505-3

- Mavhura E, Manyangadze T (2021). A comprehensive spatial analysis of social vulnerability to natural hazards in Zimbabwe: Driving factors and policy implications,

- International Journal of Disaster Risk Reduction, 56, https://doi.org/10.1016/j.ijdrr.2021.102139.

- Mavhura, E., Manyangadze, T. & Aryal, K.R. Perceived impacts of climate variability and change: an exploration of farmers' adaptation strategies in Zimbabwe's intensive farming region. GeoJournal (2021). https://doi.org/10.1007/s10708-021-10451– 0

- Mavhura, E., Manyangadze, T. & Aryal, K.R (2021) A composite inherent resilience index for Zimbabwe: An adaptation of the disaster resilience of place model. International Journal of Disaster Risk Reduction, Vol 57, https://doi.org/10.1016/j.ijdrr.2021.102152.

University of Development Studies (UDS)
Ghana
http://www.uds.edu.gh/ktcsr

The Kazuhiko Takeuchi Centre for Sustainability and Resilience (KTCSR) is a research Centre in the University for Development Studies (UDS). It was established as a Research, Development and Extension Centre for issues of Sustainability and Resilience in Climate and Ecosystem Changes and Disaster Risks Reduction.

During the period under review these were the activities undertaken by KTCSR ;

1. *AIMS collaborated with KTCSR to organize training on the UNESCO Recommendation on Science and Scientific Researchers (RSSR)*

African Institute for Mathematical Sciences Ghana (AIMS – Ghana) collaborated with Kazuhiko Takeuchi Centre for Sustainability and Resilience (KTCSR), University for Development Studies (UDS), to organize a training and sensitization workshop on the UNESCO's 2017 RSSR at the University for Development Studies, Dr. Naa Andani Chamber, Central Administration, Tamale on 3rd November, 2022.

Group picture of participants at the training workshop

Prof. Hamdiyah Alhassan
Director
Email: ahamdiyah@uds.edu.gh

2. Multi-Stakeholder Dialogue on Climate Change

On Friday, 23rd September 2022, Youth Advocacy on Rights and Opportunities (YARO) in partnership with Friedrich-Ebert Stiftung (FES) Ghana Foundation collaborated with Kazuhiko Takeuchi Centre for Sustainability and Resilience (KTCSR) and Ghana Agricultural Workers Union

Group picture of the participant at the dialogue

(GAWU) and brought together experts and practitioners in the development practice space for a critical assessment of climate change and new strategies to mitigate and adapt to its effects in Northern Ghana. The dialogue included short expert presentations by specialists and structured discussion sessions on the challenges of climate change and strategies farmers in northern Ghana are currently using to mitigate and adapt to the effects of climate change. The theme of the dialogue was "Building inclusive climate change mitigation and adaptation in Northern Ghana". It venue was Regal Hotel, Tamale, Ghana and the participants were 35 people from 10 different organizations.

3. KTCSR Sustainability Webinar

The centre organized its Maiden KTCSR Sustainability webinar. The speaker was Dr. Giovanni Vinti a researcher from the University of Brescia, Italy. He presented on the topic " Solid waste safety plan- Case studies presentation", held virtually on 24th August, 2022.. The KTCSR Sustainability Webinar is aimed at creating a platform for scholarly discussions and deliberations on sustainability and resilience issues.

4. Fact finding mission in flood prone areas in northern Ghana

KTCSR undertook a fact finding mission in Pwalugu in the Talensi District of the Upper East Region and Kpasenkpe in the West Mamprusi

Municipality of the North East Region. The aim was to co-produce knowledge that incorporates indigenous practices into scientific flood knowledge and management practices for effective flood adaptation and preparedness. The information acquired will be used to build the capacity of farmers in other flood-prone areas which will enhance their resilience to flood. This activity was from 22nd to 23rd April, 2022.

5. Participation in the XI International Summer School, in Brescia, Italy.

The Director of KTCSR, participated in the XI International Summer School organized by the Research Center for Appropriate Technologies for Environmental Management in Resource-Limited Countries (CeTAmb), University of Brescia, Brescia, Italy. The XI International Summer School was on the theme, "Appropriate Technologies for Sustainable Development: A Focus on Low and Middle Income Countries". The Director made a presentation on the topic, 'Solid Waste Management in Ghana: The Way Forward", where she shared the Ghanaian context on the issue of solid waste management. This was held from 20th to 24th June, 2022 at the University of Brescia, DICATEM, Italy.
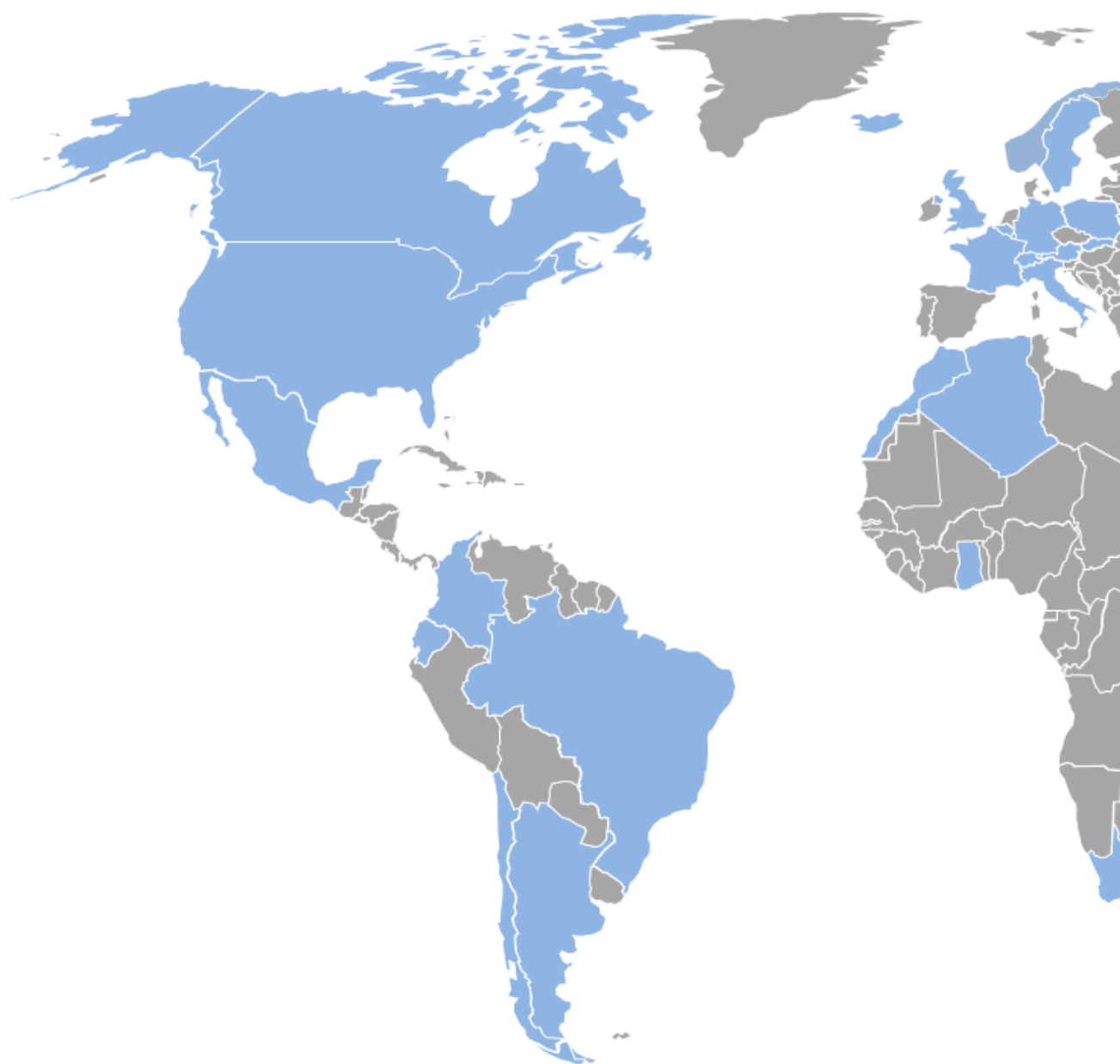
Publications:

- Owusu-Sekyere, E., **Alhassan, H**., Jengre, E., Amoah S.T., Opare-Asamoah, K., and Toku, A. (2022). The societal significance of informal economics during the COVID-19 pandemic in an African city. *International Journal of Social Quality*, 12(1), 29-53. doi:10.3167/IJSQ.2022.120103
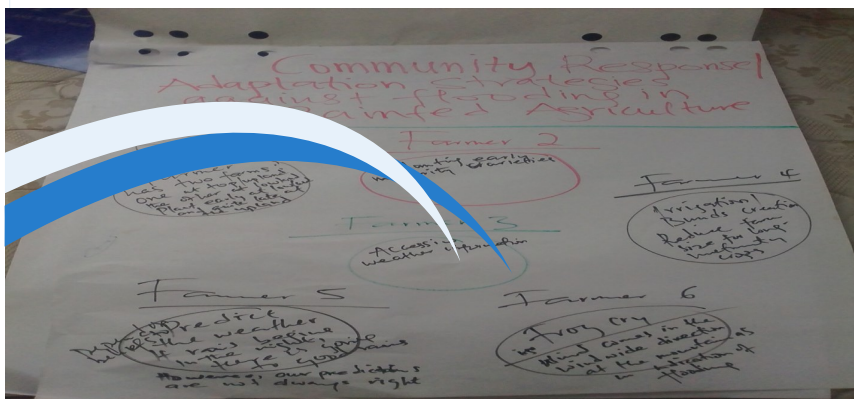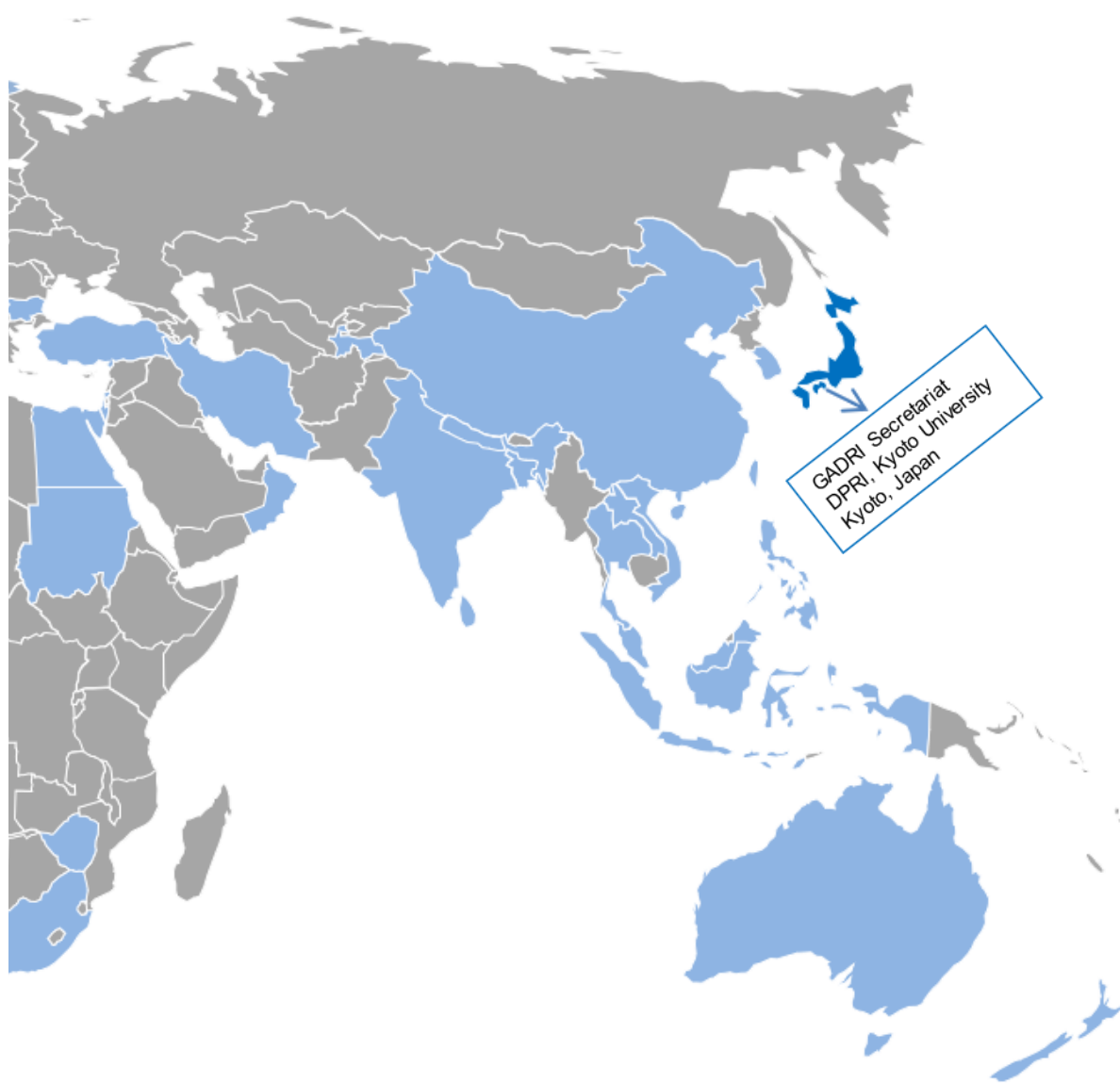

Farmers' Indigenous Practices for adapting to floods

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