

ANNUAL REPORT 2018



GADRI

Global Alliance of
Disaster Research Institutes

GLOBAL ALLIANCE OF DISASTER RESEARCH INSTITUTES



The First Global Summit of Research Institutes for Disaster Risk Reduction was initiated by the Disaster Prevention Research Institute (DPRI), Kyoto University, Uji Campus, Kyoto, Japan in November 2011 and one of the outcomes was the proposition to establish a network of disaster research institutes fostered by DPRI, Kyoto University to bring together research institutes working on disaster risk prevention and mitigation in various disciplines.

This was accomplished and by the Global Alliance of Disaster Research Institutes (GADRI) was launched with a mandate to support the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 during Second Global Summit held at DPRI, Kyoto University, Uji Campus, Kyoto, Japan in March 2015 which was held soon after the UN World Conference on Disaster Risk Reduction (WCDRR, 2015) which took place in Sendai, Japan.



Currently, GADRI are members of the Scientific and Technical Advisory Group (STAG), and the Global Risk Assessment Framework (GRAF) of the United Nations Office for Disaster Risk Reduction (UNDRR). GADRI works closely with the science and technology community endorsing policies related to disaster risk reduction, and disseminating and sharing cutting-edge knowledge and information supported by evidence-based research among research institutions, international organizations and the private sector in various nation states. GADRI community continue to evolve and strengthen research activities towards disaster risk reduction and management.

We thank all our members for providing inputs for the GADRI Annual Report 2018.

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GADRI Secretariat

Disaster Prevention Research
Institute (DPRI) Kyoto University

Uji Campus,

Gokasho, Uji Shi

Kyoto 611-0011, Japan

Tel: +81-0774-38-4651

E-mail: secretariat-
gadri@dpri.kyoto-u.ac.jp

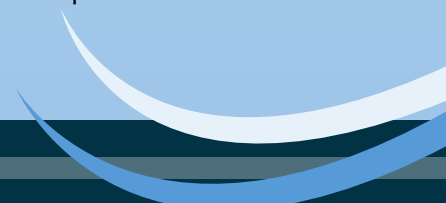
Web: <http://www.gadri.net>

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Edited and designed by Hirokazu Tatano and Wilma James.

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GADRI Annual Report 2018





Message from the Secretary-General, GADRI

I take pride in sharing with you the GADRI Annual Report 2018. It highlights the many ways in which GADRI moved forward in realising its goal of making a significant and sustainable global contribution in the area of disaster risk reduction and resilience to disasters. I am delighted to report another year of progress among members of GADRI.

One significant note-worthy progress was GADRI involvement with the Science and Technology community of the UNDRR. Currently GADRI are members of the Science and Technology Advisory Group (STAG) and the Global Risk Assessment Framework (GRAF) of the UNDRR. GADRI actively partook in various meetings and engaged in many working groups. At the next GADRI conference, 4th Global Summit of Research Institutes for Disaster Risk Reduction in March 2019, the main focus of the conference will be to contribute to the contextualization of the 2016 Science and Technology Roadmap adopted to support the implementation of the Sendai Framework Agenda 2015-2030. In addition, GADRI Secretariat will request all of its members to continue voluntary evaluations of ongoing research activities and research gaps.

On reflection, this year we were inundated with an increase of disasters from earthquakes to hurricanes, typhoons, wild fires, tsunamis, floods,

climate change, and heat waves to melting of the glaciers and much more. These challenges reaffirm our responsibilities and commitment to contribute to enhance disaster risk reduction and disaster resilience in collaboration with world stakeholders by networking, sharing our knowledge, experiences and initiatives to make the world a better place. With your support, GADRI continued to move forward endorsing the voice of its members and its objectives among various global platforms and stakeholders.

Much work is ahead of us and I have no doubt of your support and contributions to fruitfully achieve the goals set out by GADRI.

While we continue to expand the footprint of GADRI among various stakeholders in the realm of disaster risk reduction and resilience, we count on your amazing partnership with GADRI to work towards fulfilling our mission.

I would like to take this opportunity to thank all of you members, the Board of Directors, the Advisory Board and everyone at the GADRI Secretariat for devoting your valuable time, support, contributions and resources toward GADRI and its activities.

I hope you will enjoy reading the GADRI Annual Report 2018 and learn about the work carried out by our members.

Hirokazu Tatano
Secretary-General, GADRI



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 road map, 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

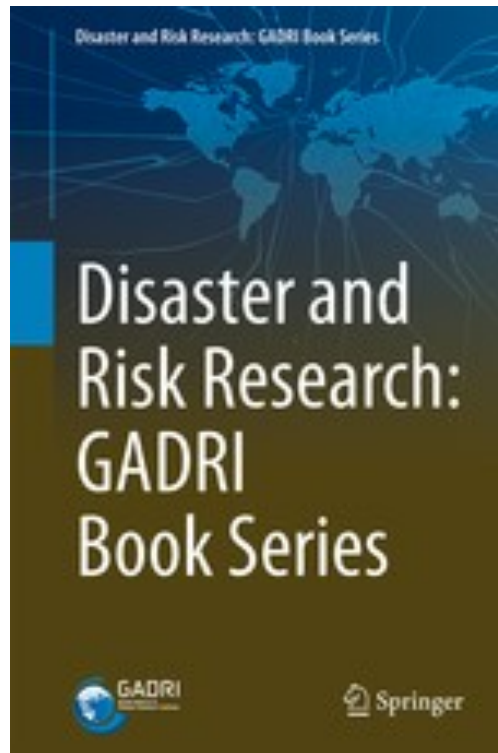
- Planning and organization of regionally or globally collaborative disaster risk research initiatives
- Formation of international research groups to investigate current global disasters, and implement new research methodologies for disaster risk reduction and implementation
- Establishment of an international 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.



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.

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



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.

The Global Alliance of Disaster Research Institutes was established in March 2015, directly after the United Nations World Conference on Disaster Risk Reduction (WCDRR 2015) in Sendai, Japan, based on the belief that a multi-institutional alliance can strengthen disaster research and its influences around the world. GADRI has a mandate to support the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 and is a member of the Scientific and Technical Advisory Group (STAG) of the United Nations Office for Disaster Risk Reduction (UNISDR). In addition, GADRI provides a platform for scientific communities from different disciplines, backgrounds and countries, helping them share their knowledge, findings and views. This approach yields more holistic and farther-reaching insights, which can contribute to further steps in effective disaster risk management.

GADRI Connections with UNDRR

GADRI closely worked with the United Nations Office for Disaster Risk Reduction (UNDRR), Geneva, Switzerland.

GADRI is a member of the Science and Technology Advisory Group (STAG); and GADRI was elected as a member of the Expert Group on the Global Risk Assessment Framework (GRAF).

Science and Technology Advisory Group (STAG)

GADRI attended the Science and Technology Advisory Group (STAG) meeting held at the UNDRR, Geneva, Switzerland from 30 to 31 August 2019. Main focus of the meeting was the review of the 2016 Science and Technology Conference Roadmap and reporting the progress at the Global Forum 2019.

Further details available at GADRI Actions—http://gadri.net/resources/pdf/GA-Newsletter_AugDec_2018.pdf

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. The establishment of the Expert Group was one of the principal recommendations of the

Expert Meeting on the GRAF held in Geneva on 20 to 21 November 2017. The initial responsibility of the Expert Group is to provide guidance and direction in the co-design and collaborative development of the GRAF, including strategic, technical, functional and operational aspects. The Expert Group will guide the development and co-creation of a preliminary implementation roadmap, including the definition and possible composition of the GRAF Sub-Working Groups that will need to be established to support the co-design and development process.

The first meeting of the Expert Group on the GRAF took place in Geneva, Switzerland from 13 to 14 June 2018.

Further details available at GADRI Actions—http://gadri.net/resources/pdf/GA-Newsletter_AugDec_2018.pdf



GADRI Lecture Series

Various Lectures at DPRI by GADRI Affiliates

GADRI was visited by its members and other partners. During such visits, GADRI Secretariat took the opportunity to organized various lectures to be delivered to DPRI faculty and students.

Two such events are listed here.

Further details are available at GADRI Actions—http://gadri.net/resources/pdf/GA-Newsletter_AugDec_2018.pdf

Lecture on "Addressing Urban Risks in Planning of Satellite Towns of Mega Cities: Case of the Kolkata Metropolitan Area (KMA)" was delivered by

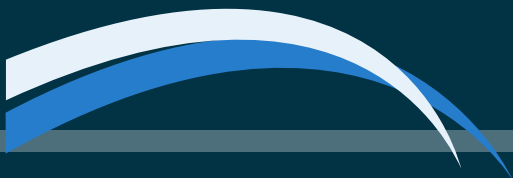
Dr. Uttam Kumar Roy, Assistant Professor, Indian Institute of Technology (IIT), Roorkee, India at the Room S-207D, DPRI Main Building, Uji Campus, Kyoto University, Japan on 15 January 2018.



Dr. David Mendonça, Rensselaer Polytechnic Institute, New York, USA visited GADRI and DPRI, Kyoto University on 11 October 2018. During his visit, he delivered a lecture on Empirical, Methodological and Organizational Frontiers in Interdisciplinary Hazards Research. The talk proposed three empirical, methodological and organizational responses to an emerging set of exogenous and endogenous threats to research excellence in the disaster domain. His remarks were based on his own observations over the last two decades, but also on his recent experience as a program officer at the US National Science Foundation--perhaps the major funder of basic research in the disaster domain in the US.



Keeping in touch with members



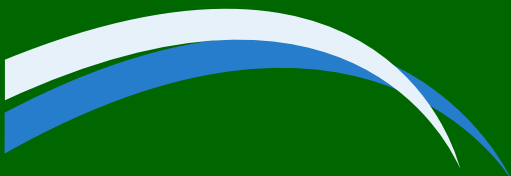
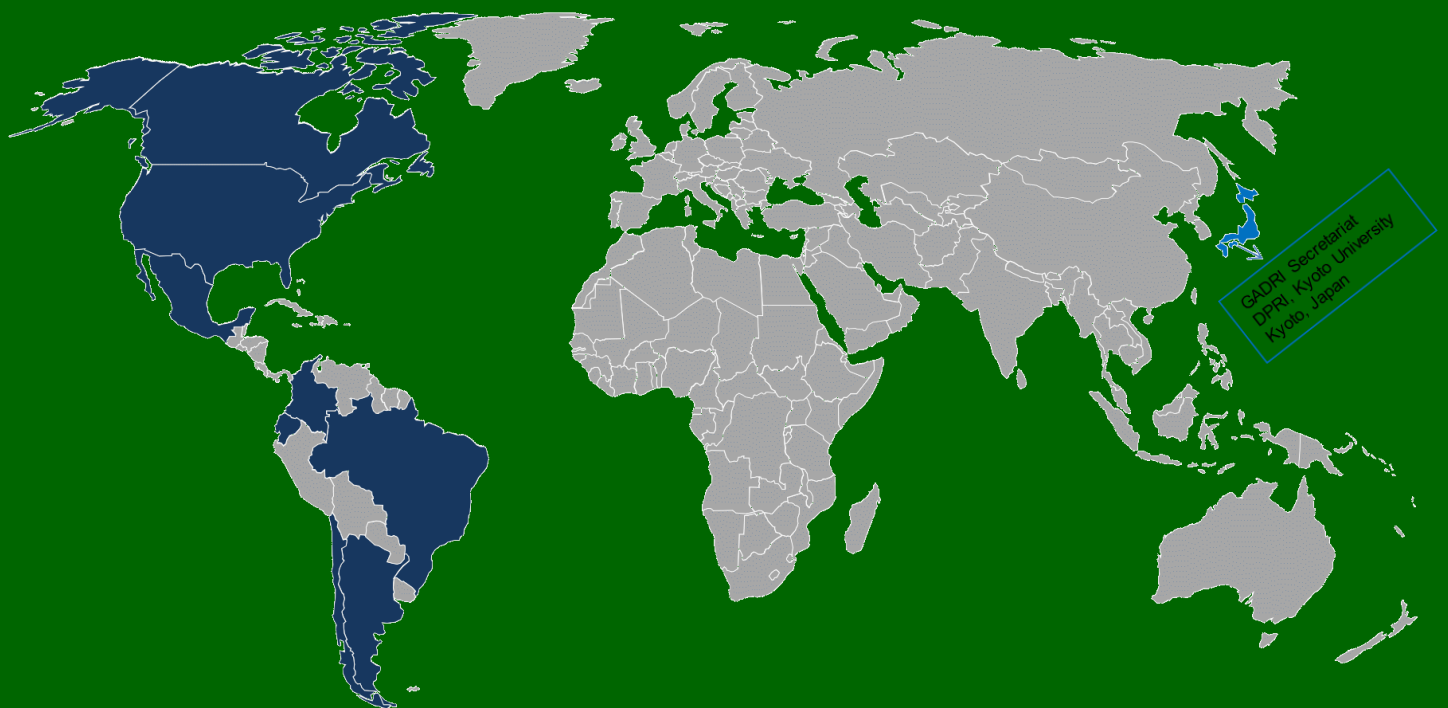


Keeping in touch with members





Americas





Americas



Americas—Members

Argentina	Environment and Natural Resources Research Program (PIRNA), Instituto de Geografía “Romualdo Ardisson”, 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	Universidade Federal do Rio Grande do Sul (UFRGS)
Canada	The Institute for Catastrophic Loss Reduction (ICLR), Western University
Chile	Centro Nacional de Investigación par la Gestión 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 Politécnica 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
USA	Hazard Reduction and Recovery Center (HRRC), Texas A&M University (TAMU)
USA	Geologic Hazards 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 has historically focused on disasters in a broad sense, spanning several areas. This is partly motivated by the institution's location in the a semiarid region of Brazil, high populated and socially and economically vulnerable to environmental hazards, such as droughts, desertification, land degradation, flash floods, health vulnerability, leading to social inequality. Our present interests are on understanding local and regional needs and the social aspects of Disaster Risk Reduction, in partnerships with regional, national and international networks. Our research teams come from diverse disciplines: climate, hydrology, geology, environment, biology, ecology, agriculture, geography, engineering, computing and information technology, management, health, medicine, law, sociology, anthropology, education, urban and regional planning, architecture, design and economics.

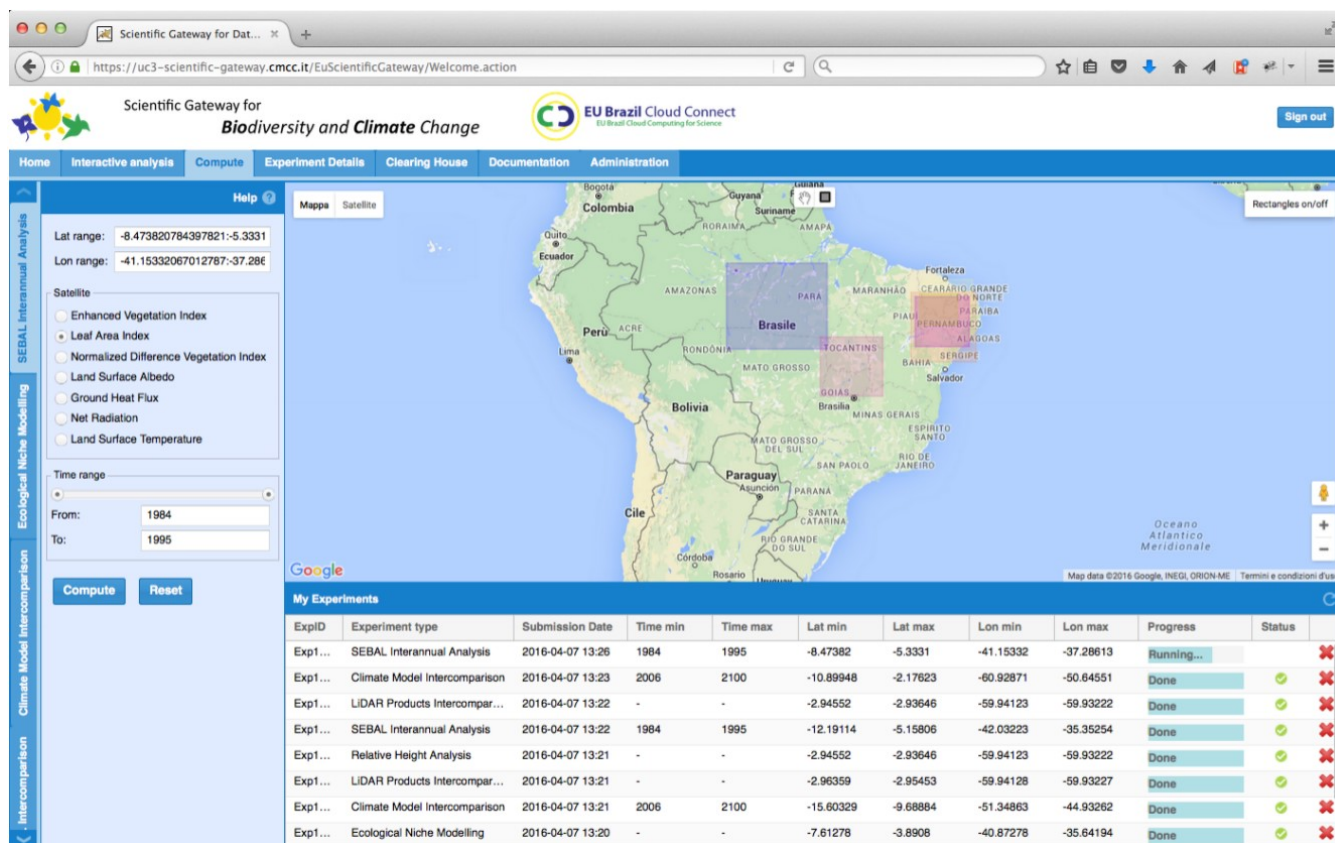
In this report, we highlight the First Brazilian Interdisciplinary Seminar on Disasters, hosted and organized by the Department of Geography of our university in October 2018.

The topics addressed in the sessions of the event were: disaster dynamics and connections to other crises, planning and management for disaster risk reduction (DRR) at municipal level, education for DRR, psychology and DRR, participatory approaches to DRR, desertification, people displacement by dams, urban rivers disasters, climate extremes, technological disasters, civil defence and protection in metropolitan regions, social and environmental vulnerability due to urban sprawl, the Brazilian information system on disasters (S2ID), vulnerability analysis of risk-prone areas through geo-technologies.



Prof. Carlos de Oliveira Galvao

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



Bioclimate: Scientific Gateway for Biodiversity and Climate Change

(<https://doi.org/10.1016/j.future.2017.11.034>)

Americas

We continued the development of remote sensing based information systems on land use and land cover change analysis, particularly to detect human-driven deforestation and its impacts on climate and biodiversity in seasonally dry forests, such as the Brazilian Caatinga. Our teams, in cooperation with European colleagues, brought new evidences that the use of surface albedo as a proxy for land-cover clearing in these forests provides the detection of deforestation at the resolution of the Landsat satellite sensors (30 meters) with higher accuracy than previous approaches.





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

<https://www.cigiden.cl/en/home/>

CIGIDEN

Research Center
for Integrated Disaster
Risk Management

CIGIDEN has been developing multi-hazard methodologies and transdisciplinary research initiatives focused in central Chile:

Multi-hazard assessment at the watershed' scale

The Maipo Basin is first order geographic system from the western limit of the Andes Mountain to the Pacific coast, where nearly 40% of the Chilean population lives. CIGIDEN is developing an interdisciplinary project, where fundamental geological and geophysical knowledges are being integrated to elaborate multi-hazard maps of the entire basin scale, which consider landslides, strong ground motion effects in foundation soils, volcanoes, flash floods, and coastal erosion. This project aims at defining specific areas where interactions with engineering and social sciences would lead to quantitative measures of potential risks, and to address potential impacts on infrastructures and communities. Two pilot areas have been defined: the high-altitude mountain part of the basin with potential impacts of landslides and flash floods, and the coastal border, where Cartagena is located, where coastal hazards are to be addressed. Working at the watershed scale is intentionally aimed to develop a multi-risk framework for Andean countries and to connect with the two other initiatives described next.

Disaster' Scenarios and Resilience of Critical Infrastructure Networks

We are addressing the complex physical response and resilience of critical infrastructures as well as the socio-economic impacts of natural hazards in urban settings. The first goal is to evaluate the risk and resilience of Transportation, Health, Electricity and Water networks. This requires a comprehensive study of the physical and functional responses of these complex systems and their components, which in turn impact different aspects of the socio-economic dimension. Physical damage of these networks resulting in functionality losses have substantial socioeconomic impact due to the extensive areas of the territory they cover. Thus, natural systems disciplines are related to the complete characterization of the geographically distributed hazard, while social sciences, are related to the social consequences of these large disruptions. Physical impacts on the different infrastructures and evacuation processes are assessed and socioeconomic assessment of the impacts is being addressed in collaboration with researchers from the social practices.



Dr. Rodrigo Cienfuegos

Director

E-mail: director@cigiden.cl



Community-Based Disaster Risk Reduction Model

Understanding the community-resilience nexus at and from the local level, and from there elaborate a Community-based Disaster Risk Reduction Model, is a priority. During 2018 we set the bases for an integrative case study in the Cartagena bay. This project is a collaboration between social scientists, earth scientists, geographers, urban planners, and engineers, with a strong participative approach and a focus on multi-hazards in complex coastal urban settings. Also, we conducted

community meetings to integrate neighborhood organizations into the design of the research questions and methods. Institutional, educational, and industry actors will also have a relevant role. Being a unique case of interdisciplinary and participatory research on resilience and multi-hazards, the objective is a methodology for local risk reduction strategies applicable to Chile and to other geographical contexts. We intend to answer the question of how citizens participate and educate themselves in developing resilient communities that are better prepared for disaster risk reduction.





Workshop held by PEER with USGS



Pacific Earthquake Engineering Research (PEER) Center, University of California, Berkeley, USA

<https://peer.berkeley.edu>

1. PEER became the Pacific Regional Node, responsible for the earthquake hazard, of the Structural Extreme Events Reconnaissance (StEER) Network, funded by the US National Science Foundation in August 2018 for two years.
2. PEER researchers published around 10 reports and briefings from the early virtual reconnaissance efforts of many earthquakes around the world and in the US, including the recent July 2019 Ridgecrest, California earthquakes (Mw 6.7 and Mw 8.1) and May 2019 Peru earthquake (Mw 8.0). PEER director was an editor of many virtual reconnaissance reports related to hurricanes.
3. The California Energy Commission awarded a \$4.9 million grant to PEER on May 15, 2019 to improve the seismic risk assessment of natural gas storage and pipeline infrastructure. During the 2.5-year project, PEER will develop open-source software to better assess risks to natural gas storage and pipeline systems from seismic activity with the objective of reducing the negative consequences of the earthquake hazard on communities.
4. PEER organized two important competitions in 2018. First is the blind prediction competition on the numerical simulation of a large-scale liquefaction shaking table experiment, which aimed at evaluating the current abilities of the earthquake profession to model earthquake induced liquefaction and suggesting potential modeling enhancements. Second is the PEER Hub ImageNet Challenge for the automated identification of damage from images using machine learning and computer vision techniques, with the aim of promoting the tools of Artificial Intelligence tools amongst the earthquake engineering and other hazards communities. Both competitions were well received with more than a total of 75 teams attending the competitions.
5. PEER issued a brochure titled "Expected Earthquake Performance of Buildings Designed to the California Building Code," with the objective of educating the general public about the intentions of seismic codes and clarifying the common misunderstood aspects. The brochure explained the intent of the California Building Code, the expected performance of code-compliant new buildings when they are subjected to moderate and large earthquakes, possible consequences to residents, businesses, and communities, and initial proactive actions that can be taken.



Prof. Khalid Mosalam

Director

E-mail: mosalam@berkeley.edu



6. PEER partnered with many important organizations, including the United States Geological Survey (USGS) and the California Seismic Safety Commission, to develop a report on the consequences of the the HayWired earthquake scenario, which anticipates the impacts of a hypothetical M7 earthquake on the Hayward Fault, with epicenter in Oakland. HayWired scenario creates a platform, or plausible basis, by which research can dig deeper into developing solutions to problems that are posed by the scenario, with the aim of shortening the region's recovery time, shedding light into the recovery and resilience aspects of other earthquake prone regions around the world.
7. PEER organized the Annual Meeting with nearly 250 participants consisting of researchers, students, governmental agencies and industry partners. In addition, PEER organized several important workshops on hybrid simulation, high performance computing, and the fragility of bridge columns. The aim of these workshops was to improve tools that are used for the evaluation of infrastructures subjected to extreme events.
8. PEER funded 11 projects at the end of 2018 on a wide range of topics such as ground motions, tsunami research, resilient systems, city-scale modeling and uncertainty quantification.





Natural Hazards Center, University of Colorado, Boulder, USA

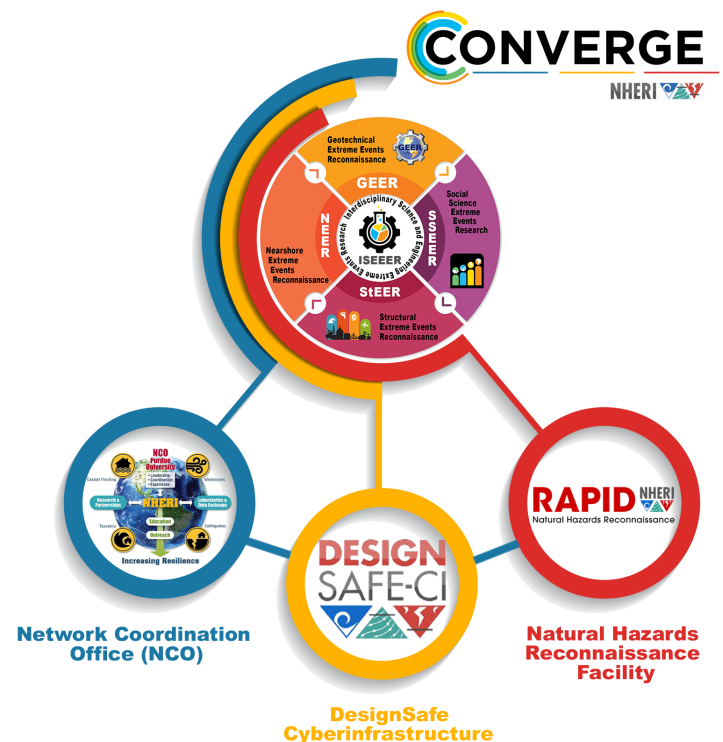
<https://hazards.colorado.edu/>

The Natural Hazards Center at the University of Colorado Boulder is the National Science Foundation-designated information clearinghouse for the nation. We are dedicated to reducing disaster harm through:

- (1) translating and sharing hazards and disaster research and information;
- (2) building connections between researchers, non-profit and private sector professionals, the media, policy makers, and local, state, and federal officials;
- (3) advancing social science and interdisciplinary knowledge, with a special emphasis on the most vulnerable populations and places; and
- (4) training and mentoring the diverse next generation of hazards and disaster professionals.

Every day, we work to empower a culture where all people are educated and inspired to take positive action to mitigate hazards losses and to build stronger communities.

In 2018, the Center team hosted the 43rd Annual Natural Hazards Workshop, which brought together over 500 leading researchers and practitioners. In addition, at the 2018 Workshop, the Center convened a meeting of North American directors of academic hazards and disaster centers. At the meeting, the group voted on a charter to establish the North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI).



Prof. Lori Peek

Director

E-mail: Lori.Peek@colorado.edu

The Center currently has numerous active research projects in the areas of hazards, disasters, and social vulnerability. Center Director Lori Peek is the Principal Investigator of CONVERGE, which is a [National Science Foundation](#)-funded initiative headquartered at the [Natural Hazards Center](#).



CONVERGE advances social science, engineering, and interdisciplinary research and establishes and strengthens networks between disciplinary communities. In the next five years, CONVERGE will:

- Create and support the CONVERGE Leadership Corps for coordinating and advancing rapid response disaster research.
- Identify, map, and accelerate the training of social science and interdisciplinary researchers through the Social Science Extreme Events Research ([SSEER](#)) and Interdisciplinary Science and Engineering Extreme Events Research ([ISEEER](#)) networks.
- Develop a series of [training modules](#) to advance the ethical conduct of hazards and disaster researchers.
- Partner with the [Natural Hazards Review](#) journal to publish a new CONVERGE Quick Response Research [Briefing Sheets](#) series to focus attention on best practices for hazards and disaster research.
- Encourage and fund research projects across the disaster lifecycle among SSEER and ISEEER researchers.
- Work with the [NHERI RAPID facility](#) to advance mobile applications for social science and interdisciplinary reconnaissance.

Collaborate with [NHERI DesignSafe-Cyberinfrastructure](#) to build a novel social science and interdisciplinary data model to curate and publish hazards and disaster research instruments and data.



Center for Risk-Based Community Resilience Planning Colorado State University, USA

<http://resilience.colostate.edu>



The Center has examined a number of testbed communities in the United States recently - earthquake and flood effects on the Memphis Metropolitan Statistical Area, including Shelby County, TN. The Galveston-Bolivar Peninsula, TX testbed investigated coupled hurricane-storm surge impacts with a focus on better understanding population dislocation and the role of housing recovery and business recovery on the resilience of this coastal community on the U.S. Gulf coast. A hindcast of the Joplin, MO tornado of 2011 enabled a number of algorithms in IN-CORE to be validated against the actual performance of the Joplin infrastructure during and following the EF5 tornado. A longitudinal resilience-focused study of Lumberton, NC was initiated following the severe flooding from Hurricane Matthew in 2016 to document flood damage and community recovery over an extended period of time including key decision points made by community leaders and published in 2018 (*NIST SP 1230*); the effect of race/ethnicity, income, and education level on initial population dislocation was quantified.

Substantial effort has been devoted to the computational environment, the first public release of which is scheduled for December 2019: The Interconnected Networked Community Resilience Modeling Environment

(IN-CORE), is the product of nearly five years of research for the Center. It is an open source Python-based programming environment that will enable users worldwide to create their

own natural hazard scenarios with their own community topologies, explore alternative improvements in design and/or policy, and help communities make decisions that benefit their stakeholders. IN-CORE is different than other natural hazard software in that it couples the physical, social, and economic domains using advanced physical infrastructure models, computable general equilibrium economic models, and data-driven social science models such as population dislocation predictions following an event. Going forward, we expect that IN-CORE will be updates pushed out approximately every six months to add content. For more information, visit the Center website and follow us on Twitter @commresilience to learn more about IN -CORE's public release.

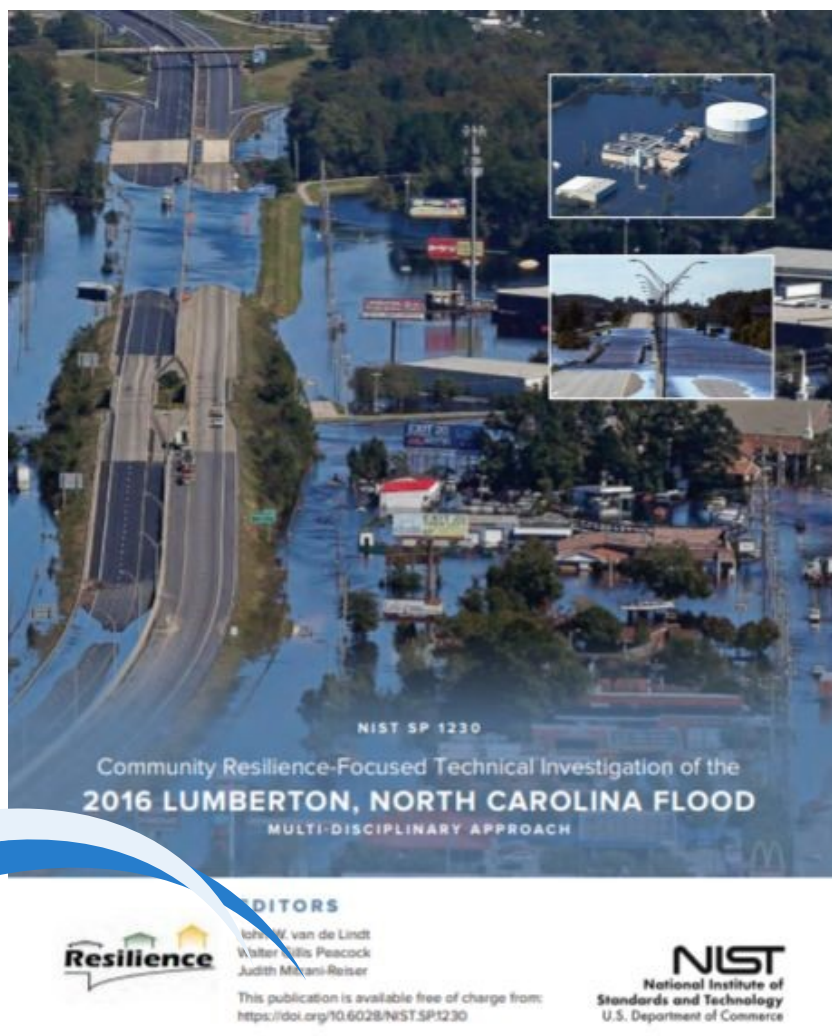


Prof. John W. van de Lindt

Co-Director

E-mail: jwv@colostate.edu

- Community Resilience-Focused Technical Investigation of the 2016 Lumberton, North Carolina Flood Multi-disciplinary Approach”, NIST SP 1230, Editor, October 2018, <https://doi.org/10.6028/NIST.SP.1230>.
Available free on line.
- Bruce R. Ellingwood, Co-director of the Center, received the Geerhard Haaijer Award for Excellence in Education, American Institute of Steel Construction, Awarded April, 2018
- Researcher Elaina Sutley received the U.S. National Science Foundations most prestigious funding source, the CAREER Development Award.
- Researcher Suren Chen was elected to Fellow status of the American Society of Civil Engineers.
- Christine Standohar-Alfano, Co-Director John W. van de Lindt, and Eric M Holt received the Best Journal Article of 2018 Award for their paper entitled “Comparative Residential Property Loss Estimation for the April 25-28, 2011 Tornado Outbreak” from the Architectural Engineering Institute.
- Therese P. McAllister, Leader of the Community Resilience Program at NIST, was co-recipient of the Ernest Howard Award from ASCE.
- Longtime Advisory Member of the Center Jim Harris also was recognized with Honorary Membership in the American Concrete Institute “for visionary leadership in the development of codes and standards for the design of safe and reliable buildings and for dedicated service to the structural engineering profession.”



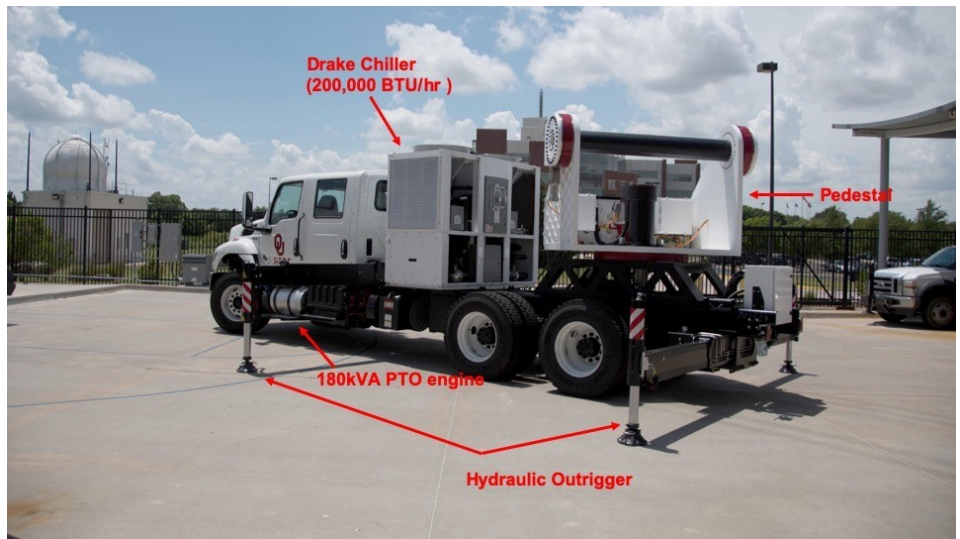
From webpage—<https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.12>



Advanced Radar Research Center (ARRC) University of Oklahoma, USA

<https://arrc.ou.edu>

1. The ARRC's research expenditures were more than \$8.2M in FY2018 with funding from NSF, NOAA, NASA, DARPA, ONR, AFRL, AFOSR, private industry, and others.
2. The ARRC team published more than 80 peer-reviewed journal papers and book chapters having a major impact on a variety of fields including antenna and filter design, adaptive scanning with digital radar, polarimetric phased array technology, cloud physics, precipitation measurement and validation, radar waveforms, and other areas.
3. ARRC faculty organized and hosted the highly successful 2018 IEEE Radar Conference in Oklahoma City. Record attendance resulted in excellent exposure and recognition for the ARRC and OU.
4. Multiple students won paper competition or research awards:
 - Mirhamed Mirmozafari (PhD): 2nd place student paper at the 2018 IEEE APS Symposium;
 - Tony Segales (PhD): Outstanding Student Oral Presentation Award at the AMS 23rd Symposium on Boundary Layers and Turbulence;
 - Andrew Byrd (PhD): 1st place student poster at the 2018 Texas Symposium on Wireless and Microwave Circuits and Systems;
 - Andrew Mahre (PhD): 1st place poster presentation at the AMS 34th Conference on Environmental Information Processing Technologies;
 - Jay McDaniel (PhD): OU Grad. Student Senate Outstanding Grad. Student Award in Research;
 - Russell Kenney (undergrad): 1st place in IEEE local & regional IEEE student paper competitions.



5. Sponsored by the National Science Foundation, the ARRC has been developing a mobile C-band polarimetric atmospheric imaging radar (PAIR) that will be shared by communities. The imaging radar exploits the floodlight concept to achieve unprecedented temporal resolution. PAIR will be capable of steering a fan beam and applying digital beamforming techniques to received signals from a number of independent receivers to produce *simultaneous* range height indicator (RHI) of polarimetric variables. The PAIR team and collaborators have shown strong interests in applying PAIR to studies of severe and hazardous weather such as tornadoes, hurricanes, cloud electrification, etc. Each of the major subsystems of the truck platform is substantially complete. The PTO generator, chiller, pedestal with riser and hydraulic outriggers have been installed on the truck, as shown in the figure. Significant progress has made for the radar electronics including antenna, RF front end, digital backend and signal processor. PAIR is expected to be operational in late 2022.



Prof. Tian-you Yu

Director of Operations

E-mail: tyu@ou.edu



Texas Tech University, USA

<http://www.depts.ttu.edu/nwi/>

Planning meeting for Industry/University Cooperative Research Center (I/UCRC) was held during the year. The two institutions involved in proposing the Wind Hazard and Infrastructure Performance (WHIP) Center are Texas Tech University (located in Lubbock, Texas) and Florida International University (located in Miami, Florida). Several private companies were represented at this planning meeting held in Miami, Florida. The companies included State Farm Insurance Company, Swiss Reinsurance, CBI, CDC consulting, North America Glass Association, Simpson Strong-tie, Permasteelisa, GAF Materials, SCOR Reinsurance, Berkshire Hathaway Specialty Insurance, Risk Management Solution, AIR-WORLDWIDE, and others. The universities and the industry partners agreed to submit a proposal to the National Science Foundation (NSF). The proposal was to establish Virtual Center for Phase 1 which would be of five year duration. If Phase 1 is successful additional Phases 2 and 3 (each five year duration) can be supported by NSF.

For almost 50 years, Texas Tech has been a leader in wind hazard mitigation, wind engineering and wind science, and the WHIP Center will be affiliated with its National Wind Institute (NWI),



NHERI 12-Fan Wall of Wind Experimental Facility at FIU

drawing from the institute's interdisciplinary approach to research and education. The International Hurricane Research Center (IHRC) at FIU was created in 1996 following the disastrous effects of Hurricane Andrew (1994) in South Florida. The Laboratory for Wind Engineering Research (LWER) is one of the four laboratories under IHRC and is home to the Wall of Wind (WOW) research and testing facility. This unique facility will be the core of the FIU WHIP Site along with a dedicated team of experts in Extreme Events and Natural Hazards. In addition to TTU and FIU, Florida Institute of Technology (Florida Tech)'s Wind and Hurricane Impact Research Lab (WHIRL), home to the engineering team of the Florida Public Hurricane Loss Model (FPHLM), will provide expertise in the area of wind vulnerability modeling.

PS: The Center is funded by the NSF and began operation in early 2019.



Prof. Kishor Mehta

E-mail: Kishor.Mehta@ttu.edu



Uji Campus, Kyoto University Kyoto, Japan





Asia

Japan and Oceania





Asia

Japan and Oceania



Asia — Members

Bangladesh	Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET)
Bangladesh	Department of Disaster Science and Management (DSM), Faculty of Earth and Environmental Sciences, 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 (CAS)
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	Institute for Disaster Management and Reconstruction (DMR), Sichuan University - The Hong Kong Polytechnic 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	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	Shri Ram 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	Soil Conservation and Watershed Management Research Institute (SCWMRI), Agricultural Research, Education and Extension Organization
Iran	International Institute of Earthquake Engineering and Seismology (IIEES)
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	Center for Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM), Institute for Environment and Development (LESTARI), University of Kebangsaan Malaysia
Malaysia	Universiti Kebangsaan Malaysia (UKM)
Malaysia	Universiti Sains Malaysia (USM)
Malaysia	Universiti Tenaga National (UNITEN)
Malaysia	Centre for Coastal and Ocean Engineering (COEI), Universiti Teknologi Malaysia (UTM)
Malaysia	Centre for Environmental Sustainability and Water Security (IPASA), Research Institute for Sustainable Environment, Universiti Teknologi Malaysia (UTM)
Malaysia	Institute of Noise and Vibration, Universiti Teknologi Malaysia (UTM)
Malaysia	Malaysia Japan International Institute of Technology (MJIIT), Universiti Teknologi Malaysia (UTM)
Malaysia	Disaster Management Institute (DMI), Universiti Utara Malaysia (UUM)
Nepal	International Centre for Integrated Mountain Development (ICIMOD)
Nepal	Institute of Engineering, Tribhuvan University
Oman	German University of Technology in Oman (GUTech)

Philippines	PEMSEA Resource Facility, Partnerships in Environmental Management for Seas of East Asia
Philippines	R&D, Graduate School, Philippine School of Business Administration
Philippines	National Hydraulic Research Center, National Engineering Center, University of the Philippines, Diliman Campus
Philippines	Philippine Society of Emergency Medical Technicians
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)
Turkey	Kandilli Observatory and Earthquake Research Institute, Bogazici University
Vietnam	Department of Geo-Environment, VietNam National University (VNU), Hanoi



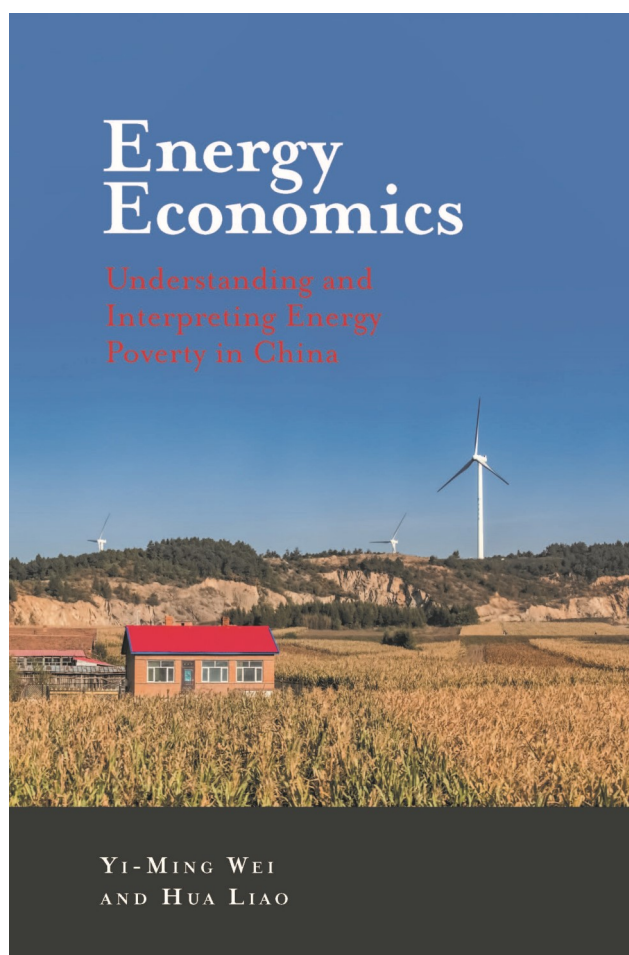


Center for Energy and Environmental Policy Research Beijing Institute of Technology (CEEP-BIT), China

<http://ceep.bit.edu.cn/english/>

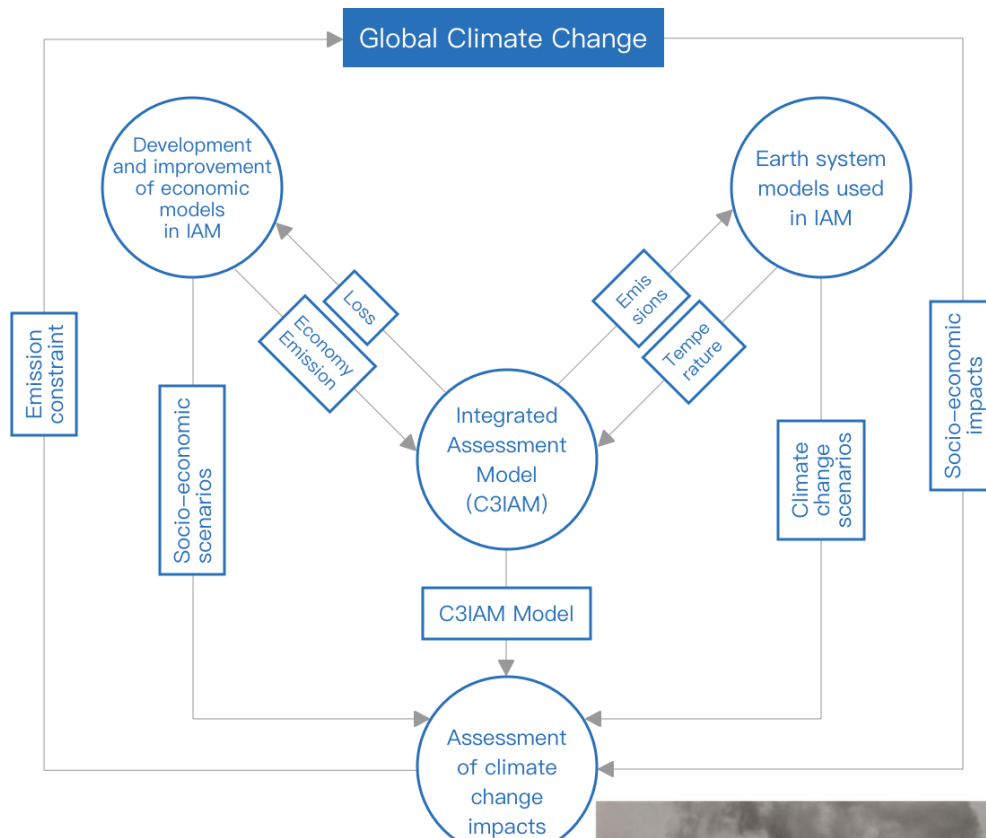
In 2018, based on the National Natural Science Foundation of China (NSFC) Innovative Research Team, CEEP-BIT research group published 3 books: ***Energy Economics: Understanding and Interpreting Energy Poverty in China***, ***China Energy Report (2018): Green Transition in Energy Intensive Sectors***, and ***Comprehensive Evaluation and Data Envelopment Analysis***; published 91 papers in peer-reviewed journals including ***Nature-Energy***, ***Renewable and Sustainable Energy Reviews***, ***Global Environmental Change***, etc.; had 2 policy consulting reports adopted by the General Office of CPC Central Committee or State Council; were awarded 2 research outputs by provincial authorities with First Prize and Second Prize, respectively; developed the China's Climate Change Integrated Assessment Model (C3IAM); developed 13 software systems with independent intellectual property rights; were authorized 3 utility model patents; had 3 invention patents entered into substantive examination; cultivated more than 10 graduate students in the field of energy economics and climate policy; took more than 20 topics from NSFC, National Key Research and Development Project of China, Fok Ying Tung Education Foundation, Office of the National Energy Leading Group, etc.

In addition, team members established close academic exchanges and cooperation with internationally renowned institutions such as the University of College London, the Pacific Northwest National Laboratory, the Australian National University, the University of California, etc. Research team co-hosted and participated in ***the Sino-Denmark iCLIMATE workshop on sustainable energy, health and climate change*** in Denmark. According to the rankings of RePEc in November 2018, CEEP-BIT ranks 29 in the field of energy economics and ranks 33 in the field of Environmental Economics worldwide.



Prof. Yi-Ming Wei

E-mail: wei@bit.edu.cn



China's Climate Change Integrated Assessment Model (C3IAM) Link <http://inems1.bit.edu.cn/C3IAM>



Future scenarios for energy consumption and carbon emissions due to demographic transitions in Chinese households

Biying Yu^{1,2*}, Yi-Ming Wei^{1,2*}, Gorni Kei³ and Yuzuru Matsuoka⁴

Population dynamics has been acknowledged as a key concern for projecting future emissions, partly because of the huge uncertainties related to human behaviour. However, the heterogeneous shifts of human behaviour in the process of demographic transition are not well explored when scrutinizing the impacts of population dynamics on carbon emissions. Here, we expand the existing population-economy-environment analytical structure to address the above limitations by representing the trend of demographic transitions to small-family and ageing society. We specifically accommodate for inter- and intra-life-stage variations in time allocation and consumption in the population rather than assuming a representative household, and take a less developed province, Sichuan, in China as the empirical context. Our results show that the demographic shift to small and ageing households will boost energy consumption and carbon emissions, driven by the joint variations in time-use and consumption patterns. Furthermore, biased pictures of changing emissions will emerge if the time effect is disregarded.

The ongoing demographic transition, entailing changes in population size, age structure, household composition, regional distribution, migration and so on, has become a world-wide issue affecting developed and developing countries alike^{1,2}. Establishing a clear link between demographic transition and carbon emissions is a complicated task. The human population influences the environment through the bulk effects of forces such as economic growth, technological development, urbanization, population dynamics and behavioural alteration^{3–5}. Speaking broadly, we can intuit that a population shift can affect energy consumption and emissions via three main channels: first, the redesign of time-use patterns among work, leisure and home activities, which are elements that act directly on the demand for energy services (for example, time spent on appliances and travel) and indirectly on material requirements through changing income due to changes in working hours^{6–10}; second, the dependence of productive activity on the household and age structure (that is, labour force in the household), which could pose constraints or stimulation on consumption activities^{11,12}; and third, the potential influence of household composition changes on industrial production via altered demand^{13–15}. In this paper, we can group these consumption channels into two categories: the first is the household-level consumption, which is directly related to the household's energy consumption and emissions; the second is the industrial-level consumption, which is indirectly related to the household's energy consumption and emissions.

not the number or composition of a population that will directly cause the change of emissions; instead, the lifestyle shift accompanying the demographic transition causes the change of aggregate time spent on productive and consumptive activities as well as the aggregate money spent on goods and services, which consequently drives the change of total emissions.

Many studies to date have evaluated the impacts of population change on energy consumption or carbon emissions^{16–21}, among which behavioural or lifestyle impacts are generally approached from the perspective of changing the basket of goods and services they purchase^{16–17}. Most, however, have devoted little attention to describing the environmental implications of how people spend their time, another fundamental dimension of people's lifestyles^{22–24}. A narrow body of research has built on the notions of commodity intensity, energy intensity or CO₂ intensity of activities, and has used time as a denominator to establish comparisons between the ways in which energy consumption and emissions are generated for different households through the activities of everyday life^{25–27}. Although they are on a descriptive level, the integration of time use into environmental analysis opens a whole new array of possibilities for sustainability research.

Another obstacle blocking our view of the inherent changes when demographics shift is the widely adopted notion of the 'representative household/individual', which assumes that one productive and consumptive pattern is shared among all individuals and households. The occurrence of demographic transitions in the future will change the distribution of population or households in each life stage, which will in turn change the aggregate energy consumption and emissions. Given the evident heterogeneity of lifestyle, people in different life stages (that is, inter-life-stage variation) or different groups (that is, intra-life-stage variation) as well as between people in the same life stage (that is, intra-life-stage variation, or intragroup variation)^{28–30}, a population shift to, for example, smaller and ageing



Industrial plants in Sichuan, China, where population changes are expected to lead to higher emissions of heat-trapping gases. Credit: Arnold Drapkin/ZUMA Press/Alamy

CLIMATE CHANGE • 05 January 2018

China's societal shifts will take a toll on climate

Demographic changes affect a population's activities – and could raise carbon emissions.

Book Link: <https://books.emeraldinsight.com/page/detail/energy-economics-yiming-wei/?k=9781787567801>

Paper Link <https://www.nature.com/articles/s41560-017-0053-4>

Nature Research Highlights Link : <https://www.nature.com/articles/d41586-018-00121-6>

¹Center for Energy and Environment Policy Research, Beijing Institute of Technology, Haidian District, Beijing, China. ²School of Management and Economics, Beijing Institute of Technology, Haidian District, Beijing, China. ³Kushikawa Branch, National Institute for Environmental Studies, Futsuka 10-2, Miharu-Machi, Fukushima, Japan. ⁴Department of Environmental Engineering, Kyoto University Cluster, Kyoto-Daigaku-Katsura, Nishikyo-ku, Kyoto, Japan. *e-mail: yu@energy.bjdit.edu.cn; ymwei@263.net

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Institute of Tibetan Plateau Research, Chinese Academy of Sciences (ITPCAS), China

<http://ceep.bit.edu.cn/english/>

Under the support of DPRI international cooperative project, we worked on the clarification of seismic hazards in the Tibetan-Himalayan area. We studied source, faulting information of recent large earthquakes and conducted seismic hazard assessment. We found significant spatial variation in seismic hazard levels. This information is needed for planning seismic mitigation efforts of the growing cities and towns that are close to the earthquake prone Tibetan-Himalayan area. In addition, we have published several papers and successfully applied new projects, including the China National Foundation Key project.

Prof. Ling Bai was awarded visiting professor position at the Stanford University, USA.

Projects

- 2017.04~2019.03, Source and Structural Properties of the 2015 Mw7.8 Nepal earthquake, Disaster Prevention Research Institute of Kyoto University, Principal investigator : Prof. Ling Bai from ITPCAS, Prof. James of from DPRI
- 2018.01~2020.12, The seismic controls of geohazards related to the 2015 Nepal earthquake, NSFC International Cooperative Key project, Principal investigator : Prof. Ling Bai from ITPCAS

Publications

- Rahman, M.M., Bai, L., 2018. Probabilistic seismic hazard assessment of Nepal using multiple seismic source models. *Earth Planet. Phys.* 2: 327-341.
- Rahman, M.M., Bai, L., Khan N. G., Li, G., 2018. Probabilistic Seismic Hazard Assessment for Himalayan-Tibetan Region from Historical and Instrumental Earthquake Catalogs. *PAGEOPH.* 175: 685-705. doi: 10.1007/s00024-017-1659-y.



Prof. Yaoming Ma

E-mail: yyma@itpcas.ac.cn



东北师范大学
Northeast Normal University

Natural Disaster Research Institute (NDRI)

Northeast Normal University, China

<http://ndri.nenu.edu.cn/>



Forum of Jilin Association of Science and Technology Young Scientists

- The Innovation Base of Application of Jilin Remote Sensing Information Technology Approved by Department of Science and Technology of Jilin province .2018.08.
- National Key R&D Program of China: Integrated Risk Assessment and Cartographic Technology of Multiple Major Natural Disasters.2018.12-2012.12.
- Key Scientific and Technological Research and Development Projects of Science and Technology Development Plan for Jilin province: Technology and Application of Changbai Mountain Volcano Eruption Triggered Collapse and Landslide Disaster Risk Assessment and Early warning & Forecasting.2018.01-2020.12.
- Geological Hazard Risk Assessment and Emergency Resources Survey of Jilin Province:2018.06-2019.12.
- To Hold the Forum of Jilin Association of Science and Technology Young Scientists 2018. 2018.10.23-24. Changchun City, Jilin Province.
- Over 31 academic papers related to disasters were published in high-level international academic journals.
- Invited 10 experts in the field of disaster from the United States and other countries to conduct academic exchanges and cooperative research.



Prof. Jiquan Zhang

Director

E-mail: zhangjq022@nenu.edu.cn





College of Architecture and Environment Sichuan University (SCU), China

<http://www.scu.edu.cn/acem/>



The faculty has been expanded in the past year – 8 new assistant professors has joined the institute. Their research and teaching focus on earthquake engineering, wind engineering, structural health monitoring, and structural vibration control. The development of Western China Earthquake and Hazards Mitigation Research Centre has been accelerated in 2018. A new structural lab was completed and several new facilities for testing large scale structural components, seismic bearing, and energy dissipation devices were added. A series of academic activities were held in 2018 in memory of the 2008 Great Wenchuan Earthquake, including International Conference for the Decade Memory of the Wenchuan Earthquake, the 10th

National Conference on Earthquake Disaster Prevention and Mitigation Engineering, and Workshop on Integrated Disaster Reduction in Active Seismic Zones. More than 3,000 participants visited Sichuan University and got involved in these activities. These events remind the world the disastrous consequence of strong earthquakes – these activities work as special educational program to those researchers, professors, students, and engineers



Prof. Kaoshan Dai

Chair

E-mail: kdai@scu.edu.cn





Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI), Hong Kong, China

<http://www.hkjcdpri.org.hk/>

The Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI) at The Hong Kong Academy of Medicine was launched in November 2014 with the generous donation from The Hong Kong Jockey Club. Led by the Hong Kong Academy of Medicine in collaboration of The University of Hong Kong (HKU) and The Chinese University of Hong Kong (CUHK), and supported by international experts, the HKJCDPRI provides a platform for training, research, policy discussion and knowledge exchange to enhance the knowledge in building resilience in the community.

The HKJCDPRI develops capacity building programmes for emergency planners to enhance their knowledge and skills required for disaster response. HKJCDPRI's leadership development courses highlight the importance of critical



Community Activity

decision making, effective communication and coordination skills for emergency operations.

The HKJCDPRI utilises different teaching modalities including online learning, Virtual Reality (VR) simulation, table-top exercises and case sharing for blended learning.

The Annual Conference of the HKJCDPRI has become a flagship event since its establishment, three annual conferences had been conducted. Given the success of these conferences, the 4th annual conference of HKJCDPRI titled "Emergency Challenges and Opportunities Ahead" had been organized in January 2018 and was attended by over 300 participants.

"Adapting international norms and lessons learnt to meet local needs" is the motto of HKJCDPRI. The Overseas Training Fellowship programme of the HKJCDPRI provided international learning and exchange opportunities for participants to gain practical insights and inspiration from the programme.



Overseas fellowship training activity



Ms. Eva Lam

Director

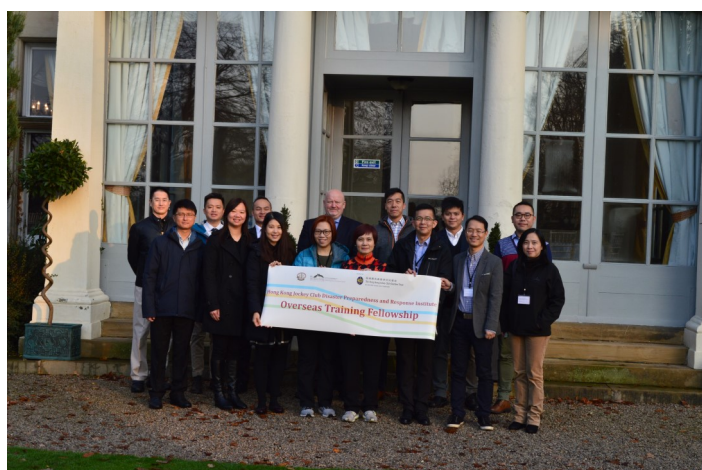
E-mail: eva@hkam.org.hk



Annual Conference 2018



Training simulation session



Overseas fellowship training programme

In 2018, three overseas training fellowship programmes had been organised to bring experts together to the United Kingdom and Australia, in collaboration with overseas training institutes and the local government.

Research and knowledge dissemination is another important scope of work of the HKJCDPRI. In 2018, the HKJCDPRI collaborated with the Hong Kong University of Science and Technology (HKUST) on a research to develop a Smart Landslide Barrier. The Smart Landslide Barrier is capable of detecting the impact of landslides of various types for enhancing the landslide detection technology. In September 2018, super typhoon Mangkhut devastated the city and caused substantial destruction including blockage of more than 1,000 road sections by fallen trees and coastal damages. In response to the catastrophe, the HKJCDPRI conducted a survey to gauge the public views on typhoon preparedness for Mangkhut to generate useful recommendations for preparing for the next typhoon season.

Disaster resilience cannot exclude community-based work. Through the “Community Campaign on Disaster Resilience” project, the HKJCDPRI collaborated with different organisations and schools to design community-based disaster preparedness and education programmes for specific target groups.

In the sector of tertiary education, the HKJCDPRI works with HKU and CUHK to develop and launch modules on disaster topics under their Master of Public Health (MPH) programmes and e-learning modules.

The HKJCDPRI keeps continuing its efforts in enhancing knowledge dissemination and regularly re-assesses the needs of Hong Kong and the region to set the way forward.





Centre of Excellence in Disaster Mitigation & Management Indian Institute of Technology (IIT) Roorkee, India

<https://www.iitr.ac.in/centers/COEDMM/pages/Home.html>



- Achievements, awards: The Centre has signed MoU to work with the National Institute of Disaster Management (NIDM), New Delhi in November, 2018.
- The Centre has joined hands in joint research on Lightning location system with Disaster Prevention Research Institute, Kyoto University, Japan in continuation with the DPRI-Kyoto University, Japan.
- To initiate Earthquake Early Warning System (EEW) network in India, a team of faculty members and students lead by Prof. Ashok Kumar have deployed sensors at different locations in the seismic gap region of Garhwal Himalayas with the help of Ministry of Earth Sciences in 2015. These Sensors are streaming data in real time to a computer server at the Institute. The sensors are used for issuing warnings for earthquakes of magnitude above 6 on Richter scale. The project was successfully completed in 2017. After this, Government of Uttarakhand has funded this project to the Centre for maintenance of this EEW System, installation of 100 additional sensors covering Kumaun region, installation of

sirens at Dehradun and all district HQs of Uttarakhand and installation of 100 sirens in the cities of Dehradun and Haldwani. In future, the EEW system can be used by Government and Semi-Government organizations like Delhi Metro, Nuclear Industry, Hazardous Industries and Public at large.

- National Mission on Himalayan Studies (NMHS) has awarded Himalayan Fellowship to the Centre to do research activities under the following
- Seismic Safety of Hill Buildings by using Low Cost Energy Dissipating Device
- Conceptualization, design and

development of forest-waste based sustainable complete materials

- Unraveling the hydrology of Hiamalayan catchment through high resolution hydrological data
- Impact of Future climate change on Himalayan snow and glacier melt runoff
- The Centre has awarded research project by ISRO Ahmedabad on "Vulnerability and Risk Analysis of Geohazards in Himalayan Region"

7 Ph.Ds. and 50 M.Tech. Degrees have been awarded so far.



Prof. Mahua Mukherjee

Director

E-mail: coe_dmm@iitr.ac.in





Nālandā
UNIVERSITY

Nalanda University, India

<http://www.nalandauniv.edu.in/>

In 2018, Nalanda University placed much emphasize on collaborative research with number of institutes around the world.

One of the institutes with which such collaborative research activities undertaken were the exchange visits of researchers with Disaster Prevention Research Institute (DPRI), Kyoto University, Japan,

Dr Subhajyoti Samaddar from DPRI visited Nalanda University and presented his ongoing research to students and faculties and also organized a short course on disaster risk assessment at the School of Ecology and Environment Studies. (Fig. 1)



Figure 1. Guest lecture by Dr. Subhajyoti Samaddar at Nalanda University

Similarly, Dr. Prabhakar Sharma from Nalanda University spent a week at DPRI to explore the research collaboration. They also developed a collaborative research proposal and attempted for funding through bilateral scientific collaboration under India-Japan Cooperative Science Programme. During his visit to DPRI, he also delivered a lecture on "Pollutant Fate and Transport of the Subsurface Systems". (Fig. 2)

His presentation covered different anthropogenic activities near the large water bodies which can lead to a heavy load of pollutant on the wetland and ultimately to the subsurface systems.

Dr. Prabhakar Sharma

Assistant Professor

E-mail: psharma@nalandauniv.edu.in





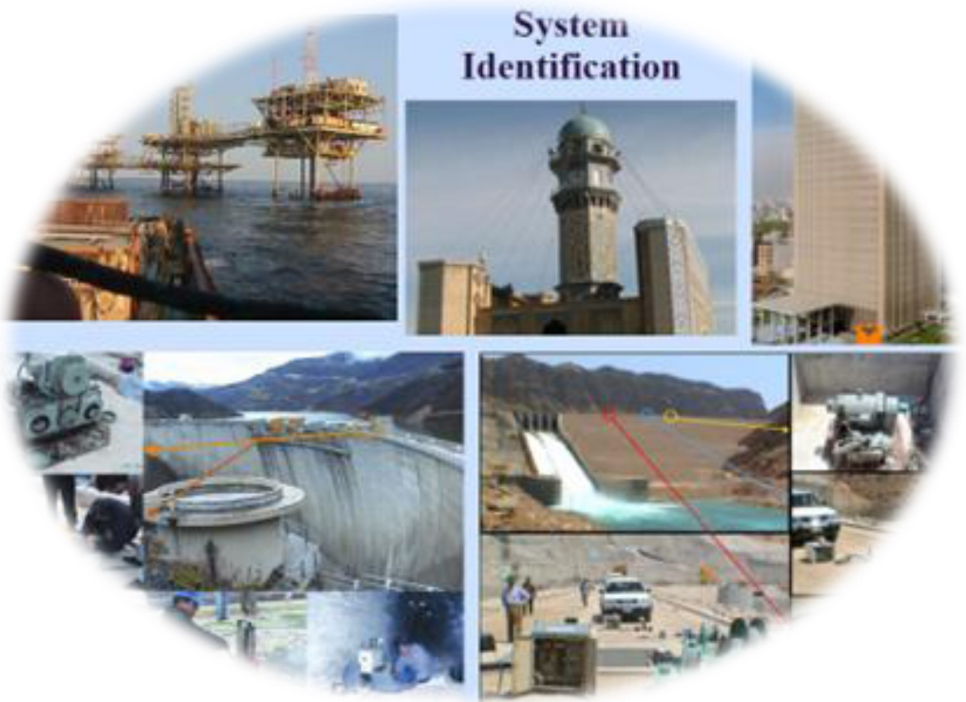
Figure 2. Dr. Prabhakar Sharma visit and seminar at DPR I

The University had received a big grant from Australia to produce an effective mechanism for social implementation of drought risk reduction strategies. This social mechanism is critical in developing country context where increasing number of people are at risk and having less resource to tackle them. This project is attempting to deliver a demand-driven convergent water solution for suddenly available water. In this project, the farmer beneficiaries from selected villages would be co-participants in the process. The socio-economic background, land holding pattern and the willingness and active interest of farmers is being analyzed for drought risk reduction strategies. The proposed institutional model is based on an assessment of the proper channels and actors who can communicate and raise concerns among the farmers regarding their environmental vulnerability due to water stress, and possible solutions to address them.

Within the School of Ecology and Environment Studies at the University, there is strong emphasis on disaster management and risk assessment courses at the existing master's program at the School. It aims to cover the interdisciplinary perspectives of characteristics, mechanisms, impacts, prediction and risk assessment of disasters. In addition, students are trained on GIS and remote sensing based technology for disaster risk and emergency management. They are also exposed to satellite positioning systems, communication technologies, crowd-sourcing and WebGIS techniques employed in different phases of disaster management cycle.

In 2018, following activities were undertaken:

- Development of Earthquake-induced Landslide Hazard Zonation Model Using Iran Database
- Application of Perfectly Matched Layer (PML) in Dynamic Analysis of Embankment Dam-Foundation Interaction
- Analytical development of seismic vulnerability functions for gas transmission pipelines in Iran
- Improving the existing methods for inclusion of kinematic interaction in seismic evaluation of soil-structure systems
- Development of Spatial Statistics Methods to Evaluate Seismic Vulnerability of Lifeline Networks
- Evaluating the Interaction of Surface Fault Rupture – foundation – Steel Structure
- Direct time integration from earthquake-induced equations of motion with steps larger than conventional without direct dependence to the response
- The Increasing of Energy –Absorption of CBFs by using of the new Steel or aluminum Cases based on



Structural Engineering Research Center

experimental investigations

- Self-Centering Wall, Level of Structural Damages, Energy Dissipation, Outside Steel Plate, Stiffener
- Development of an Image Based on Response recording Software
- Precising Measurement of Shear Modulus and Damping Ratio by resonant Column Test
- Upgradation of National Center of Broadband Seismic Network of Iran



Prof. Mohsen Ghafory-Ashtiany

E-mail: ashtiany@iiees.ac.ir;
mohsen.ashtiany@gmail.com



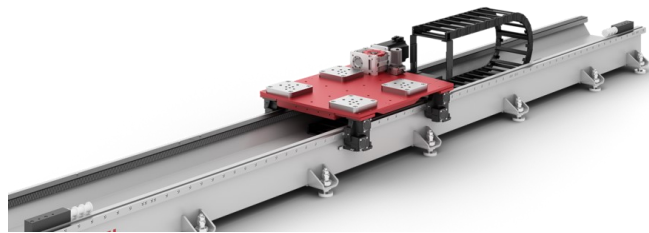
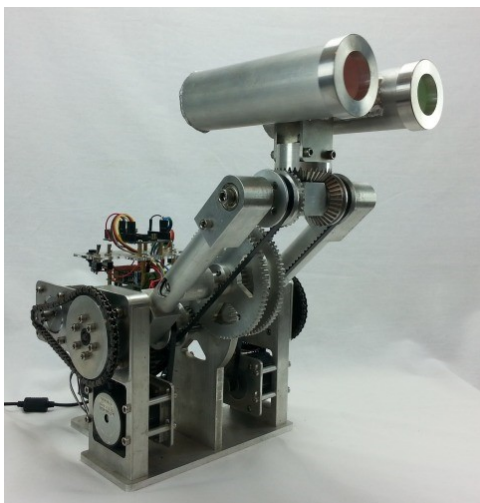
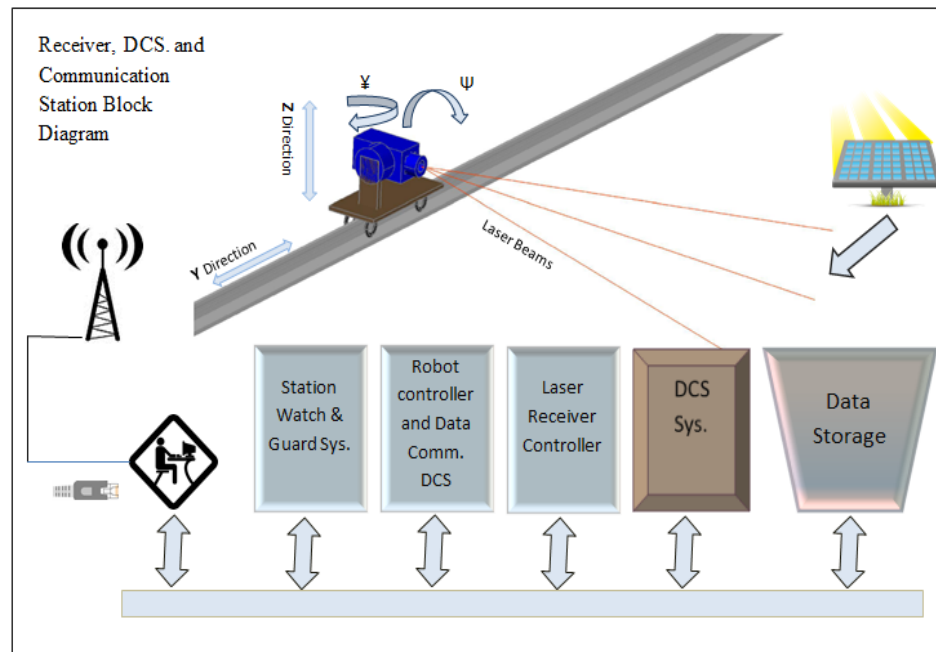
Soil Conservation and Watershed Management Research Institute (SCWMRI), Iran

<https://www.scwmri.ac.ir/>

The Landslide group of soil conservation and Watershed Management research has started its research activities since 1992. More than 25 research project has been initiated and implemented since its establishment. In 2018 the following are some of ongoing projects:

- Landslide occurrence risk assessment in the selected watersheds
- Evaluation of landslide vulnerability potential in the selected watersheds
- Preparation of landslide hazard zoning maps using Artificial Neural Network (ANN) in the selected watersheds
- Research on the effect of landslides on sediment delivery of landslide susceptible basins. "

Design and construction of prototype 'Robotic Landslide monitoring and logging system based on neural network'



Dr. Zieaoddin Shoaie

Professor

E-mail: zshoaiei@gmail.com,
zshoaiei@scwmri.ac.ir





College of Agriculture and Natural Resources (UTCAN) - Environmental changes Institute University of Tehran, Iran

<https://utcan.ut.ac.ir/en>



Being the best in Iran, the University of Tehran has been ranked as one of the top universities in Asia. The foundation of the College of Agriculture & Natural Resources (UTCAN), goes back to the year 1900, when it was first established as "School of Agriculture". 120 years of education, research and policy-making, has turned UTCAN into a pioneering and leading focal point in Iran and also in Asia. UTCAN is honored to have former Minister of Agriculture, Minister of Economy, Acting-Minister of Science, Parliament member, President of the University of Tehran and other great leaders among its faculty members. UTCAN, with more than 240 eminent faculty

members. 4500 Students are currently studying in 148 majors and specializations in 17 departments.

- Many regions of the world are increasingly facing challenges when it comes to management of resources and environmental changes and finding solutions for those related problems. The nature of these challenges differs from one location to another. Environmental changes which result in floods and droughts as well as long term impacts of climate change on different elements of environment can cause significant economic losses to various regions and nations and also increase the risk of disasters. We plan to establish a

specific institute on disaster risk management and environmental changes in 2019, but by then all activities are at UTCAN level.



Dr. Sharareh Purebrahim

Associate Professor

E-mail: Sh_pourebrahim@ut.ac.ir

- To promote scientific research on the issues and problems related to disaster management and environmental changes.
- To create and reinforce networks for the exchange of scientific, technical and policy information on disaster and environmental issues among the institutions and individuals in the region and in other countries.
- To develop and coordinate cooperative research activities on disaster management and environmental issues, taking advantage particularly of the installed scientific and professional capacity of the region and non-governmental organizations.
- To organize knowledge and information transfer activities on the subject, including international training courses, symposia or workshops, and to engage in appropriate awareness raising activities.
- To develop a strong program of information and communication technology to further objectives.
- To provide technical consulting and advisory services in the region and beyond as required.
- To produce technical publications and other media items related to the activities





Israel National Knowledge and Research Center for Emergency Readiness University of Haifa, Israel

<http://muchanut.haifa.ac.il>

The National Knowledge and Research Center for Emergency Preparedness was established in January 2018. The 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) performed gap/research needs assessments over a period of 7 months leading to the identification of disciplinary and multidisciplinary areas of necessary research. The process involved academic and gray literature surveys, interviews with researchers, experts, and practitioners, and group brainstorming sessions. The Center's subsequent areas of research focus on addressing the multi-disciplinary gaps identified (for a list of those gaps [see here](#)).

Four research projects were initiated in 2018, chosen on the basis of the following criteria: degree to which proposal addresses identified gaps; degree to which it is multidisciplinary; suitability of methodology; contribution (theoretical and empirical); suitability of investigators; expected outputs; budget.

The 2018 research projects chosen:

- Robust Preparedness Against Surprises in Extreme Events: Multi-Site Fires and Earthquakes
- Insurance, Thresholds and Mechanisms for Post Disaster Resilience
- Managing a Nation and its Citizens During a Crisis: Interrelation Test Between Government and Public During Emergency Times
- Using Twitter for near real-time alerts and damage analysis of natural hazards in Israel and its close surrounding



Dr. Michal Ben Gal

Research Coordinator

E-mail: bmichal@geo.haifa.ac.il



Risk Assessment and Management—two-day course

In addition, the following activities took place in 2018:

- Construction of database (ongoing)
- Bi-monthly seminars, all on YouTube and can be watched in real-time as well as archived – see “[Events](#)” on our website
- Two day condensed course on *Risk Management for Emergency Readiness* open to stakeholder public
- International workshop held in conjunction with [DIM2SEA](#) project - *Cascading Disasters: Theory, Methods and Empirics*, November 28 -29, 2018. For program and videos from the event – see [here](#) (publication forthcoming in 2020: *Cascading Effects in Disaster Risk Science: Multi-Disciplinary Perspectives* to be appear in the *International Journal of Disaster Risk Reduction* (IJDRR), published by Elsevier.



Cascading Disasters Workshop

More information about Center research is available on our website at:

<http://muchanut.haifa.ac.il/index.php/en/research/center-research>



Cascading Disasters Workshop



University of Kabangsaan Malaysia, Malaysia

<http://www.ukm.my/seadpri/>



Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM) at the Institute for Environment and Development (LESTARI) University of Kabangsaan Malaysia, Malaysia



Since 2016, SEADPRI-UKM was awarded as Integrated Research on Disaster Risk (IRDR) International Centre of Excellence (ICoE) for Disaster Risk and Climate Extremes. Hence SEADPRI-UKM is now one of the 16 ICoEs at the global level, that aims to promote DRR activities and programmes within the respective regions. The ICoE represents, in this case of SEADPRI-UKM, the South East Asian region, focusing on strengthening localised inputs to address regional DRR related matters. SEADPRI-UKM will continue to capitalise on this partnership framework to further advance work related on DRR.

SEADPRI-UKM embarked on a research project involving teams from Malaysia and the United Kingdom, awarded under the Newton-Ungku Omar Fund, administered by Innovate UK and the Malaysian Industry-Government Group for High Technology (MIGHT). The project, Disaster Resilience Cities: Forecasting Local Level Climate Extremes and Physical Hazards for Kuala Lumpur focuses on ways to best adapt selected meteorological and hazard models to enable better forecasting of climate extremes and physical hazards in Kuala Lumpur. Pilot studies will be conducted in Kuala Lumpur and adjacent areas, focusing on areas that include meteorological forecasting, hazard modelling and multi-hazard forecasts for flash floods, landslides, sink holes, strong winds, urban heat and air pollution at very detailed scales.

Under the collaboration agreement between Universiti Kebangsaan Malaysia and the Cambridge Malaysian Education and Development Trust (CMEDT), in association with the Malaysian Commonwealth Studies Centre (MCSC) that led to the Asian Network for Climate Science and Technology (ANCST) and Malaysia-Window-to-Cambridge at Universiti Kebangsaan Malaysia (MW2C@UKM), with the objective to enhance capacity-building in areas related to atmospheric science and climate change in Malaysia and the region, to help strengthen the expertise required for future disaster prevention. The MW2C@UKM annually hold programme to facilitate junior staffs and student exchanges to enhance awareness and strengthen ties between the University of Cambridge and UKM. It also serves as a gateway to Cambridge for scientists from Malaysia and Asia.



Prof. Dato' Mazlin Mokhtar

Director, LESTSRI, UKM

E-mail: seadpri@ukm.edu.my

In 2018, SEADPRI was awarded 3 new project namely Capacity Building Research in Relation to IPCC, SDGs and the Paris Agreement by Asia Pacific Global Network (APN); Development of Synthetic Biology Sensors for Detection of L-arginine in Fruits and Commercial Beverages by Malaysian Research University Network Grant (MRUN); and Development of Rapid and in-situ Mycotoxin Detection Kit by Research University Grant.

With technical support from SEADPRI-UKM and the United Nations Office for Disaster Reduction (UNISDR) Asia & Pacific Regional Office, the National Disaster Management Agency in the Prime Minister's Department of Malaysia (NADMA Malaysia) successfully organised the Sendai Framework Monitor (SFM) Orientation and Training Workshop on 19-20 March 2018 at UKM Bangi.

The workshop was the first national training workshop using the Sendai Framework Monitor (SFM) System in the world, since its inauguration on 6 December 2017 by UNDRR. This workshop was designed specifically for Malaysia to learn about SFM System and its data entry, analytical capabilities as well as its application at the global, regional, national and local levels, in achieving the Global Targets of the Sendai Framework.

Besides, there are other on-going initiatives such adoption of green technology (collaboration between university and private sector) to prevent pollution, adoption of Sustainable Development Goals (SDGs) into National plans, and prevention of chemical-related disaster.



Sendai Framework Monitor (SFM) Orientation and Training Workshop on 19-20 March 2018 at UKM

Institute of Noise & Vibration (INV) Universiti Teknologi Malaysia (UTM), Malaysia <http://inv.com.my/>



The Institute of Noise & Vibration is a centre of excellence of Universiti Teknologi Malaysia established in 1992 offering technical services and industrial research of the University in noise & vibration and seismic engineering to industry.

It is a National Higher Institution Centre of Excellence (HiCoE), recognised as a referral centre by the industry and government agencies for noise & vibration and structural integrity assessment in the country. Personnel of the Institute are leading authorities in this specialised field in the region.

Being a technical service provider operating within an academic and research ecosystem, we have strong skills in practical problem solving and design—gained from more than 30 years of hands on track proven experience and continuous involvement in industry driven research. Our analytical, computational, modeling resources, track record and experience is unmatched in the ASEAN region.

INV is currently involved in several national-level projects as consultant for noise & vibration mitigation work. All new highways development and highway expansion projects in Malaysia require a Detailed Noise Study, and where noise mitigation is required, a Design Brief for Noise

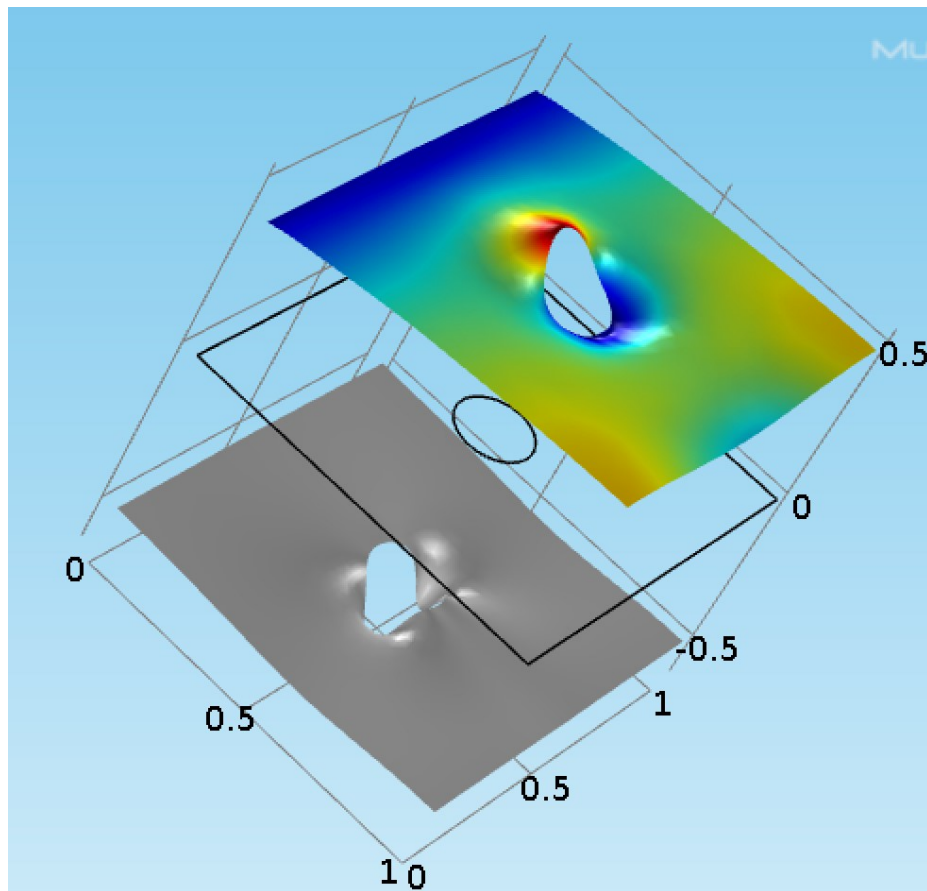
Barriers. The Institute is the country's leading expert in highway noise, and is highly regarded by the Malaysian Highway Authority (LLM). Furthermore, the same work also is being carried out for Malaysia's railways (Mass Rail Transit and LRT). We undertake detailed design of trackform isolation and building isolation for ground-borne vibrations and noise affecting buildings built adjacent and above railway lines.

INV also has successfully organized Engineering Applications of Artificial Intelligence (EAAI) Conference in Sabah, Malaysia. This conference was held on 3 ~ 5 December 2018 at Sutera Harbour Resort, Sabah, Malaysia. Engineering Applications of Artificial Intelligence (EAAI) Conference is a conference that is held to bring together scientists, engineers, researchers and practitioners to share latest information, trends & technology in the field of engineering applications of machine learning and artificial intelligence.



Prof. Mohd Salman Leong

E-mail: salman.kl@utm.my



Work on the project **“Towards a flood-resilient Omani society: improved tools for flood management”**, funded by the Omani Research Council (TRC), was continued in 2018. Major topics were the delineation of watersheds in the study region (Al Batinah South) and the extension of the sediment transport model. There were also preparations for finalizing the project in spring 2019.

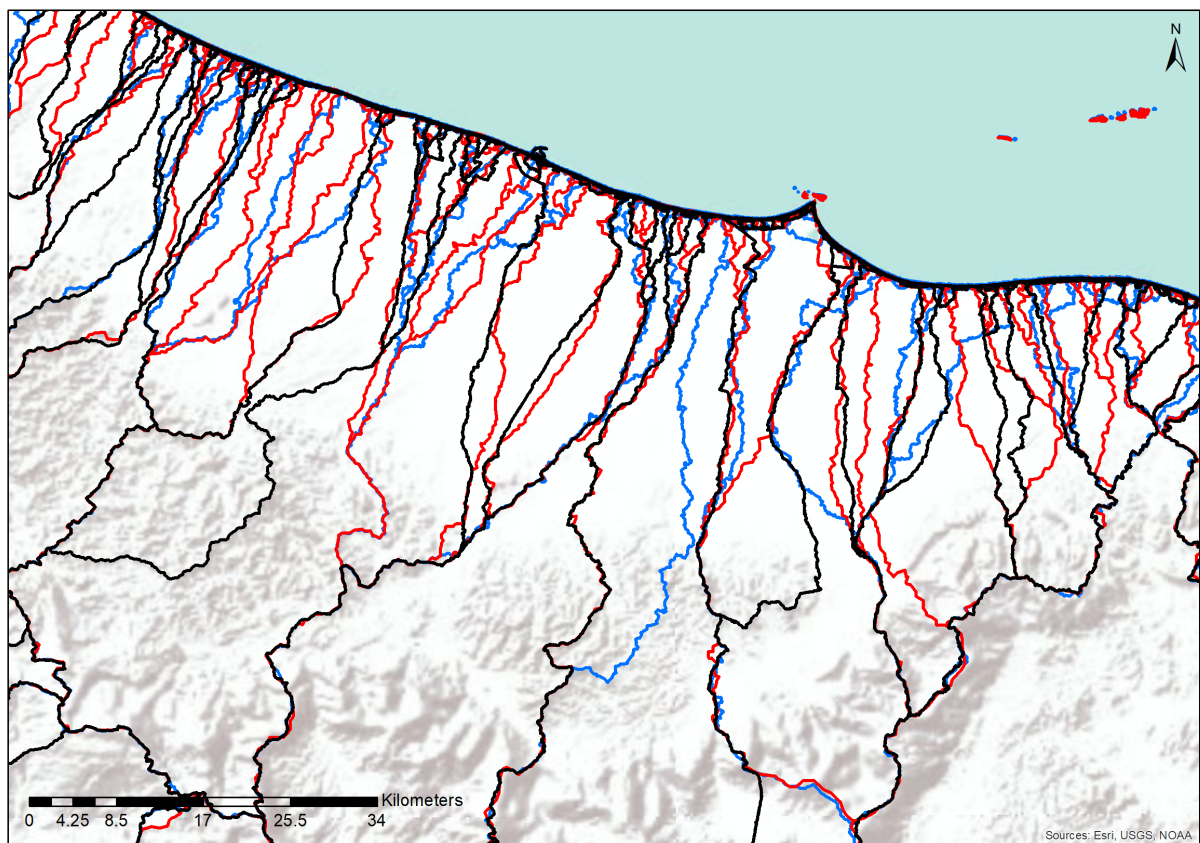
Concerning the delineation of watersheds differences were examined that appear, when an automatic delineation tool is applied using different digital elevation maps (DEM). For that demonstration we used the ARCGIS toolbox and DEMs from SRTM, GDEM and TanDEM (see center figure below). First results were presented at the 4th Symposium on Flash Floods in Wadi Systems (ISFF4) (Hadidi & Holzbecher, 2018). There were also preparations on the print version of this work.

The sediment transport simulation was implemented as an extension of a shallow water equation model for fluid flow. Bedload and suspended load are considered in the model. The simulation was examined on generic test cases. The top-right figure below shows the change of water table and bottom surface around a cylindrical obstacle. The model was presented at two conferences (Holzbecher & Hadidi, 2018a,b). The former presentation is available as a print version in the electronic proceedings on the internet.



Prof. Ekkehard Holzbecher

E-mail: Ekkehard.holzbecher@gutech.edu.om



As final part of the project work a study was initiated dealing with quick on-line simulation of flood events. For this purpose collaboration was established with Nelen & Schuurmans, The Netherlands, in order to examine the application of the advanced 3Di model for the creation of flood maps. A flood scenario was established for a reduced model region that includes the university campus. There was field-work required for the scenario set-up (see bottom figure).

The international cooperation was intensified in 2018. There was continuous contact with the Atmosphere and Hydrosphere Research group at Kyoto University, Disaster Prevention Research Institute. Two members of the GUTech team participated at the ISFF5, as members of the scientific and organizing committees, as reviewers and as presenters (see Figure top left). At the conference there was extensive exchange with the teams from Kyoto University and the Moroccan hosts. At the end of the year a new cooperation was established with

the Dutch group promoting the 3Di model approach.

Publications

- Holzbecher E. & Hadidi A., A multiphysics approach to sediment transport in shallow water, COMSOL2018, Lausanne, October 22-24th, 2018a
- Holzbecher E. & Hadidi A., Coupled flow and sediment transport in shallow water, 4th Symp. On Flash Floods in Wadi Systems, Casablanca, December 4-6th, 2018b
- Hadidi A. & Holzbecher E., Delineation of catchment boundaries in wadis' downstream in South Batinah, 4th Symp. On Flash Floods in Wadi Systems, Casablanca, December 4-6th, 2018



Philippine School of Business Administration (PSBA) Philippines

<http://psba.edu/>

The Disaster Risk Management (DRM) Unit, under its Graduate School of Business (GSB), Philippine School of Business Administration – Manila (PSBA-Manila) won First Place in the National Capital Region (NCR) Regional Gawad KALASAG Awards 2018 for the Higher Education Institutions category organized by the Republic of the Philippines Office of Civil Defense (OCD) under its Department of National Defense on July 30, 2018. This award is given to Philippine institutions for their outstanding contribution and excellence in disaster risk reduction and management, as well as humanitarian assistance.



From left: Ms. Marquinez, Engr. Lopez, Dir. Salvador, Dr. Raza, MGen. Cabantac, Ms. Tiongson, Mr. Pandan, and Ms. Maala receiving PSBA-Manila's 2018 Gawad KALASAG Award for higher education institution category in NCR

Further, the DRM Unit of PSBA-Manila, in collaboration with its local and international partners: the Quezon City Local Government; University of the Philippines Planning and Development Research Foundation; Asian Institute of Technology (AIT), Thailand; Lahore College for Women University (LCWU), Pakistan; and National Health Emergency Preparedness & Response Network, Pakistan; co-organized two International Seminars held in Quezon City Experience Theater, Philippines as follows:

- International Symposium 2018 with theme "Public Private Trends In Business Management – Understanding Disaster Risk towards Business Continuity". <http://psba.edu/proceedings/international-symposium-january-27-28/>
- International Research Colloquium 2018 with theme "Business Management Resiliency towards Risk Reduction in Changing Climate, Promoting Financial, Industrial and Environmental Safety". <http://psba.edu/proceedings/3rd-international-research-colloquium-october-13/>



Prof. Tabassa, Raza

Director, DRM Unit

E-mail: tabassamr@psba.edu

An International Workshop held in AIT, Thailand; and Faculty Strengthening Program was held in LCWU, Lahore, Pakistan. The proceedings for these events are disseminated through the PSBA-Manila website at <http://psba.edu/downloads>.

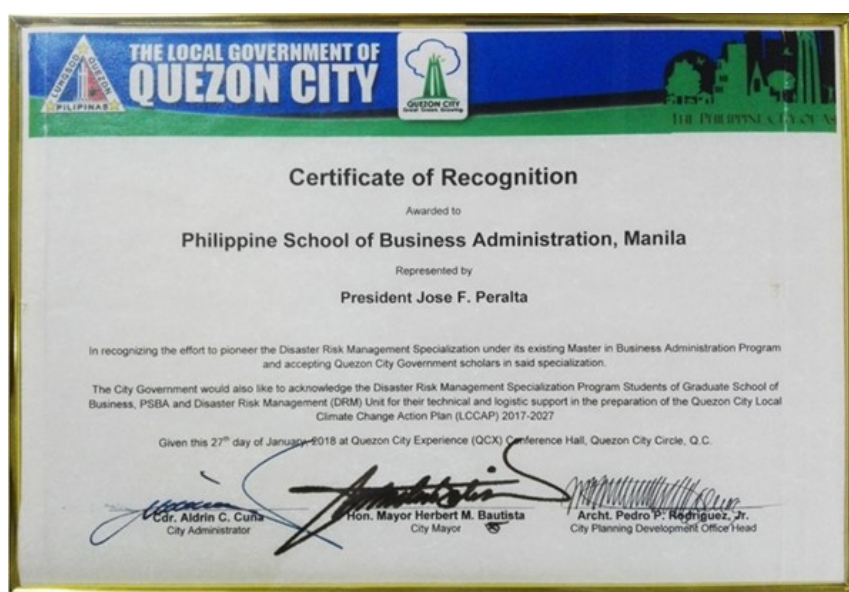
Researches produced in 2018 by the DRM Unit Research Fellowship Program in collaboration with partners include:

- Raza. T., Andres A., Castro J., Vinarao V., Rentoy F., Raza. TK., & Siddiqui T. (2018). "Understanding and Managing Risks of Climate Extremes: A Local Sustainable Development Action Plan, Quezon City, Philippines" presented at the Sixth Annual International Conference on Sustainable Development, also known as ICSD 2018, held on the September 26 to 28, at the Alfred Lerner Hall, Columbia University, New York City
- Raza. T., Andres A., Castro J., Vinarao V., Rentoy F., Raza. TK., & Siddiqui T. (2018). "Climate-Related Disasters Challenges for Sustainable Development: Innovating a Science and Policy Framework towards Sustainable and Climate-Resilient Quezon City, Philippines" accepted in the International Conference on Building Resilience (ICBR) Lisbon' 2018, November 14-16, 2018, Lisbon, Portugal, p11.

- Raza. T., Andres A., Castro J., Vinarao V., Rentoy F., Raza. TK., and Espinosa R. (2018). "Enhancing Urban Resilience towards Water Sufficiency during Extreme Weather Disastrous Impact: Sectoral Adaptation Action Plan of Quezon City, Philippines" presented in the International Conference, Water Science for Impact, October 16-18, 2018, Orion Wageningen, The Netherlands

In addition, DRM Unit, GSB, PSBA-Manila achieved the following recognitions as follows:

- Certificate of Recognition from Quezon City Government to PSBA-Manila for technical and logistical support in preparing the QC Local Climate Change Action Plan (LCCAP) 2017-2027
- Certificate of Recognition from the Lahore College for Women University
- Plaque of Appreciation from the National Health Preparedness Response Network, Ministry of National Health Services & Regulations & Coordination Islamabad, Government of Pakistan



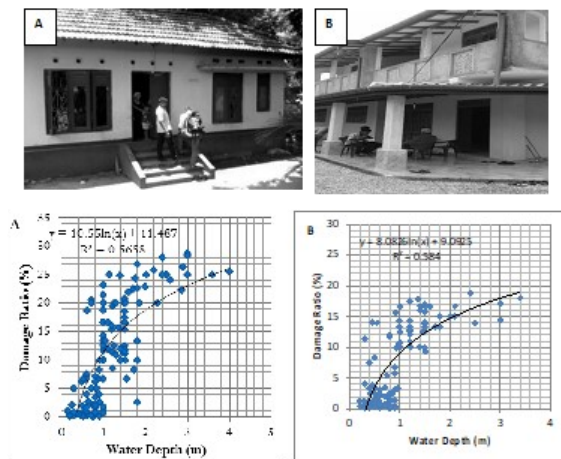
Certificate of Recognition from Quezon City Government (QCG) to PSBA-Manila for technical and logistical support in preparing the QC LCCAP 2017-2027

1. The building for center for flood control and water management is now under construction and will house a state-of-the-art real time forecasting and control center to manage floods in Metro Colombo. The center also has agreements with the University of Peradeniya and the University of Moratuwa, Sri Lanka, so that center staff can be enrolled in the M.Sc. Eng. programmes of the universities in one-year research degrees based on the research work carried out at the center. Three students have completed and moved on in 2018 and currently 7 new staff enrolled in M.Eng. programs. The center also can host visiting postgraduate students who can conduct research on various aspects of urban water management where the Megapolis Development Programme will serve as a “living laboratory”. The home page (full access require login accounts).

2. Monitoring and Forecasting

The center has established an automated system for flood early warning and risk assessment that comprise of interconnected systems of weather forecasting, real time rainfall and water level monitoring system, hydrological and hydro dynamic simulation, flood damage and potential flood risk assessment and dissemination, Figure 1 shows some of the components related to monitoring and forecasting. Figure 2 shows the system for estimating potential structural loss and people affected in Colombo based on detailed building foot print, damage functions for different building types and population distribution in the city. These assessments were verified by checking with past major floods in the city.

Risk Based Flood Management



10 building categories. Reclassified to 5 groups with damage functions

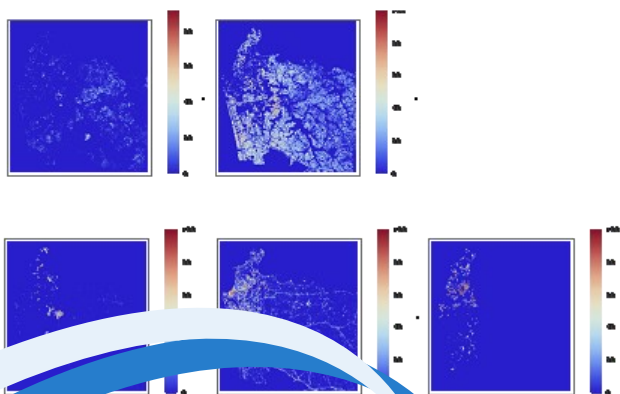
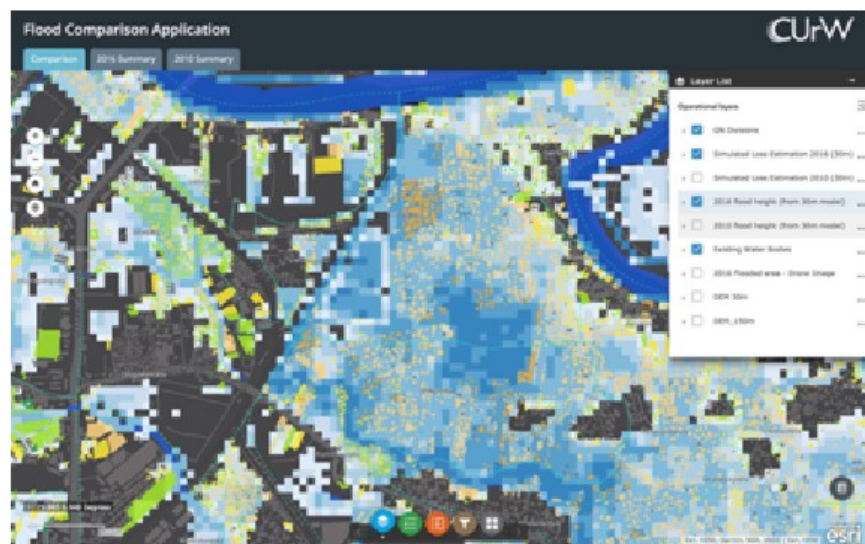


Figure 2: Stems used in assessing potential flood impacts based on inundation forecast and building





National Building Research Organisation (NBRO) Sri Lanka

<http://www.nbro.gov.lk>

Nature Based Landslide Risk Management at NBRO

In the past, when implementing structural mitigation interventions for landslide risk management, country has largely relied on engineering solutions and the application of nature-based and hybrid (engineering and nature based) approaches was limited. It has been demonstrated in many countries in Asia that the risk-informed nature-based solutions can be also effective in reducing the occurrence and impact of such landslides.

Therefore, World Bank has launched an Analytics and Advisory Services project on Nature Based Landslide Risk Management in April 2018. This project, which is implemented by the National Building Research Organisation, aims to raise awareness and deepen the knowledge on the role of nature based and hybrid solutions for landslide risk management within the country. The Asian Disaster Preparedness Center (ADPC) has been assigned to provide implementation support and technical guidance in executing the project activities.

- Preparation of a guidance document on nature-based landslide management approaches. This guidance manual has been developed with the purpose of providing guidance to those who are involved in landslide mitigation work (such as NBRO, relevant local authorities, other practitioners) to help in designing, implementation and monitoring the nature-based mitigation solutions for landslide and erosion risk reduction. Since measures are applied under a range of physical conditions, the manual covers practical as well as theoretical aspects of bio-engineering measures that can be applied for mitigating the landslide risk in Sri Lanka.
- Dissemination /Validation Workshop and submission of the Final Report incorporating the suggestions made during the stakeholder workshop. The said workshop has been organized considering the importance of disseminating the outputs to a wider audience.
- Assessment of relevant legal, regulatory and institutional framework. A full report on the study outcome of relevant legal, regulatory and institutional framework as well as the recommendations for creating an enabling environment are some of the highlights of this task.
- Preparation of a Comprehensive landslide risk management plan for selected pilot sites. The activities under this task have been carried out based on two pilot sites in Badulusirigama in Badulla District and Galaboda in Rathnapura District.



Dr. Asiri Karunawardena

Director

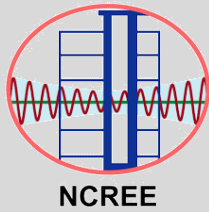
E-mail: asiri13@hotmail.com

The following important lessons could be drawn from the activities project:

- Developing a process for application of nature-based solutions (NBSs) for landslide risk mitigation from scratch is difficult but achievable. Availability of data plays a significant role in selecting candidate sites. When data is limited reasonable assumptions can be made but better if data can be made available through additional investigations and other efforts
- Advance work carried out for literature survey has given lot of inputs for designing the project activities and lining up them in a systematic order
- Limited awareness on the subject increased the interest for learning as well helped in developing better understanding of the subject and for creating appropriate knowledge base within the implementing organization NBRO.
- Creating an interest group consists of a young and enthusiastic set of scientists representing multiple disciplines is a good indicator for success. Linking project staff with national and international level subject experts selected to provide resource inputs under different tasks could help in achieving the sustainability. They can continue extending help in enhancing the capacity and knowledge of the group beyond the existence of the project.
- There is a scope for promoting nature-based solutions in future as an effective instrument for disaster risk mitigation. This helps in creating an enabling environment for promoting application of nature-based solutions for protection and conservation of the natural environmental resources.



Selected pilot site



National Center for Research on Earthquake Engineering (NCREE), Chinese Taipei

<https://www.ncree.org/>

Developing Seismic Assessment and Retrofitting Techniques for Soft- and Weak-Story Buildings



Fig.1. The shaking table test on soft- and weak-story building

Taiwan has identified as many as 33 active faults in the island. The areas within ten kilometers on both sides of these faults are subjected to the impact of near-fault effects where more than 8.6 million people and 2.5 million buildings will be affected. The situation is more dangerous for buildings as near-fault ground motions are characterized by their large velocity pulses and large fault displacements. To resolve the problem, the National Center for Research on Earthquake Engineering (NCREE) has been continuing to develop seismic assessment and retrofitting techniques for soft- and weak-story buildings by conducting a series of large-scale shaking table collapse experiments. The aim is to explore the effects of near-fault earthquakes on soft- and weak-story buildings and devise solutions to mitigate such effects, in order to secure the safety of the public.



Prof. Shyh-Jiann Hwang

Director-General

E-mail: sjhwang@ncree.narl.org.tw

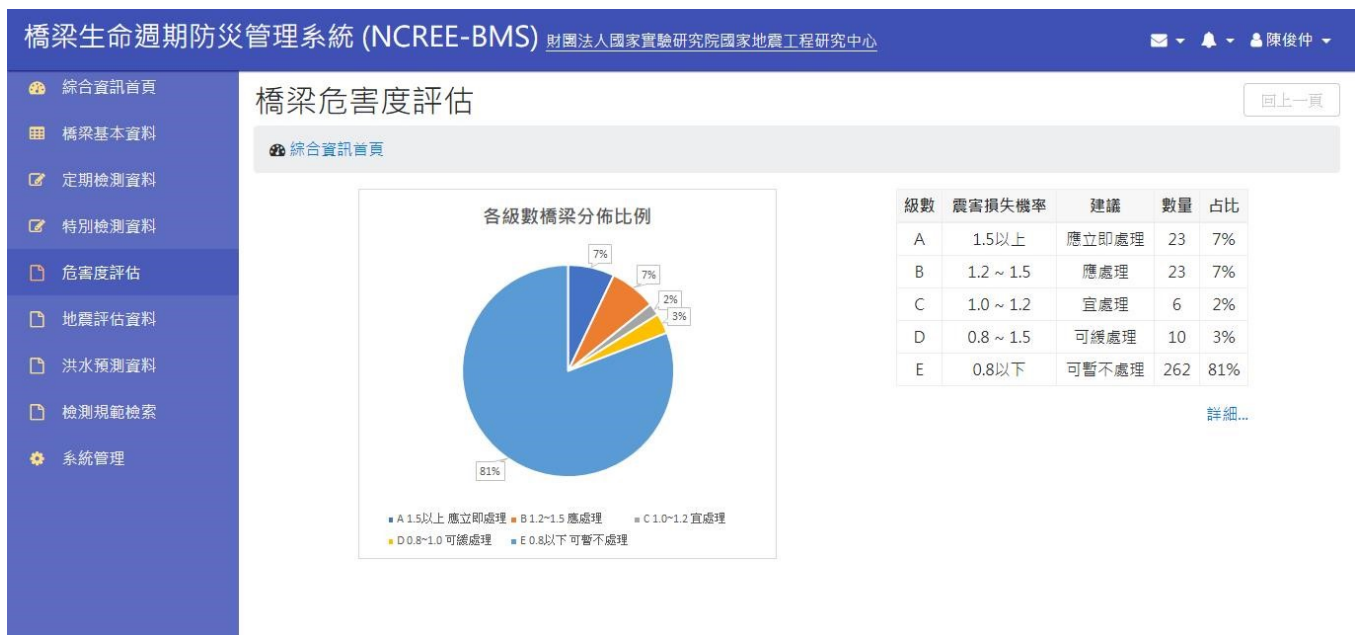


Fig.2. The automated report of bridge hazard evaluation

The Guardian of Bridge Safety: Life-Cycle Based Bridge Management System for Disaster Prevention

Taiwan has nearly 28 thousand bridges, ensuring bridge safety is far more crucial than we could have imagined. Thereby, NCREE has developed the Life-Cycle Based Bridge Management System for Disaster Prevention, which aims to manage bridge safety and can automatically assess the health condition of bridges in their everyday uses. The system was inspired by healthcare management for humans. Additionally, the cutting-edge, fully-automated system also transmits timely warnings to bridge safety management authorities before disasters strike. Therefore, the developed system is a driving force that can thrust forward Taiwan to achieving a new milestone in bridge safety management.

Design guidelines for the support structure of Taiwan offshore wind turbines-Domestic design guidelines for offshore wind turbines

Due to the site conditions in Taiwan Strait and extreme environmental conditions e.g. earthquakes and typhoons which are different from European experiences, the design of offshore wind turbines and the establishment of wind farms require domestic guidelines to ensure safe operations of the wind farms. According to the DNV GL standard adopted by the international certification system, NCREE has formulated and finalized the “Design guidelines for the support structures of Taiwan offshore wind turbines” as a basis for the domestic wind power industry. In addition, NCREE cooperated with the Bureau of Standards, Metrology and Inspection to transfer the contents of the seismic design force and geotechnical surveys developed in the guidelines to national standard.



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

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

In 2018, huge earthquake, typhoons and torrential rains hit Taiwan. As usual, NCDR has offered information intelligence for emergency operations, and the results did improve efficiency to make effective decisions for emergency preparedness and response. At the information age, big data and crowdsourcing data not just facilitate trade activities and business operation, but also bring benefits to disaster risk reduction, emergency preparedness, business continuity planning, resilient global supply chain, critical infrastructure protection and tourism safety. In 2017 and 2018, NCDR has kept on applying the big data and communication tools to promote the information service. NCDR and LINE had announced a non-profit collaboration in March 2018 to push pre-subscribed and location-based disaster alerts to users' mobile phones through NCDR Official Channel. During the torrential rain event in the mid of June, an exponential increased of number of



subscribers, from fifty thousand to over half million within 24 hours. From this fresh experience, NCDR is still putting efforts how to prepare understandable information for the general public through a social media.



Ms. Kiri Chan

Assistant Researcher

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





To enhance the joint efforts for private, civil and public sector on disaster reduction, NCDR and the Daniel K. Inouye Asia-Pacific Center for Security Studies (DKI APCSS) cohost the “Integrating Private, Civil & Public Sector Disaster Response” Workshop that brought disaster management professionals from 12 regional nations to Taipei City, Taiwan. The targets of workshop are to enhance partnerships among all participants through lectures and group discussions. In the workshop, not only provided valuable experiences and studies to share, but also mapped out several activities for discussions, dialogues and brainstorming. Taiwan has worked in disaster response and already integrates private, civil, and public sector response in planning and execution. That experience was on display as Taiwan representatives shared their experience with other participants and cooperatively developed solutions for improving sector integration.



Disaster Preparedness, Mitigation and Management (DPMM), Asian Institute of Technology, Thailand

<https://www.ait.ac.th/>

Disaster Preparedness, Mitigation and Management (DPMM) at Asian Institute of Technology, Thailand is regularly conducting Post Graduate program (Masters and PhD). Apart from the regular courses significant projects and publications are listed as follows,

- Project: “Evidence-based Analysis of Flood Risk Management and Social Vulnerability – A System Approach in Sakon Nakhon Province, Thailand” 2018 -2019 – IRDR-ICoE (Taipei) / International Council for Science (ICSU).

The Sendai Framework Agenda for 2030 calls to increase awareness on disaster risk reduction and resilience and implement policies to prevent new risks.

The unique amalgamation of disaster resilience and sustainable development educators in Asian region is a vital need to develop cross cutting education system particularly in vulnerable Asiapacific region. The “sharing of resources and knowledge” and “mutual learning” approaches are important ingredients of resilient community. To inculcate the integration of the Natural Science and Social Science approach towards DRR and Sustainable development through multidisciplinary higher education process, an International Symposium on “Disaster Resilience and Sustainable Development” was organised by Asian Institute of Technology, Thailand from 7 - 8 March 2019. The programme included keynote speeches, panel discussions, technical session, poster presentation and academic exhibition.

<https://www.ait.ac.th/event/international-symposium-disaster-resilience-sustainable-development/>

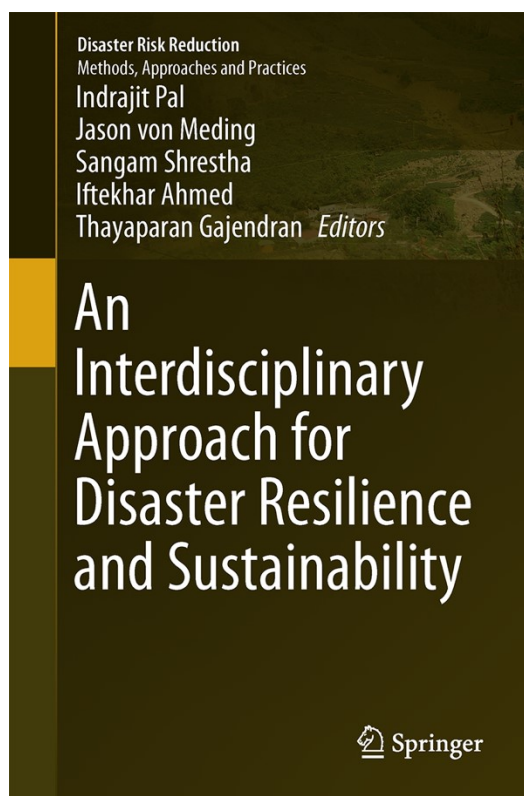


Dr. Indrajit Pal
Assistant Professor

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

- Project: “Disaster Resilience and Sustainable Development Education Network in Asia” 2018-2019– by ProSPER.net, UNU, Tokyo, JAPAN. This project aims to establish a working group on Higher Education Institutions on Disaster Resilience and Sustainable Development under the ProSPER.Net umbrella. Its aim is to form a robust regional network with the collective capacity to lead initiatives that protect society from shocks to physical, socio-cultural, politico-economic and natural systems and hence enhance the potential for sustainable development of the region. The working group intends to pursue curriculum reform to integrate the sustainability agenda into postgraduate courses, curricula and programmes, along with the development of a multidisciplinary curriculum mapping tool focussing on the Sendai Framework for Disaster Risk Reduction (SFDRR) and the Sustainable Development Goals (SDGs). <http://prospernet.ias.unu.edu/>
- Project: Co-Principal Investigator for the UKRI funded GCRF Project “Living Deltas” 2019 – 2024.
- Deputy Lead of the project “Capacity Building through Curriculum Development, Conduct Various Trainings for Provincial and District Disaster Management Authorities and Line Department Government Officials – Sindh Province, Pakistan” 2019-2020.
- Book Publication: “An Interdisciplinary Approach for Disaster Resilience and Sustainability” – Springer Nature, 2019 (in Press).

This book includes selected papers presented at the international expert forum on “Mainstreaming Resilience and Disaster Risk Reduction in Education,” held at the Asian Institute of Technology, Thailand on 1 to 2 December 2017. <https://www.springer.com/gp/book/9789813295261>



Japan and Oceania

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
Research and Development Center of Fire and Environmental Safety (RDFES), 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

Oceania	
Australia	Fenner School of Environment & Society, Australian National University (ANU)
Australia	College of Health & Human Sciences, 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	School of Earth and Environmental Sciences (SMAH), University of Wollongong
New Zealand	GNS Science





Asian Disaster Reduction Center (ADRC), Japan

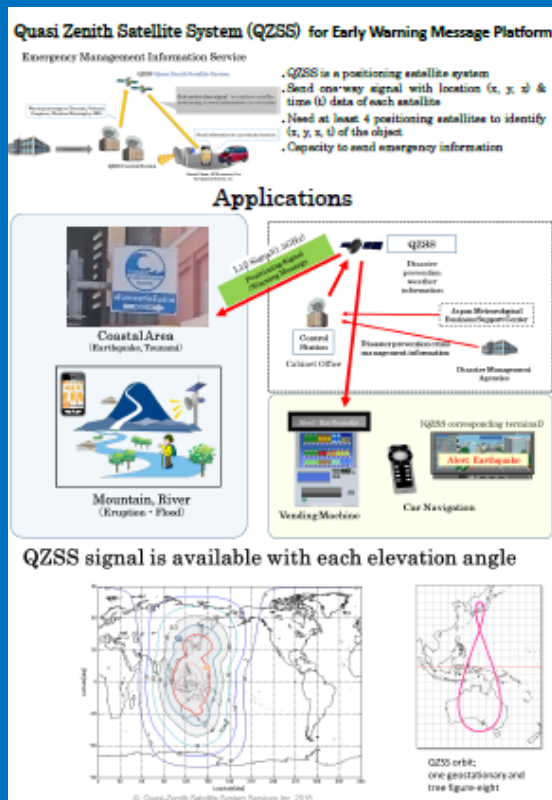
<https://www.adrc.asia>

Asian Disaster Reduction Center (ADRC) was established in Kobe, Japan in 1998. Since then, ADRC has been committed to enhance disaster resilience, build safe communities and create a society where sustainable development is possible in its 31 member countries in Asia and the Pacific.



Quasi Zenith Satellite System (QZSS)

ADRC has been involved in a project for application of Quasi Zenith Satellite System (QZSS), the Japanese GNSS. Although it is a positioning satellite system, it has a capacity to send early warning message to a designated area. The early warning message through QZSS is available with a QZSS signal receiver when and where Wi-Fi, telephone, radio and TV are not available or not working. For making this technology a practical disaster risk reduction tool, there are some challenges. Since the QZSS capacity for sending early warning message is limited, the message needs to be coded to reduce the volume of the message. The protocol to convert the text message into the coded message needs to be developed. understanding of DRR, and strengthen cooperation through the network of ADRC.



Dr. Shiomi Yumi

E-mail: ys-shiomi@adrc.asia

adrc.shiomi@gmail.com

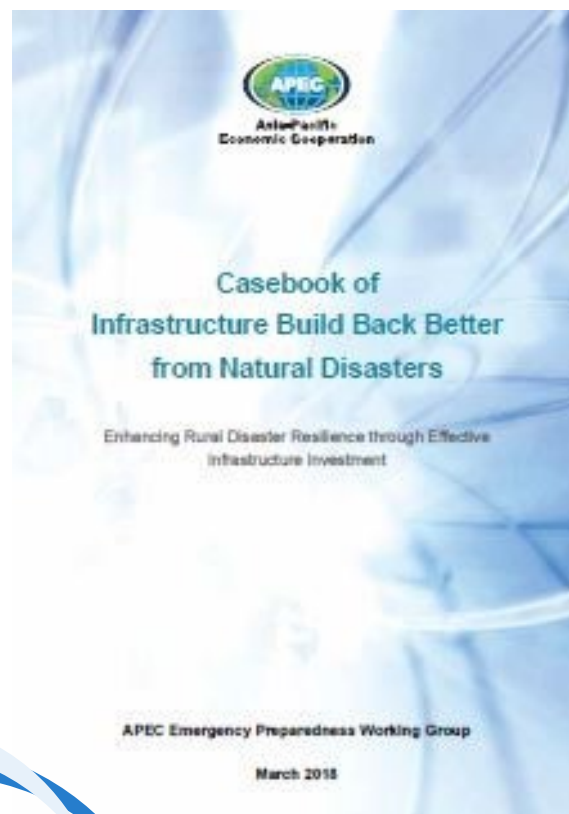


Publication

In 2018, ADRC compiled a Casebook of Infrastructure Build Back Better from Natural Disasters: Enhancing Rural Disaster Resilience through Effective Infrastructure Investment. This casebook is the output of the APEC project, Enhancing Rural Disaster Resilience through Effective Infrastructure Investment, aimed at facilitating quality infrastructure investment at the Build Back Better (BBB) stage. Focus is placed on non-metropolitan areas, including small- and middle-sized cities, and rural areas facing growing demands for important infrastructure investments in the coming decades. The researchers and experts from Chinese Taipei, Indonesia, Japan, Philippines, Vietnam and the US made contribution to the casebook, after conducting surveys in infrastructure recovery situations after major disasters in the region.

Capacity Development

Among its major activities for capacity development, ADRC has been promoting Visiting Researcher Program since its inception. In 2018 six VRs from its member countries, India, Maldives, Malaysia, Myanmar, Philippines and Thailand, joined the program. During the program, they were provided with various opportunities to obtain academic and practical expertise, enhance understanding of DRR, and strengthen cooperation through the network of ADRC.





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

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

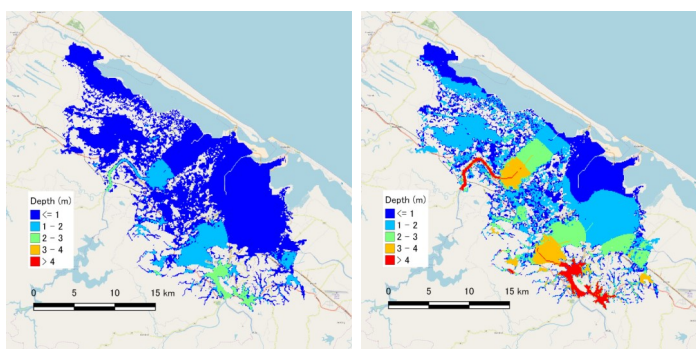
International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO was established as a UNESCO category II center and a part of the Public Works Research Institute of Japan on 6th March 2006.

The mission is to serve as the Global Centre of Excellence for Water Hazard and Risk Management by observing and analyzing natural and social phenomena, developing methodologies and tools, building capacities, creating knowledge networks, and disseminating lessons and information in order to help governments and all stakeholders manage risks of water related hazards at global, national, and community levels.

To achieve the mission, ICHARM has conducted various activities based on its three pillars, i) innovative research, ii) effective capacity building, and iii) efficient information networking, including following special topics;

i) Innovative research

The future flood risk associated with climate change in three cities in Vietnam was estimated on the ADB project. For the evaluation, GCMs that more appropriately expresses the climate characteristics of the target area were selected from CMIP5, and the uncertainty of the future results was evaluated by statistically downscaling the selected GCMs. In addition, the results of MRI



Flood inundation depth of 100-year return period simulated with RRI model for past (1979-2003) and RCP8.5 future (2075-2099) climate.



Graduation Ceremony 2018

-AGCM was physically downscaled to create future climate scenario and using RRI (Rainfall runoff and inundation model), the increase in flood area and inundation depth in the future compared to the present condition was evaluated. Establishment of monitoring and forecasting system for agricultural drought in Ceara State, Brazil started on the WB project.



Prof. Toshio Koike

E-mail: t.koike@pwri.go.jp



Participants of the AWCI Session, 24 October 2018

ii) Effective capacity building

ICHARM provides a one-year M.Sc. program as a joint effort with JICA and GRIPS. This program is targeted at officials of administrative organizations and designed for them to obtain master's degree within a single year. In September 2018, the eleventh batch of 14 students from ten countries graduated, and in the following month, the twelfth batch of eight students entered the program from eight countries.

And ICHARM also provides a doctoral program in collaboration with GRIPS to produce experts who are capable of making policies on water-related disaster risk management and taking the leadership in implementing them. In October 2018, three students from Japan, Sri Lanka and Vietnam joined as the ninth batch.

iii) Efficient information networking

The International Flood Initiative (IFI) is a worldwide framework to promote collaboration in flood management among international organizations such as UNESCO, WMO, UNU and UNISDR. As the IFI secretariat, ICHARM proposed the basic action plan of IFI, which was adopted as the Jakarta Statement. Under the IFI, ICHARM supports the establishment of "Platforms on Water Resilience and Disasters" in the Philippines, Myanmar, Sri Lanka and Pakistan. At the opportunity of the 11th Global Earth Observation System of Systems (GEOSS) Asia-Pacific Symposium held on October 24 -26, 2018, in Kyoto, Japan, the Asian Water Cycle Initiative (AWCI) session was attended by experts and representatives

from the IFI implementing countries, where the participants discussed issues on the promotion of regional cooperation among the these countries.

ICHARM is also active in creating and developing the international networking through organizing the sessions and participating in the major global and regional conferences such as the 9th World Water Forum held during 17-23 March 2018 in Brasilia, Brazil and the 50th Annual Session of the Typhoon Committee (TC), a joint intergovernmental body of WMO and UNESCAP, held from February 25 to March 3, 2018, in Hanoi, Vietnam, for example.





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

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

The Center for Disaster Countermeasures started a new international cooperation project in Hai Phong city, Vietnam. We aim to enhance capability of cross-linkage cooperation and coordination across various emergency management teams that deal with natural and man-made hazards. Commonly used training method of emergency responders in Vietnam is drills. Use of table-top and functional exercises is limited in its scope. In this project, we introduce methodology of designing, conducting and evaluating table-top and functional exercises that are intended to improve communication among emergency management teams and upgrade their cooperation/coordination capability.

This project is funded by Japan International Cooperation Agency (JICA) as one of its grassroots cooperation projects and lasts until Aug 2021. Our counterpart in the city is Hai Phong Firefighting and Prevention Police, which is a section of Hai Phong Department of Public Security. From the Japanese side, Kitakyushu City Crisis Management Department, Fire and Disaster Management Bureau, Kitakyushu Foundation for the Advancement of Industry, Science and Technology, Infogram Inc. and Sampo Risk Management Inc. work together to drive this project. From the Vietnamese side, University of Firefighting provides support for our activity.

Major activities done in 2018 are;

- Kick-off meeting in Hai Phong city that involved major emergency management agencies
- Study tour to Kitakyushu, Japan by leading emergency management officials of Hai Phong city
- Lectures by Japanese experts of emergency management in Hai Phong city for firefighters and other emergency responders.
- New table-top exercise method applied to discussion of rescue team operation in a hospital fire case in Hai Phong



Table-top exercise in Hai Phong Firefighting Police on Dec 13, 2018



Prof. Takaaki Kato

E-mail: tkato@kitakyu-u.ac.jp



Research Center for Urban Safety and Security (RCUSS), Kobe University, Japan

<http://www.rcuss.kobe-u.ac.jp/>

To prepare for future exogenous risks such as natural disasters, we will construct a research unit, MIRAI (Multidisciplinary Integration for Resilience and Innovation), that can provide a grand design of a new living space and environment. This project promotes cooperation with the local governments in neighboring areas (Kobe City, Hyogo Prefecture, Ministry of Land, Infrastructure, Transport and Tourism, Kinki Regional Development Bureau), research institutes (RIKEN Center for Computational Science: RCCS, NIED Hyogo Earthquake Engineering Research Center: E-Defense, JAMSTEC) and private companies (Hanshin Expressway Company) and the mass communication (Kobe Shimbun), and we collaborate to solve various problems caused by exogenous risks in cities, and achieve social implementation of the outcome.

The major contents of this project are:

- (1) to consolidate disaster prevention / mitigation studies, to construct an interdisciplinary study field on the safe and secure urban resilience, thereby creating a sustainable urban vision for the future generation,
- (2) to organize a regional collaborative base against exogenous risks such as natural disasters, and deepen research by synergistic achievement with external research institutes of cooperation parties,
- (3) to establish 'Dojo' (Future Society Initiative Study Group) in which what is the science of fusion is studied to realize a true interdisciplinary fusion. We are going to settle the urgent and serious social issues of strengthening our lives and activities in the city against various risks such as disasters.

みんなで考えよう
安心・安全で快適な
まちづくり

KOBE UNIVERSITY RESEARCH CENTER FOR URBAN SAFETY AND SECURITY
神戸大学都市安全研究センター
オープンセンター 2018

12月2日
午前11:00 ▶ 午後16:00

会場 スペースシアター
神戸ハーバーランドセンタービル地下1階
※神戸地下鉄 徒歩5分
地下1階ハーバーランド地下駐車場5分

都市安全研究センターでは、当センター教員による都市安全に関する研究、政策活動や研究発表を広く市民の方々に知っていただくことを目的として、平成13年よりオープンセンターを開催しています。このオープンセンターは、市民・研究者に関する知識の普及と意識の向上に貢献できればと思っています。

《参加無料・申込不要》

主催：神戸大学 都市安全研究センター
共催：神戸市

お問い合わせ 078-803-6437 <http://www.rcuss.kobe-u.ac.jp>

●ステージ・セッション
11:00~11:10 オープニングセレモニー
11:10~11:30 防災生活による市民参加型（スター）の表彰式
11:30~12:00 ミニ講演「地震に自覚がありますか？」
神戸市住宅都市計画局都市政策推進課 課長 中田 和也
神戸市消防局消防防災センター（チームTEC） 代表 寺嶋 英雄
13:30~14:00 ミニ講演「防災教育がもたらす効果」
神戸大学都市安全研究センター 教授 吉岡 祥一
14:30~15:00 ミニ講演「内閣府日本防災センター」
神戸大学都市安全研究センター 教授 吉岡 祥一

●講演・体験コーナー
●センター紹介：神戸大学都市安全研究センター
＜設立経緯・主な活動・期待＞
●防災・防災に関する「防災教育」 神戸市消防局、ボランティアグループ「チームTEC」
●防災に関する人を知りますか？ 神戸市消防局、ボランティアグループ「チームTEC」
＜防災教育がもたらす効果＞ 神戸大学都市安全研究センター
●防災に関する人を知りますか？ 神戸市消防局、ボランティアグループ「チームTEC」
＜防災教育がもたらす効果＞ 神戸大学都市安全研究センター
●防災に関する人を知りますか？ 神戸市消防局、ボランティアグループ「チームTEC」
＜防災教育がもたらす効果＞ 神戸大学都市安全研究センター
●防災に関する人を知りますか？ 神戸市消防局、ボランティアグループ「チームTEC」
＜防災教育がもたらす効果＞ 神戸大学都市安全研究センター

In addition we also held the Open Center day on 2 December 2018.

Prof. Takashi Nagao

E-mail: nagao@people.kobe-u.ac.jp



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

<http://www.kwansei.ac.jp>



The annual network meeting of disaster-affected areas in Japan

An annual network meeting and forum

The institute organized an annual network meeting of disaster-affected areas in Japan from January 7-8, 2018. 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.

In 2018, The theme was: “how can we transfer our revitalization knowledge?” The first day was a network meeting with the specialists from various disaster-affected areas. The meeting focused to transfer experiences from the affected area to the area where disasters are expected in the future. The second day was a symposium and panel discussion. There were more than 200 participants at the meeting and forum.

Project activities

During 2018, the institute continued to implement following research activities.

- Study on establishment of mid-and long term evacuation plans in nuclear power plant regions.
- Study on upland relocation in the planning of pre-disaster recovery and revitalization for the Nankai trough Mega Earthquake
- International comparative study on disaster recovery and revitalization policies

Various study groups were organized for discussing the above issues. Each study group cooperates with academics, government officers, and NGO/NPO workers for cross sectoral learning.

Policy advocacy

The institute has formulated and finalized a draft proposal for a comprehensive act for affected people. We will promote the realization of the draft proposal by the end of FY 2019.



Prof. Masayuki Noro

E-mail: masa1117yuki@kwansei.ac.jp



The public forum at Mae Fah Luang University, Thailand

International network

We had opportunities to broaden our network with Thailand and Korea in 2018. Mae Fah Luang University in Thailand organized a public forum on Disaster Management: Lessons Learnt from Japan to Thailand. We were invited to share our experiences with them. We also organized a joint research seminar in collaboration with Hallym university in Korea. We will continue to extend our international network for sharing our lessons.





Disaster Prevention Research Institute (DPRI) Kyoto University, Japan

<http://www.dpri.kyoto-u.ac.jp/en/>



Atmosphere-Hydrosphere Research Group

Extreme Winds in Urban Districts during Typhoon Jebi (2018)

Typhoon Jebi (2018) made landfall in the Osaka Bay area, Japan and caused significant damages to buildings and houses, trees, power lines, and so on. The maximum instantaneous wind measured at the meteorological observatory in Osaka reached 47.4 m s^{-1} , the third record in the history of the observatory. Here we report the damages in an urban district of Osaka City, Japan and the results of the numerical analysis on extreme winds in the densely built, urban district.

1. Introduction

Typhoon Jebi (2018) developed in the western North Pacific in August 2018 and obtained the lifetime minimum central pressure of 915 hPa. After obtaining this intensity, Typhoon Jebi maintained its intensity while moving northward. On September 4th, Typhoon Jebi finally made landfall on the islands of Shikoku and Honshu, crossing over the Osaka Bay, and

the bay areas as well as strong winds over the inland areas. Kansai International Airport (KIX) established on a reclaimed island in the Osaka Bay in 1994 was seriously damaged by storm surge. Furthermore, a large number of points observed extreme winds, which caused severe damages to houses/buildings, trees/forests, power lines, etc.

2. Damages by strong winds in the Namba area, Osaka City

In the Namba area, one of the business district in Osaka City, severe damages to houses, structures, trees along streets and in parks, occurred. Figure 1 shows a damage to an old wooden house in the Namba area. There were also damages to roofs, walls, signboards, etc. of buildings and houses. A large number of trees along streets and in parks in Osaka City were severely damages. Figure 2 shows the damages to the trees along the Midousuji street, the major street of Osaka City.



Figure 1: Damage to an old house in Osaka City.

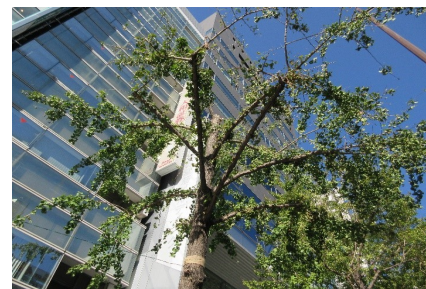
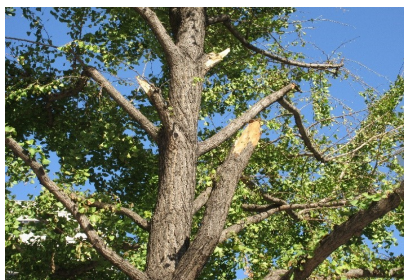


Figure 2: Damages to trees on the Midousuji street.

spawned storm surges/high waves around



Dr. Tetsuya Takemi

E-mail: takemi@storm.dpri.kyoto-u.ac.jp

3. Numerical analysis of strong winds in Osaka City

After the severe damages occurred in urban districts, quantitative estimations of winds in the areas are necessary. However, it is very difficult to quantitatively estimate strong winds in urban districts, because of the absence of the observations within urban districts, and because of the inability to simulate airflows in urban districts only by a numerical weather prediction model. Explicit representations of urban buildings and structures are critically important to reproduce airflows within urban districts.

Our idea in this study is to combine the advantages of a numerical weather prediction model and a turbulence model (large-eddy simulation model; LES) to quantitatively estimate the wind speeds in the business district of Osaka City. The weather prediction model can reproduce actual meteorological situations including Typhoon Jebi (2018), while the LES model can incorporate the actual buildings and structures and hence reproduce turbulent airflows within actual urban districts. The framework of this analysis is presented in

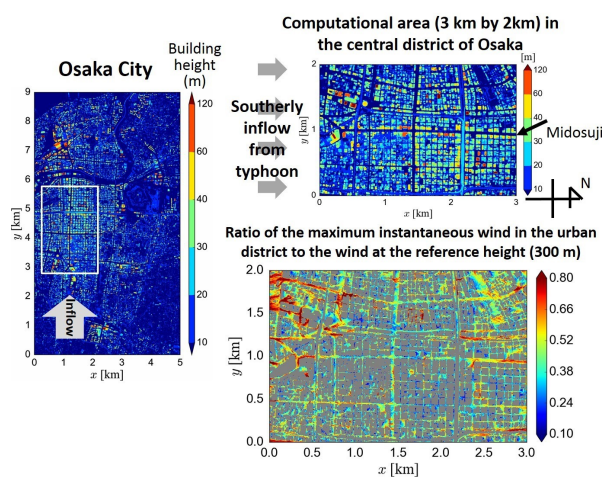


Figure 3: A conceptual framework of the numerical analysis of strong winds in urban

Figure 3.

The LES model was able to simulate fluctuating, turbulent airflows within the business district of Osaka City. By referring to the simulated wind speeds by the weather model and quantifying the wind speeds

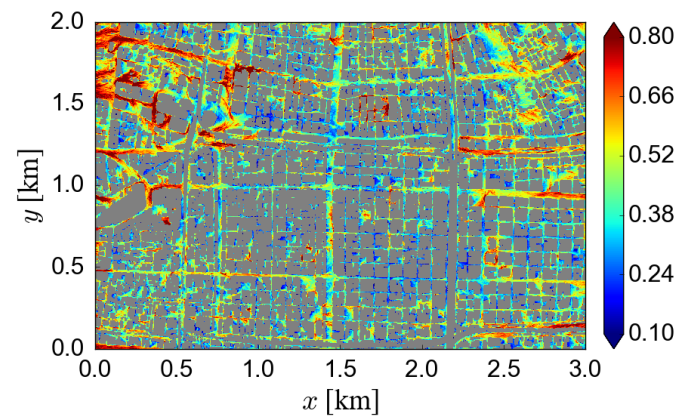


Figure 4: The spatial distribution of the maximum instantaneous wind speed at the 10-m height from the time series of the wind speed at each grid point in a business district of Osaka City.

simulated by the LES model, the maximum wind speeds in some areas within the district analyzed here were estimated to be 60 - 70 m s⁻¹, owing to the downward transport of strong winds at higher levels above the urban canopy (Figure 4).

4. Implications

We have successfully estimated the turbulent airflows and the maximum wind gusts within the actual business district of Osaka City by combining the meteorological simulations and building-resolving turbulent airflow simulations. Wind speeds are highly variable, depending on the arrangement and vertical extent of surrounding buildings and structures. From our study, we would emphasize that it is critically important to understand the risk of strong winds hidden in urban districts by conducting similar analyses on various metropolitan areas. Considering the ongoing re-shaping of metropolitan areas and the increasing number of high-rise buildings in Japan and the possible impacts of future climate change on the intensification of typhoons, we have to understand immersing risks of strong winds in urban districts.

References

Takemi, T., T. Yoshida, S. Yamasaki, and K. Hase, 2019: Quantitative estimation of strong winds in an urban district during Typhoon Jebi (2018) by merging mesoscale meteorological and large-eddy simulations. *SOLA*, **15**, 22-27, doi:10.2151/sola.2019-005.



Disaster Prevention Research Institute
(DPRI) Kyoto University, Japan

<http://www.dpri.kyoto-u.ac.jp/en/>



Atmosphere-Hydrosphere Research Group

International Symposium on Flash Floods in Wadi Systems

By: Dr. Sameh Kantoush

In the last two decades, many Arab cities such as Riyadh (2016), Casablanca (2016), Doha (2015) and Guelmim (2014) have experienced flash floods despite their highly arid and semi-arid climate. These events have caused live losses and important damages. Such casualties are usually due to the combination of many factors such as extreme precipitations, weak or insufficient urban storm water infrastructure and drainage system, urban stream bursting their banks, uncontrolled urban sprawl, groundwater table high rise or tides generated backwater effects on drainage systems outlets in coastal cities.



Doha, 2015 (aljazeera.com)

Image from 4th ISFF website

These phenomena are still not well studied. Besides, mitigation and adaptation measures are very rare in such countries and regions because of the prevailing arid or semi-arid climate and growing urbanization.

Tackling these problems requires a good analysis of climate change and meteorological data, particularly precipitation, and good knowledge of the city vulnerability to floods in such territories. Finding solutions to these challenging problems requires close collaboration between scientists, practitioners, and stakeholders from local, regional, national and international organizations whether they are public or private. So we encourage you to contribute to the development of future solutions for urban floods in the MENA countries.



**field excursion to Waid Shab during 3rd ISFF
from 5th -7th December 2017, Muscat,
Sultanate of Oman**

Dr. Sameh Kantoush

E-mail: kantoush.samehahmed.2n@kyoto-u.ac.jp



This event was the fourth in a new series of annual international symposia on flash floods in wadi systems. Furthermore, this symposium is supported by the Water Resources Research Center (WRRC) and the Global Alliance of Disaster Research Institutes (GARDI) of the Disaster Prevention Research Institute (DPRI), Kyoto University, Japan. The first International Symposium on Flash Floods in Wadi Systems held in October 2015 in Kyoto, Japan, was attended by about one hundred scientists, practitioners and stakeholders from 11 countries (Japan, Arab Region, Europe; see <http://ecohyd.dpri.kyotou.ac.jp/en/index/1.html>). The second Symposium was held at Technische Universität Berlin, Campus El Gouna, Egypt. The third International Symposium on Flash Floods in Wadi Systems was held in Oman and the fourth edition of this international symposium will be held in Casablanca, Morocco.

Symposium themes included:

- River/Wadi basin management and flood protection
- Storm water infrastructures and urban drainage systems
- Urban planning, green infrastructure and flood mitigation
- Climate change impacts, weather forecasting and flood warning systems
- Rainfall-runoff data monitoring and analysis



- Hydrology and hydraulic modeling of floods
- Groundwater flooding and impacts on urban areas
- Sediment management, water harvesting and flood control
- Flood vulnerability and risk assessment
- Flood damage assessment: environmental, social and economical tools
- Flood adaptation: structural and non-structural measures
- Poster session—including nearly 50 oral and poster presentations.

In addition, there was an excursion to Wadi El Malleh Flood Protection Dam and west Casablanca floodway channel for urban Wadi Bouskoura diversion (West Super Channel).



Disaster Prevention Research Institute
(DPRI) Kyoto University, Japan

<http://www.dpri.kyoto-u.ac.jp/en/>



Integrated Arts and Sciences for Disaster Reduction Research Group

Collaborative Activities



Dr. Masamitsu Onishi interacting with students of Brawijaya University

DPRI, Kyoto University and the GADRI Secretariat promoted international collaborative activities on research and exchange visits.

A group of nine members including doctoral students and faculties from Brawijaya University, Indonesia visited DPRI on September, 2018. Associate Professor Masamitsu Onishi and Subhajyoti Samaddar from Disaster Prevention Research Institute, Kyoto University hosted Indonesian delegates and conducted interactive course on disaster risk communication and governance.

A brief description of the session abstract: Cities are complex and interdependent

systems, extremely vulnerable to threats from natural and environmental hazards. The very features that make cities feasible and desirable – their architectural structures, population concentrations, places of assembly, and interconnected infrastructure systems – also put them at high risk to floods, earthquake, cyclones and so on. Annual losses from natural hazards in urban areas are staggering. Most of these losses occurred at locations where vulnerable urban settlement were

developed near known hazard areas, such as floodplains, earthquake fault zones and cyclone prone shorelines. Must we continue to accept these losses? The short answer is no. We must find ways to mitigate their impacts.



Dr. Subhajyoti Samaddar

Associate Professor

E-mail: samaddar@storm.dpri.kyoto-u.ac.jp



group photo of the interactive session

Over the decades, however, it has been realized that solely engineering based structural measures are inadequate to establish resilient city. In retort to this challenge, it is suggested to encourage citizens to adopt innovative disaster preventive measures , such as nailing furniture, installing rainwater harvesting, raising plinth, following building bylaws, evacuation etc.). However, the reality is that despite the enormous efforts of local government and disaster management authorities, urban communities living in disaster risk prone areas continue to demonstrate a reticence to adopt protective measures. Therefore, the important question is how can we best facilitate individual and collective changes in behavior for better preparedness?

Effective risk communication is critical for increasing risk awareness and encouraging preparedness among the community members. But the decision making on environmental and disaster risks faces three major challenges that make risk communication more difficult – complexity, uncertainties and ambiguity. It became evident that it is not the information per se that determines whether people take actions to manage their risks reflect how people interpret and collate information to make it meaningful to them. The risk communication in urban planning context becomes more challenging because there involve diverse stakeholders and it is critical to manage and incorporate the values, interest and concerns of stakeholders in the decision making process. The goal of this course was to explain how planners and practitioners can design and implement communication plans related to urban disaster risks.





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(DPRI) Kyoto University, Japan

<http://www.dpri.kyoto-u.ac.jp/en/>



Integrated Arts and Sciences for Disaster Reduction Research Group

Collaborative Activities

Disaster Prevention Research Institute, Kyoto University (DPRI-KU) has launched a research academic hub for emergency risk management for Aviation under large-scale eruption. Mt. Sakurajima located at the South edge of Kyushu Island, the west of Japan and it is expected that the tremendous volume of volcanic ash will be disseminated and covers the most of territory of Japan if its large-scale eruption occurs. The last large-scale eruption (Taisho eruption) occurred in 1914 after 135 years later of large-scale eruption (An'ei eruption) in 1779. Given the fact that more than 100 years has passed since the last large-scale eruption, a next large-scale eruption is likely to occur in several decades.



Volcanic ash Aircrafts' jet engines are vulnerable to volcanic ash floating in the air. Due to the technical vulnerability of aircraft, the global aviation network, particularly in Europe suffered great disruption in 2010 after the large-scale eruption of Eyjafjallajökull in Iceland. Expected large-scale eruption of Mt. Sakurajima will be the first catastrophic case after the modern aviation network has developed in Japan.

Sakurajima Volcano Observatory of DPRI has continuously promoted academic studies researches to develop technologies for forecasting eruption and dissemination scenario before the eruption.

DPRI-KU organized a domestic workshop on 19 May 2018 inviting relevant experts and practitioners in Japan which includes academics of

volcanologist, atmospheric, air transportation, decision-makings, information science, and practitioners of civil aviation authority in Japan and airline operators. In addition, an international workshop will be held from 17 to 18 February 2019 in Kagoshima where Mt. Sakurajima locates, inviting international academics and experts from Iceland, Indonesia and Taiwan in addition to domestic members. DPRI-KU and associate institutes, organizations including the civil aviation authority and airlines are working closely for setting up an emergency response system utilizing precursors of eruption to minimize the damage on domestic and international aviation transport due to large-scale eruption.



Dr. Masamitsu Onishi

Associate Professor

E-mail: onishi.masamitsu.7e@kyoto-u.ac.jp



Japan Society for Civil Engineers (JSCE) and American Society for Civil Engineers (ASCE) memberships are jointly working for developing a framework for infrastructure resilience which defines processes, tools and outcomes for system assessment, as well as governance and management useful for analyzing for the design of systems or following actual disruptions. The project is initiated by Prof. Kiyoshi Kobayashi (President of JSCE in 2018) as the JSCE presidential taskforce and Prof. Hirokazu Tatano and Dr Masamitsu Onishi at Disaster Prevention Research Institute, Kyoto University (DPRI-KU) have actively participated as secretary members of the project. ASCE memberships includes Dr Craig Davis, the founding chair of ASCE-IRD (Infrastructure Resilience Division), Prof. Bilal Ayyub, the former chair of ASCE-IRD, Prof. John Willem Van De Lindt, the vice-chair of ASCE-IRD, and Prof. Sue McNeil, the Chief Editor of ASCE's Journal of Infrastructure Systems.

The framework emphasizes infrastructure systems and how they support community

resilience through eight key elements. These elements provide the foundation for system assessments and governance and the management of resilient infrastructure. Elements underpinning assessments identify the framework processes for evaluating existing or proposed systems and provide a strong basis for governance and management.

Under this project, the 1st JSCE-ASCE Joint Symposium on Infrastructure Resilience will be held from 22 to 23 May 2019 at the JSCE headquarter to share and discuss the framework with civil engineers in academics and practitioners. For more information, please visit the website. <http://www.jsce-int.org/node/596>

The project is now moving on to the next step that develops Manual of Practice (MoP) for infrastructure resilience. The framework is conceptual and MoP helps how the framework is actually used for management and governance of infrastructure resilience.





Disaster Prevention Research Institute (DPRI) Kyoto University, Japan

<http://www.dpri.kyoto-u.ac.jp/en/>



Integrated Arts and Sciences for Disaster Reduction Research Group

NATECH Project

By: Maria Camila Suarez
Paba and Ana Maria Cruz

The increased awareness on Natech impacts and area-wide consequences has called the attention of different stakeholders. This has resulted in the increasing interest in developing mechanisms to prevent, prepare, mitigate and respond to Natech scenarios. Several activities regarding Natech (joint natural and technological) risk management and Natech research have been carried out this year highlighting the growing attention to Natechs. Researchers at the Disaster Risk Management laboratory (DRS), Disaster Prevention Research Institute (DPRI), Kyoto University, led by professor Ana Maria Cruz, have actively participated in these activities.

One of these activities was the 4th Natech Symposium hosted by the Joint Research Centre, European Commission, and co-organized by Kyoto University and Osaka University, was held in Ispra, Italy on 3 October 2018. The 4th symposium followed the 1st, 2nd and 3rd Natech Symposiums which were carried out in 2015, 2016 and 2017, respectively, at Osaka University and Kyoto University in Japan. Over 30 people attended the 4th Natech Symposium including experts from academia and government organizations, and researchers from DPRI.

Another activity was the 2nd Natech Workshop organized by the Organization for Economic Cooperation and Development (OECD) and co-organized with the United Nations. This high level workshop, attended by representatives of member states (e.g., civil protection authorities and government officials responsible for chemical and Natech risk management), international organizations, local government, and researchers, was held in Potsdam, Germany on 5-7 October 2018.

Presentations from different countries regarding Natech regulations, best practices and lessons learned, and implementation of prevention measures and methodologies to improve Natech risk assessment were given. Several researchers from DPRI, including graduate students, presented their work. As a result, there were fruitful discussions that contributed to the consolidation of the Discussion Document that will present recommendations for further improvements in the Natech Risk Management agenda and guidance document on Natech risk management published by OECD.



Prof. Ana Maria Cruz (centre and Maria Camila Suarez Paba (centre-right)

Another highlight is the creation of the Subgroup on Natech, in December 2017, by the United Nations International Strategy for Disaster Reduction (UNISDR) under the Science and Technology Advisory Group (STAG). This is an important step to formalize the inclusion of Natech risk management and risk reduction in the Sendai Framework. This group has had meetings in Geneva, with the participation of experts in the field. DPRI, as well as other GADRI member organizations are supporting these activities.

The next STAG meeting will be held during the IRDR-SC Agenda for the 20th Scientific Committee Meeting in Chengdu, China in October, where the Natech STAG subgroup will participate.

There is growing interest in China concerning Natechs, and how to cope with

their potential consequences. For this reason, Nanjing University will host a Natech workshop in March 2019 where several members of GADRI including Prof. Cruz will be attending.

Finally, in November, Indonesia will carry out the ASEAN Regional Disaster Emergency Response Simulation Exercise (ARDEX 2018), which seeks to evaluate the efficacy of emergency response mechanisms when a Natech event occurs. Professors Cruz and some of her students will participate in the event.



Disaster Mitigation Research Center (DMRC) Nagoya University, Japan

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

名古屋大学
NAGOYA UNIVERSITY



Disaster Mitigation Research Center

Report on Evacuation Activity After Explosion of the Aluminum Factory: Case of Sojya City of Okayama

One of the activities in 2018 included an evacuation activity after the explosion of the aluminum factory caused by floods in July 2018.

An aluminum factory explosion happened by flood inundation at midnight of 6 July 2018 in Sojya city of Okayama. Shimobara area was hit by explosion and was heavily damaged before the area was flooded. The residents of Shimobara area were evacuated after the explosion based on the previous community works prepared for the flood.

2018.7 Japan Flood—Heavy downpours continued from 28 June to 8 July 2018 mainly in west Japan by typhoon 7 and the seasonal rain front. Special heavy rain warnings were issued in 11 prefectures by weather officials. 224 people were dead and 8 people were missing by floods and landslides (Cabinet office report, 9 Sep. 2018).

The aluminum factory explosion—The aluminum factory was located at the point of Shinpon river flow into Takahashi river which has been around since 1975. They produce deoxidizer for steelmaking and aluminum alloy ingots by recycling of aluminum. According to the news reports, the aluminum factory operates a melting furnace to produce aluminum over 24 hours in general.

However, to prepare for the forecasted heavy rain, the factory had been requested to stop operating the melting furnace since morning of

July 6. Staff members of the factory tried to remove high temperature aluminum from the furnace prior to evacuating around 10 PM July 6 as the water reached up to the factory.

Around 11:35 PM the aluminum factory exploded. Highly-heated scatters from the factory caused multiple fires and demolished rooftops. Air blast of the explosion destroyed window glasses and walls of houses in the surrounding area of the factory in Sojya city and Kurashiki city and some people were taken by ambulance to hospital.

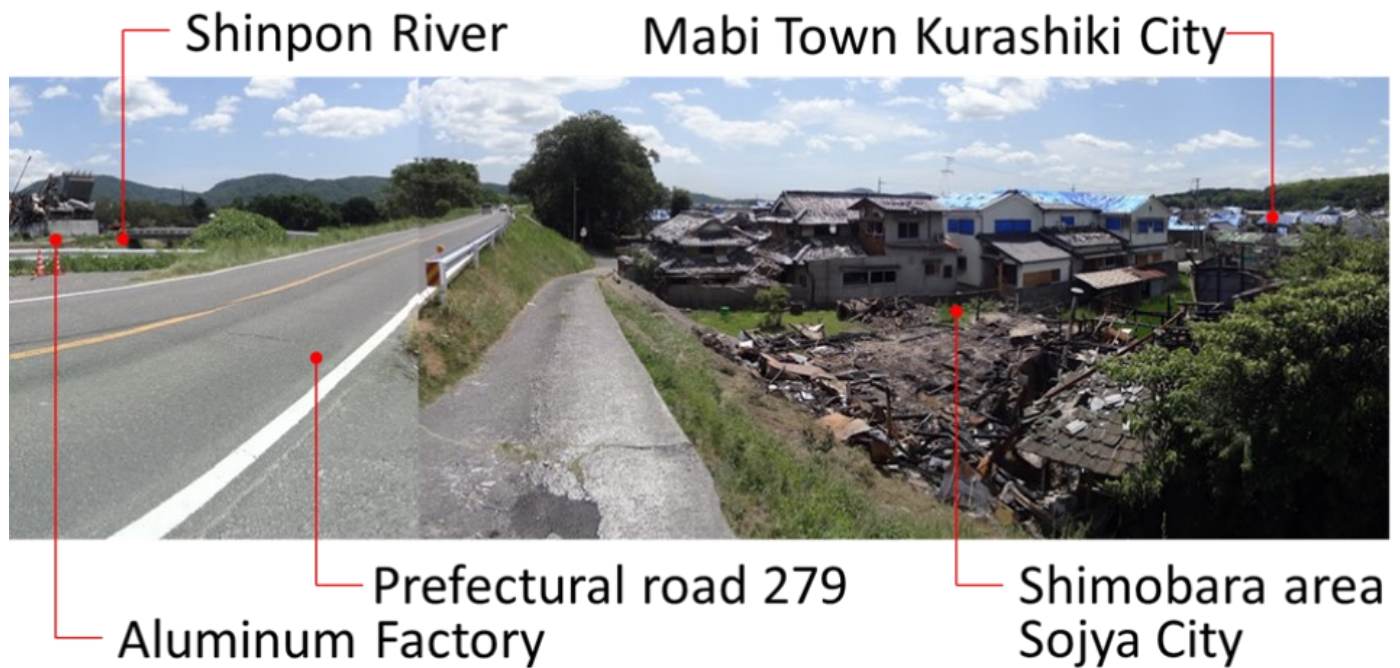
Evacuation process of Shimobara area residents—Shimobara area is located west side of the aluminum factory and surrounded by 157 householders. Jishubousaisoshiki (Jisyubou) is the community-based organization counter for major disasters in Japan. Shimobara Sako Jishubou was established in April 2012.



Dr. Yuko Araki

Research Associate Professor

E-mail: arakiy@nagoya-u.jp



Since 2013, they had included night evacuation drills in the evacuation drills conducted for the community. Through this activity Jisyubou members grasped information of the residents and they identify how and who help vulnerable people at times of disaster.

At the time of the factory explosion, the leaders of Jishubou were in the Shimobara community hall to respond for the flood warning. Police and Sojya city disaster management headquarter (DRM) indicated to Jisyubou leaders to evacuate to Kibiji Arena of Sojya city to prepare for the additional explosion. Jisyubou leaders requested for vehicles through the city DMH for evacuation activity and tried to provide evacuation information by designated 7 area leaders of Jishubou to residents.

Around 1 AM, 5 minivans arrived driven by city officers. The residents evacuated to Kibiji Arena by the minivans or by their own car sharing. Jishubou leaders confirmed a place of evacuation for about 270 residents at 2AM. They used the check list of residents used in the evacuation drill.

Jisyubou leaders finally moved to Kibiji Arena after the

confirming the residents have evacuated designated area of evacuation around 4 AM of July 7.

That was a good case of community-based activity worked well by the cooperation between Jisyubou and administrative agencies even in the unexpected accident. But it cannot say they could do the same if flood water would come in the resident area before the explosion or those occur at the same time. It could be harder to extinguish the fire and stop spread-out of fire. Additionally, information transfer and evacuation activity were could be difficult.

Preventive Evacuation is necessary if there are risks of complex disaster and Natech. The residents had no information or knowledge of the risk of explosion if the aluminum factory were flooded. In order to response and reduce the risk, it is necessary to conduct prior risk communication by the business operator, residents' organization and administrative agencies.

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

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



Institute of Disaster Mitigation for Urban Cultural Heritage, Ritsumeikan University



Site visit for learning the Firefighting Facilities

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 - 12th INTERNATIONAL TRAINING COURSE (ITC) on DISASTER RISK MANAGEMENT OF CULTURAL HERITAGE 2018 was held for 3 weeks from 29 August to 19 September 2018 with 15 participants from Brazil, Bhutan, Zimbabwe, Ethiopia, Mexico, Nepal, Georgia, India, Pakistan, Iran, Belgium, Romania, and Italy. Participants were managers of cultural heritage, disaster risk management experts, decision makers and government officials involved in cultural heritage

conservation or disaster management.

Just as last year, this year the ITC focused on theme "Towards Integrated Protection of Immovable and Movable Cultural Heritage from Disasters". During the course, the trainees have deepened an understanding of not only various aspects of disaster risk management of cultural heritage in Japan, but also the distinctive issues and the previous lessons which involve in the field of cultural heritage conservation and the disaster risk management in the world. All the lectures, site visits, exercises and workshops are performed by the worldwide experts.



Prof. Takeyuki Okubo

E-mail: rekibou@st.ritsumei.ac.jp

This year also Ritsumeikan University cooperated with the Japanese experts. So, the trainees could learn a study of risk management for both immovable and movable cultural heritage from last disasters in Japan and comprehensive countermeasures and approaches. As the details of the course, the trainees learned the disaster risk management of cultural heritage from the various kind of disasters, and the emergency response for movable cultural heritage through the lectures in the institute, the practical exercises in the Kyoto National Museum, and site visits on the temples and the Ponto-cho district in Kyoto. In addition, they learned about the flood disaster occurred in the Hirafuku, Sayo-cho and Takeda, Asago-shi and also

a long-term recovery process in Kobe area from the Great Hanshin-Awaji (Kobe) Earthquake in 1995.

After this training course, the International Symposium “Working with the Local Communities on Disaster Prevention for Cultural Heritage -the Experiences of the World and the Future of Japan- (holding by National Institutes for Cultural Heritage)” was held and approximately 65 international experts and audiences were participated. It could discuss potential roles of disaster risk management for cultural heritage from the global perspective, based on the experience and acknowledges which have been obtained from the past disasters. Two representative trainees made presentation through

the symposium, and the presentations were developing their relevant efforts to the disaster risk management for cultural heritage in their countries. We strongly expect their activities in the future.

The training course is organized in cooperation with the UNESCO, ICCROM, ICOM, ICOMOS/ICORP and relevant institutions of the government of Japan. We will continue this outreach activities and dissemination of our research outcomes to the international society.

Call for application for the ITC2019 will be announced at our website:

<http://www.r-dmuch.jp/en/project/itc.html>



Exercise for
Emergency
Response



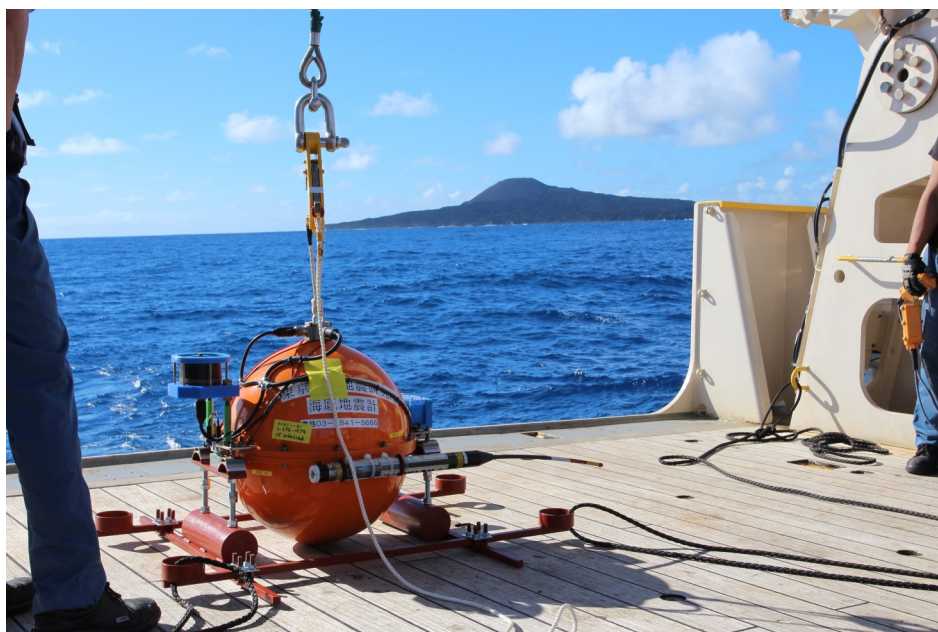
Earthquake Research Institute (ERI), The University of Tokyo Japan

<http://www.eri.u-tokyo.ac.jp/>

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.

Research highlights in 2018 include: Monitoring of Nishinoshima volcano using ocean bottom seismometers (photo), Chemical composition measurement of deep Earth using Hyper-Kamiokande, Beginning of Pacific Array, Integrated program for next generation volcano research and human resource development, Enhancement of solid earth science simulations by combining artificial intelligence with high-performance computing, New system to evaluate building safety soon after a destructive earthquake, Science of slow earthquakes, Integration of the next-generation seismic observations and the forefront of Bayesian statistics, Integrated Research Project on Seismic and Tsunami Hazards around the Sea of Japan.

As a Joint Usage/Research Center of Japanese universities on earthquake and volcano sciences, ERI organizes various joint research projects and actively conducts collaborative activities. The nationwide "Earthquake and Volcano Hazards Observation and Research Program" involving many universities and research institutes across Japan is a five year project, and 2018 was the last year of the



current project, hence summarized the last five years' activities.

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. Every year, more than 100 international researchers and students study in ERI.



Prof. Kenji Satake

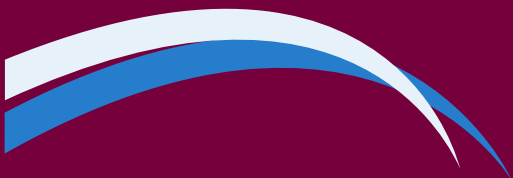
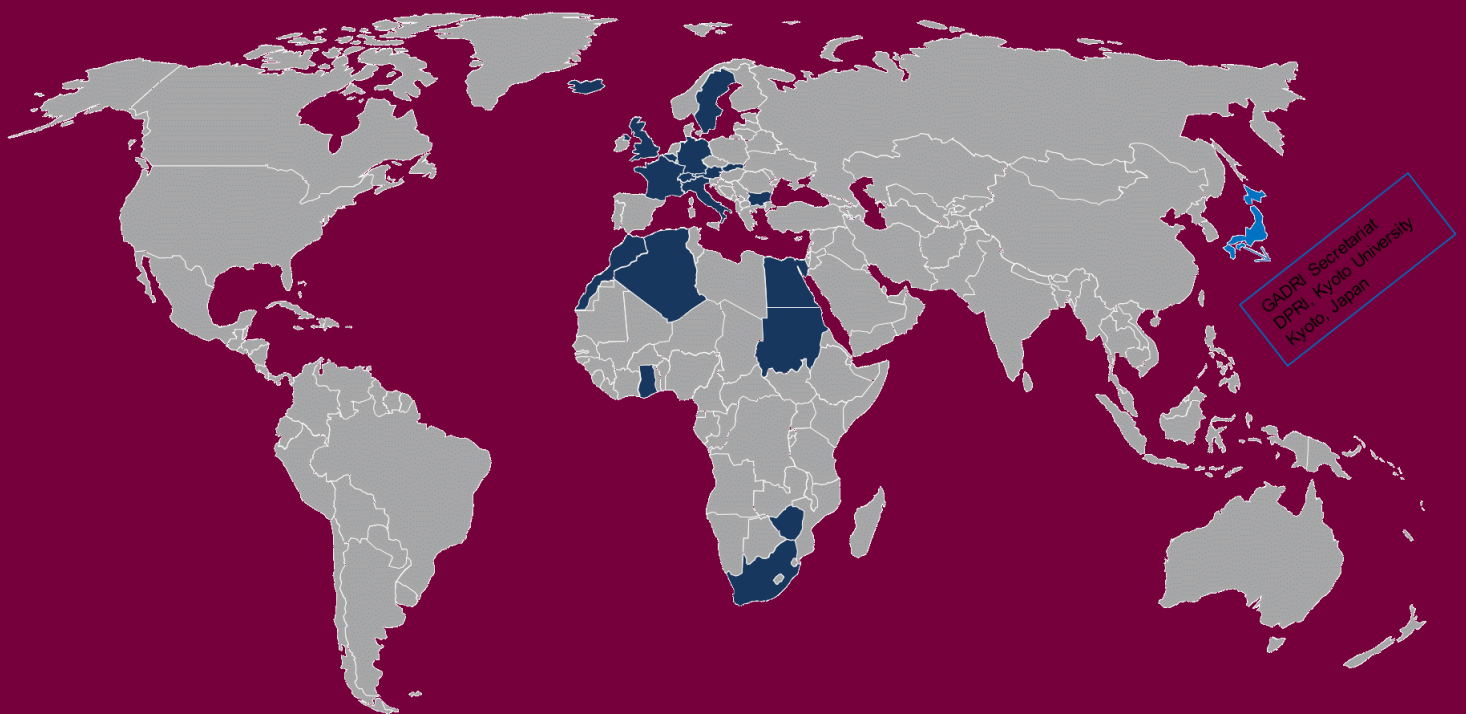
Director

E-mail: director@eri.u-tokyo.ac.jp



Europe

Africa





Europe Africa



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
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
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	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	School of Business, Dept. Management, Innovation and Technology Division, University of
UK	Disaster and Development Network (DDN), Department of Geography, Northumbria University
UK	Overseas Development Institute (ODI)
UK	Global Public Health, Public Health England (PHE)
UK	Centre for Disaster Resilience, University of Salford
UK	Swansea University



Disaster Competence Network Austria (DCNA) Austria <http://dcna.at/>

DCNA as a non-profit and open association under university management established a network with 12 ordinary and 3 associate members up to the end of 2018. Ordinary members are all Austrian institutions whose tasks include scientific disaster research. Associate members are those institutions which are interested in the activities of DCNA and its support but who are not engaged in scientific research.

Strategic partnerships with national (e.g. we4DDR, CCCA) and international organizations (GADRI) were entered into for

DCNA is currently involved in three research projects under the Austrian Security Research Program KIRAS; covering contents of tunnel incident response, CBRN public sensor network development and live risk mapping for first responders. Other projects with involvement of the research network are IRONORE2019, an EU co-funded project where an international civil protection exercise with 600 stakeholders will be evaluated. DCNA is also contributing to a technological project with the aim of developing an operational scientific laboratory container for scientific advice to policy makers and disaster management.



EU Presidency Event “Austrian Disaster Network Days 2018”

further collaborations in science and research.

At national level five scientific working groups focusing on (1) Mass movements and earthquakes, (2) Floods, (3) Extreme weather conditions, (4) Critical infrastructure and industrial hazards and (5) Socio-economic disaster aspects, were launched with a Kick-Off meeting in November 2018.



Dr. Christian Resch

E-mail: christian.resch@dcna.at



Members of the scientific working groups

DCNA jointly organized with the EC/JRC DRMKC under the Austrian EU presidency the Austrian Disaster Network Days from 11th to 12th October, held in Vienna at the University of Natural Resources and Life Sciences. Experts from about 30 nations were coming together, aiming to discuss the usability of the disaster risk data for national applications and the roll-out of an EU-wide Risk Data Hub.

DCNA was presented at several different national and international events (e.g.: Hydraulic Engineering Symposium Graz in September 2018, Understanding Risk Balkans Conference Belgrade in September 2108, AGIT – Symposium and Expo for Applied Geoinformatics Salzburg in July 2018, 3rd Annual Scientific Seminar DRMKC Sofia





International Institute for Applied Systems Analysis (IIASA) Austria

<https://www.iiasa.ac.at/>

Located near Vienna, Austria, IIASA is an international institute that conducts policy-oriented research into problems that are too large or complex to be solved by a single country or discipline.

These problems—which include climate change, energy security, and sustainable development—must be resolved by international cooperation.

IIASA research comes under the following programs:

- Advanced Systems Analysis
- Air Quality and Greenhouse Gases
- Ecosystems Services and Management
- Energy
- Evolution and Ecology
- Risk and Resilience
- Transitions to New Technologies
- Water
- World Population.

thesis and IIASA's research agenda, the goal being to write a publishable paper. All YSSP participants are personally mentored by IIASA senior scientists.

For further details, visit the website—<http://www.iiasa.ac.at/web/home/education/yssp/about.html>

A book project based on results found during the Third Global Summit of Research Institutes for Disaster Risk Reduction, which was held in March 2017 at the Disaster Prevention Research Institute, Kyoto University, Japan, was launched by GADRI in November 2017 with Springer under the theme of Disaster and Risk Research: GADRI Book Series. During the initial meeting a total of 12 books were proposed under the series.

The book on “Disaster Risk Reduction and Resilience” is one of the proposed books under the series and could be the first to be published under GADRI Book Series in the near future. The focus of the book is on the multidimensionality of resilience and the various perspectives through which disaster risk reduction can be viewed. Such a discussion of the multidimensionality of resilience is very much needed given its short but intense history as a concept related to disaster risk reduction. Editors for the book are Dr. Muneta Yokomatsu from the Disaster Prevention Research Institute, Kyoto University, Japan, and Dr. Stefan Hochrainer-Stigler from the International Institute for Applied Systems Analysis, Laxenburg, Austria.

GADRI Book Series—<https://www.springer.com/series/16177>



International Institute for Applied Systems Analysis
www.iiasa.ac.at

research fellowships in austria
iiasa young scientists
summer program yssp

The Young Scientists Summer Program (YSSP) at IIASA offers fellowships for PhD students to undertake a summer project on a topic related to IIASA's research agenda

Information on the Young Scientists Summer Program (YSSP) at IIASA was shared with GADRI member institutes.

IIASA

Every summer from 1 June to 31 August, IIASA hosts up to 50 doctoral students from around the world in its Young Scientists Summer Program (YSSP). Each participant works on a topic related to his or her PhD



Dr. Stefan Hochrainer-Stigler

Senior Research Scholar

E-mail: hochrain@iiasa.ac.at



Schloss Laxenburg, home of IIASA





University of National and World Economy (UNWE) Bulgaria

<https://www.unwe.bg/en/>

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

The ITDRR 2018 Conference

The Science Research Center for Disaster Risk Reduction (SRCDRR) co-organized the *3rd IFIP Conference on Information Technology in Disaster Risk Reduction (ITDRR 2018)*, September 20 – 21st, 2018, at the Poznan University of Technology, Poznan, Poland, <http://itdrr.unwe.bg/>.

ITDRR-2018 provided an international forum for researchers and practitioners to present their latest R&D findings and innovations. The conference was focused on the various IT aspects and challenges of coping with disaster risk reduction. ITDRR-2018 invited experts, researchers, academicians and all other, interested to disseminate their work. The conference continues to establish an academic environment that fosters the dialogue and exchange of ideas between different levels of academic, research, business and public communities.

The conference emphasized on topics, such as: Advanced ICT and disasters, Big Data and disasters, Climate change and disaster risk, Communications in disasters, Crowdsourcing and emergency management, Disaster information processing, Disaster prevention and mitigation, Disaster relief, resilience and research, Disaster risk management capability assessment, Emergency preparedness, Hazard, vulnerability and risk mapping, ICT challenges in emergency management, Disaster monitoring, Disaster risk assessment, Security and privacy issues in disaster management, Simulation and gaming for disaster management, Socio-economic impacts of disasters, etc.

The Program Committee received 34 paper submissions, out of which 15 research papers were finally accepted and presented at the conference. The ITDRR-2018 Proceedings will be published by Springer, as the previous two volumes.



Prof. Dimitar Veleev

Director

E-mail: dgvelev@unwe.bg

Participation in Disaster-related Conferences and Events

SRCDRR members took part in 11 disaster-related conferences and events during 2018 with a special focus on the Asian Science and Technology Conference for Disaster Risk Reduction, (**ASTCDRR**), April 17-18, 2018, Beijing, China; the European Emergency Number Association (**EENA 2018**) Conference, April 25-27, 2018, Ljubljana, Slovenia; the European Forum on Disaster Risk Reduction (**EFDRR 2018**), November 21-23, 2018, Rome, Italy.

Ongoing R&D project

The SCRDRR continues activity on the R&D university project titled: “Research on the Applicability of Virtual Reality in Education and Training”, with a 2017-2019 time frame. Special focus of the project in 2018 is Augmented reality (AR) and Virtual reality (VR) in Disaster Preparedness Training for Society Resilience and Vulnerability Analysis of Electricity Networks from Natural Hazards Using Virtual Reality.



3rd IFIP ITDRR-2018,

Poznan University of Technology, Poznan, Poland,

September 20 – 21st, 2018

<http://itdrr.unwe.bg/>





Photograph of the city of Kourou

BRGM teams achieved several major projects concerning risk reduction in 2018. The most famous one is about the volcano-tectonic crisis at Mayotte, Comoros islands. Hundreds of earthquakes have occurred in Mayotte since May 2018, including the biggest shock ever recorded in the Comoros area with a magnitude of 5.8. Since the beginning of this crisis, BRGM provides seismological monitoring, informs the State services and regularly publishes on its website to inform the public (<https://www.brgm.fr/actualite/essaim-seismes-mayotte-connaissance-phenomene-se-precise>). A scientific mission bringing together several French institutes (CNRS, IPGP, BRGM, etc.) has just found the origin of this crisis: a young submarine volcano.

Another major project of BRGM deals with the impact of the 2017 and 2018 fires in Corsica. BRGM was asked to assess their consequences on slope instabilities using an innovative approach. An erosion model was built using field surveys (amount of clay, thickness of soil that can be mobilized, etc.) and was used to carry out simulations to quantify peak flows and volumes resulting from sediment transport. The objective was to target areas that could be impacted by

runoff to organize emergency measures.

In 2018, BRGM also helped the city of Kourou to set up a medium and long-term management strategy for its coastline, in reaction to the erosion and marine submersion phenomena of 2016. BRGM, with partners AUDEG, and ARTELIA characterized stakes and hazards, developed scenarios as well as an economic and environmental analysis of these solutions to allow choosing the most relevant one. This project resulted in a field survey to characterize some of the stakes, marine submersion maps, the projection of the coastline by 2050, and the development of different solutions for coast management.



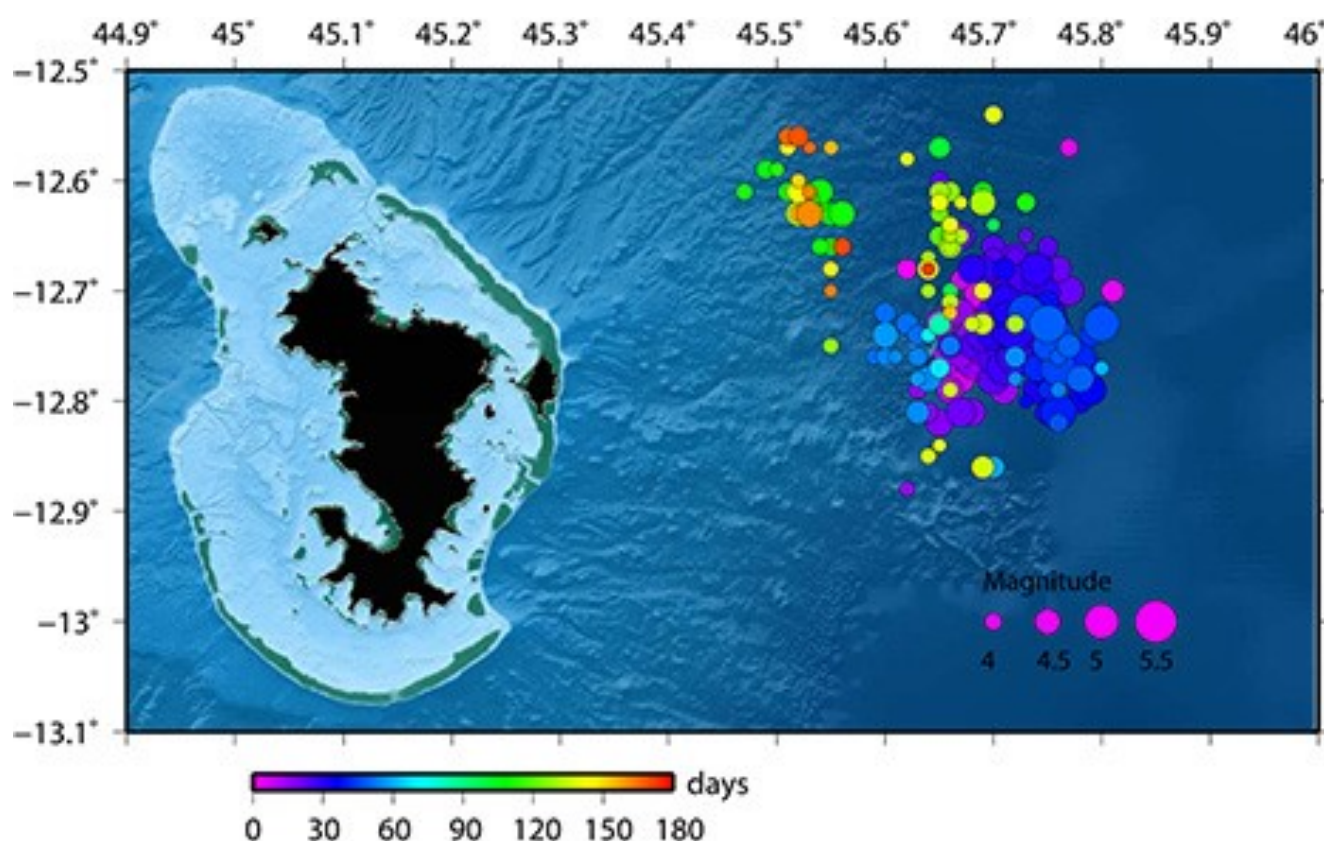
Dr. LEVY Clara

E-mail: c.levy@brgm.fr

BRGM is concerned by strategies to increase our knowledge on natural hazards. Thus, BRGM contributed to the prefiguration of the website of the French National Network of Coast Observatories (RNOTC, <http://observatoires-littoral.developpement-durable.gouv.fr/>), along with the Ministry for the Ecological and Solidary Transition and Cerema. BRGM coordinates this network, which aims at federating local structures in charge of coastal monitoring. Its website allows now privileged exchanges, with the objective of promoting the sharing and dissemination of knowledge among the public as well as promoting common actions in terms of observation, expertise and communication on the coastline.

One of BRGM's missions is to ensure the link between research and policymaking. As such, BRGM participated to the ESPREssO European

project that aimed at improving synergies for disaster prevention in the European Union. ESPREssO main challenges were: 1) to create more coherent national and European approaches on Disaster Risk Reduction, Climate Change Adaptation and resilience strengthening; 2) to enhance risk management capabilities by bridging the gap between science and legal/policy issues at local and national levels in six European countries; 3) to address the issue of effective management of trans-boundary crises. ESPREssO's main products were the Guidelines on risk management capability and a Vision Paper on future research strategies in order to better define the research priorities following the Sendai Framework for Disaster Risk Reduction 2015-2030.



Location of earthquakes of magnitude greater than 3.8 since the beginning of the volcano-tectonic crisis at Mayotte, Comoros islands, until October 29, 2018. © BRGM / Bathymetry HOMONIM, SHOM and GEBCO (2014)



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 field of disaster and resilience research. By synergistically combining competences from different disciplines, CEDIM develops new models and concepts for novel solutions in the fields of natural disasters, hazards and resilience.

Within the current research focus on near-real time Forensic Disaster Analysis (FDA), CEDIM investigates the dynamics and interrelations of disasters, identifies major risk drivers, estimates the impact as fast as possible, and infers implications for disaster mitigation. In 2018, CEDIM produced FDA reports for the 2018 German drought / heat wave (see Figure) and the Typhoon Mangkhut (Philippinen) and FDA short reports for the storm Friederike (Western and Central Europe), the earthquake Lombok (Indonesia), the hurricane Florence (US), and the volcano-tsunami Anak Krakatoa (Indonesia).

CEDIM R&D projects in 2018 included Rapid Earthquake Impact Modeling, Energy risks toward 2025: Disaster risk and resilience assessment of renewable and traditional systems, Resilience of urban infrastructures in the course of time, Vulnerability and resilience of the critical infrastructure as exemplified by Chile, Rapid Earthquake Impact Modeling, Willis Hail Hazard Assessment, and the internet platforms Early Warning of Hazardous Weather and CATDAT, one of the world's largest and most detailed historical catastrophe loss databases developed by founding partner James Daniell since 2003.

CEDIM was visited by several official delegations of international organizations institutions, among

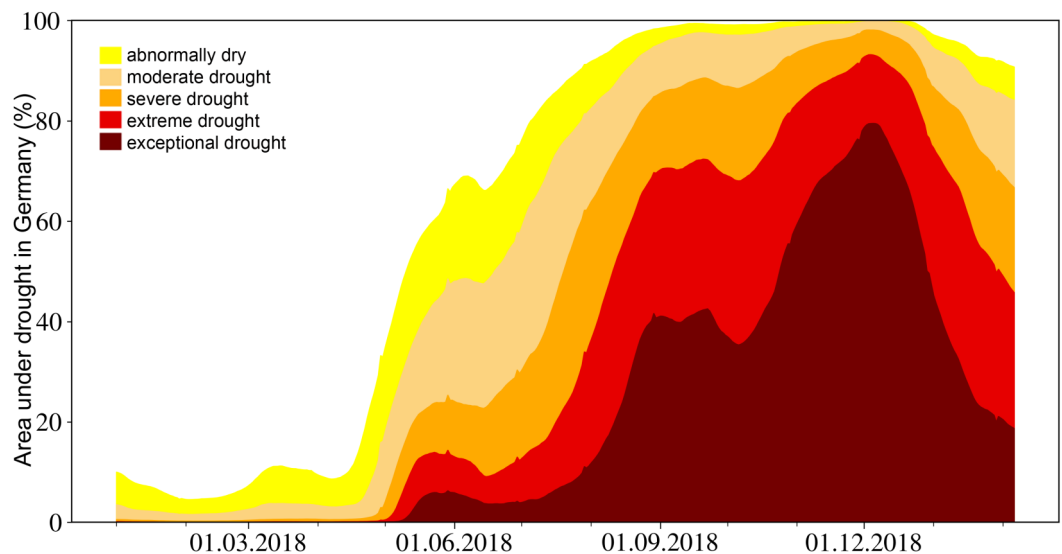


Fig: Area under drought in Germany (Data source: German Drought monitor, UFZ).

them the President of the German Technisches Hilfswerk (THW), China Earthquake Association (CEA), the Universidad de Chile, or the DKKV. Other knowledge transfer activities were: Organization of a session at the European Geosciences Union (EGU) conference (including invitation to the official press conference); various presentations (e.g., Forumg Public Security in the German parliament; WMO High-Impact Weather workshop in Beijing); various press releases and numerous citations in highly-ranked media (e.g., The New York Times, Washington Post, Science, BBC, NZZ, Bloomberg).

CEDIM is currently beginning cooperation with the World Bank as part of its Global Rapid post-disaster Damage Estimation (GRADE) initiative. GRADE is an approach that can provide an initial rapid estimation of the physical post-disaster damage incurred by key sectors within two weeks of the disaster.



Prof. Michael Kunz

CEDIM Spokesman

E-mail: info@cedim.de



Disaster Research Unit (DRU) Freie Universität Berlin, Germany

<http://polsoz.fu-berlin.de/dru>

Freie Universität Berlin



The DRU is pleased to announce the launch of the research project WAKE (Migration-Related Knowledge Management for Civil Protection of the Future), which is funded by the German Federal Ministry of Education and Research. The Hans Ertel Centre for Weather Research decided to extend the project WEXICOM (Weather warnings: from EXtreme event Information to COMunication and action) for a third research phase.

The DRU successfully completed two Indo-German research projects, funded by the German Federal Ministry of Education and Research: "INVOLVE - INITiate VOLunteerism to counter VulnErability, coordinated by DRU" on volunteerism and vulnerability, and "FloodEvac", Subproject "Cultures and Catastrophe in Germany and India during climate change, Catastrophe Culture".

The DRU successfully completed the research-project "KOPHIS – Care-dependent Persons in Disaster Situations" which goal was to develop a scenario-based understanding of the needs for assistance and resilience potentials of aid and care-dependent persons in their social relations for all phases of the disaster process.

The DRU successfully completed the research project VERSS - Aspects of a more just distribution of safety and security in cities", subproject "Vulnerability, Safety, and

Security in a Just City". The theoretical and empirical aim of the project was to generate in-depth understanding of the habitation and residential conditions of the various social milieus, which should then give forth to conclusions about the relationship between the subjective and objectified conceptions of safety and security. Upon the basis of our theoretical analysis, the principle practical goal of the project was to develop a process for negotiation, with which a (more) just distribution of safety and security in the city can be achieved.

Furthermore, the DRU was able to extend its international networks, among others via two definition projects: The DRU led the German-Iranian definition project REVISE (Integrated Disaster Risk Management and Involvement of Volunteers for Disaster Preparedness in Teheran). The DRU also participated in the German-Ghanaian definition project EARLY-INFOCAT (Early-warning-based optimization of information, communication, warning and practices in floods and droughts in Ghana), both funded by the German Federal Ministry of Education and



Prof. Martin Voss

Head

E-mail: martin.voss@fu-berlin.de



Institute for Advanced Sustainability Studies (IASS), Germany

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

The Systemic Risks group investigates the primary, secondary and tertiary effects of systemic interdependencies at the interface of technology, nature and society. Systemic risk is the term used to describe risks whose effects are global, complex and far-reaching, for example climate change, ubiquitous natural disasters, financial crises and social inequity. The research undertaken by this group yields policy recommendations for effective, efficient, resilient and fair resolution of risk conflicts. The concept of systemic risks offers a new perspective on socio-technical and socio-ecological transformations. This perspective focuses attention on decision-making processes in a situation characterized by complexity, uncertainty and social ambiguity, and opens avenues for better transdisciplinary risk governance. Policy recommendations for reducing disaster risk derived from an analysis of the interdependencies of critical infrastructure, natural hazards and institutions or social interaction processes are a case in point.

In 2018, the group was engaged in empirical research on resilient coastal management in Germany, in assessing and evaluating the risk of plastic waste on soil and assessing the likely impacts of climate engineering. Furthermore, it investigated strategies to avoid global financial risks in combination with major environmental changes (climate, biodiversity, water shortage) and provided policy advice to the International Risk Governance Council as well as the International Standard Organization (ISO).

In 2018, scientific director Ortwin Renn received the Medal of Honor awarded by the State of Baden-Württemberg for outstanding scientific and public services to the State.



Governor Winfried Kretschmann awards the Order of Merit of the federal state of Baden-Württemberg to Professor Ortwin Renn, Scientific Director at the Institute for Advanced Sustainability Studies (IASS). Staatsministerium Baden-Württemberg

The Order of Merit of the federal state of Baden-Württemberg – known as the “Medal of Merit” until June 2009 – is awarded by the State Governor to honour outstanding services to Baden-Württemberg, in particular in the areas of politics, culture, economics, and civil society. The Order of Merit is generally awarded once a year at a ceremony. It has been awarded to 1,941 people since 1975.

For further information visit website—https://www.iass-potsdam.de/en/search?search_for=Medal+of+Honor+awarded+by+the+State+of+Baden-W%C3%BCrtemberg+for+outstanding+scientific+and+public+services+to+the+State



Prof. Ortwin Renn

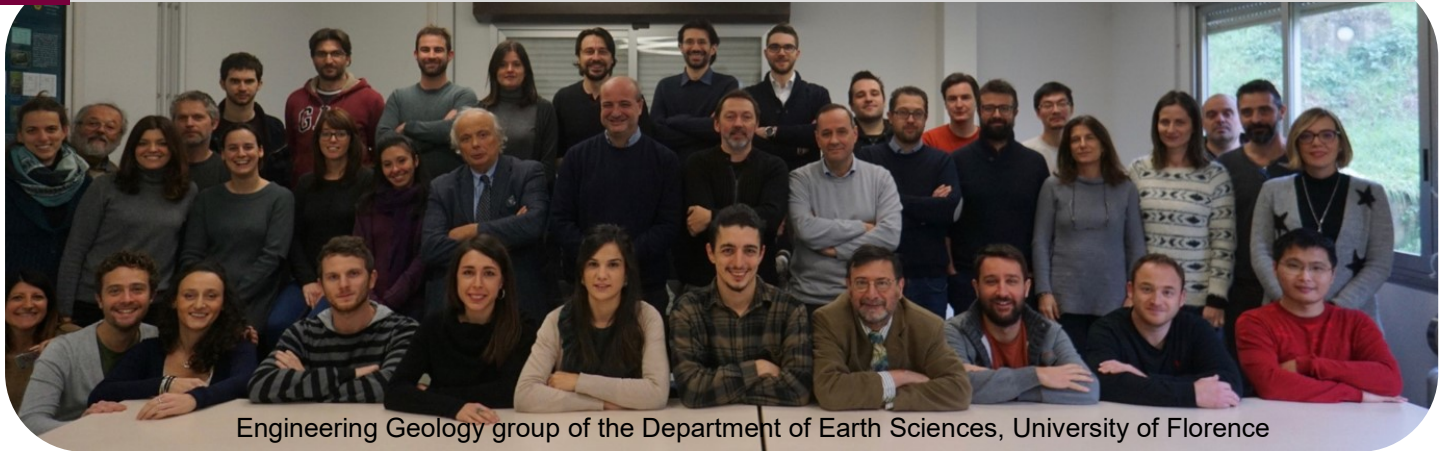
Scientific Director

E-mail: Ortwin.renn@iass-potsdam.de



Department of Earth Sciences University of Florence, Italy

<https://www.unescogeohazards.unifi.it>



Engineering Geology group of the Department of Earth Sciences, University of Florence

The Department of Earth Sciences, UNESCO Chair on Prevention and Sustainable Management of Geo-hydrological hazards of the University of Florence (DST-UNIFI), is an important center for research and higher training in Italy with an Engineering Geology group counting nearly 60 persons among which are professors, researchers, technicians, post-doc fellows, PhD students, collaborators and visiting fellows.

In 2018 at DST-UNIFI has been established the Civil Protection Centre that gives scientific and technical support to the University of Florence and the National Civil Protection Service through operational activities in national emergencies and was involved in several sites for emergency support related to geo-hydrological hazards treating human life and infrastructures.

Research activities focused on the use of innovative technologies (Ground-based SAR interferometry, UAV, Laser Scanner) for landslide monitoring and early warning; on the exploitation of EO (Earth Observation) data and technology to detect, map, monitor and forecast ground deformations and development of regional landslide forecasting models under the framework of the national and international projects and the outcomes were published in more than 50 published papers in peer-reviewed scientific journals, winning 2018 Best Paper Award of the journal *Geoenvironmental disasters*.

The DST-UNIFI was appointed as UNESCO Chair in 2016, and has participated in several national and international missions in 2018, in collaboration with UNESCO and official partners, to promote the protection of the World's cultural heritage threatened

by geo-hydrological hazards, some of which are part of the UNESCO World Heritage list, especially in developing countries. organizations and institutions (at different levels).

The Chair has developed a new International Academic Master's Degree (totally in English language) on "Geoengineering" (<http://www.ing-gem.unifi.it>), with the joint competences of all the core members of the Chair, focusing to train experts on prevention, management and mitigation of geo-hydrological risks. Several lectures, seminars and presentations have been hosted by the Chair, aiming at promoting a knowledge sharing network, through capacity building and dissemination towards different actors. Training were addressed to the scientific community, Italian and foreign researchers and students, associations,

As a member of the International Consortium on Landslides (ICL) the DST-UNIFI is signatory of the ISDR- ICL Sendai Partnership 2015-2025. The Sendai Partnership was accepted and signed during the 3rd United Nations World Conference on Disaster Risk Reduction (WCDRR) in Sendai (March 11- 15th 2015). In 2018 DST-UNIFI has worked to the drafting of the Kyoto 2020 Commitment for global promotion of understanding and reducing landslide disaster risk and it will be signed during the next World Landslide Forum in Kyoto in 2020.



Prof. Nicola Casigli

E-mail: nicola.casigli@unifi.it



Global Earthquake Model (GEM) Foundation, Italy

<https://www.globalquakemodel.org>



GEM Secretary-General, John Schneider receives the award on behalf of GEM from UNISDR Head, Mami Mizutori, at the European Forum for Disaster Risk Reduction in November 2018, Rome, Italy.

The year 2018 was a milestone year for GEM because of the completion and release of the Global Earthquake Hazard and Risk Maps to the public, and for being accorded the UNISDR's Damir Čemerin 2018 Award at the European Forum for Disaster Risk Reduction, Rome, Italy.

GEM scientists presented the global earthquake hazard and risk maps in Pavia, Italy to more than 130 delegates around the world from public, private and academic organizations that participated in the GEM2018 launch on December 5th. More than 5000 downloads of GEM's global earthquake hazard and risk maps have occurred since they were released, and there has been extensive online media coverage, with the global maps page accessed from more than 140 countries.

The products released at the December 2018 event were as follows:

1. Hazard and risk maps (print and PDF/PNG downloadable files)

2. Interactive map tool

- Global hazard map with PGA value for selected cell
- Global exposure with number & value of buildings per country
- Global risk map with average annual economic losses per country, link to risk profile

3. V1.0 Country Profiles for around 120 countries (PDF download)

4. Updated Active Fault Database (on github)

5. Updated vulnerability Database (300 functions)



Prof. John Schneider
Secretary-General

E-mail: john.schneider@globalquakemodel.org

Before the release of the global maps, the UN Secretary-General's Special Representative for Disaster Risk Reduction, Mami Mizutori awarded GEM (represented by John Schneider, GEM Secretary-General) the Damir Čemerin Award at a ceremony in Rome in November 2018. The prestigious award was accorded to GEM in recognition of GEM's leadership in supporting disaster risk reduction globally.

The award is named after Mr. Damir Čemerin, a founder member of the European Forum for Disaster Risk Reduction, who died in 2013 after long service in support of disaster risk reduction in his home country of Croatia as well as globally.



GEM presentation of the global earthquake hazard and risk maps, December 5th 2018, Pavia, Italy.





Faculty of Security Engineering, University of Žilina Slovakia

<http://fbi.uniza.sk/en/>

The Faculty of Security Engineering is oriented towards the managerial and technological studies in security and safety area. There are 4 departments: Department of Fire Engineering, Department of Security Management, Department of Technical Sciences and Informatics and Department of Crisis Management.

In 2018 faculty employer and university Vice-Rector Prof. Jozef Ristvej achieved an award of popularization of science in Slovak Republic between young people, from Ministry of Education, science and sport of Slovak Republic. His intention has always been to show young people not to be afraid of science and technical disciplines.

Faculty has organized in February a big Open Day in cooperation with all local rescue services encompassing very dynamic and interesting



programme for students in all levels of study and public. This activity was awarded as one of the most interesting Open Days of faculties organized in 2018.

We have started close cooperation between our faculty and state administration bodies represented by certain ministries in Slovak republic e.g Ministry of Interior, Ministry of Education, Ministry of Education, science and sport in area of security and safety issues and have started scientific projects solving in call Effective State Administration.



Dr. Katarina Holla
Associate Professor

E-mail: katarina.holla@fbi.uniza.sk



Stockholm Environment Institute, Sweden

<https://www.sei.org/>

SEI's International Centre of Excellence on Transforming Development and Disaster Risk (ICoE-TDDR) launched two major capacity development events: the TDDR Forum and TDDR Academy, held in Bangkok in October 2018. The Forum was well-received and attended by approximately 100 participants.

Participants included a number of UN organizations, NGOs, academics, and local and national government officials. It was co-hosted by the Asian Disaster Preparedness Centre (ADPC) and Chulalongkorn University. The Forum examined how current development models in Asia may increase disaster risk and suggested actions for development and DRR actors to transform the relationship between development and disaster risk for more equitable, resilient, and sustainable communities, now and for the future. The TDDR Academy brought together 30 PhD and Masters students and early-career researchers from major universities in Bangkok (Asian Institute of Technology, King Mongkut's Institute of Technology, and Chulalongkorn University). The Academy enabled SEI researchers to share our pathways and approaches to transformation in the context of development and disaster risk.

Members of SEI's Transforming Development and TDDR Initiative edited a special issue in *Sustainability* journal which published 11 papers from 51 authors in 15 with case



Participants at SEI's Transforming Development and Disaster Risk Forum

studies involving 19+ countries in Asia, the Pacific, Africa, North and South America, and focused on the complex relationship between development and disaster risk.

SEI researchers conducted fieldwork in Tacloban, Philippines to understand how disaster recovery efforts following Typhoon Haiyan in 2013 have contributed to differential resilience levels among affected communities in the years following the typhoon. A number of interviews and Focus Group Discussions were held to identify the drivers of inequitable resilience post-disaster.



Dr. Karlee Johnson
Research Associate

E-mail: karlee.johnson@sei.org

Institute of Earth Sciences (ISTE) University of Lausanne, Switzerland

<http://wp.unil.ch/risk/>

<https://www.unil.ch/iste/home.html>



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The group risk continued several projects dedicated to the characterization of slope mass movements hazards, mainly by remote sensing data. The study about Kii Mountain (Japan) in collaboration with Prof. Chigira has been completed in 2018 and finally published in 2019. The project dedicated to the thermal effect on rock slope dishabituation is ongoing on rock slope in Yosemite park. We are charged to evaluate the hazard of a large rock slope instability “La Brenva” in the Mont Blanc massif which produced a large rock avalanche in 1997. Modelling dedicated to rockfall using real 3D data (point cloud) and tsunami generated by landslide are still under developments. Our group discovered the first rock avalanche in Tunisia that was probably triggered by an earthquake. In addition, we stated to work on the Pizzo Cengalo disaster that killed eight persons and destroyed part of village. This was a rockslide- rock avalanches – debris-flows. We are trying to understand this instability and we tried to simulate the propagation.

We invited two visiting scientists at ISTE to support our research. Professor Chigira (DPRI) spent 1 month to study the slope instability in Switzerland, the ongoing project is to understand the creation of deep-seated landslides in southern Alps. Dr. Pudasaini (Uni Bonn) spent three months to work on landslide propagation modelling, about super-elevation of debris-flows and multiphase flow.

The risk group participated to several conferences such as 7th Canadian Geohazards

Conference (June 3-6, 2018) in Canmore (Alberta). We were involved in the scientific committee of the 3rd Virtual Geoscience Conference in Kingston (Canada). Prof. Jaboyedoff has been invited for lectures at the 5th International Symposium on Mega Earthquake Induced Geo-disasters and Long-Term Effects Effects (MEIGLE 2018) during May 11-16, 2018 in Chengdu, to the Large-Scale Landslide Workshop in Taipei (October 11th), to the Australian Geoscience Council Convention 2018 in October 2019 in Adelaide and in the International Symposium Rock Slope Stability 2018, was held in Chambéry (13 -15 November 2018).

Finally, Prof. Jaboyedoff has been appointed as scientific officer for landslide for the General Assembly of the European Geosciences Union and he is a member of the International Advisory Board of the Risk@Univ. Grenoble Alpes project.



Prof. Michel Jaboyedoff

Director

E-mail: michel.jaboyedoff@unil.ch



Evidence Aid, United Kingdom

<https://www.evidenceaid.org/>

Evidence Aid had many achievements during 2018, but one of the most significant was the publication of our new evidence guide 'Research evidence in the humanitarian sector: A practice guide'. This is now available in English, French and Spanish from our website <http://www.evidenceaid.org/use-of-evidence-in-the-humanitarian-sector-a-practice-guide/>. We had three launches of the English version of the guide – one at Save the Children in London, UK, one in the Houses of Parliament, London, UK and one in Kellogg College, Oxford, UK where many people attended. We have hard copies of the guide (English only) which we are offering to post to people if they should like one.

Humanitarian Evidence Week was a great success with lectures, webinars, training courses, blogs, podcasts, publication launches and videos. More than twenty organisations provided content, which ranged from academia, publishers, NGOs and consultants, and the website statistics show a measured increase in traffic.

We also held a number of training courses which we will build upon in 2019, extending our course content, and reach to those who might take part. We held an inaugural course titled 'Evaluating complex humanitarian interventions – utilising evidence-based approaches' which was facilitated by Professor Paul Montgomery and which was very successful. This will be run again, alongside other courses, in 2019.

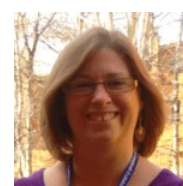
Our blog series grew, adding 14 new blogs to the series.

We also expanded our evidence collections. We launched the expanded evidence collection 'The health of refugees and asylum seekers' to include oral health. We published a newly updated collection of evidence on 'Windstorms' and started to update our collection on 'Ebola'. All the summaries of the systematic reviews in the collections



have also been translated into French and Spanish, which resulted in a greatly increased number of both Spanish and French speakers to our site. We also submitted a paper to the Journal of Humanitarian Action which described the process of our evidence collection 'Prevention and treatment of acute malnutrition in humanitarian emergencies' which has since been accepted for publication.

Finally, we appointed a new Chief Executive Officer, Ben Heaven Taylor. Ben has been with us since June 2018, and has established Evidence Aid's focus on its three key objectives and mission '*to alleviate suffering and save lives by providing the best available evidence on the effectiveness of humanitarian action and enabling its use*'.



Ms. Claire Allen

Operations Manager

E-mail: callen@evidenceaid.org

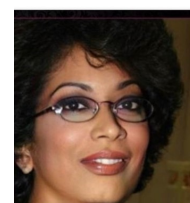
Global Disaster Resilience Centre University of Huddersfield, United Kingdom

<http://www.hud.ac.uk/gdrc>



In 2018, academics at the Global Disaster Resilience Centre, University of Huddersfield, UK have been successful in receiving key international grants, awards, esteemed positions and with key publications:

- NERC/ODA funded **Mitigating hydro meteorological hazard impacts through transboundary river management in the Ciliwung River basin project** This project will examine how and why the current transboundary river management arrangements are mitigating or exacerbating flood hazard impacts in urban and peri-urban areas of the Ciliwung river basin, in light of key physical flood variables and any future changes to statistically significant future flood variables. Value is within the range of £ 700,000.00. it is led by Professor Richard Haigh and the South-east Asian-based PI is Institute of Technology Bandung, Indonesia. Other partners of this initiative include: School of BMKG; BNPB; BMKG; Bappenas; Research and Development Agency, Ministry of Public Works and Housing; Ciliwung Cisadane River Basin Organisation; Local Disaster Management Organization at West Jawa Province; The Indonesian Association of Disaster Experts (IABI); Jakarta Provincial Government.
- **Governance of the upstream-downstream interface in end-to-end tsunami early warning systems was funded by the GCRF/QR/URF.** Its objectives included development of a self-assessment tool on tsunami early warning at the interface between upstream and downstream activity, and development and testing of decision-making criteria for Tsunami when the evidence is less straightforward, or the scenario is marginal.
- **Prof. Amaratunga and Prof. Haigh were the International Observer,** Exercise Indian Ocean Wave 2018: An Indian Ocean-wide Tsunami Warning and Communications, UNESCO IOTWMS. 2018.
- **REGARD – Rebuilding After Displacement is funded by** European Commission Erasmus+ Strategic Partnerships for higher education. Prof. Dilanthi Amaratunga is leading this initiative and other partners include: Tallinn University (Estonia), Lund University (Sweden) and University of Colombo (Sri Lanka). Grant Amount is €449,000.



Prof. Dilanthi Amaratunga
Head

E-mail: d.amaratunga@hud.ac.uk



In 2018, Prof. Dilanthi Amaratunga Received the **“His Excellency the President of Sri Lanka Award”** from His Excellency, Maithreepala Sirisena, President of Sri Lanka, for the contribution to Disaster Resilience in Sri Lanka .

GDRC was also the **Winner of the UALL International Award** for 2018 for its CADRE (Collaborative Action towards Disaster Resilience Education) project. UALL International Award recognises innovative engagement, including partnerships, that create change in an international and transnational context. Criteria for assessment included: Innovation and Creativity, Impact and Transferability.

Prof. Amaratunga was appointed as a **Member of the European Commission’s Joint Research Center (JRC) and UNISDR, European Science & Technology Advisory Group (E-STAG)**. The principal goal of the European Scientific and Technical Advisory Group (E-STAG) is to provide scientific and technical support to the 56 European and Central Asian countries for the implementation of the Sendai Framework for Disaster Risk Reduction, and other DRR related relevant frameworks or policies in the EU.

Further details about GDRC activities in 2017 can be read by visiting: <http://www.hud.ac.uk/gdrc>



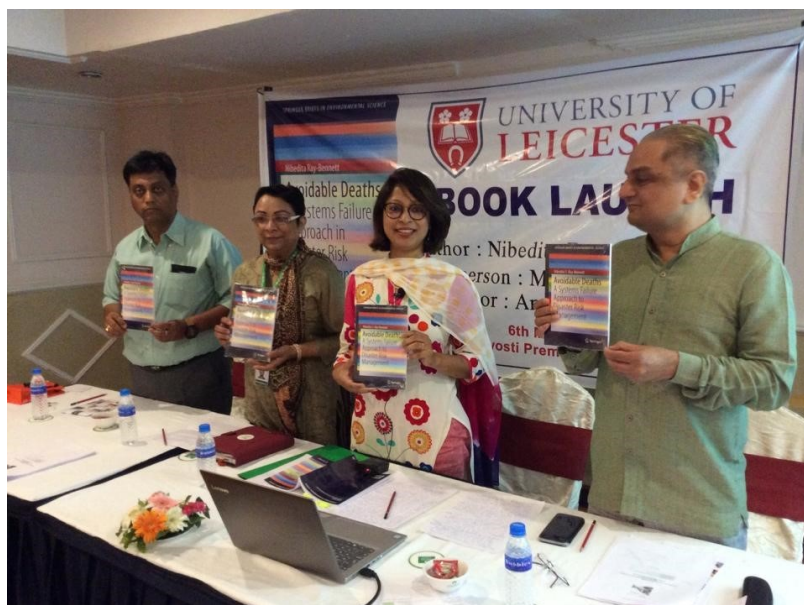
Report on Avoidable Deaths

Ray-Bennett, N.S. 2018. *Avoidable Deaths: A Systems Failure Approach to Disaster Risk Management*. Springer Nature: Switzerland. Environmental Hazard Series. <http://www.springer.com/gb/book/9783319669502>

Book abstract:

This book addresses one of the most fundamental questions of the 21st century: why deaths continue to occur in natural disasters despite the tremendous advancements in disaster management science and weather forecasting systems, the increased sophistication of human-built environments and the ongoing economic and policy development worldwide. By presenting an interdisciplinary tool for analysing 'systems failure', the book provides concrete suggestions on how deaths may be reduced in resource-poor contexts. It goes beyond traditional risk and vulnerability perspectives and demonstrates that deaths in disasters are complex problems that can be solved by adopting a socio-technical perspective to improve current disaster management systems in the developing world. The book is a timely contribution, as it directly addresses the Global Target A of the UN's 'Sendai Framework for Disaster Risk Reduction', which has urged 185 UN Member States to reduce disaster mortality by 2030. Further, it offers a valuable resource for students, researchers, policy-makers and practitioners interested in disaster risk reduction, human rights, gender, sociology of risk, crisis and disasters, environmental science, organisation and management studies.

Nibedita Ray-Bennett launched her book on the 6th of March 2018 in Bhubaneswar, Odisha. The expert panel included Mr Mihir Bhatt from the All India Institute of Disaster Management and Mr Ambika Prasad Nanda from TESCO-CSR. Please see the picture.



The book was reviewed by Professor Michael Petterson (Auckland Institute of Technology)

To read the book review published in *Disaster Prevention and Management: An International Journal*, please follow this weblink: <https://doi.org/10.1108/DPM-04-2018-301>

Related publications to the book:

- Ray-Bennett, N.S. 2017. Disasters, Deaths and the Sendai Goal One: Lessons from Odisha, India. *World Development*. 103 (2018): 27-39. <https://doi.org/10.1016/j.worlddev.2017.10.003>
- Ray-Bennett, N.S. 2018. 'How Can Asia Address Avoidable Deaths?', *Avoidable Deaths: A Way Ahead*. 178(2018): 7. https://www.preventionweb.net/files/62165_62165178snetavoidabledeaths.pdf



Dr. Nibedita Ray-Bennett

Associate Professor

E-mail: nsrb1@leicester.ac.uk

Exploring the Challenges and Opportunities Around Reproductive Health in Disasters in Bangladesh (2015-2018)

In August 2018, as a Principal Investigator Dr Nibedita Ray-Bennett concluded a 32-months International Planned Parenthood Federation (IPPF)-funded consortium-based research project called: *Exploring the challenges and opportunities of reproductive health during disasters in Bangladesh*. For details on the project, please visit this weblink:

<https://www2.le.ac.uk/departments/business/research/affiliated/cssu/cssu-research/Reproductive%20Health%20in%20Disasters%20-%20Bangladesh>

The consortium included: The Government of Bangladesh's Ministry of Health and Family Welfare, IPPF-South Asia Region (IPPF-SAR), ICDDR, B, and Data Management Aid Bangladesh.

This Leicester-led consortium tested an intervention package called RHCC (**R**eproductive **H**ealth **K**it, **C**apacity building and **C**ommunity awareness) to improve the quality and availability of post-abortion care during a flood in Belkuchi/Bangladesh. RHCC demonstrated: an increase in skilled management for Nurses and Family Welfare Visitors;

improved

quality of life for clients of the Kits; and changed practices in the delivery of the Government of

Bangladesh's national family planning programme.

This Leicester-led consortium produced two policy briefs for the Government of Bangladesh, a technical report for IPPF and IPPF-SAR, two facility assessment tools that can facilitate the implementation of the UNFPA's Reproductive Health Kit in disasters and humanitarian crises, and behaviour change communication posters (BCC) to manage post-abortion care in Bengali and English. To access these products, please visit this weblink: <https://www.ippf.org/resource/improving-quality-and-availability-post-abortion-care-humanitarian-crisis>

The research findings have been disseminated in 6 international conferences, including the:

'Asian Ministerial Conference on Disaster Risk Reduction in New Delhi, India' (4 November 2016);

'The Impact of Hazard, Risk, and Disasters on Societies Conference in Durham, UK' (19 September 2017);

'Asian Ministerial Conference in Disaster Risk Reduction in Ulaanbaatar, Mongolia' (3-6 July 2018);

'International Family Planning Conference in Kigali, Rwanda' (12-15 November 2018);

'International Congress on Women's Health and Unsafe Abortion in Bangkok, Thailand' (21 February 2019); and

'19th General Membership Meeting Reproductive Health Supplies in Kathmandu, Nepal' (25-28 March 2019).

The research project was shortlisted for the

Leicester's 'Research Excellence Award 2018' and is currently selected as an 'Impact Case Study' for the School of Business' Research Exercise Framework 2021. The research findings have been published in the *Gates Open Journal*: <https://gatesopenresearch.org/articles/3-788/v1>,

Gaveshana: <https://www.gaveshana.lk/about> and an Input Paper for the UNISDR's *Global Assessment Report 2019*.

Nibedita has secured a further grant from Economic and Social Science Research Council-Impact Accelerator Award (ESRC-IAA) to showcase the research project at the ESRC Social Science Festival at Leicester on the 6th of November 2019. This forthcoming event will engage with schools, colleges and Universities from the East and West Midlands in the UK. It will also engage with key stakeholders such as Leicester's City Council, UNDRR, UNFPA, pharmaceutical companies, IPPF, Government of Bangladesh – among others – to upscale the impact of this research project.



Water Engineering and Development Centre (WEDC), Loughborough University United Kingdom

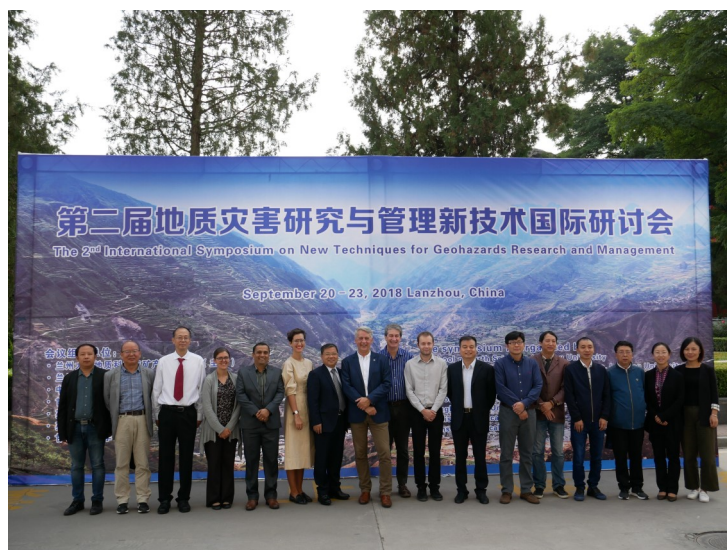
<https://www.lboro.ac.uk/research/wedc/>

The School of Architecture, Building and Civil Engineering, Loughborough University has secured over £1.2 million research funding from UK research councils on disaster-related research projects. In these research projects, the Loughborough University researchers work with multi-disciplinary and international teams to build resilience to disasters to achieve sustainable development.

- GCRF Living Deltas Hub, Research Councils UK, 2019-2024
- Web-Based Natural Dam-Burst Flood Hazard Assessment and Forecasting SysTem (WeACT), NERC-DFID, 2019-2021
- 'River basins as living laboratories' for achieving sustainable development goals across national and sub-national scales, NERC, 2019-2021
- FUTURE-DRAINAGE: Ensemble climate change rainfall estimates for sustainable drainage, NERC, 2019-2020
- Valuing the benefits of blue/green infrastructure for flood resilience, natural capital and urban development in Viet Nam (ValBGI), NERC, 2019-2021
- Safer Self-Recovery, interdisciplinary research into post-disaster peri-urban shelter reconstruction in Nepal and Philippines, British Academy, 2017-2018



The inception meeting for the “River basins as living laboratories” for achieving sustainable development goals across national and sub-national scales” project at Nankai University



The organizing committee and key speakers of the 2018 2nd international symposium on new techniques for geohazards research and management, held at Lanzhou University, Gansu Province.

- Exploring community-based geohazard response schemes in Gansu, China. CENTA Doctoral Training Programme, NERC, 2018-2022
- Hydro-geohazards and resilient urban growth, Research Link workshop, British Council, 2018-2019

The school has successfully organized the 2nd International Symposium on New Techniques for Geohazards Research and Management together with the British Geological Survey, Lanzhou University, Xi'an Center of Geological Survey and Gansu Geohazards Emergency Response Centre (Geo-environmental Monitoring Institute).



Prof. Qiuhua Liang

E-mail: q.liang@lboro.ac.uk



**Northumbria
University**
NEWCASTLE

Disaster and Development Network (DDN) Northumbria University Newcastle, United Kingdom

<https://www.northumbria.ac.uk>

During 2018 the DDN made representations on Disaster Risk Reduction, Resilience Building and Sustainability in more 15 international forums including as co-leader of the first 'Sustainability and Resilience' conference to take place in the Gulf region hosted by University of Bahrain, in the formation of a new 'Peace Ecology in the Anthropocene' commission with the International Peace Research Association (IPRA) launched at IPRA 2018 in Gujarat, India, and in supporting the World Health Organization facilitated Health Emergency and Disaster Risk Management platform and research group through events in Hong Kong and Geneva. The DDN continued to develop initiatives with the United Nations Science and Technology Advisory Group (STAG) in particular in developing a strategic approach to better use of data for achieving the targets of the Sendai Framework for Disaster Risk Reduction 2015-2030. The DDN, Northumbria also continued to co-chair the United Kingdom Alliance for Disaster Research (UKADR) who's annual conference was hosted by University of Bristol and in preparation for the 2019 conference being hosted by Northumbria University. Northumbria DDN is also honored to continue as an elected Board institution and to provide the Chair for the Board of the Global Alliance of Disaster Research Institutes (GADRI).

Several significant research projects have been further developed including with civil societal organizations and NGO's. One particularly innovative project that has been funded for a second phase involves the development of risk communication techniques with children in schools of some of the poorest neighborhoods of Nairobi using puppetry and for which an understanding of the processes of engagement and behaviour change have been observed.

The techniques are being developed with a local NGO for further adaptation during 2019 within the Myanmar border Refugee areas of south-west Bangladesh. The work is orientated during this phase to water,



sanitation and hygiene related hazards and as such the project follows on from multiple earlier projects DDN had developed with partners in both regions using people centred health risk reduction approaches. Initiatives were also made in developing a multiple institution £20 million bid to the Global Challenges Research Fund for work in four regions of the world on multi-hazard disaster risk transitioning. Notification of the success of this proposal, for which Northumbria DDN is a Co-institution, arrived at the end of 2018 and will be reported on further in the 2019 annual report.

Students of the Department of Geography and Environmental Sciences that hosts the DDN at Northumbria continued to select disaster and development studies as a focal area of their studies, attracting the largest cohort of undergraduate students selecting this focus to date. The autumn term of 2018 witnessed also the largest numbers of graduating MSc Disaster Management and Sustainable Development students in one go since the programme began in 2000. The 2018 year however also brought one point of great sadness in that one of the early founding members, alumnus by MSc and by PhD, and an early employee who had recently been recruited back into the group following a period at Manchester University, died suddenly whilst on fieldwork with our partnerships in Southern Africa. Dr. Bernard is sadly missed by all who knew him and will be remembered evermore for his warm and enthusiastic commitment and passion for this field of work.



Prof. Andrew Collins
Leader

E-mail: andrew.collins@northumbria.ac.uk



Overseas Development Institute, United Kingdom
<https://www.odi.org/>

The Overseas Development Institute (ODI) is an independent think tank with more than 230 staff, including researchers, communicators and specialist operational staff. We provide high-quality research, policy advice, consultancy services and tailored training – bridging the gap between research and policy and using innovative communication to mobilise audiences.



ODI at COP24

ODI's Risk and Resilience Programme delivers high quality research, analysis and policy advice on the distribution of risk, impacts of climate, weather extremes and other hazards on development, and the political economy of resilience strategies.

Below is a selection of publications and events by the Risk and Resilience Programme at ODI

The team's ways of working include:

- Understanding current and emerging risks at the global, regional, national and sub-national levels and their implications for poverty, vulnerability, economic growth and sustainable development;
- Analysing the distribution and differential impacts of risk management strategies;
- Identifying strategies for building resilience in relation to risks in areas ranging from climate, extreme weather events and geophysical hazards, to infrastructure investment, urbanisation, rural livelihoods and disasters;
- Developing analytical frameworks that explore the inequalities in the distribution of risk and risk management capabilities.

- Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED) The role of multilateral climate funds in supporting resilience and adaptation through insurance initiatives Lena Weingartner, Alice Caravani and Pablo Suarez
- How does resilience change over time? Tracking post-disaster recovery using mobile phone surveys Lindsey Jones, Paola Ballon and Johannes von Engelhardt

Ms. Emma Lovell

E-mail: e.lovell@odi.org.uk



Pathways to Resilience in Semi-arid Economies (PRISE)

- Unlocking climate-resilient economic development in drylands: pathways to a resilient world Eva Ludi, Erin Roberts, Rebecca Nadin, Margherita Calderone, Rajeshree Sisodia, Guy Jobbins and Nathalie Nathe
- 'Leaving no one behind' through enabling climate-resilient economic development in dryland regions Guy Jobbins, Eva Ludi, Margherita Calderone, Rajeshree Sisodia, Moizza B. Sarwar
- EVENT: PRISE at Adaptation Futures 2018
- EVENT: PRISE at the United Nations High-Level Political Forum on Sustainable Development

Other Publications

- Meeting the global challenge of adaptation by addressing transboundary climate risk Magnus Benzie, Kevin M. Adams, Erin Roberts, Alexandre K. Magnan, Åsa Persson, Rebecca Nadin, Richard J.T. Klein, Katy Harris and Sébastien Treyer
- Forecasting hazards, averting disasters: implementing forecast-based early action at scale Emily Wilkinson, Lena Weingartner, Richard Choularton, Meghan Bailey, Martin Todd, Dominic Kniveton and Courtenay Cabot Venton

- Disability inclusion and disaster risk reduction: overcoming barriers to progress John Twigg, Maria Kett and Emma Lovell
- Disaster Risk Reduction and violent conflict in Africa and Arab states: implications for the Sendai Framework priorities Katie Peters and Laura E.R. Peters
- 'Leave no one behind' index 2018 Marcus Manuel, Francesca Grandi, Stephanie Manea, Amy Kirbyshire and Emma Lovell
- Towards a more resilient Caribbean after the 2017 hurricanes Emily Wilkinson

Other Events

- Building resilient food systems and value chains through financial services COP24 in Katowice
- Exploring transboundary climate risks and opportunities COP24 in Katowice
- Disaster risk reduction in fragile and conflict affected contexts ODI



Africa—Members

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 African Alliance of Disaster Research Institutes (AADRI)





University for Development Studies (UDS) Ghana

<http://www.uds.edu.gh>



The University for Development Studies (UDS) reports on activities of the Kazuhiko Takeuchi Centre for Sustainability and Resilience (KTCSR) which was established as a research, development and extension centre for issues of sustainability and resilience to climate and ecosystem change in 2017.

The Centre has since continued with dissemination engagements with various stakeholders on strategies for enhancing resilience against climate and ecosystem changes in Africa through workshops and peer review journal article publications:

- In collaboration with United Nations University Institute for Natural Resources in Africa UNU-INRA, the Centre has secured a 3-year funding from USAID to carry out joint research with Hophoubouny University in Cote D'ivoire on Fresco Coastal landscapes under the West Africa Biodiversity and Climate Change Project (WA BiCC).
- The Centre has secured support from the UNDP adaptation fund to collaborate with an NGO, ProNET North in upscaling the adoption of locally constructed improved mud cookstove by sheabutter and food processors across the three northern Regions.

Research Theme 1: Biodiversity, Ecosystems and Agro ecological Systems

Undertaking research within the larger context of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) framework at the local level by deepening the understanding of biodiversity and ecosystem service inter-linkages especially through local knowledge.

Addressing the disruptive changes in agricultural systems by focusing on the understanding of drivers of change, impact assessments, adaptation management and value chain management.

Research Theme 2: Water Systems Management and Disaster Risk Reduction

Focusing on research geared towards the holistic understanding of climate risks and adaptation planning.

Water-Energy-Food Nexus: Addressing the complexities, material flows, inter-linkages, synergies and trade-offs among water, energy and food sectors in both rural and urban areas of Africa.

Seeking funding support for research into coping measures for annual flooding of the Volta River Basin for recommendation to Government of Ghana and local communities.

Research Theme 3: Capacity Development and Policy Research

Undertake policy driven research on Sustainable Development Goals and capacity development (i.e. through trainings and short courses) tailored to the human resource needs of the African continent. This thematic group is also working on a postgraduate program in Disaster Risks Reduction (DRR)



Dr. Godfred Jasaw

Director

Email: gjasaw@uds.edu.gh

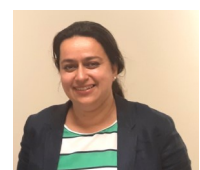
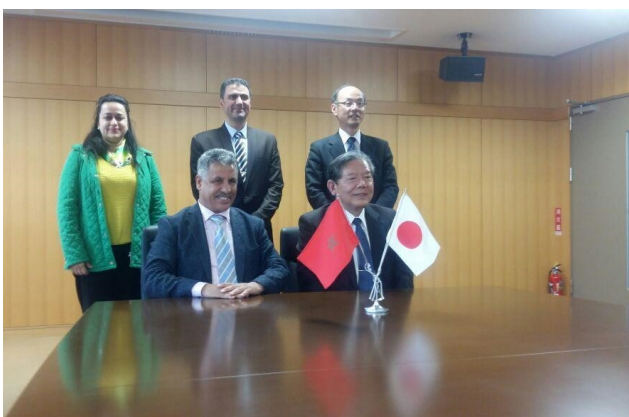


Faculty of Sciences and Technics of Mohamadia, University of Hassan II of Casablanca, Morocco

<https://www.fstm.ac.ma/>

1 A Moroccan delegation made a visit to DRPI and GADRI on 12 to 16 of March, 2018. The main outcomes of this visit are:

- MOU signing between Faculty of Sciences and Technics of Mohamadia - Morocco (FSTM) and DRPI during the visit of the Moroccan Delegates to Kyoto University,
- Giving the 'Morocco Seminar' at DRPI on 13 of March, 2018
- Participating in GADRI Forum where the Moroccan delegation gave a presentation entitled "An Overview on Disaster Risk Management and Research in Morocco", at DRPI, 14 March, 2018.



Prof. Dalila Loudyi

Email: Loudyi.d@gmail.com



Participation at GADRI Forum

2. Organized the 4th International Symposium on Flash Floods 2018 in Casablanca, Morocco, in collaboration with GADRI and DRPI, 6-8 of December, 2018. This year edition was about: " Urban Flood Risk Management: Mitigation and Adaptation Measures in the MENA Region". The event gathered more than 150 participants from different countries (Algeria, Bulgaria, Egypt, France, Germany, Japan, Morocco, Oman, Saudi Arabia, Sudan, Taiwan, USA).
3. Meeting with high officials at the Moroccan Ministry of Equipment, Transportation, Logistics and Water for the "Promotion of Technical and Financial Support by Japan for Serious Problems of Dam Reservoir Sedimentation in Morocco", 07 December, 2018



4th International Symposium on Flash Floods





Africa Alliance for Disaster Risk Institutions (AADRI), Bindura University, Zimbabwe

<https://www.aadri.org.zw/>



Prof. Manatsa (far right) with colleagues during one of the field trip to revisit the agro-ecological regions of Zimbabwe which have been affected by climate change.

Africa Alliance for Disaster Risk Institution (AADRI) which is a member of GADRI, was formed recently as a collaborative platform for engaging discussion, sharing knowledge and promoting networks on topics related to risk reduction and resilience to disasters related to Africa. The interim chairman who coordinated AADRI formation is by Prof. Manatsa from Bindura University of Science Education. Bindura University is one of the few institutions outside South Africa, with Disaster Research that is very active to the extent that it has disaster related degree programs from undergraduate to PhD level. Although AADRI activities are currently confined to Zimbabwe, Mozambique, Zambia and Malawi, the aim is to spread regionally to cover the whole of Africa. The following are the activities and projects related to AADRI during the reporting period:

- AADRI is engaged in the flood mapping exercise in the Zambezi Valley for which encompasses Zambia, Zimbabwe and Mozambique
 - AADRI is involved in the distribution of food for children in drought affected areas.
 - AADRI is spearheading coming up with the Climate Change National Adaptation Plans for Zimbabwe.
- AADRI is participating in the revisiting the Zimbabwe Agro-Ecological Zones whose traditional boundaries have been shifted by climate change.



Prof. Desmond Manatsa

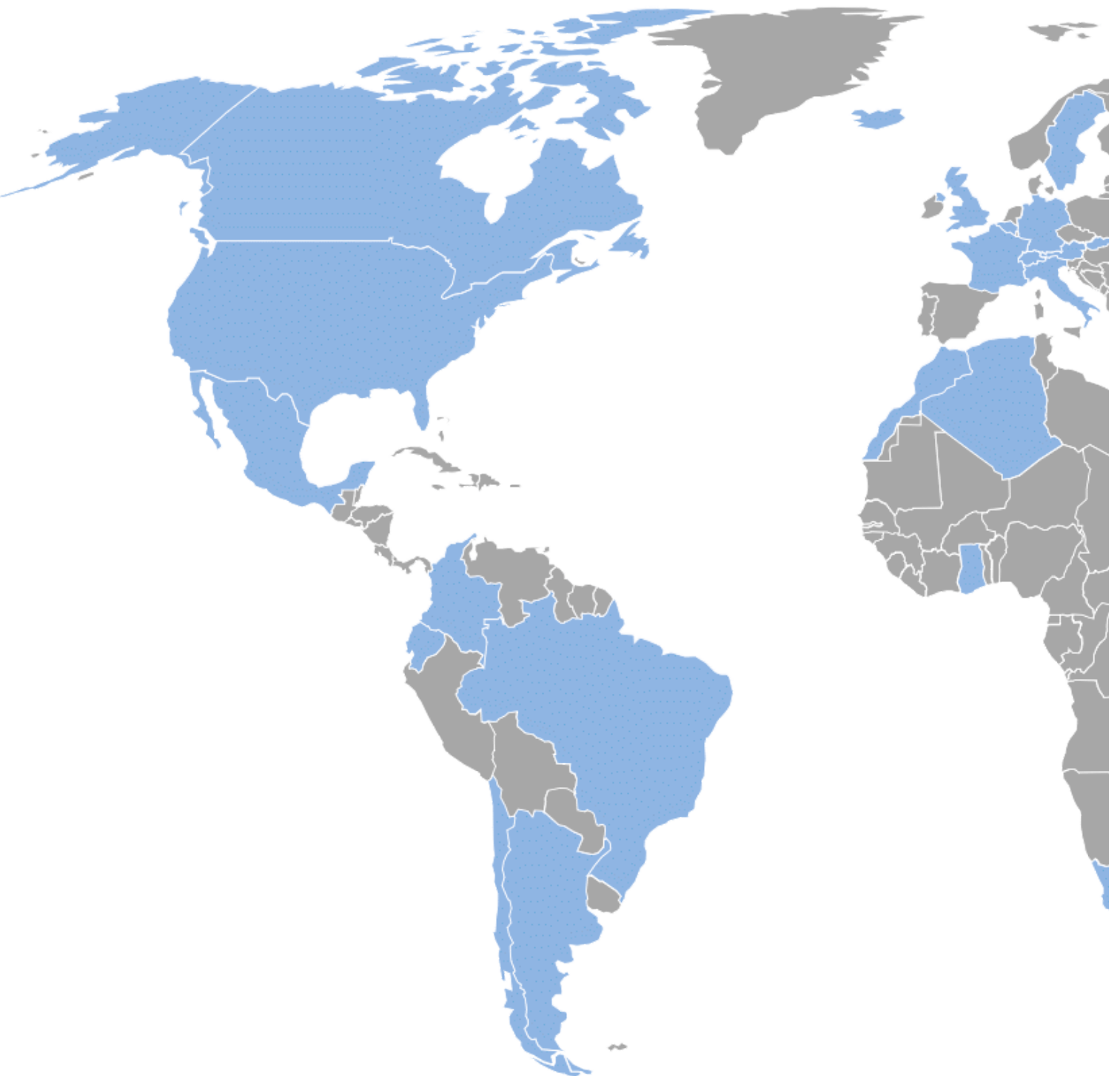
Email: dmanatsa@gmail.com



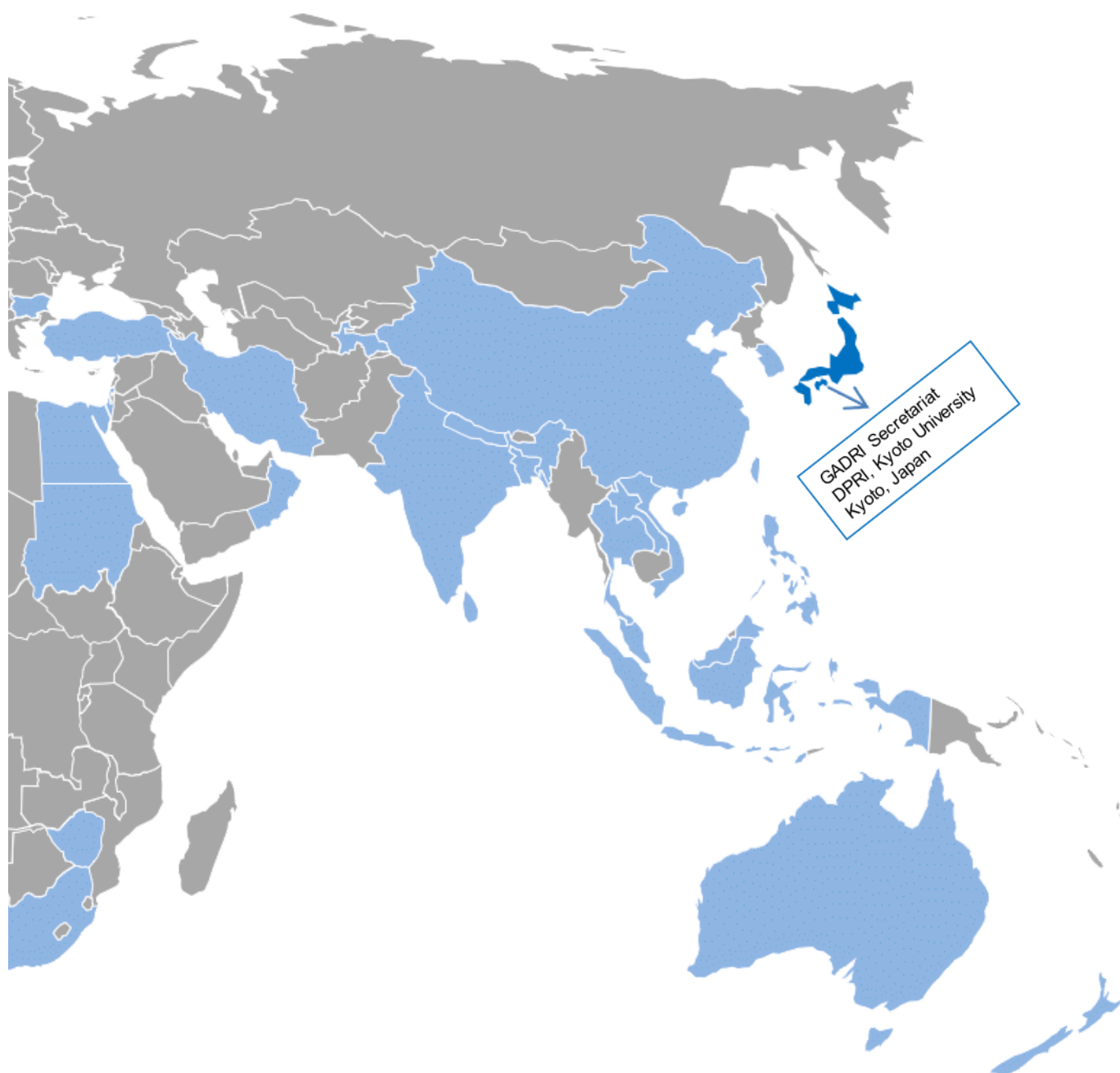
Distributing food to children in drought affected areas of Mashonaland Province of Zimbabwe



Geographical Distribution of



Members of GADRI as of 31 December 2018





GADRI Secretariat, Disaster Prevention Research Institute (DPRI), Kyoto University

GADRI SECRETARIAT

Disaster Prevention Research Institute (DPRI)
Gokasho, Uji-shi, Kyoto 611-0011, Japan

Tel: +81-774-38-4651

E-mail: secretariat-gadri@dpri.kyoto-u.ac.jp

Website: <http://gadri.net/>