

# GADRI ACTIONS

Summer and Winter 2021 Volume 15— Number 1

5<sup>th</sup> Global Summit of GADRI Engaging Sciences with Action

# 31<sup>st</sup> August to 1<sup>st</sup> September 2021

Dear Members of GADRI,

Compliments of the season!

Despite the obstacles thrown at each one of us, we have braved ourselves to move forward and do the best we can under the circumstances. The situation even dared us to explore new ways, things we thought as impossible and put them into implementation. One amazing example is the 5th Global Summit of GADRI held last August. The results were amazing.

We thank all members of GADRI and our partners for continuing their tremendous work on disaster risk reduction, prevention and mitigation. The COVID-19 pandemic is an eye opener for all of us reminding us about the unknown risks and the importance of preparedness and risk communication shared among stakeholders and our communities. COVID-19 has also shown us how the decision makers and governments were leaning towards the science community for evidence-based science research and policies. Risk communication and sharing evidence-based science with decision-making was widely expressed during the 5th Global Summit of GADRI too. When you work collectively together, there is nothing that we cannot accomplish. We therefore, count on your continued support and collaboration.

We would like to share with you how GADRI moved forward in 2021.

- GADRI Board of Directors continued to have quarterly meetings to review and discuss the activities and direction of GADRI.
- 5<sup>th</sup> Global Summit of GADRI : Engaging Sciences in Action held virtually and intercontinentally from 31<sup>st</sup> August and 1<sup>st</sup> September 2021. This could not have been accomplished if not for the extraordinary support and coordination received from our members and partners in North and South America, Europe, Africa, Middle East, Oceania and Asia and all other partners especially the UNDRR. We all came together to make this event a success.
- GADRI Newsletters we published the Spring 2021 version.
- Contributions to the UN Climate Change Conference of the Parties (COP26) held in Glasgow, Scotland from 31<sup>st</sup> October to 12 November 2021. GADRI shared its contribution through UK Research Institute (UKRI).
- GADRI was invited by UKRI to participate in the finale event of UKRI COP26 meeting on 15<sup>th</sup> December 2021. The Chair, Prof. Paul Kovacs of GADRI Board of Directors, Prof. Mahua Mukherjee, member of the Board of Directors, IIT, Roorkee, India, and Prof. Andrew Collines, ormer Chair of GADRI Board of Directors and member of GADRI, DDN, Northumbria University, represented GADRI at the finale event.
- The Disaster Prevention Research Institute (DPRI), Kyoto University, Japan provided a research grant to GADRI to carry out a collaborative research project on the "GADRI Collection of World Disaster Databases".
- Under the Disaster and Risk Research: GADRI Book Series, two books were published Proceedings
  of the 3<sup>rd</sup> Global Summit of GADRI; and the Ecosystems-Based Disaster and Climate Resilience. You
  may wish to visit the site to obtain further information https://www.springer.com/series/16177
- GADRI Board of Directors is taking steps to form five working groups to work on the five major objectives of GADRI
- GADRI met with the Tohoku University, International Research Institute of Disaster Science (IRIDeS), Japan to discuss about the next World Bosai Forum

None of these activities could have been accomplished without your active and generous support.

We wish you all a very happy and safe holiday season. Wish you a Happy Christmas and a Happy New Year!

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Yours sincerely,

Hirokazu Tatano and;

Wilma, Ayuna, and Matsuura

PS: A sincere apology for the delay in publishing this version of GADRI Actions. We have worked hard on the videos to capture the discussions of the 5th Global Summit of GADRI: Engaging Sciences with Action held in August 2021. We hope you will enjoy reading the stories and reminiscing on our amazing and incredible conference with which we went around the world in 28 plus hours.

Photos: All photos of presenters and PPTs are screen shorts from zoom meeting of the 5th Global Summit of GADRI.

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# 5<sup>th</sup> Global Summit of GADRI: Engaging Sciences with Action 31<sup>st</sup> August to 1<sup>st</sup> September 2021 Virtual and Intercontinental Conference (22:00 hours 31<sup>st</sup> August to 0:00 hours 1<sup>st</sup> September 2021 JST)

The Global Alliance of Disaster Research Institutes (GADRI) https://gadri.net/ organised the 5<sup>th</sup> Global Summit of GADRI under the sub-theme of Engaging Sciences with Action virtually and regionally from 31<sup>st</sup> August to 1<sup>st</sup> September 2021. http://gadri.net/ summit/

The 5<sup>th</sup> Global Summit of GADRI aimed at stock taking of progress and achievements in DRR research from its members toward the targets of the Science and Technology Roadmap to implement the goals and priorities of the Sendai Framework. The programme communicated academic science across scientific disciplines to policy makers and practitioners. It is an important aspect for academics to be aware how science can directly contribute to national and local disasters, for example, the current global pandemic COVID-19, earthquakes, volcanic eruptions, etc. Such situations prompt scientists' interventions, expertise, experience and the opportunity to share them with emergency managers in crisis situations.

This year's Global Summit of GADRI was organised with cooperation with its regional alliances. The outcomes and recommendations of the summit will be fed into the forthcoming, UN Climate Change Conference of the Parties (COP26) in the UK in November 2021; and the UNDRR Global Platform for DRR in Bali, Indonesia in May 2022. The recommendation from the summit to the COP26 will be facilitated through the UK Research and Innovation (UKRI).

The 5<sup>th</sup> Global Summit of GADRI was opened by Prof. Paul Kovacs, Chair, Board of Directors of GADRI and followed by a video message from Ms. Mami Mizutori, Special Representative of the Secretary-General for DRR, UNDRR, Switzerland; and the greetings from the Secretary-General of GADRI, Prof. Hirokazu Tatano.

The first Plenary Session on the topic of Systemic Risk and Current Action was covered by Ms. Loretta Hieber Girardet, Chief,

#### **Background:**

During the first global summit, initiated by the Disaster Prevention Research Institute (DPRI), Kyoto University, Uji Campus, Kyoto Japan from 24 to 25 November 2011, during the same year a Risk Knowledge, Monitoring and Capacity-Development Branch, United Nations Office for Disaster Risk Reduction (UNDRR); COVID-19 and other hazards – Science into Action was delivered by Prof. Virginia Murray, Head, Global Disaster Risk Reduction, Public Health England (PHE), UK; and the Lessons of COVID-19 for Systemic Risk Governance: Recycling Sustainability and Resilience was delivered by Prof. Ortwin Renn, Scientific Director, Institute for Advanced Sustainability Studies (IASS), Germany. The session was chaired by Prof. Kaoru Takara, Professor and Dean, Graduate School of Advanced Integrated Studies (GSAIS) in Human Survivability (Shishu-Kan), Kyoto University.

The Opening Ceremony and the Plenary Session I was logged in by about 334 people from around the world.

The regional sessions took place soon after the opening plenary.

- Americas covering North and South America was on Current Situation of Science Collaborations in Hazards DRR.
- The second Plenary Session on How to Engage Science in the Decision-Making Process within National Governance and Relate Science into Action?
- Asia and Oceania regional session covered the topic on Engaging Sciences with Action: Voices from Asia and Oceania
- Europe with Africa and the Middle-East was on Exploring solutions to Bridge the Gaps for Implementation of Science in Action.
- There was parallel sessions on Networking with Institutes and an e-poster session.

The summit closed with a final wrap-up session for the regional session the closing ceremony.

An amazing number of 640 participants from 77 economies registered for the conference; and nearly 568 members from 73 economies logged in via zoom meeting to attend the 28+-hour long conference.

#### Subsequent sessions include:

The Third Global Summit of GADRI under the theme of Expanding the Platform for Bridging Science and Policy Making from 19 to 21 March 2017, Kyoto, Japan with 102

triple disaster – Great East Japan Earthquake and Tsunami devastated Japan in March 2011. The First Global Summit which brought together 52 research institutes involved in disaster risk reduction and management from around the world, proposed the establishment of an international forum of disaster research fostered by DPRI, Kyoto University. This proposal was further endorsed by the Second Global Summit that took place at DPRI, Kyoto University from 19-20 March 2015 soon after the UN World Conference on Disaster Risk Reduction, participated by 83 institutes, and established the Global Alliance of Disaster Research Institutes (GADRI) to support the Sendai Framework for Disaster Risk Reduction 2015-2030 agenda. institutes and 251 participants from around the world. One of the major outcomes of this was the establishment of the Disaster and Risk Research: GADRI Book Series with Springer Nature.

The Fourth Global Summit of GADRI under the theme of Increasing the Effectiveness and Relevance of our Institutes was organised in March 2019 at DPRI, Kyoto University, Japan. It was attended by 107 institutes and 246 participants. This session of the summit contributed to the contextualisation of the Science and Technology Roadmap. Its recommendations were submitted the UNDRR Global Platform for DRR in May 2019 in Geneva, Switzerland.

# 22:00 JST 31<sup>st</sup> August 2021

# **Opening Ceremony**

The 5<sup>th</sup> Global Summit of GADRI was opened by Prof. Paul Kovacs, Chair, Board of Directors of GADRI and followed by a video message from Ms. Mami Mizutori, Special Representative of the Secretary-General for DRR, UNDRR, Switzerland; and the greetings from the Secretary-General of GADRI, Prof. Hirokazu Tatano.



Opening Ceremony Chair:

Prof. Kaoru Takara, Dean, Graduate School of Advanced Integrated Studies (GSAIS) in Human Survivability (Shishu-Kan), Kyoto University, Kyoto Japan

Prof. Paul Kovacs, Chair, GADRI Board of Directors; and Executive Director, and Adjunct Research Professor, Economics, Institute for Catastrophic Loss Reduction, Western University, Canada (Toronto, Canada—08:00 am)



Prof. Paul Kovacs commenced his greetings by expressing his appreciation to all organisers of the 5<sup>th</sup> Global Summit of GADRI especially the Disaster Prevention Research Institute (DPRI), Kyoto University and the

Kyoto University for hosting the GADRI Secretariat and support rendered for its activities. After greeting the participants, he expressed his enthusiasm to participate in the unique event of the 5<sup>th</sup> Global Summit of GADRI which had over 640 registrants from nearly 77 economies. The theme Engaging Sciences with Action could not have been discussed in a better time. The conference is bringing together some of the world's leaders in the disaster science community to speak over a period of 26 to 27 hours and literally go all around the world to bring the best and the brightest together to share thoughts, ideas, and on how to make the world better and to discuss about better engagement in science in action for DRR.

Holding the 5<sup>th</sup> Global Summit of GADRI under the current constrained situation has its own merits. For example, there are more institutions, and people participating in the conference. More prominent speakers are able participate in the conference

and share their views. People who are not able to travel due to conflict of schedules or budgetary constraints are able to participate especially young scientists and people from developing countries.

He stressed that it is quite remarkable to note how the research community and disaster scientists have been able to come together to put on this event possible. The event not only brings all together but also help to advance societies' knowledge and understanding of science so that better decisions are made on the hazards that are confronting us. GADRI as a community is helping to better understand, and support knowledge and action so that societies can be better prepared going forward. This event is part of that process. It is part of GADRI's mandate too. How can we work across institutions? Each one is doing amazing work individually. As institutions, and through the Alliance, it has brought together institutions to play a greater role by working collectively to advance how science support action. The role of the alliance brought together many institutions from around the world and it is very exciting for events like this to support collaboration, publications, research, and support in many other ways to play the biggest role.

On behalf of the Global Alliance of Disaster Research Institutions, Prof. Kovacs welcomed everyone to the 5<sup>th</sup> Global Summit of GADRI.

#### Video Message by Ms. Mami Mizutori, Special Representative of the Secretary-General for DRR, UNDRR, Switzerland

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Ms. Mami Mizutori congratulated and thanked GADRI for organizing the 5<sup>th</sup> Global Summit of GADRI which will take stock of research progress and achievements in disaster risk reduction. She stated that as we are increasingly observing, contribution to DRR, particularly as the world seeks the expert opinions of academics and scientists to navigate the global pandemic and find solutions.

disaster risk is interconnected and the impact of a hazard may cascade across sectoral and geographical boundaries and have seen this with COVID-19, as a public health crisis quickly turned into a socio-economic crisis.

Under the theme "Engaging Sciences with Action", this conference is a unique opportunity to elevate science's

GADRI and its regional alliances are also coordinating efforts to bring results and recommendations from the 5th Global Summit of GADRI to inform the UN Climate Change Conference of the Parties (COP26) in November this year, as well as to contribute to the Global Platform for DRR in May next year in Bali Indonesia.

Ms. Mizutori also took the opportunity to thank Professor Eiichi Nakakita, Director of the Disaster Prevention Research Institute (DPRI), Kyoto University; and the Kyoto University for hosting the GADRI's Secretariat at the DPRI, Uji Campus, Kyoto University, Japan. Prof. Hirokazu Tatano, Secretary-General, GADRI; and Professor, Disaster Prevention Research Institute (DPRI), Kyoto University, Japan

In his presentation on the objective, structure and the expected



outcomes of the 5<sup>th</sup> Global Summit of GADRI, Prof. Hirokazu Tatano shared information on with the unprecedented impact of the pandemic have brought flexibility to explore other interesting ways to hold a global conference of

this magnitude and how he is amazed with the result. He explained how the members of the GADRI Board of Directors and the Advisory Board came together to support the GADRI Secretariat to organise the 5<sup>th</sup> Global Summit of GADRI, and how they volunteered to host the continental sessions at their respective institutes and today, the summit was possible due to their untiring and active support and intervention.

He explained that in order to manage the time zones, the conference will be held in three different continents:

- Americas covering North and South America Multidisciplinary Modeling Progress and the Role of Community Engagement in Resilience Planning
- Asia and Oceania Engaging Sciences with Action voices from Asia and Oceania
- Europe with Africa and the Middle-East Exploring solutions to Bridge the Gaps for Implementation of Science in Action

He continued to state that the main purpose of the conference is how to engage sciences with action? The continental hosts have looked at this issue in different angles and cast wider net to bringin an impressive number of 93 excellent speakers in different fields of specialization. The conference uniquely provides an opportunity to young scientists especially in developing countries who otherwise may not be able to participate in person at the Global Summit of GADRI due to various constraints. The online conference paved the way for especially for them to engage in discussion and share their research interests with GADRI members and other global stakeholders.

One of the major outcomes of the 4<sup>th</sup> Global Summit of GADRI held in Kyoto in March 2019 was agreement to intensively contribute to the S&T Roadmap action plan. The members agreed to share voluntary evaluation reports of activities and achievements during the biennial Global Summits of GADRI. Based on this agreement, prior to the 5<sup>th</sup> Global Summit of GADRI, all members were requested to provide their institute report of activities and achievements towards the targets of the Science and Technology Roadmap to implement the goals and priorities of the Sendai Framework for Disaster Risk Reduction. A few of the institutes responded to this request, and it is an exercise that will be carried out until the end of March 2022.

GADRI intends to share its outcomes and recommendations from the 5th Global Summit of GADRI with the UN Climate Change Conference of the Parties (COP26) in Glasgow, November 2021, facilitated by the UKRI, and the 7<sup>th</sup> Session of Global Platform for Disaster Risk Reduction in Bali, May 2022. Prof. Tatano reiterated that the scientific contributions from the members of GADRI towards disaster risk reduction, climate change mitigation and adaptation, and current and post-COVID-19 pandemic are needed to influence policy making and practice associated with international frameworks such as the Paris Agreement on Climate Change and the Sendai Framework Agenda.

He detailed the programme planned for the 26-27 hours of the summit, and encouraged everyone to participate to the extent possible, and actively engage in the discussion sessions. Also, he introduced the Networking with Institutes session, a new session to encourage collaboration among GADRI members, and the e-poster session. Networking session encourages collaboration with institutes that have necessary seeds for research collaboration and institutes which are in need of research collaboration. E-poster session is also a another portal to summarise research achievements by institutes and encourage all participants to login to these sessions as well.



#### **Plenary Session I: Systemic Risk and Current Action**

Ms. Loretta Hieber Girardet, Chief, Risk Knowledge, Monitoring and Capacity-Development Branch, United Nations Office for Disaster Risk Reduction (UNDRR) (from Paris, France 14:20 hrs.)



In her presentation, she discussed in detail on two, current major global concerns, the Covid-19 pandemic and the worsening effects of climate change. She stressed how very little is known about the composition of risk, the origins, the interconnections. COVID-19, and also climate related disasters are the manifestations of systemic risk realized. Within that context, it really goes without saying that the value of the work of the research community for Disaster Risk Reduction is immeasurable. It is a known fact that risk is unequivocally increasing. Hazards are growing in intensity, frequency, and unpredictability.

She also drew attention to the IPCC assessment reports 6 which was published in August 2021, and which needs to be seen as a wakeup call for all of us. It summarized the physical science basis, the cutting edge understanding of the physical aspects of climate change and it is worthwhile to reflect on the findings and understand what they mean for disaster risk.

Further, there has never been a time in history when a more urgent call was issued for accelerating action to reduce disaster risk, especially climate related disasters and tackling risk is not easy. Systemic risk and how these conditions come together to make a devastating scenario such as COVID-19 possible, is much harder to understand than to measure, quantify, and communicate. Some people say it was impossible to have foreseeing the risk of an event like the COVID-19 pandemic. But it was predicted in the 2019 UNDRR published the Global Assessment report, which noted - all diseases such as cholera and plague have returned and new ones have emerged. Another Ebola epidemic or a new influenza pandemic are likely and almost certain. The only unknowns are when and where they or a new lethal threat will emerge.

- need to strengthen the engagement of scientists who are working on Disaster Risk Reduction with other sectors such as health, understanding that multisectoral approach is critical for achieving the goals of reducing multi hazard risk.
- need to bridge the gap within the scientific disciplines, especially the DRR and climate change domains. One of the priorities for UNDRR is to promote comprehensive disaster and climate risk management, and this really does require a sound scientific basis.
- In particular, need to provide further meaning to climate projections and long-term risk assessments to be able to translate these into comprehensive disaster and climate policy planning and implementation.
- In addition, Ms. Girardet added that certain degree of change of focus or perception is also required, for example:
- to become more comfortable with uncertainty. This goes for both research and policy makers. This does not mean systemic uncertainty. It means the acceptance of that there are unquantifiable things about the world and the need to learn how to take these into account when planning for disaster risk reduction interventions.

She further stated that justice, and equity matters. When disaster damage reports estimate the total loses in billions of dollars, it is usually of the physical assets and it does not address the needs and, interests of capacities of the people who are on the front line of disaster risk. It necessary to take the losses of people who are voiceless in the equation. They are often the ones who have the least chance to participate in these processes.

The scope and scale of what is left to know about the way risk is constructed and managed is astronomical. Our knowledge of non - probabilistic hazard alone is dangerously incomplete, and to say nothing of exposure, vulnerability and the emergent properties arising from their commingled. Attaining the goal of this entitlement to reduce risk is a very challenging proposition.

She concluded with the words that UNDRR considers GADRI a direct partner who works across all efforts made to help countries better understand and manage disaster risk reduction and reiterated the that the research, science and technology community plays a unique and pivotal role in helping the world to understand more honestly, and better. She invited all members to actively engage in STAG networks to support information exchange and collaboration as partners in the scientific endeavors to reduce risk in a way that truly leaves no one behind.

She stated that it is quite important to improve the use of science, data and risk knowledge to transform those systems that both build and manage these situations. One very critical ingredient, achieving this transformation is the strengthening of the relationship between science and policy making.

Wrapping up, she pointed out:

• The need to strengthen collaboration between national disaster management agencies and science, including ensuring that the scientific community is an integral part of national DRR platform.

#### A few examples of the Q&A session:

**Q**: We are very much encouraged to hear you say that GADRI as a direct partner of UNDRR. Definitely, we want to work closely together with UNDRR too. WE will continue to organise this kind meetings, collect research achievements and contribution towards accomplishing the target and goals set out by the Sendai Framework. We have many good results and ongoing initiatives too. However, it is not easy for us to share this kind of evidencebased science with other stakeholders in the world directly. Do you have any suggestion for us how to share valuable information and opinion with other stakeholders in the world, how could we proceed in that direction?

**A:** Well, thank you very much and I hope that we can maybe continue the conversation afterwards about very concrete measures. But one thing I've just mentioned is that we are really enhancing our work through our Science and Technology Advisory Group at the regional level.

The aim here is to really develop program of work at the regional level that will be shared through probably in an annual forum of some sort. Additionally, I would really invite all of you and I'm happy to share it with you to take a look at the Global Research Agenda that we have pulled together with IFC and IRTR, which really spells out what we see as very critical areas of the scientific endeavour that should be taken forward. What we're really looking for in our partners is who can commit to areas of work that have been laid out in that scientific agenda to move forward.

I won't go through all of them now, but that's exactly how we see collaboration taking forward that not necessarily us doing the work. That you being inspired by the agenda that has been identified and looking at what specific areas you and your partners could take forward. So those are two very concrete ways I believe that we can enhance that collaboration.

#### Q—comment from Chair of the Board of Directors of GADRI:

The work that you and the team are doing are incredibly exciting and on behalf of GADRI, we look forward to supporting it going forward. You may not be aware, but those of us who were in Sendai, many of us at the end of the meeting, went directly to Kyoto for a meeting of the Global Alliance of Disaster Research Institutes. The very next day we announced our commitment to support UNDRR. It is at core of what we are doing in the institutes. It is just building on the comments.

Within the research community, the 200 plus DRR members account for an enormous share of the disaster research that is

were finding very challenging. It was unclear how to act on that and they were showing some frustration in contrast to perhaps the other three action priorities that were relatively straightforward. What was required? What was recommended, what was wanted, and how to get the science to do that was just getting the data or whatever. But the fourth one was seen as far more complicated and less clear - what the path forward was. So it was quite intriguing some of the work done by GADRI to understand and work directly with people going forward. Anyway, I'm just intervening. Thank you so much for your work and for your time today, Further, commitment from the members of the Global Alliance are here to help.

**Q:** question in the chat box on Himalayan mountains and issues around mountains and resilience

**A:** The question about combating disasters in the Himalayan region. It's interesting because one of the areas of work that we're starting to look at a little bit more than we've done in the past, is mountains and issues around mountains and resilience. Not specific to the Himalayan region. But more generally, trying to shine a light more on the specific resilience issues in mountainous areas and part of this is through some connections the Swiss government has made with us and some of the research institutes that they are funding. So we are planning to produce in the course of this year, two different papers on looking at specific DRR issues in mountains. And not surprisingly, it will be very much linked to climate change. So watch that space. We will hopefully be able to incorporate some of this into our global platform as well, maybe through a side event. It is considered to be an area that we haven't focused enough, perhaps not enough.

taking place in the world. With the remarkable work that you and the team are doing, you have always been a resource with a very small team and contrasted with the resources available to the institutes within GADRI. We have a remarkable capacity of people and ideas to be there and help you. On a personal side when we hosted some meetings funded by the Japanese government in Tokyo, about inviting countries committed to implementing the Sendai Framework, what science would help them, they were finding in particular, with the building back better or the 4th Priority for Action, the science support from that they

#### Hour 2

# — 23:00 JST 31<sup>st</sup> August 2021

COVID-19 and other hazards – Science into Action by Prof. Virginia Murray, Head, Global Disaster Risk Reduction, Public Health England (PHE), UK (14:00 hrs.)



In her greetings, Prof. Virginia Murray said that it is such a privilege and honour to be part of the GADRI family; that the GADRI family has been inspirational and the engagement from the incredible work that happened after the Sendai Framework with the first conference in Kyoto immediately afterwards was memorable.

Prof. Murray's presentation on COVID-19 and other hazards and science interactions, focused on some of the work they have been doing to date, and with statistics, updated on the activities that have been going on in a complicated year. While there are many globally funded research projects on COVID-19, there has also been an incredible number of peer-reviewed publications that have been produced across the world. Pulling this data together, the policy and practice makers are provided the best evidence on the current COVID-19 situation.

The COVID-19 was an entirely a new disease. The impact upon the world has led to a year or so without precedent for the World Health Organization. Everything from managing very worrying cases, to healthcare, to prevention, to try and deal with the personal protective equipment to getting the samples, the supplies, the training, the engagement, the analysis, the vaccines and the issues about travel and other preventative measures that have been key issues to all.

On 30<sup>th</sup> August 2021, the WHO stated that more than five billion vaccine doses have been administered globally, and they continue to call for vaccination. WHO had a timeline from the 31st of December 2019 when COVID-19 was reported under the International Health Regulations and by 12th of January 2020, they were already publishing comprehensive guidance on topics related to the management of an outbreak or a new disease.

Most importantly, there was an important science meeting which took place on the 11th to 12th of February 2020 and reviews show how important it is to keep learning the whole way through the whole of the pandemic in order not to lose that knowledge and also to learn how to try and minimize harm in the future.

Finally, with COVID-19, it has shown the importance to address cascading complex hazards risks. The UNDRR and ISC review on Hazard Definition and Classification Review aims to provide a common set of hazard definitions from monitoring and reviewing implementation which calls for a data revolution, rigorous accountability mechanisms and renewed global partnerships.

On the UN Research Roadmap for the COVID-19 Recovery report, Prof. Murray stated that What she thought was so important was the very strong message about what we might need to do to deal with the 70 odd million people pushed into poverty issues, about prison over overcrowding, the domestic violence, or school closures, let alone the good health and wellbeing impacts. They've called for many things that we need to do, but one of them that I particularly like is science for science. The idea that we need to improve our data infrastructure, that we need to have implementation science taking science to inform policy and practice. That we need knowledge mobilization and we need rapid learning systems. It is absolutely essential. With COVID-19 we need to do more of really good science and make it much more accessible to all.

She also drew attention to the paper that was recently published with the International Science Council - call for Knowledge Exchange centres in Disaster Risk Reduction. Why? Because we need better informed decision making. We need to reduce disaster risk. We need to contribute to sustainability and we need to enhance resilience.



science was at the heart of all responses. At the meeting, they called for A Coordinated Global Research Roadmap which had many topics in it. She shared some of the principles powering this research, which is coordinating research committed to fair and equitable access and facilitating future research actions.

COVID-19 has resulted in a whole series of reviews and some of the reviews of the Global Health Security Agenda (GHSA) has been absolutely critical to this purpose. These GHSA

#### **Professor Virginia Murray**

Head of Global Disaster Risk Reduction and a COVID-19 senior public health advisor Public Health England Member of Global Alliance of Disaster Research Institutes Chair of UNDRR/ISC technical working group for Hazard Terminology and Classification Review Member of Integrated Research on Disaster Risk (IRDR) Scientific Committee Member of CODATA international Science Council Executive Committee Member of the UN Sustainable Development Solutions TReNDS Network Co-Chair of WHO Thematic Platform Health Emergency and Disaster Risk Management Research Network

In concluding, Prof. Murray drew attention to a few of the recently published reviews:

- 2015 landmark agreements of which the Sendai Framework is key to science
- COVID-19 has been a wake-up call to the world
- What has happened is the agreement upon A Coordinated Global Research Roadmap: something that has driven to clarity and what research needs to be done; and reduce the research duplications or gaps by filling this together.
- Linking to this is how WHO may move forward with the WHO Health Emergency and Disaster Risk Management Framework as a more holistic approach
- As part of that, covering all hazards, the Hazard Definition and Classification Review by UNDRR and ISC is a pathway to the future

She stated that by working together with disaster related statistics, we will be able to be much clearer knowing what we need to manage if we are to do this by proper measurement and possibly, to see whether the Knowledge Exchange Centres may work for the future to help us to deliver this better.



#### A few examples of the Q&A session:

**Q:** Thank you for your outstanding leadership and in particular to integrate health into the broader conversation about hazards. Your leadership is been so valued and so well done. Virginia, are you sensing that the UN agencies and national governments are sincere in their commitment to build science and use science is the foundation for action forward? Are you finding evidence that we're making progress on that front?

A: We very fortunately in the UK have our scientific advisory group and emergencies, which is led by our government chief scientific advisor and we have been working really closely with this group sitting inside Public Health England. Everything from behavioral science to genomics to making sure that whether our guidance will actually be implemented and whether it is going to be a relevance to all. Our view is that science is really critical to inform policy and practice. We are not the decision makers. We are merely the providers of knowledge and it is up to the decision makers to make their choices which are way beyond us. But the opportunity to engage, we feel it is really important to engage science with leadership. There are tremendous calls for much more engagement. But it has to be the will of the politicians that actually science can help. And the more we talked to them, the more we hear that they feel science has a real relevance. And I think that is very important.

A: So let me start with the COVID-19 vaccination hesitancy. We were very much aware of it. It has been something that is a real concern. But I think because we had done so many clinical trials to assess our vaccination program and we in the UK have been very much aware that vaccination saves lives, I wanted to share with you how many lives we think we have saved and how many infections from the data that only came out last week. This has helped to deliver less hesitancy, but also there are things like nightclubs, young want to go to. At the end of September they will have to produce a certificate of vaccination, we think before they can get into a nightclub, and that has been rather encouraging. The numbers have gone up, but of course it is only trying to help people to be safer and to try and reduce harm that has been so critical to us.

#### **Q:** What about the natural and human made hazards?

Q: how did the UK handled the issue of COVID-19 vaccine hesitancy? Can you respond to them?

A: Natural hazards are the ones that everybody has associated so much with and work that we have been doing. But I think the privilege of working on the hazards engagement that we have had shown that it is really important that all hazards are really something that occurred because you are there. What we need to try and do is to make sure that people are much more aware of these hazards and that we improve our early warning as a whole. That is why Sendai Framework's Global Target G will be so relevant. But equally I think that natural and human made hazards are something that we are very critical and we are concerned about delivering. And we hope that our hazard information, our hazard definition and classification will help to reflect so much of that.

#### Hour 3

# — 23:40 JST 31<sup>st</sup> August 2021

Lessons of COVID-19 for Systemic Risk Governance: Recycling Sustainability and Resilience by Prof. Ortwin Renn, Scientific Director, Institute for Advanced Sustainability Studies (IASS), Potsdam, Germany (15:40 hrs.)



After thanking the previous speakers and the 5<sup>th</sup> Global Summit of GADRI organizer, Prof. Ortwin Renn continued to enlighten the audience on lessons from covid-19 and other disasters experienced over the last two or three years and the number of disasters specifically increasing in intensity which have become a matter of global concern.

He focused on kinds of systemic risks and on systems thinking in risk. First is the need to look into the breakdown of systems functionality. It is not just looking at losses which are bad enough but look at the collapse of the systematic function of society. This was evident with the COVID-19 crisis, when the health system did not work anymore or was overstressed and its functionality crashed, sometimes rejuvenated but very often it was at least at the edge of being dysfunctional.

The second which is very clear with covid and it is also true with other natural and technological disasters, is that they are infecting other systems. With covid it is clear as it is a health threat, and it extended into economics, education, social, physical and other individual spheres. Maybe the health impacts were only secondary to some of the social impacts that have been witnessed.

The third fact is not new, but it is important in terms of systemic view is that there are all kind of risk cascades within and between systems. These kinds of cascades are basically an issue in which no one thing originates in one domain. But then, maybe it comes out from a natural disaster like a tsunami which becomes a technological disaster when it hits, for example, a nuclear power station and it becomes a social disaster, and not to mention anything about the problems in terms of power relationships or in terms of preparedness for dealing with these kinds of disasters.

The fourth aspect is that very often these modern disasters are related to wicked problems where there are epistemic uncertainties. In a lot of aspects, the specific cause effects are unknown. Not only they are very complex systems, but also normative ambiguity that things are not quite clear and how they should be dealt with, and where to have some kind of a prudent judgment, for example, between saving human lives in an epidemic and having a vital economic life. Often both of that is somehow in conflict with each other and it is necessary to make prudent judgments. emphasize placed on these kinds of interactions. If strong focus is on the risk agents and able to use tools like probabilistic risk analysis, then the focus is more on the risks absorbing system, which will actually suffer from the risk agents, and then move on stronger tools which are called vulnerability or resilience analysis. There are challenges that come along with it. Although very often there are the kind of qualitative information, it may not be the real quantitative models to represent the reality.

On turning to the tipping points, Prof. Renn informed that there is an inadequacy of trial-and-error learning notes. Because if there is a tipping point, prior to that there is always positive feedback. It was obvious with the financial crisis in 2008 and 2009 where people were really rewarded for doing the wrong thing. Once the system collapsed, it was too late. Therefore, it is not realistic to learn by error. The difficulty with that is, it is necessary to anticipate the error, which makes it very difficult. As a matter of fact, to do good politics is essentially difficult as it requires to something before people could feel it. That is also part of global warming and other crisis – people need to see before they could act. Once seen or experienced with negative impacts, then everyone starts to act. There are cross sectoral, and cross boundary cascading effects. It makes it very difficult to contain it, even in governance or even in understanding into one domain. Even with a stochastic relationship between causes and effects, it makes it difficult to deal with that. There are very often non-linear functional relationships, often with tipping points and learning by trial and error is not a good idea.

On risk management strategies, Prof. Renn stressed on the need to focus more on resilience and risk absorbing systems as there are many interactions between agents or it will not be able to understand all the risk agents that will have an impact on the system. There is a need to think about how to make the system more resilient, more robust, even be able to absorb surprise events. For example, to focus on a variety of unlikely stress scenarios although there may not be one actually occurs but the system could be made more resilient against these surprises.

Focus on combinations of risk agents and corresponding risk cascades are necessary too. The good thing is that there are only seven agents, and it is possible to make permutations of all these agents and to see how they would affect the specific system. Then there is the need to include the societal developments and assess this before because that is a strong interaction. Lastly, he concluded that is also an inclusion issue, it is necessary to include the people that are affected. He also mentioned that it is a point echoed by two previous speakers. It is very important that those who are affected by risks are also part of the risk governance. Otherwise, all of these issues that are just mentioned will not be really dealt with in a prudent and a very

And lastly, the governance of these systems requires an approach. If it is called systemic, which is integrated and targeted oriented, and that it needs policy packages that go beyond just the domain in which the original hazard has occurred. There are other risk agents and vectors too.

All these things interact and then they basically add to the overall risk or to the overall damage in the end. What is important is the effective way.



#### A few examples of the Q&A session:

**Q**: My confusion is that systemic risk -is it a kind of another source of risk, or is it a kind of perspective of risk? That means - do you think that all risk should be considered from the perspective of systemic risk? Or is it a particular situation or particular hazards that triggered that risk?

A: A very important question, and it is not easy to answer because you know our imagination can help us to put any risk into a systemic context. However, I think pragmatically, it is good to have some questions. For example, if I have a car accident, yes, you could think about it as systemic risk. Basically it's much better to think about it as a conventional risk, so you can contain it. It's one car running against a tree or knocks another car, its kinetic energy and damage, and that's basically may be an economic problem too. But it's not that the whole health system will be overwhelmed or so on, because those are, facts that, we know about. We know the probability and the occurrence over one year, so we can plan for it. I don't think that's a systemic risk.

Also, a lot of toxic material where we know exactly the effects of something where I think that's conventional.

The good thing is, at least for most of the OECD countries is a little different than for other countries. These conventions have been fairly well managed over the last 20 years. If you could look at the figures of risk reductions in terms of car accidents, in terms of occupational health and safety, in terms of major technological explosions, accidents and so on, we see a dramatic decrease in risk as totally different from what the systemic risk here now. Also different from the natural risks, that, of course are strongly affected by human action. In that sense, the conventional risks that are can be easily contained where we have a governance agency that can deal with it and doesn't have to deal with other neighboring agencies. We are pretty successful there. The governance tools use basically, for post-disaster risk assessment plus cost benefit analysis, using the measures, plus maybe whatever we have developed for this. It seems to work. But if you look at systemic risks that have this cascading effects over very different domains, these kinds of tools are not sufficient. They're not bad, but they're not sufficient. That is where I would say the systemic risk and we need to place much more attention to them.

**Q**: from the social science perspective if I can come back to this issue of narratives which you mentioned in the context, just that it is not only about identifying systemic risk per say, but also about the opportunity then to look more deeply into the origins of the fears and perhaps visions that are expressed by these kinds of narratives, in both conventional media and social media, that give us some clue as to where we should be thinking about risk before we are in the midst.

A: That is a very important to point specifically, because trial and

motivation to act, we will be losing risk game. In that sense, I'm extremely glad that you said it. I would like to combine it with two points to that end about the risk absorbing system.

Now if you don't know exactly what the risk agent will be that attacks you, you have different possibilities and basically 3

- one is you can do a technical resilience, which means putting more diversity, more redundant, thicker walls, more levies into your system. Even if it comes worse than expected, we still have some functional means.
- The second one is organizational and the organizational means is that we need to have a good, flexible, adaptive management style. That's very different from the conventional risk where you need routines. But we have good routines you can deal with that. If you have something that you don't know yet, then you need flexibility. You need to be able to learn from one second to the other without getting confused. And that is not easy to do for organization. Definitely not. But it is not necessary, and we have seen very good examples where this adaptive management have actually saved millions of lives.
- And thirdly, it is behavior and that people are getting better prepared. For example, Prof. Norio Okada, has established community universities, disaster universities in small communities where people learn from each other about how to be better prepared for something that they have not experienced yet but that could be a real problem. What we have experience is not that difficult to learn, but to have not experienced yet, is extremely difficult. These kinds of community universities are a way to give people the opportunity to, get themselves in a learning mode for these kinds of disasters.

All three things are very important in terms of the risk of during system, the technical, the organizational, and of behavior.

**Q:** Perhaps this question is already covered some in one of those questions answered earlier already. Questions is starting with the slides on conventional risk aspect. As we learn from you and others, we have to know in courses and assess the risk and then the impact, the consequences, and device the strategy accordingly. I guess you are implying that for the systemic risk, there is a conventional risk perspective which is no longer applied. Hence my question of, can we still meaningfully make attempt to assessing systemic risks? Or should we just skip it and it is just not meaningful anymore? Instead, start building up that governance capacity. But I guess you have to somehow benchmark the positive building. What should be target? I guess you talked about some of those point already in a technical or ergenizational behavior.

error is not a good learning method. We need very good narratives that help us to orient ourselves without feeling what went wrong? For example, I cook something and you put your fingers on the stove and you get burnt, you don't do that again. If you put CO2 in the air nothing happens. In that sense, yes we need a narrative that helps people to combine things they do with potential impacts that are a part of the mental model in which they feel they have either responsibility or feel that the consequences are something that they don't want to endure. I mean, that is very, very clear and science needs to be placed within these kinds of narratives. We can talk about models, we could talk about the measurements, but unless we have a good idea of integrating them into narratives that give people orientation but also organizational behavior.

A: I think that is a very pertinent question. I do not have the answer to this. What I would like to stress is that conventional risk management and their tools is not oblivious. We still need them. I think we need something more too. We have to add something. When I said we need adaptive management, we still need routines. When we need something like whatever a system above that it says, this routine is now good and we can take it. But this routine is not good or we have to combine A routine with B routine, we have not done that yet. That is a way we can do it.

Continued in the next page.....

#### A few examples of the Q&A session:

I think that we can see COVID-19 is a wonderful example of this. Where in the beginning it was basically an infection control and nobody cared about what happens with the kids. What happened to domestic violence? What happened to the economy? Of course, that we do not care about the infection of whatsoever. That is the other extreme. I think what we need a kind of interacting system where we can say, how can we develop a flexible approach in which all our routines need to be combined? Because the routines are still good. But if you apply them, you know like a mechanical clock, then they do more harm than they do good.

**Q:** I want to discuss about the strategy and role of the science community to address the systemic risk. We have been discussing about very similar target field in sustainability sciences or climate change. How can we transform our framework to address this kind of systemic risk?

**A:** That is again is a very important question. Again, there are a couple of hints. I do not have a recipe for this, so a couple of hints.

First is interdisciplinarity. When I can see is that very often and again, the COVID crisis we had all the virologist sitting together and doing social engineering, did not work very well because it was not their expertise. We need to make sure that experts from different fields come together because different fields are normally affected.

The second one is transdisciplinary. It means that if you do a hazard management and governance, it is very important to include those who will be either suffering or will have some kind of acting power exists. In a society in which lots of people acting in whatever way, it is very important to know first, their perceptions, but secondly also their intentions. And if you get them into the planning process, that is the best way to make sure that things are running in a good, flexible but also in a very effective manner.

The third thing is that taking into account the kind of major insights from complexity science which basically says do not look for causes, look for analogies. If you look for causes, yes, that is very good, and as a scientist that is right to do that, but it is always partial if you look in very complex system. If you look into analogies, you will find that you see that specific structures seem to reshape or to repeat themselves in very different contexts. And that is a very powerful learning tool in order to make sure that even if you do not understand all the calls of connections, you can see the larger picture and that can be also in going the wrong direction. And we know that, but it is very often very helpful in which we can see that this kind of pattern recognition for more complex structures by analogy, can have major impacts in terms of a good learning method.

#### Hour 3

# — 0:40 JST 1<sup>st</sup> September 2021

#### GADRI Activities

Voluntary Reports of Achievements contributing to the targets of S&T Roadmap for implementation of the goals and priorities of the Sendai Framework.by Dr. Subhajyoti Samaddar, DPRI, Kyoto University, Japan

Following the recommendations of the 4th Global Summit of GADRI held in 2019, the GADRI Secretariat collected voluntary reports of achievements by members of GADRI. The questionnaire survey consisted of three questions: to describe their projects and research; to identify impactful interlinkages and opportunities for strengthening these pathways and engaging science with action; and to identify the research gaps. The reported outcomes were based on a very limited number of survey reports. Most of the focus was on the understanding risk; with a major portion on build back better and disaster recovery and preparedness.

On Priority Area 1 - Understanding of risk: knowledge and understanding the risk was most critical for research institutes. There was emphasis on understanding the risk from the assessment and prediction of the knowledge. Most of them were moving towards from understanding the hazards to understanding the risk in exposure and vulnerability. Priority Action 2strengthening disaster risk governance: . Most of them stated that there is a gap between in the risk and the countermeasures, and the knowledge. On Priority Area 3 – Investing in Disaster Risk Reduction and Resilience - the research appeared to be focusing more on capacity building, developing knowledge and information dissemination, enhanced knowledge, social and economic resiliency and capacity building for the disaster resilience. On Priority Area 4 – Enhancing disaster preparedness for effective response and build back better – although a large number of institutes focussed in this area, there is still a need to be more proactive in BBB and it should be country specific for example which is working for Japan may not work for Bangladesh.

It was agreed to continue the exercise to collect achievement reports until March 2022.



# Results of the Questionnaire Survey by Dr. Genta Nakano, DPRI, Kyoto University, Japan

GARDI Secretariat embarked a survey Questionnaire Survey to collect contributions to Sendai Framework, Climate Change Adaptation, and Covid-19. The survey results were analysed by Dr. Genta Nakano, DPRI, Kyoto University, Japan. 34 member institutes of GADRI responded to the questionnaire survey.

The questionnaire survey structure had four sections - Section 1: general information of each institute including financial

commitments to DRR. Section 2: contributions to Sendai Framework, especially focusing on target E component. Section 3: contributions to climate change mitigation and adaptation. Section 4: COVID-19 related research and action.

Section 1: on general information of each institute which belongs to GADRI - looked at the number of professors and students in the 34 institutes that responded. The results from 34 institutes were quite impressive and showed collectively how GADRI institutes are contributing towards the disaster risk reduction related research and education.



Section 2 - contribution towards Sendai Framework focusing on target E - 20 institutes out of 31 responded - these institutes are involved in the national or federal platforms on disaster risk

reduction studies or production to apply scientific research outcomes. According to the results, most of the GADRI institutes are contributing to the topics of education, capacity building or disaster simulation modelling.

To undersi climate ch To make th Climate Cl Disaster R	and collectively the progress and achievements of GADRI in ange adaptation and COVID-19 related actions lei Input as GADRI's collective contributions towards internati arage Conterence of the Parties (COP26) and the 7th Sessic isk Reduction	stitutes towards SFD ional agendas at the U on of Global Platform	RR, JN for
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On Target E - Sendai Framework: 15 institutes out of

31 responded that they contribute to the UN related International Scientific Committees on DRR in collaboration to UN-related international reports on DRR.

Section 3 - Climate change mitigation and adaptation; this was responded by 18 institutes and they are involved either in national and federal platforms for climate change mitigation and adaptation in order to utilize the scientific research outcomes. Mostly on disaster risk management and climate change adaptation and decisions issues.

# Disaster and Risk Research: GADRI Book Series, Dr. Sameh Kantoush, DPRI, Kyoto University, Japan

Dr. Sameh Kantoush, DPRI, Kyoto University, Japan introduced the Disaster and Risk Research: GADRI Book Series, and shared the current status of the books in the pipeline for publication under the series. The idea of the GADRI book series was initiated during the Third Global Summit of GADRI. It paved a unique opportunity to evaluate policies, research activities including most important research and identify research gaps in disaster risk reduction.

The main purpose of the book series is to disseminate and to enhance knowledge, collaborative opportunities and communications among researchers, practitioners, policymakers,

Book on Ecosystem-based Disaster and Climate Resilience: Integration of Blue-Green Infrastructure introduced by Prof. Mahua Mukherjee from Indian Institute of Technology (IIT), Roorkee, India



Prof. Mahua Mukherjee introduced the book on Ecosystem-based Disaster and Climate Resilience recently published under the Disaster and Risk Research: GADRI Book Series by Springer Nature. Section 4 - COVID-19 related research and actions. Seven institutes responded that they are involved either in national and federal platforms for response to COVID-19. It included the development of vaccines, medicines or medical devices for diagnosis and treatment or development of ICT tools, policy making, economic risk analysis, epidemiological surveys.



Even though the responses were from a very limited number 34 institutes, it showed the GADRI that members are active in research. education contributing and to DRR, climate change, and COVID-19 related

issues through national/federal platform and the international organizations to make a significant investment for DRR.

Considering the low number of responses, it was recommended by the Chair of the Board of Directors of GADRI to extend the deadline until end of September 2021.

indicators and students as well. It was proposed to share research results in the area of disaster risk reductions through publications, reports, data and other research outputs to improve future of scientific and technological guidance with clearly identifiable



directions and roadmaps for research for DRR and disaster resilience community. So, under the book series, three books were published: The Proceedings of the 3<sup>rd</sup> Global Summit of GADRI held in 2017; Disaster Risk Reduction and Resilience; and the Ecosystem-based Disaster and Climate Resilience: Integration of Blue-Green Infrastructure.

to the target set by the SDG's, climate agreements, Sendai Framework and the new urban agenda proposed by Habitat III. 58 experts from 11 countries with multi-disciplinary backgrounds have shared their experiences to enrich the content of the book. The book has 23 chapters organized in three parts - policy analysis, policy framing and recognition of nature- based solutions. Second part is on the science investigation technology and planning intervention. And the third part is on case studies.

Highlight of this book is its importance for policy and planning for blue-green infrastructure, science investigation, research analysis, design and implementation planning, how important they are for nature solution and importance of co-design and co-delivery in the

This book has responded

Book on Disaster Risk Reduction and Resilience introduced by Dr. Muneta Yokomatsu, DPRI, Kyoto University, Kyoto, Japan

Dr. Yokomatsu introduced the book on Disaster Risk Reduction and Resilience which actually was the first book to be published in 2020 under the GADRI Book Series.

Dr. Muneta Yokomatsu spent a year at IIASA, Austria to work on the book with Dr. Stefan Hochrainer-Stigler, Advancing Systems Analysis Program, IIASA, Austria. This book dates back to the first summit in 2017 where a workshop on DRR and resilience was held and was chaired by Prof. Charles Scawthorn. The workshop participatory mode. brought together about 60 participants and debated on the need to understand resilience. The book focuses on the disaster risk reduction from a multidisciplinary

resilience perspective. It

includes discussions of



how diverse topics connected with goals identified by the Sendai Framework; and address resilience to various natural hazards including flood, wind, earthquake, volcano, landslide, and Natech.

# Hour 4 — 01:10 JST 1<sup>st</sup> September 2021

# Americas Time Zone Session covering North and South America Current Situation of Science Collaborations in Hazards DRR

09:10 hrs 31<sup>st</sup> August 2021 Colorado, USA

The regional session on Americas covering North and South America was on **Current Situation of Science Collaborations in Hazards DRR.** The session was opened by Dr. Guirong Grace Yan, Director, Center for Hazard Mitigation and Community Resilience, Missouri University of Science and Technology.

Keynote speech on Multidisciplinary Modeling Progress and the Role of Community Engagement in Resilience Planning was delivered by Prof. John W. van de Lindt, Colorado State University & Center for Risk-Based Community Resilience Planning. USA; and Board Member, GADRI Board of Directors.

The following four topics for panel discussion sessions were selected by the North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI). The four sessions were divided to two parallel sessions, i.e. I and III and II and IV.

- I Enabling Resilience: Preventing Disasters in Hazard-Prone Areas
  - What goal do we want to achieve? The goal is to enable resilience by preventing natural hazards from becoming disasters
- II Reducing Barriers for Scientists and Engineers to Enhance Resilience
  - How to achieve the goal by developing innovative approaches?
- III Innovative Approaches in Disaster Resilience
  - How to reduce barriers in implementing the developed approaches?
- IV Equitable Resilience: Addressing Social Justice in Disasters
  - How to upgrade "resilience" into "equitable resilience" in order to reduce hazard impacts on marginalized populations?

The Americas session was coordinated by Prof. John van de Lindt, Dr. Guirong (Grace) Yan, Dr. Jamie Kruse, Prof. Lori Peek, and Prof. Paul Kovacs and brought in 25 experts in various disciplines from all over the region to do a 10–15-minute presentation and engage in discussion with the audience for 30-80 minutes.

The Americas time zone session was covered within six hours and about 377 participants from all over the world logged in via zoom

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5 <sup>th</sup> Glo Institutes	bal Summit of Researd of Disaster Risk Redu	ch ction	ing
12:00-12:30 PM	Keynote Speech Multidisciplinary Modeling Progr Engagement in Resilience Planni John W. van de Lindt Harold H. Short Endowed Chair Pro Co-director, Center for Risk-Based	ess and the Role of Community ing ofessor, Colorado State University Community Resilience Planning	
	Track 1	Track 2	
12:40-2:30 PM (EST)	Session 1: Enabling Resilience: Preventing Disasters in Hazard-Prone Areas	Session 3: Reducing Barriers for Scientists and Engineers to Enhance Resilience	
3:00-5:30PM (EST)	Session 2: Innovative Approaches in Disaster Resilience	Session 4: Equitable Resilience: Addressing Social Justice in Disasters	
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Dr. Guirong (Grace) Yan, Director, Center for Hazard Mitigation and Community Resilience, Missouri University of Science and Technology, USA



Prof. John van de Lindt, Dr. John W. van de Lindt is the Harold H. Short Endowed Chair Professor, Colorado State University & Center for Risk-Based



Prof. Jamie Brown Kruse, Director of Center for Natural Hazards Research, Department of Economics,

Community Resilience Planning. USA; and Member, GADRI Board of Directors

East Carolina University, USA

Prof. Paul Kovacs, Chair, GADRI Board of Directors; and Executive Director, and Adjunct Research Professor, Economics, Institute for Catastrophic Loss Reduction, Western University, Canada



Prof. Lori Peek, Director of the Natural Hazards Center, Institute of Behavioral Science, University of Colorado, Boulder, USA



Multidisciplinary Modelling Progress and the Role of Community Engagement in Resilience Planning was delivered by Prof. John W. van de Lindt, Colorado State University & Center for Risk-Based Community Resilience Planning. USA; and Board Member, GADRI Board of Directors



Prof. John van de Lindt's keynote speech was about multidisciplinary modeling progress, in particular, what the role of community engagement in resilience, planning and with the role of that engagement is in

the modelling; and what the role of the modeling is in the engagement, and it can become very hard or impossible to separate them to execute proper resilience planning.

Prof. Van de Lindt highlighted that the Presidential Policy Directive defined resilience is the ability to prepare for and adapt to changing conditions and to withstand and recover rapidly from disruptions. The key take-away words are to "prepare for" – that is planning to adapt to changing conditions including climate change and global warming amongst other things and also to withstand. This brings the thoughts of robustness and then to rapid recovery from disruptions. Events and hazards and even disasters will occur and it requires planning and hardening of infrastructure in order to recover rapidly.

The 2019 consensus study report was issued by US National Academies of Science Engineering, and Medicine calling for a new type of research. That was to address the dynamic state of communities and look at the changes in risk and resilience overtime. But the key was linking information from all sorts of disparate databases and looking at community resilience, priorities and link the research, the data with risk informed or resilience informed decision making. The key is for researchers to work either at the seams or if these overlaps, and of course, ideally to model resilience, they have to work where all of this overlap.

How to measure, model and improve community resilience? The key is to be able to measure it in order to model it and to end in order to improve it. It requires measuring things that cannot be necessarily seen; to integrate these physics and process-based models, many from the engineering community amongst others, with empirical data driven models and then combine these components. Referring back to report of 2019, he emphasized that is really what has to come together as all the disparate models and datasets. If it is possible to model something that represents something close to reality, then it provides the chance to look at alternative actions and ideas and explore these to improve community resilience to future events.

After giving credits to his colleagues at his Center, he referred to work that is included in the 2019 report which is a highlight of the work they have done under NIST funding and which discusses the stages of resilience in 5 stages. He gave a descriptions of the 5 stages. The key is to remember that resilience, community resilience in particular, is a process, and not a point in time. requires that measurement aspect or measuring community resilience. There are five areas of community - stability; population economics, social services, physical services, and governance.

With regard to population, typically there's empirically derived models that provide a basis for household dislocation. Economics, as mentioned, the CGE modeling is a state-of- theart or state of the science. It is available at the county level. These models can be validated at least on an annual basis. Social services covers the healthcare systems hospitals, clinics, long-term care facilities dialysis centers, any elder care facilities, anything that part of the health care system and the key is to modeling and understanding as much of these are the vulnerable populations, including the school systems. Once it is done, then it provides the ability to measure and to measure the quantity.

Physical services are a little bit easier to model and to measure, and that is because it uses the measurement in the design of engineered systems. The true inner or cross dependencies, going across these networks is progressing. But there are gaps and the standardization of how to do that. Because even with massive computers, computer speed is limited when there are hundreds of thousands of nodes and edges and trying to link all of these. Governance, count on things like 10 years of leadership for example - how long a mayor or city manager has served or the City Council rate turnover, local governments and budget to debt ratio, building ratings, bond ratings, etc.

He stated that in order to model community resilience comprehensively, hazards are needed, whether they are individual, multiple or competing hazards, or it is a long-term resilience assessment such as climate, climate change, the physical infrastructure that is of interest, and then social and economic systems as well as optimization strategies. Optimization at the most important is to be able to compare two or more policy options or mitigation options, but not necessarily a pure optimization.

Translation of good research to good practice requires stakeholder engagement, to listen to what is needed by communities, enable useful and usable tools and then provide visualization to explore outcomes effectively. Improving resilience at the community level requires the ability to compare the policy options using costs and including direct and indirect losses.

In concluding, he stressed that resilience analysis requires modeling from before, during, and after a hazard event, such as a flood or hurricane or a tornado, physical and non-physical systems both. The practical application of theoretical resilience concepts to facilitate actionable strategies requires partnerships, communication, and useful and usable tools. And there are challenges, but with engagement and partnerships, they are definitely solvable. Those challenges are ensuring broad enough applicability of tools like the IN-CORE web app, or other tools available and then modeling common policy options effectively as well as enabling effective resilience metrics that can be measured and are meaningful to communities. What is not optimal from an engineering and a scientific standpoint is not necessarily what is optimal for a community. Therefore, that is the reason for these partnerships to engage, listen, and iterate.

It is important to have the economic modelling and analysis included. Especially during the last 18 months due to COVID-19 the economic impacts are seen. The idea is that from an event, it is possible to simulate the event. It allows to look at losses in production for example, firms, wages, jobs in the local economic sector, such things that would normally be a gross domestic product, but just for the community. The whole purpose is to improve, to know community resilience is improving. That

#### Parallel session I: Enabling Resilience : Preventing Disasters in Hazard-Prone Areas

Parallel Session I on Enabling Resilience: Preventing Disasters in Hazard-Prone Areas brought in conversations and insights from researchers from the field.



The session was chaired by Prof. Jamie Brown Kruse, Director of Center for Natural Hazards Research, Department of Economics, East Carolina University, USA; and



Prof. Liesel Ritchie, Associate Director of the Center for Coastal Studies, Department of Sociology, Virginia Polytechnic Institute and State University, USA

Towards joint earthquake-tsunami hazard assessment for urban and evacuation planning: pilot study in the port city of San Antonio, Chile by Prof. Rodrigo Cienfuegos, **CIGIDEN**, Chile



Prof. Rodrigo Cienfuegos kicked off the session and introduced preliminary results of assessments on earthquake, tsunami and other potential hazards and risks done in the Port City, San Antonio in Central Chile. Chile is

highly exposed to many natural hazards from different origins in particular to number of disasters connected with the earthquakes and tsunami, which have been fairly constant in terms of frequency not to mention anything of the climate change related hazards and disaster such as flooding and storms are also increasing. Prof. Rodrigo Cienfuegos stated that they have been connecting different dimensions of research from geophysical, climate change, territorial planning education, complex systems, risk assessment, and on economic impact. Chile is reaching 3,000 years since the last mega-earthquake. They are working with different researchers from different universities in Chile including with local governments to connect with the skills and be able to compute and to determine the risk at specific locations and from there to engage in discussion with the communities.

He concluded by highlighting future challenges for Chile, in specific areas where there is a high probability to experience a large earthquake and tsunami within the next 50 years. He stressed the importance to prepare as the first wave could reach the urban areas in less than 10 minutes. While preparing for the worst scenario, evacuation planning is really important. Cascading impacts that could happen in the port area are also very complex and Prof. Cienfuegos stated the need to work a lot with the communities for awareness for selfevacuation and to be better prepared.



#### —22:00 JST 1<sup>st</sup> September 2021 Hour 4

Tsunami Early Warning in Chile: Rebuilding the System based on Science by Prof. Patricio Catalan, Universidad Técnica Federico Santa Maria, Chile



Prof. Patricio Catalan discussed the work they have been over the last few years towards better understanding of tsunamis and how to transfer that scientific knowledge into applied tools, techniques, and methodologies

thoroughly as possible. Through research and eleven years in between several tsunamis, he stated that there is a large variability of tsunami intensity metrics among events with different behaviours for single events. The second step is to refine the assessment with state-of-the-art modeling, and closer to real-time approach to use during the first evacuation.

In summary, since 2016, an improved system is currently in

that can be used by communities at large. Chile is said to be one of the most tsunami-prone countries in the world together with Japan and Indonesia.

Learning from past mistakes, and based on science, the researchers are working to develop systems that can be very useful.

Through numerical and accurate modeling done within the restriction of time, the first step is to address the early warning system that could be done within 10 minutes or less and to use an approximated approach to prompt evacuation as approach. In designing the modular system, it has allowed them to improve the on system and expand the capabilities by incorporating state-of -the-art technology.



#### Parallel session I: Enabling Resilience : Preventing Disasters in Hazard-Prone Areas

#### Integrated Modeling and Decision Support to Foster Effective Resilience Policy by Prof. Jamie Brown Kruse, East Carolina University, USA

Prof. Jamie Kruse discussed on two major research themes. One of the research themes is the open-source resilience modeling platform called IN-CORE, and the other project is of over 15 years of collaborative research that has been conducted with Dr. Rachel Davidson at the University of Delaware and other colleagues.

The first part was knowledge creation and the second part is the implementation of the knowledge; and continuing to advance, and improve knowledge associated with community resilience within thrusts. As Prof. John van de Lindt described, computational modeling, data science, there has to be validated and verified to ensure that when these models are created and handed over to decisionmakers, they are fairly confident in the process. The pieces include infrastructure, hazards, long-term resilience assessment and then of course the physical systems, economic systems, social systems. All that come together to determine whether or not a community can recover quickly from an event or has placed it in itself in a position so that the event is not as devastating as it could have been.

The second phase of Prof. Kruse's presentation discussed about a slightly different computational modeling framework that has been developed with a different set of researchers with the first study done 17 years ago. The idea behind is a similar process but central pieces of the project are what do individuals do voluntarily? What are the behavioral aspects and what is the importance of insurance that goes along with other mitigation features?

Prof. Kruse introduced a particular modeling framework, which captures the interaction between homeowners that voluntarily mitigate and retrofit and purchase insurance that interact with a profit driven insurance industry. In other words, it looks at whether or



not the insurers can write insurance in the region and whether or not they are sustainable over time with severe losses as part of it. It forms an inner game theoretical model, and the outer game is where the government

will take into consideration what is happening between homeowners' insurance, mitigation and trying to identify the policies that works best. The outputs that are potential for the government is to say whether to implement property acquisition, and in vulnerable areas retrofit grants for homeowners. Is it necessary to regulate insurance in terms of the capacity constraints, the capacity requirements of how much money must have been on hand? Or can they use their money in a different way? It is expected the insurers and the homeowners to respond to these policy choices, and then look at the outcomes for in terms of the government, the homeowners, and the insurers and the reinsurance industry.

She shared an example of a win-win solution and it is an example for that particular region in which it is possible to affect a reduction in the average annual loss, reduce the chance of extraordinary losses for the government from the government's perspective, and have preserved a viable insurance industry and constrained insolvency. At the same time, it has reduced the average annual expenditures for hazard for hurricane risk and also reduced the chance of a large loss through implementing retrofit and acquisition programs. She concluded stating that the importance of insurance is that when one start looking at recovery, the insurance pay-outs are an extremely important and usually a very quick source of money after an event. The implications for an excellent and viable insurance industry along with government support of the other services is very important to recovery.

# Hour 4 — 01:10 JST 1<sup>st</sup> September 2021

Enabling Resilience Through Social Impact Assessment by Prof. Liesel Ritchie, Virginia Tech, USA



Dr. Liesel Ritchie shared a very interesting presentation on Enabling Resilience Through Social Impact Assessment – a smaller scale project she has been working with her colleague. Dr. Ritchie and used two examples of

Social Impact Assessment (SIA) and her presentation focused on energy development projects. With regard to her presentation title, resource communities and focused on their cultural, social and economic situations are based on the harvest and use of renewable natural resources. The pipeline and tanker traffic are a great concern, or at least it was to the folks in the Gitga'at community of Hartley Bay. The primary question was what are the potential social and psychological impact of the project on the village of Hartley Bay and the Gitga'at First Nation at large?

The Mikisew Cree First Nation is in Fort Chipewyan, Alberta and Northern Alberta, the focus was at the cumulative impacts of energy development, and in particular the potential impacts of the proposed Teck Frontier Project. The question is very similar to those that the

enabling resilience through social impact assessment, Dr. Ritchie stated that her presentation title essentially takes an inventory based on empirical evidence to identify the strengths, limitations, opportunities and threats to a community in the context of the energy development activities. Doing so, it connects it to resilience. Both of the groups have been in hazardous prone areas because of technological hazards associated with energy development.

The Gitga'at First Nation is in Hartley Bay, BC, Canada was threatened by potential impacts of the Enbridge Northern Gateway pipeline project (ENGP) that was proposed back in 2010. With First Nations, one of the theories used was the ecological symbolic theory that situated the work in terms of the communities being renewable folks with the Gitga'at had for us. What are the cumulative sociocultural and psychological impacts of oil sands development on the Mikisew Cree First Nation? Thinking about cumulative social effects, they are the successive and incremental combined effects over time and it is considered in the context of cumulative impacts of disasters, particularly in disaster prone areas. They found systemic issues in both communities.

The influences of the social impact assessment - the ENGP project was halted as a consequence of combination of broader efforts and several other teams that looked at the social and environmental impacts of the project as well as the global markets at that time and general public outcry.

The approval of the Teck Frontier Project was contingent upon numerous stipulations – first, creating a buffer zone around the project development area. The industry was required to provide funds to support cultural revitalization and community wellbeing. The Mikisew Cree population now have the right to refuse and the right to consent to any additional development activities in the region. As part of that particular project, the village has a new water system paid for by industry that is associated with the cumulative effects of toxic contamination from over the years.

In conclusion, Dr. Ritchie shared the outcomes of the project - they were able to help the communities take stock of their capabilities and capacities; they were able to inform resistance efforts and provide contributions to resilience building. To enable resilience, they were able to offer ways to promote gain spirals in terms of the different forms of capital that they have, ranging from human capital, to social capital to their natural capital versus loss spirals. In these

same forms of capital in the communities, the model has been successful in supporting community efforts by providing contextual evidence and empirical data to support decision making and negotiations.

	Outcomes
•	Aid communities in taking stock of their capacities & capabilities, as well as presenting them
•	Inform resistance efforts - contributions to resilience building
•	Mitigate potential adverse impacts to help enable resilience
•	Promote gain spirals versus loss spirals
	Model that has been successful in supporting community efforts by providing contextual evidence & empirical data to support decision-making and negotiations

#### Parallel session III: Reducing Barriers for Scientists and Engineers to Enhance Resilience



This session was chaired by Prof. Rachel Davidson, University of Delaware, Disaster Research Center, USA.

Barriers to Increasing Resilience: Ideological Blinders, Science, and Money by Prof. Walter Gillis Peacock, Department of Landscape Architecture and Urban Planning, Texas A&M; and Program Director, Humans, Disasters, and the Built Environment (HDBE), Engineering Directorate, National Science Foundation



Prof. Walter Peacock shared his own perspective and viewpoints as a long-time hazard/disaster researcher with 40+ years of experience. His presentation discussed about ideological blinders

inhibiting or the ability to adopt to science with respect to resilience and science.

His presentation focused on ideologies and ideological blinders and the general constellation of ideas and values that oftentimes shape the perspective of the world and money. He also mentioned that ideology is also viewed with emotional components as well and it can easy to sway people in terms of the nature of those ideologies. Therefore, some of the ideologies are potential barriers.

In the terms of science, many barriers are experienced in science. One of the notions is general characterization of science as an individual group project versus a collective

Bridging the Gap between Research and Operations: Engaging Practitioners in Research to Ensure Operationalization by Dr. Sean Griffin, CEO, Disaster Technologies, Inc. process. While there is much competition in science, science inherently is a collective process. It depends upon our reviews of each other's work, our ability to work with it, and our ability to assess those things. In some areas of science, it is seen that data and instrument sharing as being ubiquitous and in other areas of science, in particular, in the hazards of water disaster areas, that culture is not there completely there.

In closing, Prof. Peacock, pointed out that much more science policy for stakeholders and communities need long-term systematic data collection on monitoring. It is implemented to a certain extent, for example in environmental areas are beginning to do it effectively in some areas in terms of ecosystem operational performance. But we also need in terms of infrastructure and the built environment, for land use changes, and for policy implementation and change. Those kinds of data are necessary if the large, urban centers are the elephant in the

room that are resulting in these changes, until we can effectively model the nature of these processes through these kinds of data, we are going to be in trouble in terms addressing this analysis.

Contra Cont
Barriers in Science
Science as individual vs collective processes:     Data and instrument sharing     Disciplinary boundaries and chauvinism.
<ul> <li>Ideological and theoretical blinders</li> <li>Fully address, study, and capture heterogeneity, inequality, and interdependency issues         <ul> <li>Individual Choice, all choices are not equal or possible.</li> <li>Infrastructure and infrastructure planning, distribution, access, etc.</li> <li>Housing</li> </ul> </li> </ul>
<ul> <li>Data issues:</li> <li>Data limitations on economic resources to address restoration/recovery and mitigation/adaptation – these data are critical (liming, amounts, appropriate scale etc.) yet lacking</li> <li>Limitations on governmental (census, administrative, agencies) and private sector data</li> </ul>
Modeling failures:     Compression of the second seco
<ul> <li>Uncertainties within our modeling strategies based on multiple data forms and sources.</li> </ul>

stabilize, protect the environment, build resilient communities and decision-support technologies for practitioners and researchers in disaster risk management.

They work with a number of academic institutions and work on

Dr. Sean Griffin presented an overview of the company founded by him, to build a technology specifically to accelerate the decision support technologies for situation awareness,



operational coordination, and planning before, during, and after disasters focusing preparedness, mitigation, response, and Recovery. The goal is to

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evacuation support models. He shared detailed examples of the predictions and support provided to various hurricane hit areas, such as Puerto Rico after hurricane Irma and Maria; and other areas with various hurricanes. He also shared examples of how they are able to predict and act accordingly by using past hurricane data and modelling.

He explained how they work at Disaster Tech: they co-design with users; bring in academia and industry to inform; looking at what the practitioners need to understand and what are the main points; what technologies and tools are needed to be built. Using data and curation science at the foundation of everything they do, they enable storytelling with data, surfacing inequality, teaching risk literacy and preparing for the unknown.

#### Parallel session III: Reducing Barriers for Scientists and Engineers to Enhance Resilience

Building Coastal Resilience in Virginia ~ Connecting Research to Need by Rear Admiral Ann C. Phillips, USN (Ret), Special Assistant to the Governor for Coastal Adaptation and Protection at Office of the Governor, State of Virginia, USA



She shared a completely different perspective as the Special Assistant to the Governor in a coastal State on the East Coast who has not had the big disaster, at least not recently, and does not have this big instigating, catalyzing, coalescing,

challenge to catalyze response but is at great risk, extremely vulnerable with a tremendous amount of coastal infrastructure. Certainly, they have been hit in the colonial pipeline crisis most recently. But looking at how to start to adapt to protect a state, that is facing a lot of challenges, and the need to get moving in the time of so many other crises and challenges. In the context of this process, she explained a part of what they are trying to do by creating the first cut at a masterplan for the Commonwealth of Virginia, coastal state masterplan, to pull together considerable academic capacity within the Commonwealth, and to work more directly on the needs and the research, and they are covering and identifying how best to do it in a way that it is going to add value. The take away point in her talk is the need of a wide variety of interdisciplinary academic presence in the room when the conversations are happening, so that they can best identify what is the real problem and what could solutions that research could help to evolve into and find out what comes over time. Certainly, a very different perspective, but it is getting ahead of that natural disaster and trying to prepare themselves in advance. She shared in detail the masterplan for the Commonwealth of Virginia – Virginia Coastal Resilience Master Plan 2021. Rear Admiral Ann C. Phillips concluded stating the need for interdisciplinary work, the need for interdisciplinary participation at the highest level and really being present in the room as these discussions are taking place and evolving that into a process that will withstand the test of time and political will and more broadly the challenges to society.



Performance-Based Engineering Approach to Design for Community Resilience by Prof. Gregory Deierlein, John A. Blume Professor in Civil and Environmental Engineering, Stanford University



In contrast to the prior presenters Prof. Gregory Deierlein talked about the solution and in the solution, he talked about what is called performance-based engineering approach for community resilience. To set the context, what is performance-based engineering, it is from the standpoint of several

environmental engineers' respond to designing and managing

Returning to the framework, he stressed as researcher, what they are trying to do is to build the puzzle pieces because each piece is multidisciplinary. Every researcher and different engineering groups work on a different piece of the puzzle but as mentioned in his presentation, trying from the front end to start, to build into the puzzle ways to look at policy interventions, how that can change the inventory, urban growth and improving parts along the way. and then when we get to the to the right side of the framework, it is looking at the damage and starting to simulate recovery and look at the other implications.



the construction of buildings and infrastructure on which they focused for years to make those facilities safe. The methods, building codes and other standards tend to be prescriptive maybe soon as a basis and it also a little unclear on the outcome. when it is said that a facility or building is going to be safe under an earthquake or survive a hurricane, how safe is it? Performance-based engineering is a way that look more explicitly at the performance and allows engineers, natural hazard engineers to connect with others in the community, social scientist, economic planners and so forth.

#### Hour 6

# — 04:00 JST 1<sup>st</sup> September 2021

#### Parallel session II: Innovative Approaches in Disaster Resilience (Description and abstracts-Summit Handbook)

This session aims to examine physical and spatial representations of Disaster Resilience with various interactions between socioeconomic, technological, and environmental factors. Such disciplinary convergence across spatial science, computer science, and engineering science enables us to capture more complexity and facilitate systematic thinking across encountered Disaster Resilience plans.

#### **Panelists** (in the order of presenting)





Paul Kovacs Ian Giammanco Western University IBHS N. C. Nadal-Caraballo Sam Brody U.S. Army ERDC Texas A&M University







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Resilience in Recovery - Build Back Better by Prof. Paul Kovacs, Chair, GADRI Board of Directors; and Founder and Executive Director of the Institute for Catastrophic Loss Reduction at Western University, Canada

Prof. Kovacs presentation on resilience in recovery present stated that there is an opportunity to achieve transformative improvement in disaster resilience. Experience finds strong political and public support to build back better when recovering from a major loss. Introduction of current resilience knowledge when older structures are replaced by new buildings can significantly improve resilience. Small increases in cost can greatly enhance resilience.

Pre-disaster planning is critical to realizing resilience in recovery. There is a sense of urgency when recovery begins. Achievement of resilience objectives in recovery requires early and consistent messages about the importance of building back better. Predisaster recovery planning serves to minimize the risk of delay in recovery as improvements are anticipated. The Sendai Framework for Disaster Risk Reduction identified scope to build back better as a priority for action, but experience finds that realizing this objective is challenging.

He shared a success story on a community, High River, Alberta. The community had a devastating flood in 2013. The picture shows the flooding and a picture of the community mayor and his

wife The mayor said "they went through hell in 2013 but we had a build it back better mentality". Now he is talking about his community being the most well protected community in Canada for flood risk. With a positive mindset in recovery then there is an opportunities for transformative improvement.



Bending the Curve: Stories of Resilience Success by Prof. Ian Giammanco, Sr. Director, Product Design and a Lead Research Meteorologist, IBHS Research Center, Richburg, South Carolina (Video message as he was away on Hurricane Ida recovery team)

He shared stories on resilience success stories one of which included the story about the hurricane Ivan which made landfall in 2004 and which lead to one of the biggest unknown windstorm resilience stories in the United States.

In his abstract he stated that it has become commonplace now to hear the stories after a natural disaster of destruction, displacement and the disruption that so often happens. However, across the United States we have begun to see more success across coastal Alabama in implementing the Insurance Institute for Business & Home Safety's (IBHS) FORTIFIED building standards into local residential building codes and its biggest test from Hurricane Sally (2020). Building codes are often the most visible way in which our built-environment can adapt to extreme weather but improving the performance of the materials that our home's and businesses are constructed of is another avenue for change. This presentation will also cover the asphalt shingle market changes that have took place for the better over the past two years since IBHS developed and released its first asphalt shingle hail impact test ratings.

and more success stories of resilience in action and the ability to bend down a community's risk curve. This presentation will focus on resilience successes in the face of hurricanes and severe convective storms. First, it will cover the



He shared an example on roots of a resilience success story on fortified construction on the research project for hailstone resilience. Their research was on a two-inch laboratory hail impact which is equivalent to a two-inch natural hail stone in the real world. He provided information on how a single manufacturer's response and had active and positive changes in the market place. It provided consumers with different options to mitigate hail. He stated that it is another way to foster resilience and ultimately bend down the loss curves that come with severe thunder storms.

# — 05:00 JST 1<sup>st</sup> September 2021

**Parallel session II**: Innovative Approaches in Disaster Resilience (Following description are abstracts-Summit Handbook)

#### Probabilistic Analysis and Metamodeling of Hurricane Coastal Hazards by Dr. Norberto C. Nadal-Caraballo, U.S. Army Engineer R&D Center (ERDC)

In the abstract presented by Dr. Nadal-Caraballo stated that the coastal hazards such as storm surge, waves, currents, wind, and rainfall associated with hurricanes and other extreme storms can disrupt national economies, devastate coastal communities, and threaten the lives of millions of people. These risks have highlighted the need for accurate methods to quantify coastal storm hazards to support stochastic engineering design, coastal risk assessment, mitigation of coastal damages, and facilitation climate change adaptation and resilience. The Coastal Hazards System (CHS) is a national-scale effort for quantifying coastal hazards along all United States coastlines. The foundation of the CHS is its Probabilistic Coastal Hazard Analysis (PCHA)

framework.

The PCHA is a comprehensive statistical and probabilistic framework for characterization of regional storm climatology, high -fidelity numerical modelling, metamodeling, and joint probability analysis of atmospheric forcing and primary storm responses, including associated aleatory and epistemic uncertainties. A major advancement of the PCHA framework is the capability to simulate up to millions of hurricanes and their corresponding coastal responses through the application of Gaussian process metamodeling (GPM). GPM is a cutting-edge machine-learning technology developed to emulate atmospheric and hydrodynamic numerical models to accurately and efficiently predict storm surge, waves, rainfall, riverine discharge, and sea level rise for efficient and robust quantification of coastal hazards.

Measuring, Mapping, and Communicating Flood Risk in TX by Prof. Samuel D. Brody, Regents Professor and holder of the George P. Mitchell '40 Chair in Sustainable Coasts, Department of Marine and Coastal Environmental Science, Texas A&M University, Galveston Campus

The adverse impacts of repetitive flood disasters in Texas has sparked renewed interest in how to use scientifically derived data and associated analyses to inform more resilient decisions. This presentation will set forth a framework for converting scientific knowledge to policy actions to promote flood resiliency. Special attention will be paid to a four-year project that is developing novel ways to identify and communicate flood risk and impact in multiple local communities across Texas. This project will produce maps and other visuals that paint a more complete picture of flood risk by integrating multiple data sources and models. These data include advanced hydraulic models, insurance- and aidbased flood pay-outs, crowd sourced data, socioeconomic characteristics, and survey responses. Maps will also be shared with local stakeholders to obtain feedback on how to refine our products and make them most effective in helping localities prepare, mitigate, and recover from flood events. The implications of this study in the context of the new Institute for a Disaster Resilient Texas will also be discussed.

Design against Tornadoes to Enhance Tornado Resilience by Dr. Grace Yan, Director, Center for Hazard Mitigation and Community Resilience, Missouri University of Science and Technology

In the abstract, Dr. Yan stated tornedoes have induced substantial structural damage, injuries and deaths in the USA.

requires in-depth understanding of tornadic wind effects. To find tornadic wind effects, what type of tornadoes should we look at? Tornadoes have different flow structures, single-celled single-vortex, double-celled single-vortex and multiple vortices; Even for a single tornado incident, the flow structure varies with time and location. Based on which type of tornado should the wind effects be used to modify the coefficients in the pressure calculation equation in ASCE7-16? Which type of tornadoes induce more unfavourable wind loading? Dr. Yan shared their research findings to answer these questions.

They occur in Mainland America, mainly "Tornado Alley" and Southeast of the USA, and contribute \$10B annually to the nation's loss portfolio. The devastation from recent tornadoes left no doubt as to the vulnerability of the central and south-eastern USA to tornadoes, and prompted an urgent need in developing and enforcing a tornado-resistant design for normal buildings. This

**Parallel session II**: Innovative Approaches in Disaster Resilience (Following descriptions are abstracts from the Summit Handbook)

Recent Studies on the Resilience of Structural Systems Affected by Stationary and Nonstationary Wind Hazards by Prof. Luca Caracoglia, Associate Professor, Department of Civil and Environmental Engineering, Northeastern University, Boston, Massachusetts

The presentation discussed recent study activities examining the response of tall buildings and tower structures against wind hazards. These structures are sensitive to fluid-structure interaction and susceptible to damage induced by wind loads. The common feature of the research is the quantification of uncertain wind loads, associated with both stationary synoptic winds (e.g., hurricanes) and localized, nonstationary events (e.g., downbursts

and tornadoes). The talk will examine several methodologies for predicting structural response and damage, by accounting for modelling uncertainty and load estimation "errors", e.g. in a wind tunnel test. The investigated methods are both analytical, exploiting stochastic calculus, and numerical Monte-Carlo sampling. The ultimate research goal is the systematic assessment of wind-related damage over time in the context of risk analysis and structural resilience.

Adaption of Emerging Technologies for Infrastructure Resilience by Prof. Kenichi Soga, Donald H. McLaughlin Professor and Chancellor's Professor, University of California, Berkeley

Technologies are currently being developed for enhancing the resilience of the built environment, and particularly for establishing resilient features across different types of infrastructure. For example, recent advances in sensor systems offer intriguing possibilities to radically alter the methods of infrastructure condition assessment. Rich data obtained from such systems can act as a catalyst for new design, construction, operation and maintenance

processes. The quantification of system resilience is a challenge for both stakeholders and service providers in the civil engineering industry. However, describing the contributions in a way that brings the provider and consumer together is critical to the widespread adoption of emerging technologies developed for improving infrastructure resilience. This talk discusses a methodology that systematically explores how emerging technologies can contribute to systems resilience.

Emerging Technologies for Infrastructure Resilience: Realizing the Opportunity by Prof. Mahmoud Reda Taha, Distinguished Professor & Chair – Department of Civil Construction and Environmental Engineering, UNM Resilience Institute, The University of New Mexico

Emerging technologies have become a part of our daily life and, thus, part of the engineering community work that impacts future infrastructure. A plethora of disruptive emerging technologies have been invented in the last two decades, and some inventions are and there is an obvious need for implementing methods to improve infrastructure resilience. Furthermore, resilience studies demonstrate the need to deploy innovative materials, utilize smart methods in construction technology, and deploy sensor networks to monitor infrastructure systems. Emerging technologies are thus expected to contribute to improving infrastructure resilience capacities, namely absorptive, adaptive, and restorative capacities. He provided an in-depth conspectus on the opportunity emerging technologies offer to remarkably improve infrastructure resilience and discussed how to envision different technologies can contribute to the well-known characteristic elements (known as

making their way into the field. A few examples that civil engineers increasingly observe in their everyday jobs are smart and selfhealing materials, sensing technologies, unmanned aerial systems, 3D printing, big data analytical methods, artificial intelligence, and machine learning. At the same time, infrastructure resilience has become a common theme in government and industry discussions

4Rs) of infrastructure resilience: redundancy, robustness, rapidity, and resourcefulness. He also discuss current research efforts to enable systematic assessment of emerging technologies to pave the way for incorporating those technologies in future infrastructure.

#### Parallel session IV: Equitable Resilience: Addressing Social Justice in Disasters



Chair of the Session: Prof. Kim Klockow McClain, Research Scientist and the Societal Applications Coordinator, Cooperative Institute for Mesoscale Meteorological Studies (CIMMS), USA

Resilience is a Team Sport by Dr. Jaleesa Tate, State Hazard Mitigation Officer (SHMO) and Branch Manager, Maryland Emergency Management Agency (MEMA)



Dr. Jaleesa Tate focused her presentation on the current work that is carried out on equity and resilience in the state of Maryland and the federal programs that they administer. She stated that resilience is actually a team sport. It is not in the hands of

sustainability professionals, or climate adaptation professionals to drive home the importance of resilience and ensure that people are implementing and carrying out the initiatives to help the communities. It is up to the individuals, the citizens as well as government, private corporations and everybody else. All are affected by risks to climate change impacts and everyone should equally assume responsibility as everybody plays a part in the process. In terms of equity and the relationship to resilience especially, equity is not prioritised in the work. But that is not always the case. Over the past several months, it is really pushed in as a priority at the federal levels in the US. There is a multitude of reasons why equity isn't prioritised. Equity is a complex issue, and in lot of instances, for the actual decisionmakers, equity is an afterthought. It is not thought about in that decision making process especially when it

The Role of Social Inequality in Measuring and Modeling Community Resilience by Prof. Maria Dillard, Associate Lead Technical Investigator, National Construction Safety Team (NCST)



Prof. Maria Dillard presented on the current work where they are developing new ways of measuring and modelling different and complex concepts including resilience and community resilience. Her presentation comes to climate related issues as other climate related issues take precedent over equity. Climate change issues need immediate solutions and equity sometimes takes a back seat.

On hazard mitigation planning and risk assessment, she stated that one way to make sure that it is equitable, is to ensure that the plans are no put up on a shelf but it is a continuing effort and making sure that it not making it appear as a one-size-fitsall. For certain communities continually living or experiencing disasters such as continuous flood disasters, these disasters have become a way of life for the community members, and they do not perceive the need to address the issue as they have come to terms to live with the situation. These are type of data that researchers need to be looking for so that they could identify ways to eliminate such risks for the community members.



in some cases help improve that recovery as well as thinking about the services on the resources before and after the way damage and disruption might have laid out for particular organization. Other aspects of non-physical impacts that were experienced and then what are the process support recovery and processed and they may be able to see ways to intervene or provide some policy solution.



covered various aspects of her work. On Measuring unequal recovery, she presented an example after hurricane Maria where they worked on a project focused on recovery efforts provided to some schools and hospitals and trying to understand the underlying characteristics and conditions associated with recovery and different pieces of recovery. They wanted to understand which communities are experiencing slower recovery trajectories overall and what were the conditions; the locations, and what are the things that that could

#### **Project Objectives**

- To examine the recovery trajectories of sampled schools and hospitals
- To identify the underlying characteristics and conditions associated with recovery of critical social functions from Hurricane Maria in Puerto Rico
- To study the interdependencies of the broader community (e.g., infrastructure, households, businesses) and the social functions provided by schools and hospitals



#### Parallel session IV: Equitable Resilience: Addressing Social Justice in Disasters

Doomed before the disruption? The inequitable amplification of complex event impacts on historically underrepresented group operated small businesses by Dr. Jennifer F. Helgeson, Applied Economics Office of the



Engineering Laboratory (EL), National Institute of Standards and Technology (NIST)

Dr. Jennifer Helgeson focused on one project that they have been working on small businesses, demographic hazards, the pandemic and then

natural hazard.

She discussed the effects of covid and the effects of chronic socio-economic stresses it caused. Many medium to small

Designing a Thoughtful Social Science Presence in a Weather Laboratory: Raising Local Voices by Prof. Kim Klockow McClain, Research Scientist and the Societal Applications Coordinator, Cooperative Institute for Mesoscale Meteorological Studies (CIMMS)

Prof. Kim Klockow presented on the perspective of the weather forecast community and researchers that are developing forecast technology, finding space for doing interdisciplinary work and working across different groups. She started on the call for an integration of inclusion of social scientists and people recognition of population needs in weather related events especially on post-tornado event studies. She concluded with an example of a mass evacuation ahead of the two-mile tornado heading into Oklahoma City done in 2013 where when thinking about region, also within a specific place, there are a variety of different kinds of populations living there with different communication needs and in risks and exposures. There are

Public housing recovery and participation as indicators of social justice in disasters by Dr. Sara Hamideh, Assistant Professor, School of Marine and Atmospheric Sciences, Sustainability Division, Stony Brook University



Dr. Sara Hamideh focused on public housing in terms of both as public housing size and structures and as people. Sharing two examples, she encouraged the audience though about outcomes especially on inequitable outcomes for public housing not necessarily as a result of

the individuals of the residents of the public housing, but more



businesses are affected and there is
 the widespread unprecedented closures of stores and businesses.
 Many of the private business ownerships are facing non-employment and especially women facing revenue loss as a result of

unemployment. Low-wage workers are more likely to lose their jobs due to many of the closures and these business closures probably are permanent. As far as business goes, there is just limited access to capitalize, access to skill development, and access to formal business networks. With the data gathered for hazards and covid, it is much clearer that much work is needed to ensure that better preparation is needed to move forward to help the owners of small businesses.



issues of experience and things in the risk communication cycle that need to think about and understand the population dynamics. That day more people ended up dying in the flooding that resulted from the rainfall than from the tornado itself, and most

of those people were Spanish speaking. They are trying to think and design with users in population needs in mind, and collect data after tornados. She stated that they almost never actually get any insight into how people received information, what they were thinking, and how they behaved. For example, did they respond or did not respond, what did they have access to in terms of the depth of capacities? With the study, they intend to tailor risk communication strategies and practices to those means.

fundamentally, as a result of the mechanisms in the policies and institutions that both create and amplify worse outcomes for residents of public housing which issues are called mechanisms of vulnerability. There are also inadequate options for public

housing and for rehousing. The efforts after a disaster, there was no national, predefined, long-term policies on what needed to be done for re-housing displaced public housing residents.

What are the decisions that shape housing recovery outcomes?
 <u>Quick demolition</u> without clear guidelines from HUD
 <u>Displacement and low engagement</u>: failure to provide access to the island after evacuating former residents
 <u>Reactive instead of proactive decisions</u>: lawsuits, complaints, agreements, threats
 <u>Stigma in the decisions</u>: presumptions about deservingness of victims
 <u>Focus of the rebuilding decisions</u>: the island versus displaced residents

Urban flood vulnerability according to migrant status: Lessons from Beira, Mozambique by Dr. Kelly Anderson, Researcher, University of Maryland



Dr. Kelly Anderson's presentation was on a chapter of her recent dissertation exploring implications of rural to urban migration as an adaptation to changing environmental conditions based on a comparative case study on field work

conducted in 2017 in Mozambique. She shared examples of her research work and discussed how migrants experience vulnerabilities based on environment, economic conditions and other challenges to live. In her research on quality findings, she noted that quality defining suggests, that migrants tends to be home owners, migrants tends to be renters, they tend to think about income, home ownerships, and use of public transportation, but evidence of potential conflicts was not visible. Thinking about either supporting equity and narrowing in on migrants specifically as policy beneficiaries, practitioners and academics walk kind of a fine line. On the one hand through

these findings suggest a problem with migrants and it is not supported by the data. For future research, she plans to examine differences between recent and long-term migrations and the definition of migrant.

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# — 07:00 JST 1<sup>st</sup> September 2021

**Plenary Session II:** 

## How to Engage Science in the Decision-Making Process within National Governance and Relate Science into Action?

The second Plenary Session on How to Engage Science in the Decision-Making Process within National Governance and Relate Science into Action? – was covered by four keynote speakers.

- Mobilizing science for disaster risk reduction and development safety - a decade quest of IRDR delivered by Prof. Qunli Han, Executive Director, International Programme Office of Integrated Research on Disaster Risk (IRDR-IPO), China
- Disaster Risk Reduction in Small Nations delivered by Dr. Selwyn Mahon, American University of the Caribbean School of Medicine, Sint Maartens

# Prof. Qunli Han, Executive Director, Integrated Research on Disaster Risk (IRDR), China (Abstract of the presentation)



Prof. Qunli Han gave a detailed description of the Institute of the Integrated Research on Disaster Risk (IRDR) which was established in 2010. Ins his abstract of the presented, he noted that IRDR has been actively engaged with researchers from a broad range of domains and disciplines to address the

complex challenges of disaster risk. IRDR Compilation 2010-2020, published in June 2021, demonstrates through 89 concrete cases, that the program has advanced toward most of its initial research objectives and cross-cutting themes set by the Science Plan of ICSU of 2008. Advancement is especially on the understanding the characteristics of hazards, vulnerability and

- Non-regret climate change adaptation with a paradigmshift of the water-related disasters delivered by Prof. Eiichi Nakakita, Director, Disaster Prevention Research Institute (DPRI), Kyoto University, Japan; and
- Finally a video message by Ms. Emilia Saiz Carrancedo, Secretary-General, United Cities and Local Governments (UCLG), Spain

This session was chaired by Prof. Charles Scawthorn, Visiting Researcher, Univ. California at Berkeley and Principal of SPA Risk LLC.



risk as well as their respective underlying drivers, but also on new models, scientific definitions and assessments, data standards and tools, and DRR policy recommendations for development. Clearly, these would not be possible without continued effort of IRDR in institutional capacity building. Further to its Scientific Committee, IRDR has 13 IRDR National Committees, 17 International Centres of Excellence and a Young Scientists Programme that is participated by over 160 young professionals from some 40 countries. This setting has enabled the connection of IRDR with different risk governance levels. It is anticipated that IRDR will continue under the overall new global DRR research framework of ISC, UNDRR and IRDR, with a notion that, if development is meant to be sustainable, it must be safe at the same time.

Dr. Selwyn E. Mahon, Medical Director of the Caribbean Center for Disaster Medicine based in St Maarten at the AUC School of Medicine, St. Maarten (Abstract of the presentation)



Small nations are uniquely susceptible to disasters. While all countries are exposed to a variety of hazards, small nations' limited resources, increased frequency of disasters, and geographic Many small countries depend on international support during disasters. Sadly, most of this international funding goes toward disaster response and recovery work with very little going towards prevention and risk reduction. Disaster risk reduction is dependent on information. It should be data-driven. Small countries often need help with developing data infrastructures, historical and analytical capacities. Local research is necessary but less than 1% of the citations in PubMed addressed disaster-related deaths occur in the developing world. The majority of disaster-related research articles are generated and funded by wealthy countries. Increased collaboration and support to small nations are needed by these wealthy countries that also assist with disasters to increase local research and improve data infrastructure capacity building.

increased frequency of disasters, and geographic isolation makes them more vulnerable and

increases the potential of hazards to become disasters. Disaster risk reduction (DRR) is important to all nations but specifically necessary in small nations. Disaster Risk Reduction (DRR) is everything we do to reduce the damage caused by hazards through an ethic of prevention. Massive sudden-impact disasters can destroy communities instantly, while slow-onset disasters such as droughts and pandemics can erode them socio-economically month-by-month, year-by-year. Without disaster risk reduction many small nations will experience steady decline and recurrent impediments to growth.

# Hour 10 — 08:00 JST 1<sup>st</sup> September 2021

**Prof. Eiichi Nakakita, Director, Disaster Prevention Research Institute (DPRI), Kyoto University, Japan** (Abstract of the presentation)



In recent years, climate related disasters have become more severe. Immediate implementation of adaptation measures is warranted. While scientific research is underway for the better assessment of climate change and its impact, which could be used for formulation of adaptation measures, we must pay attention to the change in and speed of climate risk. There are uncertainties in predictions of climate change and its impacts. However, for 'no-regret adaptation", we should apply the precautionary principle, and the lack of scientific evidence or information should not be reasons for inaction. Action without delay is imperative. While bottom-up approaches based on local realities are essential, at national level, it is also necessary to enhance cooperation among relevant government agencies and promote collaboration with both academic and DRR communities.

# Dr. Emilia Saiz Carrancedo, Secretary-General, United Cities and Local Governments (UCLG), Spain



In her message, Dr. Emilia Saiz Carrancedo elaborated how the United Cities of Local Government (UCLG), a worldwide organization of cities, towns, local, regional governments and their associations, has integrated disaster hazard risk

reduction in their agenda for decades and recognised it as a very critical issue for local governments around the world which suffers from hazards every day of the year, and the importance to get the communities ready to face whatever is there to come.

With increasing hazards, man-made or not, there is a need to enhance the relationship between research institutions, the academia, and policy-making institutions.

As the largest network of local and regional governments, Dr. Carrancedo stated that the world, cities, towns, territories, they are never going to be the same after the current corona virus pandermic. There will be a need to change the way in dealing with other emergencies as well as the climate emergency.

At UCLG, this means, dealing with things in a different manner and actually adapting local service provisions, getting ready for new type of services, defining a new way to interact with communities, and defining a new means to face the emergencies. That is something that all can do as a spheres of government, with the whole of government and the whole of society.

She stressed that the academia and the research institutions should play a very important role in this regard. They should help the societies define the type of actions that they need to undertake; they should also help the societies to know what is working and what is not. They should also talk with the societies about the choices to be made in the local city development; and try to analyse what is most efficient, what is most universal, and what is going to help to cover the needs of everyone, leaving no one and al of us together today.

It is also necessary to reinforce collaboration with research institutions and to enhance dialogue among communities and all stakeholders. She stated that these are the actions the society need in a world that is facing the unknown, in a more rapid manner than ever before. It is time to assess very strong basis, the biases and principles, and make sure that we do not cross the red lines in developing a mechanism for resilience and for disaster risk reduction. Unfortunately, over the summer, once again, it was apparent how vulnerable each one of us are no matter where we are in the world, and how our system of production and consumption are really harming the environment and the planet we live in. The time is now and there is no more time to waste. Neither there is a plan B and no way to ensure humanities response and taking responsibility for what we have done. But we can put our science, our knowledge, our capacity, in transformation of our actions. To do this, the local and regional governments are very critical. She stated that they think that the global agendas that have been defined together, are very useful tools in the multilateral context and stressed the importance and value of the localisation of the Sendai Framework Agenda for 2030.

She requested from the science community to work together with them, to make people, the international community, the decisionmaking agendas at all levels, realise, that local service provisions will be a very critical part of the localisation of the global agendas; and also, the sustainability of measures that put in place for reliability, and of the way that communities are going to embrace some of the difficult choices that are put in place.

It is a very important to trigger for new solutions, and to inspire for new partnership, to help build a humanity that is based on solidarity, be on a new relationship with the planet, and be an accountable government no matter where in the world, based on justice and equality.

She continued to state that at UCLG, they believe that they have the answers for many of the challenges that they are facing and that they will face in the future. And, that is the quality, proximity and localization. They are developing a pact for the future for people, planet and government. She reiterated that they count on the help from the science community, academia and the research institutions, particularly around disaster risk reduction, that they will help and be partners for them in this critical situation. She said that they can always count on the United Cities and the Local Governments to carry forward their messages in local and regional governments around the world.

no place behind.

New technologies, new measures cannot enhance the differences that already exist and aggravate the consequences of disasters in the societies. This remains a major challenge but UCLG with a membership 250,000 members, has made it very clear around the local and regional governments, that they want to make sure that whatever measures they take, they are measures that are not only efficient but they are relevant for all and everybody as well as for the future generations. A change in the perspective and a relationship with nature play a very big role in the topic that brings

Hour 11 —08:30 –9:30 hrs 1<sup>st</sup> Sept 2021 JST— Break

# Hour 12 — 09:30 JST 1<sup>st</sup> September 2021

#### Asia and Oceania Time Zone Session

#### **Engaging Sciences with Action : Voices from Asia and Oceania**

The session on Asia and Oceania, brought in diverse voices and perspectives of engaging sciences with action for effective DRR in the region.

This session started with four keynote speeches of the pioneers, stalwarts, and personalities of the region involved in engaging sciences with action. They shared their respective nations' efforts to contribute to DRR and the implementation of the goals and priorities of the Sendai Framework and highlight key issues, mechanisms, processes, and future directions for engaging science with action in the most disaster-prone region.

The session was opened by four keynote speeches.

- Science for Resilience, Haruo Hayashi, National Research Institute for Earth Science and Disaster Resilience
- An introduction of the first national comprehensive disaster risk survey project of China, Yang Saini, Beijing Normal University
- Using science to support decision-makers to reduce risk from natural hazards events: some examples from Aotearoa New Zealand, Gill Jolly, GNS Science
- Engaging Science with actions: A case for EEW in India, M. L. Sharma, SAADRI Programme Adviser

The session was chaired by Prof. Toshio Koike, Executive Director, International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO, Japan; and Member of the GADRI Board of Directors.

The four-panel sessions on the following topics were held in parallel in two parts.

I Regional Alliances: Improving collaboration to support global stakeholders on DRR and DRM

- Introducing current and existing alliances; and Introducing Viewpoints: Suggestions for Improvement –
- What should we do to encourage youth to engage in education?

II Target E - Disaster Risk Governance and Contribution for Policy Making

- Progresses and challenges of DRR policies
- Potentials of Scientific knowledge for DRR policies
- III Contributions to Climate Change Adaptation
- To create a roadmap for Universities and Research Centres in support of the climate change research agenda
- To list measurable contributions of the Asia and Oceania Region towards the COP26.
- IV Implementation of Sciences in Action
- Implementation Science in DRR

The panel discussion session brought in 32 experts in various fields of specialisation to present their arguments and to engage in discussion with the audience.

The session was closed with a final wrap-up session chaired Prof. Maki by each group chair with the session achievements and recommendations.

The Asia and Oceania time zone session was covered within six hours and was attended by nearly 140 participants from around the world.



Chair of the Plenary Session: Prof. Toshio Koike, Executive Director, International Centre for Water Hazard and Risk Management (ICHARM) under the auspices



Dr. Gill Jolly, Natural Hazards and Risk Theme Leader, GNS Science , New Zealand



Prof. Haruo Hayashi, National Research Institute for Earth Science and Disaster Resilience (NIED), Japan

of UNESCO, Japan; and Member, GADRI Board of Directors



Prof. Yang Saini, Beijing Normal University, China



Prof. M. L. Sharma, Department of Earthquake Engineering, IIT Roorkee, India

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Chair Asia & Oceania Wrap-up Session: Prof. Norio Maki, Disaster Prevention Research Institutes (DPRI), Kyoto University, Japan Science for Resilience, Integrated Research for Disaster Risk (IRDR), Japan National Committee by Prof. Haruo Hayashi, National Research Institute for Earth Science and Disaster Resilience (NIED), Tsukuba, Japan

Prof. Haruo Hayashi's presentation on the Science for Resilience discussed a recent initiative by the Japan National Committee which is "Establishing IRDR as an International Center of Excellence – Coherence among DRR, CCA and SD by Online Synthesis System (OSS)-Sustainability and Resilience (SR) and Facilitators".

It is the basic structure of the Integrated Research on Disaster Risk (IRDR), a research scientific program sponsored by the ISC - International Science Council and UNDRR started in 2008 and will end 2021. The governance structure included 13 national committees and one regional committee. IRDR-Japan is one of the first national committees of its 13 national committee body. IRDR-Japan started activities since 2012 right after the Tohoku earthquake and continued its activities to support the Sendai Framework to implement its goals and targets.

One of its major outcomes was the Global Resilience Forum in 2017 with output of "The Tokyo Statement 2017" proposing a national consensus for periodic synthesis reports on the state of



science and technology for disaster risk reduction.

Based on the proposal, they were accepted by IRDR and included as a research group programme as the Sendai Framework National Synthesis Reporting (Japan NC).

The implementation of the Tokyo Statement 2017, continued discussions to include a system and ways to be implement national synthesis reports effectively.

In 2019, a report was submitted to the Science Council of Japan reporting on the work carried out under the Tokyo Statement 2017. The report, "Building a Sustainable Global Society by Strengthening Disaster Resilience: Developing an "Online Synthesis System (OSS)" and fostering "Facilitators" to realize consilience", discussed that in order to be sustainable, it is fundamental to strengthen DRR in the basic premise. To promote that idea, it was decided to promote the online synthesis system, which is a web-based knowledge integration system. Applying that the knowledge obtained through online synthesis system to the field by mobilizing a "facilitator" and translate those global knowledge to local solutions. This recommendation has been published both in Japanese and English and is available at ReliefWeb.

site and work with stakeholders to understand the problem. At the same time, provide a new or global perspective for solving the problems they have. This experience will be at the online synthesis system or as feedback to the OSS as a very valuable tool for problem solving on site. By having this kind of reciprocal work or activities between OSS and facilitators, the online synthesis system will continue to grow by itself, and at the same time facilitators will be improving their ongoing capacities.

In 2021, they started to implement the idea of the online synthesis system and the mobilization facilitator in a stable manner The proposed idea is to have an International Center of Excellence (I-CoE) under the IRDR program. So far they have collected 17 starting Taipei. In June 2021, they summarized first-phase of the 10-years of IRDR at the International Conference, and proposed new research agenda for 2030 and beyond. In the new proposed framework, Japan was proposed as an I-CoE and to be coherent among disaster risk reduction, climate change adaptation and sustainable development by OSS – SR - sustainability and resilience - and facilitators.

He concluded his presentation with the introduction of the Japan I-COE, operated by the Japan Hub Disaster Resilience Partners – J-Hub - which is an organization consisting of 15 institutions engaged in DRR, climate change adaptation and sustainable development, and articulate these themes to deliver a safety and security to society.

The J-I-CoE, focuses on two programs. Firsts program is dealing with existential risk for Japan in the first half of this century. Around 2035, it is expected that a devastating disaster, the Nankai Trough Earthquake and tsunami which may be accompanied by Tokyo metropolitan earthquake, will engulf Japan. Preceding those big events, there will probably be a series of inland earthquakes in Western part of Japan. All of these damaging aspects will create a need for a very severe long -term recovery.

The second program looks at the severe effects of extreme weather due to climate change. Japan is now in a population decline phase with a very aging society; as well as a very low independence for energy and food. It has become a necessity to be resilient to survive or going through this kind of big events. At the same time, it is not just going through the severe disasters, but also to maintain a sustainable development. Therefore, these programs prompt the science and technology to be mobilized in an integrated fashion to find solutions to the two big and imminent real problems.



Through the function of the online synthesis system, stakeholders are able to share various kinds of information relevant to disaster risk reduction, climate change adaptation, and sustainable developments. Once they are integrated and fed into the online synthesis system, the facilitator will come to the

#### A few examples from the Q&A session:

Q: The framework itself looks very interesting and also system itself is now already available. Prof. Hayashi, is it possible for you to share your visions or directions for the country's other than Japan? Maybe within Japan, we may utilize, but outside of Japan? I know some of the examples already existing, but in what way we can expand this framework into the other countries? in what way they can access to utilize this framework in their own countries? Can you explain for that?

A: First of all we have some example existing examples this idea has been utilized right now. The first example is in Philippines directed by Prof. Koike, the Chair of this entire session. He has been using the OSS in the form of DIAS which has been developed for over a decade at the University of Tokyo, under his direction. This helped very effectively. And another example we have right now is in Myanmar. Right now the political situation is very difficult. But as an accomplishment, they had a very successful case by mobilizing duo facilitators, one local facilitators and one international facilitators. The two facilitators really worked closely and well. they designed the problems. From local facilitators the problem have been described guite well and from international facilitators available technology and knowledge have been transplanted to this local issues. These two core persons, lead the entire project. Although these are very early achievements, and we hope these small successes will continue grow bigger and bigger. We are also planning to promote this idea in Taipei and do hope the US will pick up this too.

Q: (Prof. Wei-Sen Li) – As Prof. Hayashi mentioned my name, first of all I showed my strong support to online synthesis and to facilitate it. I think that is a great idea. My comment is, I think, online synthesis will be a good platform to engage both the public and private sector. There has been there long-lasting issues in disaster risk management. Prof. Hayashi, what's your vision to enroll public/private sector together in the online synthesis and what kind of facility that they should be qualified to help to facilitate knowledge between the public and private sector?

A: The good relationship with private sector will not come up from nothing. You need to have a lead time to develop a collaborative relationship between science technology sector and then private, and apply it with the practitioner side. We have been, at IRDR, trying to promote such kind of a private/public relationship much stronger for the sake of business continuity management of the private sectors. We pick up the local problems they need to have solutions and then we use that as a target of research. Then provide the feedback to them. And it was like a framework of codesign and co- production and keep on doing this kind of work will be the very important step for the OSS and facilitated to be used by them. That that's my basic understanding. said General Motors has big datasets of almost all the new cars that is selling around the world. These cars obviously have some sensors or transmitters in them that allow them to figure out where the car is and where it has moved it. It seems to me that if these big datasets exist in the private sector and they're trying to find applications for them. They also exist in in the in the United States in privately owned utilities of all their connections of their customers and houses. How can this resource be then integrated into the work that you're thinking about? Because it just seems like I think for me I mean, in California now with all the fires that every house built in California or every house should have a sensor in it relating to some sort of fire heat sensor. But we haven't reached that area yet, but it's something where the public and private sector can come together. I mean, certainly LIDAR lights are now getting cheap enough that almost any municipality could buy them. For example, uh, yes.

A: This is kind of my thinking. A public sector institution can provide the basic data and information products. We could put them together or integrate in a relatively easy way. I'm just talking about relatively, in comparison with the integrating data among private and public sectors. We're having a very big problem. Even integrating public site data. We've been spending almost 30 years doing so. But it is relatively easier than integrating those with private sectors. The key to integrate private/ public sector together will be that integration could be beneficial for the private sectors. For example, General Motors, do have a very big data. And they spend lots of money for their own purposes and that they have the rights to be secretive or classified among them. So that it is impossible for us to get those barriers down and ask them to share with us. What we can do is, we can provide the public data and then combine those with their private data, big dataset and create some new added values. They may enjoy a joining public data and private data together. This is the first step.

Now if they have added value by combining that public sector information with their own private datasets, they may have to pay some cost to get the benefits. Those costs will be accumulated from various individual private companies. We will pool those money as a way to sustain this public/private mechanism even though this looks like a one-way approach. As a second step, we hope those private sectors, they have the information they could share with the other private companies or public sectors. Most of those will be disseminated through their own website so that we could ask them to share those website, or publicly shareable information to provide to this public/private association sector or

Q: I have a question on the kind of utilization of big data sets in your work. Recently someone from General Motors wrote me and

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mechanism. This is the second step. And then we could have some kind of private sector information to be shared by a much wider audience, which is the public and private partnership type thing. We hope this kind of reciprocal or mutual benefit mechanism will keep on going to expand the area of sharing. That's kind of an idea that I'm right now working as a small scale in this region of the world. An introduction of the first national comprehensive disaster risk survey project of China by Prof. Yang Saini, Beijing Normal University, China

Prof. Yang Saini from the Beijing Normal University introduced a domestic project, "the First National Comprehensive Disaster Risk Survey of China" which is one of the largest national scale risk assessment projects. With a few examples, she discussed how the nation has engaged science in to action.

Although in China, there exist many tools for risk assessments but they lack the authority to risk information. The first example shared was on small project on people-oriented resilience building. The project looked at different early warning standards. They collected data on heat related sicknesses and noticed, that instead of the infants or the elderly being affected by the severe heat which is currently a major hazard, it was rather the young male or the adult males who have been severely impacted by the event. It highlighted the need to have different early warning systems and prompted discussion on the different warming thresholds for individual, community and country level. There is a need for more scientific evidence to develop tolerable early warning systems that can be used by different stakeholders.

Another project looked at the road early warning systems. The project collected data from the ministries of transport and road network center and analyzed traffic created hazard disaster data. In China too, in recent years there are increasing extreme events led by climate change and at the same time there is rapid development of urban and also country road networks triggering a number of hazard related accidents despite the initialized early warning system for road transportation. Many institutions are calling for investment in resilience. At the same time, there are the questions on how to balance investments in high standard construction or to invest in service system.

Upon performing quantitative analysis on the cost benefit ratio of early warning systems, it was clear that there is a very high return ratio for investment in service. When talking about resilience building and engaging science into action, this type of quantitative scientific evidence are needed to promote fundamental new concepts.

In 2018, the central government of China has introduced nine national mega projects for disaster risk reduction: 1. Disaster Risk Assessment and Peril Investigation, 2. Ecological Protection and Recovery Services, 3. Coastal Protection and Recovery, 4. Seismic Reinforcement for Infrastructure, 5. Flood Prevention 6. Geological Hazard Prevention and Relocation; 7. Construction of Emergency Response Centers, 8. Early Warning System. 9. Disaster Prevention Control Techniques and Equipment Modernization.

Prof. Saini gave brief on the project, Disaster Risk Assessment

The project also includes risk factor surveys covering risk assessments and the risk zoning. The Risk Factor Survey covers hazard exposure, vulnerability and capacity. This will feature risk assessment and zoning for single and multi- hazards and will continue with prevention measures.

The exposure part of the project is required to survey the housing in China (there are more than four billion houses), population, and the infrastructure for transportation. Public service infrastructure such as water pipelines, environment and other natural resources are included as well. As it is a national project, the project should cover all of China.

The implementation and organization of project with such a magnitude is without challenges. It started from the central government and moved on to province, city, prefecture, town and village. The organization includes at least nine ministries in China and involves many local responsibilities and multi stakeholder participation.

Coordination is required for multi sectors and integration of different activities in different implementation schedules, softwares, database, coordination for stakeholders and the synchronization is quite challenging.

If the whole project is viewed as a scheme, it will needs the hazard investigation, exposing assessment, hazard assessment, exposure assessment, risk assessment, zoning, and it goes on. How could one synchronize everything?

There is a detailed technical guidance for each work. In addition, they set-up detailed lists for data sharing. She stressed that this is the first project in China, where an official channel is set-up for data sharing among different ministries including hazards ministries and ministries associated with exposures with stakeholder groups. The data software system operates in a four-layer database system – country, province, city, and prefecture levels.

When the system was established, it was noticed as a feasible methodology for risk informed development. Taking the opportunity, the methodology was disseminated and promoted at different levels of governments and public.

In addition, training programs and online training courses were carried out as a national project to help people understand what is risk and what is a hazard and what kind of information is available for various kind of risks and how to use the information. The project aims to cover investigating 112 counties by September 2022 and plans to update the Technical Assessment Guidance handbook. The outcome products will be opened to the public

and Peril Investigation. The aim of the project is to assess the risk for entire China and to come with a comprehensive risk assessment and exposures for such as housing, infrastructure, system resources. In addition, the risk assessment project outcomes should be applicable in planning, and in different governance activities. For example, the geological hazards team, they have set-up three-petrol call routines for geological hazard, i.e., pre-season patrol, in-season patrol, and after-season patrol. Is it a reasonable and optimizing way to get information? The project will look into such cases as well and the national disaster risk assessment and peril investigation project will try to improve regular DRR routines. giving opportunities for collaborations.



Q: It is a huge national project and I think you and your team are doing really great job. I have a simple question. I believe this kind of assessment needs time to update. What is your plan for updating - after five years or after 0 years?

A: - We already talked about it. This is the first national risk assessment. Right now, it is like throwing a stone into the lake and we need to see the ripples. Of course, the reason we want to set up this four-level software and database system is for potential updating. Right now, the plan is that we will have this type as a national census project probably every five to 10 years. But more important is when we have this four-level software system and database system, this will be installed in the central level, as well as at provincial level. With this database, the provincial government actually has the capacity to update this database as they wish. Then of course this type of project requires a lot of resource funding and human resources. Therefore, we have given the provincial level, the different level of governments, some kind of freedom. So that when they have the capacity, when they have the resources, they can update their database.

Q - You mentioned about the need for a tailored early warning systems, and I think that is very important and critical, particularly to make an impact. So I was just wondering, you know, how do you really tailor these? Through these different audiences that you have the different stakeholders that particularly those that are the most vulnerable. That's one question. The other one is that, in terms of this big project that you have for risk assessment in the whole country, what kind of standardized risk assessment methodology are you looking into adopting? This has been one of the challenges in the region. China is such a big country, so it's important that you have that standardized methodology. But when you're looking at a region as a whole, or larger region,s different countries, that's also one of the biggest challenges in terms of comparing.

YS - For the first one the early warning system. We notice that it's not necessary that we should give the same threshold. Right now in China we will have the exact same threshold. Say for example today is 37 Celsius degree, there we will start as heat wave early warning and the school should stop or say the outdoor activities should be reduced. But based on our work, our research, we are actually talking about this with the meteorological ministries and administration. So is it possible that we give different standards for different target population? Say for example, for schools for primary school for middle school? Should we still use? This is a 38 or 37 or should we lower a little bit, see if the outdoor temperature is about 36 then should we reduce the outdoor activities and for the general public probably will still use the same standards 35 or 6 or 37 no matter?

But for the outdoor workers, should they use the same threshold? These are something that we can send different early warning information to different occupations or to different population groups, for example, like for senior people - can we provide them early warning when the temperature is 35, so this is one approach.

The second question. Frankly speaking, during the past two years I have traveled a lot of different places in China. In Shanghai, one of the most developed area, they have a lot of good universities, research institutes, and many famous professors. We can for this national plan, define only the baseline work so that it is made easier for every region that has the capacity to fulfill even for the Western, the underdeveloped area. As for the baseline framework we only consider it like the higher intensity exposure and vulnerability. So with this three elements we can, and especially with the help of our software system, even in the most underdeveloped area, will be able to finish their risk assessment. But for more developed area we actually provide them with some freedom to choose the methodology they prefer. They can have scenario analysis. They can have more quantitative approach. They can have expected losses. They can have a return period. They can have exceedance curve. This is just purely based on their data quality and big data accessibility.



#### Hour 13

# — 10:30 JST 1<sup>st</sup> September 2021

Using science to support decision-makers to reduce risk from natural hazards events: some examples from Aotearoa New Zealand, Gill Jolly, GNS Science, New Zealand

Presentation on Using science to support decision-makers to reduce risk from natural hazards events, Dr. Gill Jolly shared examples from Aotearoa New Zealand and the work done during the past ten years. The presentation covered how they have responded to natural hazards and how the science has supported the decision makers' before, during, and after those events. She also acknowledged the help of Dr. Gary Wilson to prepare the presentation.

The outline of the talk provided context for disaster risk reduction in Aotearoa, New Zealand. She shared three examples of science in action in response, recovery and providing community engagement.

- Response March 2021 earthquakes and tsunami.
- Recovery November 2016 Kaikoura earthquake and landslides, and
- Community engagement: August 2012 Tongariro volcano unrest and eruption.

She explained the different timeframes of the Role of Science Advice – long-term baseline science to understand dynamic planet, to understand the geological and geophysical processes that drive natural hazards and the risk, and then the vulnerability of population and communities to those risks. The mid-term, and short-term projects are created with a range of their stakeholders, communities, government, both central and local governments, even with Māori tribes and private enterprise. That feeds into policy regulation for long-term risk reduction measures, such as long-term planning and building code.

Their science is also connected internally to other scientists, and to communities and active stakeholders and aims at doing excellent and impactful science.

Moving on to examples of the science in action, she started with the March 2021 earthquakes and the Kaikoura earthquake. The March 2021 Earthquakes were examples of science and response. One of the key things there was that the long-term baseline of science and social science lead to good public messaging. She showed a poster version of the "long strong get gone" which is the key messaging for emergency responses and scientists were very much at the forefront of the response. She explained the risk assessments they had to do in terms of aftershock forecast hazards in every area. They were also supported by the New Zealand Defence Force.  Health or safety of staff is paramount to the response situation. Often staff will be going into fairly risky situations to collect data importers, so having that long-term investment in hazard and risk science enabled to rapidly do that risk assessment to support the management decisions.

She stated that the main message from that event is that long-term science really underpins the ability to be able to respond quickly when need arises.

On the Kaikoura earthquake 2016, the Kaikoura earthquake happened in November 2016. It was an earthquake over magnitude 7.8. One of the key things was that more than 20 faults ruptured at the same time in a kind of a domino effect, generated a tsunami and produced thousands of landslides, including landslide dams. A key part of the science advising and recovery phase was what is the likelihood of aftershock and levels of shaking. This is fed into assessment of earthquake prone buildings and change of legislation, particularly to speed up the retrofit of earthquake prone buildings. Because the likelihood of a magnitude eight and above are had increased significantly.

One of the important understanding that happened as a result of this event was the close engagement across a large number of agencies.

She shared reflections and lessons learned from the event.

- the complexity of the ruptures and this information is being incorporated into the next generation of the national cycling as a model
- It is critical to be able to coordinate the science when such a large area was impacted, As a result, they have set-up a National Seismic Advisory Panel, which is being developed to bring the experts together and to share understanding before, during and after an event.
- And that increased likelihood of a magnitude 8 earthquake required rapid peer review over the space of a few days and pulled on international partners to be able to support that.
- understanding the "big calls" that those decision makers need to do and how they need that advice and providing the uncertainty around that advice too.

Key lesson learned was how to embed new knowledge and the ways to improve future practice.

She highlighted the following as lessons learned from that event:

- The importance of close engagement with the responding agency, especially at a senior government level all the way up to Minister and Prime Minister. And it also helps to know the people on the end of the phone to build trusts before the event occurs.
- Good response, the communities that reacted to the "long or strong, get gone" message and the importance of the social science and community engagement to develop that and level of understanding before the event occurs.

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#### Summary

- · Aotearoa is vulnerable to a range of natural hazards and risks
- · The national disaster resilience framework is based on Sendai
- Decisions for risk reduction, response and recovery are evidence informed, using long-, medium- and short-term science
- It is important to learn lessons from each event and focus on continuous improvement



The example of science in action with Tongariro eruptions in 2012, Dr. Jolly stated, when they started to see some indications that the volcano was becoming more active in July 2012, they engaged with the risk managers for the National Park as Tongariro sits within the national park of the Department of Conservation. Upon their advise, they talked to the local communities in partnership with them.

Although they had a good relationship with the Department of Conservation, it was not the same with their local Māori communities. She stressed the importance of building relationships with local communities, understanding different sources of knowledge, listen and learn, being humble and showing that humility goes a long way to building relationships even when one is in a highly stressed situation.

Reflections and lessons learned from that event, even simple events, have complex networks and relationships.

In closing, she summarized the following:

- Aotearoa is vulnerable to a range of natural hazards and risks.
- The National disaster Resilience Framework is based on Sendai and
- those decisions that require science to independently informed by long-term, medium-term, short term science, but at different scales and understanding that is really important.
- And then it's important to learn the lessons from each event and then focus on continuous improvement for future events.

#### A few examples from the Q&A session:

Q - in the context of community engagement and also focused very much on science into action, in that context, how much of the traditional knowledge or the indigenous knowledge of the communities were integrated into the science action that was taken place?

A - It is an area where we are very much developing. I think from that particular example, and I learned a lot from the Māori communities that live on the volcano. They talked about, how the springs had changed, and how they could smell differences and how they were making observations of hot springs and so on. Their knowledge of the environment in which they live with, is really second to none, and added to the depth and color of understanding or what the volcano is doing. On the other hand, another important aspect is there cultural understanding of the volcano as an ancestor. Hazard phenomena would normally be turned out either on a hazard map or a risk map. But the way that the tribes, the Māori understood the longer the volcano was, it is as an ancestor. It doesn't provide risk yet but you risk it if you choose as a human to put yourself in that harm's way. It is their ancestor that might be having a bit of a grumble.

So understanding that cultural perspective is really an eye opening for me. For them, the language of hazard and risk was not familiar because they looked at the world in a completely different way. And an equally valid way. So that's a learning as a western scientist to Q: You said that humility goes along goes a long way and that is quite impressive. The humility showed in this kind of the disaster situation is very important. How can we keep the discussion and reflect sense to our action?

A. Earlier in my career I worked in the West Indies on a small island monitoring the volcano. All too often you see particularly enthusiastic early career Western scientists coming in and really just wanting to collect data and science. Often that had quite an adverse reaction from the local inhabitants of the island. It is something, maybe that you learned with age partly, but it is maybe something that we can help other early career makers, scientists to be able to think about, the impacts on the local population. Especially when they're in a particularly stressful situation and they might have lost significant amounts in terms of property or in livelihoods, or even life. So being able to put yourself in their shoes and understand their situation that really does go a long way to understanding how the impact links to the work that you would like to do and you need to do will have on those communities.

hear from those communities. And if we arere wanting to be building resilience in those communities, learning to speak the same language, not literally well, literally, being able to understand and be able to speak more. But also understanding the narrative that they have around the environment in which they live.

#### Engaging Science with actions: A case for EEW in India, Prof. M. L. Sharma, SAADRI Programme Adviser, India

In his presentation on Engaging Sciences with Actions, Prof. Sharma shared examples of earthquake early warning system in India and how they support the Sendai Framework.

In the case of earthquakes, he stated, that they are unable to come up with the models which can really predict the earthquakes although they have very good prediction models for drought and floods. While their ability to work on good seismic modelling decreases, their exposures to earthquakes are increasing. In addition, there are new risks and a steady rise in disaster related losses with significant losses impacting the economy, health, and the environmental.

He stressed on the need to have a different kind of solutions, at least for the earthquakes and outlined the following challenges:

- large population prone towards earthquakes,
- less awareness and low construction quality
- very less instrumentation deployed in some of our sister countries.
- Lots of investment and high pace of development and
- Huge loss of life and economic loss because of the earthquakes

With various examples, he showed how science is working in the field as well as in public. One of the examples was on finding the return periods in the Himalayas and surrounding countries after a damaging earthquake. The return periods for the damaging earthquakes, is going to be less than 10 years. The electronic lifetime of the electronic equipment to be used for early warning system is also not more than ten years. Given this, the earthquake early warning system, perhaps in its whole lifetime, may give one earthquake early warning.

He also shared advantage examples of earthquake early warning system and how the government of India is applying the recommendations of the Sendai Framework in the national disaster risk management. In addition, the national Disaster Management Authority has the following four components in place too:

- dissemination system for earthquake early warning
- multi hazard risk mitigation of the infrastructure
- technical assistance to improve disaster risk reduction and management with emphasis on earthquake risk.
- project management and monitoring unit.

He also reiterated that to achieve the global and regional level, it is

important to promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help to reduce disaster risk. In particular those that would assist developing countries and their specific challenges. Based on many success stories of earthquake early warning systems in most earthquake prone nations, he mentioned that the science and knowledge used by those countries, should move such actions to countries and populations that cannot use such technology to overcome the hazards they are facing.

Using an example of Private Public Partnership (PPP) of the global earthquake model, he shared information on a collaborative project by IIT Roorkee with Israel and two academic institutes. It is on the development of particularly warning system, which can give to the individuals on their mobiles with information of the magnitude, location, time left and actions to be taken to the dams, metro's, nuclear power plants and lifts, and signals with maps to the administrators, managers, police, doctors, emergency services and disaster commissioners and public at large. In many other hazard prone countries, such early warning systems are working effectively. They should consider sharing the earthquake early warning systems with countries that cannot afford to invest on such instruments through funding, or by providing scientific assistance, and also by trying to increase the willpower of the political systems. The hazards and disasters do not recognize the political boundaries. Such instruments also should be placed in the global frameworks.

He concluded his presentation with the following recommendations:

- Hazard for South Asia be reworked and risk mapped, and be carried out on required scale
- the member countries being sensitized for disaster risk reduction, and
- SAADRI may take proactive steps as per the Sendai framework for those challenges.

To achieve Global and regional level It is important to promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help to reduce disaster risk, in particular those that would assist developing countries and their specific challenges;	Definition of the second secon	EEV DOWNOON DO
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#### A few examples from the Q&A session:

Q: A question on the mobile app. Australia uses mobile apps for Q: How can your community in make maximum use of such kind of

bush fire warnings and for bush fire information. During our recent landscape bushfires in Australia, the bush fires put out both the power systems and also the Internet. We had no warning for three days of what was happening in smoke filled environment. What happens in your system if the earthquakes put out the Internet?

A: We are still in development stage of our earthquake early warning system. For such a kind of situation without the Internet to transmit an earthquake early warning, or for floods, fires, etc. I would suggest the example showed by the previous keynote speaker. She shared an example of the public disaster postermessages, a disaster message to respond to disasters; and also preparing communities to react to such messages prior to an event.

#### early warning systems?

A: In science we are able to give the warning using such instruments, but how the public will react on that is a different issue. I have been working for the past two years in Uttarakhand State and I am teaching and engaging the community on disaster risk awareness, with evacuation exercises using the mobile apps and other signals that will be used as an early warning for a disaster. The government also have chosen to go public with this kind of exercises. If the public is not aware of the signals and the method to evacuation, there will be a very chaotic situation. There could also be cases of false alarm. Therefore, the public has to be trained through awareness campaigns.

## Hour 14

# — 11:30 JST 1<sup>st</sup> September 2021

#### Parallel Discussion Sessions

Parallel Discussion Sessions I: Regional Alliances : Improving collaboration to support global stakeholders of **DRR and DRM** 

#### Discussion Sessions I—1: Introducing Existing Alliances

Chaired by: Prof. Srikantha Herath and Prof. Kenji Kawaike



Prof. Srikantha Herath, Director, for Transdisciplinary Center Research, Sri Lanka and Director, Envi Forecasting, co. Australia.



Prof. Kenji Kawaike, River Prevention Disaster DPRI, Systems, Kyoto University, Japan



Prof. Desmond Manatsa



Prof. Akira Igarashi



Prof. Ian White



Dr. Indrajit Pal

Following session summary was prepared and presented by Prof. Srikantha Herath:

There were 3 presentations on regional alliances and 2 presentations in panel discussion.

- Presentation—1: SAADRI presented by Dr. Herath
  - South Asia Alliance of Disaster Research Institutes constitute of 5 thematic areas addressed by 5 working groups.
  - Emphasis is placed on Promoting applied research for DRR and Policy framework analysis and proposals in regional and local context to enhance DRR activities.
  - On going activities and planned activities were outlined and requested wider participation of GADRI community in SAADI



actions

 Presented a cloud based Flood Early Warning system that can be adapted for different cities/countries and available currently mechanism for participation by interested parties

- Presentation—2:

- Presentation—3: Natural Disaster Research Council, Prof. Akira Igarashi, DPRI, Kyoto University, Japan
  - Comprehensive introduction to NDRC activities both national and international
  - Many opportunities to collaborate through existing NDRC ongoing programs



- Presentation—4: Improving Collaboration for DRR and DRM in Small Island Developing States, Dr. Ian White, Ian White, Emeritus Professor, Water Resources, Australian National University, Australia
  - Community based activities are the most important ones for small islands
  - They need long term commitment and association on

ATTICAN AIIIANCE for Disaster Research Institutes (AADRI) : **Opportunities and Challenges since Inception – by Prof** Desmond Manatsa, Bindura University of Science Education, Zimbabwe

- Focus thematic areas for Africa are
  - DRR; and Climate change adaptation
  - Sustainable Development Challenges
  - Funding
  - Institutional framework under development
  - COVID-19 hampering activities

decadal time frames rather than large scale funding.

International organizations advocacy and support has proved be to effective



# Hour 15 — 12:30 JST 1<sup>st</sup> September 2021

- Panel Presentation -2: Leveraging Academic Diplomacy for Resilience and Addressing Cascading Risks, Dr. Indrajit Pal, Assistant Professor and Chair, DPMM Program, Asian Institute of Technology (AIT), Thailand
  - DPMM program of AIT has successfully developed and delivered DRR programs not only in Asia but also in other parts of the world
  - It has successfully transformed many of its programs to online courses to address challenges posed by COVID-19

#### **Outcomes of the Discussion Session:**

- Two important areas emerged from the discussion
- How can the different regional initiatives collaborate, what avenues are available?
- We need to find overarching themes to connect different programs to discuss findings to identify commonalities and disparities and learn from each other.
- For example in SAADRI discussions there are these two focus areas: (a) Improving knowledge to practice transformation to benefit affected people and (b) Improving Polices for effective DRR. We may discuss where policies were formulated to enhance or adopt successful practices or where good policies led to improved practices. This type of topics can bring different

 Has developed programs for both graduate students and practitioners including empowering communities

Resilience building	ng for Cascading Risk
<ul> <li>Region</li> <li>Reside</li> <li>Syster</li> <li>Govern</li> <li>Govern</li> <li>Casat</li> <li>Polyce</li> <li>Casat</li> <li>Casat</li></ul>	hal cooperation through Risk and nec Research and Education incrisk reduction through informed on making anance Capacity development through reducational ntric Governance Approach for ling risk reduction ted platform to bridge the gape on disaater risk knowledge discourse actitioners

regional perspectives to be discussed together.

- Early warning, Climate change adaptation and Infrastructure safety were themes that were addressed by most groups. Workshops under these topics can be another approach.
- Community engagement
- It may be worthwhile to explore how GADRI can support and develop a program to synthesize rich experiences of small islands, the programs conducted by AIT etc., to develop education and practice guidelines for engagement of communities to create a long term effective dialogue between research researchers and affected communities.
- Endorsement of such a program by a UN organization would make it effective.

# Hour 16 — 13:30 JST 1<sup>st</sup> September 2021

Discussion Sessions I-2: What should we do to encourage youth to engage in education?

Chaired by: Prof. Gretchen Kalonji and Prof. Wei-Sen Li



Prof. Gretchen Kalonji, Dean, Institute for Disaster Management and Reconstruction , Sichuan University, China

Panellist of the session:

- Introducing Viewpoints: Suggestions for Improvement, Antonia Yulo Loyzaga, President, National Resilience Council (NRC), Philippines
- 2. Building DRR capacity for youth: Practical experience from Asia, Bill Ho, Asian Disaster Preparedness Center (ADPC), Thailand
- 3. Transboundary and cross-generation disaster risk reduction knowledge co-creation platform, Yi-Chung Liu, Associate Researcher, International Collaboration, National Science and



Prof. Wei-Sen Li, Secretary General of National Science and Technology Center for Disaster Reduction (NCDR) Chinese Taipei

#### Taipei

- Alliance of youth and young professional in science, engineering, technology, and innovation for disaster risk reduction (U-INSPIRE Alliance): enabling factors and prospects, Mizan Bisri, representing U-INSPIRE, Indonesia
- Roles of the University of the South Pacific and partners in rebuilding the culture of resilience in Pacific Island Countries, Viliamu lese, Senior Lecturer – Disaster Risk Management at the Pacific Centre for Environment and Sustainable Development, at the University of the South Pacific (USP), Fiji

Technology Center for Disaster Reduction (NCDR), Chinese



Dr. Antonia Yulo Loyzaga



Dr. Bill Ho



Prof. Viliamu lese



Dr. Misan Bisri
Parallel Discussion Session I – 2: What should we do to encourage youth to engage in education? Chaired by: Prof. Gretchen Kalonji and Prof. Wei-Sen Li

Following session summary was prepared and presented by Prof. Wei-Sen Li

I-2 What should we do to encourage youth to engage in education?

- Within Session 1.2, five panelists extensively delivered roadmap, ideas, project outcomes, capacity building programs and networking for engaging, empowering and enabling the youth for next generation education in disaster risk management (DRM). All speakers are welcomed to cover the following three topics during their talks.
- 1. How to build up platform for youth's involvement with multistakeholders?
- 2. What are necessary elements to be include in new DRM paradigms for the youth?
- 3. Where are the ideal approaches to attract the youth to initiate the next mile of DRM?

Following highlights a few of the recommendations:

- To enroot "culture of protection", DRM education should start early at basic education and be carried out lifetime.
- To meet dynamic social development, an enabling education environment should be inclusive of possible social and physical impacts.
- To build connection and collaboration between universities and national platform to enable an environment for both researcher and disaster manager.
- To highlight creativity of the youth in IoT and social media to enhance risk communication.
- To motivate social enterprise as one engine to continuously engage the youth in DRM.
  - To encourage young "voice" and "face" to speak out DRM like

Greta Thunberg advocating for CCA.

- To recognize youth group as a resource for DRM work, instead of vulnerable group.
- To make youth as an important source of DRM information for local communities
- To deliver tailored youth/young adult learning approaches
- To introduce more mainstreaming of disaster risk reduction into sectoral policy/development process
- To welcome more regional/sub-regional collaboration and knowledge sharing on the subject
- To utilize platform like U-INSPIRE Alliance connecting regional and global youth professionals to co-work and co-implement.
- To invest more in youth DRM education.
- To include diversities of disciplines, languages, cultures and hazards for DRM education to the youth.
- To organize platforms to enable out-of-the-box thinking, openended dialogues among multi-stakeholders, cross-cutting collaboration and public-private partnership with youth generation and other stakeholders.
- To deliver capacity building program or curriculum through diverse and inclusive approaches and to address how science and technology can make broad-spectrum contributions to disaster risk reduction and emergency management.
- The session 1.2 is a starting point to map out how GADRI can make changes to DRM education and the topic should continue to produce more fruitful outcomes.

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# - 14:30 JST 1<sup>st</sup> September 2021



#### **Lessons learnt**

- Youth is an important source of information for local communities
- Baseline assessment is critical
- Creating an enabling environment with relevant policies and guidelines is essential
- Close and constant consultations with relevant stakeholders
- Participatory approach is a must
- Tailored youth/young adult learning approaches

## Hour 18 — 15:30 JST 1<sup>st</sup> September 2021

**CUSP** 

### Food for thoughts

- Education and **research** are crucial in rebuilding the culture of the second in our Pacific people proven (USP)
- Inclusion and Leadership of Youth is paramount cultural challenge
- Be proud of who we are as Pacific people, our cultures, marriage of Traditional knowledge and modern science
- Need the involvement of youth in the localization of DRR and
  Humanitarian actions capacity building is critical to do it the right way
- Need for a cross sectoral and transdisciplinary approach to communicate and work well (few people)
- It is also very expensive tertiary education, TVET courses, research costings
- It is time consuming conflicting priorities (many hats)
- That is why we need strategic partnerships including youth, communities, universities, governments, international communities
- We need a transformational attitude towards youth engagement –
  empowerment and leadership





# 5<sup>th</sup> Global Summit of GADRI: 31<sup>st</sup> August to Group Photos Taken During the Opening





Engaging Sciences with Action 1<sup>st</sup> September 2021 and the Closing Ceremony



Panel Discussion Session II: Target E: Disaster Risk Governance and Contribution for Policy Making

### Chaired by: Ms. Ritsuko Yamazaki-Honda



Ms. Ritsuko Yamazaki-Honda, National Research Institute for Earth Science and Disaster Resilience (NIED)



Following session summary was prepared and presented by Dr. Toshio Fujimi, DPRI, Kyoto University, Japan.

### **Objectives:**

This session will discuss on disaster risk governance and contribution for policy making in line with the Sendai Framework. This session will be held in two parts.

Progresses and challenges of DRR strategies

--> Session 2-1

- Potentials of scientific knowledge for DRR strategies
  - --> Session 2-2

2-1 Progresses and challenges of DRR strategies: Progress and Achievement of Sendai Framework Target E in Asia Pacific Countries:

- Mr. Timothy WILCOX, Regional Office for Asia and Pacific, United Nations Office for Disaster Risk Reduction (UNDRR)
- Disaster Risk Reduction Strategies in Asia and the Pacific: Implementation Challenges in Post-Covid19 Landscape
- Mr. Aslam PERWEIZ, Deputy Executive Director, Asian Disaster Preparedness Center (ADPC)
- JICA's Global Agenda for DRR & Development Support for Local DRR Strategies/Plans,
- Mr. Hideaki MATSUMOTO, Director of Disaster Risk Reduction Team 2, Japan International Cooperation Agency (JICA)

# Key questions in 2-1: Progresses and challenges of DRR strategies

- How have national and local governments adopted DRR strategies so far in line with Sendai Framework?
  - Total 120 countries
- What are good practices of DRR strategies in national and local levels?
  - 8 steps approach by JICA

- Monitoring and evaluation
- Multi-language

### 2-2: Potentials of scientific knowledge for DRR strategies

- SENTINEL ASIA Utilization Space Technology for DRR
- Dr. Makoto IKEDA, Senior researcher, the Asian Disaster Reduction Center (ADRC)
- Potentials and challenges of randomized controlled trial for evidence-based DRR policies,
- Dr. Toshio FUJIMI, Associate professor, Disaster Prevention Research Institute, Kyoto University
- Analysis of the GADRI Questionnaire Survey covering contributions to Sendai Framework, Climate Change Adaptation, and Covid-19
- Dr. Genta NAKANO, Assistant professor, Disaster Prevention Research Institute, Kyoto University

# Key questions 2-2: Potentials of scientific knowledge for DRR strategies

- How can scientific knowledge support national and local governments to make and implement DRR strategies?
  - Satellite image just after disasters is helpful for making DRR strategies
  - Approach integrating both human system (evacuation drill) and natural system (hazard maps)
  - Communications among residents, governments and researchers
- How can scientific knowledge provide evidence for effective implementation of DRR policies?
  - Randomized control trial (RCT) is useful to select out actually effective policies among seemingly effective policy
  - Although strict RCT is difficult to be conducted in field,

- Case study in Philippine
  - Extending application to other Asian countries
- What are challenges for making and implementing DRR strategies?
  - Multi-hazard and New risk landscape
  - Financing is very much important
  - Involving multi-stakeholders with inter-sector corporation
  - Risk assessment information is the first step to involve multi-stake holders

modified versions of RCT can be feasible.

- How can research institutions contribute to capacity development of national and local governments and practitioners in fields?
  - 8 steps approach by JICA
  - Evacuation drill study based on the integrated approach human and natural system
  - Win-win relationship is important for sustainable contribution



#### Target E – Challenges and Opportunities

#### Challenges

- Need to continue strong efforts to continue Target E self-scoring into SFM
- A number of Member States are entering incomplete data or not validating
- Have seen a drop in data entry since COVID-19 outbreak

#### Opportunities

- Alignment of National DRR Strategy M&E Frameworks to Sendai Indicators
- Use of Custom Indicators to track progress of National DRR Strategy
- Leveraging support from regional organisations and development partners to support data entry
- Using in-country partners to assist in self-scoring

Hideaki MATSUMOTO

**Timothy Wilcox** 

5: ADPC in improving DRR Governance through DRR Strategies

> Strategic and policy directions in the **current context of hazards and disaster risk** (increasing trends of hazards and vulnerability, climate change-induced hazards, urbanization, rapid population growth, depleting natural resources, etc.);

Influencing transformative aspects of DRR with economic development, climate change adaptation, and financing institutions; and social protection and disaster risk financing.

Leverage regional instruments such as the Regional Consultation Committee (RCC) fo action at the national and local levels

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WEATHER AND CLIMATE

WATER RESOURCES

LAND COVER / LAND USE AND ECOSYSTEMS

WUNDRR

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AGRICULTURE AND FOOD SECURITY



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#### Contents of the 8 steps

- Step 1: Collecting local hazard information
- Step 2: Understanding local disaster risks
- Step 3: Confirming DRR plans by national and other authorities
- Step 4: Identifying residual risks considering time-scale • Step 5: Listing all necessary DRR measures by local
- government Step 6: Prioritizing DRR measures
- Step 7: Arranging budget allocation in necessary levels
- Step 8: Implementing DRR measures and reviewing periodically

⇒ By compile these information, it becomes a local DRR plan to reduce disaster risks.





Makoto IKEDA



#### Toshio FUJIMI

Autism due to MMR vaccination

Examples of seemingly effective policies

Cholera [1850s in London]

· Misconduct of youth

Education for children

• Pellagra [The early 1900s in U.S.]

Seemingly effective policy: Stop MMR vaccination for children

Seemingly effective policy : prevention from airborne infection - Actual reason: infection through water supply  $\leftarrow$  John Snow

• Seemingly effective policy: prevention from infection of unknown virus + Actual reason: lack of nutrition (protein)  $\leftarrow$  Joseph Goldberger

 Seemingly effective policy: education to increase their self-esteems • No effects (or adverse effects on prejudice) ← Baumeister et al. (2003)

- Fraud of research (Wakefield, A. et al. 1998 )  $\leftarrow$  Deer B. (2011)
- No effect ← Jain A, et al. (2015)

• Seemingly effective policy: One Laptop per Child • No effects ← Inter-American Development Bank (2009)







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International organization

Panel Discussion Session III: Contributions to Climate Change Adaption Chaired by: Prof. Mahua Mukherjee and Prof. Kenji Tanaka

The following summary was prepared by Prof. Tetsuya Takemi, Prof. Kenji Tanaka, Prof. Mahua Mukherjee and Prof. Andrew Collins.

### Panellist of Session III—1:

- Science and Technology: a key instrumental for Sustainable Climate Change Adaptation at the Community Level in Thailand by Dr. Sutat Weesakul, Sutat Weesakul, Director, Hydro-Informatics Institute, Ministry of Higher Education, Science, Research and Innovation, Thailand
- Some examples integrated research on climate-related geohazard risks, impacts of climate change and planning policy by Dr. Choun-Sian LIM, Southeast Asia Disaster Prevention Research Initiative, Universiti Kebangsaan Malaysia, Malaysia
- Adapting to climate change and variability: Research and delivery of improved climate products and projections for India by Dr. Vijay Kumar Soni, Head (EMRC), Indian Meteorological Department, India
- 4. Application of Earth Observation for DRR in the Hindu Kush Himalayan Region by Dr. Mandira Singh Shrestha, Programme Coordinator, Climate Services Initiative, ICIMOD, Nepal
- 5. Assessing the impacts of extreme weather on local-scale hazards in urban areas and complex terrains for climate change adaptation by Prof. Tetsuya Takemi, DPRI, Kyoto University, Japan



### Session III—2:

- Climate change adaptation and disaster risk reduction: Space technology contribution by Dr. Shirish Ravan, Head, UN-SPIDER, Asia and Pacific; Programme Officer, United Nations Office for Outer Space Affairs, Austria
- 2. Analysis on Surface Heating Field by Using Different Methods over the Tibetan Plateau by Prof. Weiqiang Ma, The Institute of Tibetan Plateau Research, Chinese Academy of Sciences, China
- 3. A National Action Plan for Climate Change Adaptation in



Water and Energy Sectors by Dr. Ali Chavoshian, Director, Regional Centre on Urban Water Management under the auspices of UNESCO (RCUWM), Iran

- 4. Disaster Risk Reduction and Climate Change Adaptation: Bangladesh Context by Prof. Dewan Abddul Quadir on behalf of Prof. Towhida Rashid, Professor and Chairperson, Department of Meteorology, Faculty of Earth and Environmental Sciences, Dhaka University, Bangladesh
- 5. Resilient infrastructure and nature-based solutions by Prof. Mahua Mukherjee, CoEDMM, IIT, Roorkee, India
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Panel Discussion Session III: Contributions to Climate Change Adaption

Chaired by: Prof. Mahua Mukherjee and Prof. Kenji Tanaka

### **Discussion Points:**

- 1. Important milestones for roadmap for universities and research centres in support of the climate change research agenda
- 2. Listing measurable contributions of the Asia and Oceania Region towards the COP26
- Important milestones for roadmap for universities and research centres in support of the climate change research agenda:

### Nepal:

- Individual and institutional capacity building at regional, national to local level for informed decision making for enhancing adaptive capacity for climate and disaster resilience
- Strengthening partnerships and networks

### Thailand:

- Sharing of Thailand's experience on the application of Science, Technology, and Sufficiency Economy Philosophy (SEP) concept for Climate Change Adaptation at the community level. Focusing on Community Water Resource Management in particular, the presentation is made via the good practice case study of "Ban Huay Pla Lod", a hill tribe community in the upper north of Thailand
- Science, Technology, and Sufficiency Economy Philosophy as tools to achieve Sustainable Development and Climate-resilient adaptation
- Community Water Resource Management
- Rule of Law

### Malaysia:

We have a special program on Climatic Hazards, along with other two programs (Geological Hazards and Technological Hazards) We also align our research to work transdisciplinary to SDGs and Sendai Framework and work on local level DRR CCA and promoting risk identification using technologies and community

### India:

Dedicated educational programmes from school to university would greatly advance awareness about climate change and its implications. Such programs could encourage young minds to contribute through individual and collective efforts that are crucial for climate action. It is necessary to develop "useful to usable" research and application agenda that can translate research to onground, effective decision tools for adapting to climatic change

# 2. Listing measurable contributions of the Asia and Oceania Region towards the COP26:

### Nepal:

- Need for enhance Observation network particularly in mountain areas for better data and information for climate modelling and validation
- The nature of risks are changing there are more compound risks leading to cascading disasters - science and technology and use of Earth Observation plays a critical role in understanding the risk

### Thailand:

- The application of transdisciplinary approach in the adaptation
- Roadmap the use of case study for Climate Change Adaptation using SEP concept

### Malaysia:

- Risk identification using science, to enhance capacity of local modelling and understanding
- Risk communication from research for bridging policy and early warning system
- Research in local customise including indigenous practise CCA & using best science available (vs costly infrastructure mitigation based on climate scenarios), promoting low-regret option CCA mitigation

### India:

CCCR-IITM has developed a state-of-the-art Earth System climate model suitable for long-term climate studies in order to generate reliable future projections of the global and regional climate, and particularly the Indian monsoon rainfall. High-resolution simulations (~ 35 km in longitude x 35 km in latitude) of 20<sup>th</sup> century climatic variations and future climate projections have been developed over the South Asian region. These high-resolution simulations offer new opportunities to better understand several key regional scientific issues concerning climate change over South Asia - e.g., Monsoons, precipitation extremes, heat waves, droughts and floods, changes in cyclonic weather systems, hydrological cycle etc. Monthly outputs of simulated rainfall and surface air temperature for the historical period (1951 - 2005) and 21<sup>st</sup> century RCP4.5 scenario projection for the period 2006-2095 are presently made available for downloads for researchers (http:// cccr.tropmet.res.in). The ensemble of high resolution regional climate change projections until 2100 at 50 km spatial resolution over South Asian region generated at CCCR, IITM by dynamical downscaling of six CMIP5 global climate model outputs using the ICTP regional climate model (RegCM4) are also disseminated to assist the science community in conducting studies of climate change impacts at regional scales. Further, the observed long term rainfall and temperature data are available over Indian region (https://imdpune.gov.in).

#### Japan:

The Ministry of Education (MEXT), the Ministry of Environment, and other government organizations have been implementing research funding to support basic and applied studies of climate change prediction and adaptation, and disaster risk reduction under climate change. Collaborations among academic institutes and governmental (central and local) organizations are in progress to implement climate change adaptation strategy and planning.

\* Centre for Climate Change Research (CCCR), Indian Institute of Tropical Meteorology (IITM) is autonomous institute under Ministry of Earth Sciences, India

Panel Discussion Session III: Contributions to Climate Change Adaption

Chaired by: Prof. Mahua Mukherjee and Prof. Kenji Tanaka

CONCLUSION—Session III—1: Important milestones for roadmap for universities and research centres in support of the climate change research agenda

- Need for enhance Observation network particularly in mountain areas for better data and information for climate modelling and validation
- The nature of risks are changing there are more compound risks leading to cascading disasters - science and technology and use of Earth Observation plays a critical role in understanding the risk
- Individual and institutional capacity building at regional, national to local level for informed decision making for enhancing adaptive capacity for climate and disaster resilience

- CONCLUSION—Session III- 2: Listing measurable contributions of the Asia and Oceania Region towards the COP26
- Integrated approach for DRR and CCA
- Data and knowledge sharing both at national-level and international-level, transboundary collaboration
- Evidence from observations in-situ and remote-sensing observations
- Weather and climate monitoring: DRR and CCA
- Third Pole: important weather & climate driver in Asia-Oceania region
- Impact-based forecasting, early warning and rapid information dissemination
- Resilient infrastructure



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Strengthening partnerships and networks

#### -> Setup a comprehensive site



## National Action Plan for Climate Change Adapt

#### \*Demand Management

- · Approval of the national water scarcity strategy and implementation plan at local levels
- · Integrate urban and rural water and wastewater utilities to improve urban water governance

#### \*Structural Measures

- · Investment in water desalination utilities
- Implement local projects to increase resilience to water stress (Agriculture, Industry and Domestic)
- · Facilitate the use of pump electric motors instead of diesel engines in wells

#### \*Non-structural Measures

- Updating dams operation instructions and manuals to cope with climate change impacts
- · Re-arrangements of organizational / administrative structures (RBOs)
- Training and capacity buildings

3-30-24 - Sharing Started

#### Disaster Management Challenges

- Early warning with adequate lead time in community language
- The capacity of coordination and making relationship among emergency responders.
- The capacity to produce the appropriate information timely.
- Integrated framework for incident management and communication.
- Resilient embankment, green belt along the coast.
- Expansion of regional and global networks for real time data/ information sharing.
- Mainstreaming disaster risk reduction and climate change adaptation in development process.
- Strengthening linkage with regional and international organizations involved in DRR in line with SFA and MDG.

### Panel Discussion Session IV: Session 4 : Implementation of Science Implementation science overcoming conflicts over science

### Chaired by: Dr. Subhajyoti Samaddar

The following summary was prepared by Dr. Subhajyoti Sumaddar, and Dr. Masamitsu Onishi DPRI, Kyoto University, Japan.

# Implementation of Sciences in Action—How can we better evaluate DRR researchers?

DRR researchers are evaluated mainly by their academic achievements as done in other academic disciplines. There are several ways to evaluate the performance, but the most commonly used scheme universally would be the number of academic peer-reviewed papers or the number of citations. However, these methods of measuring the 'best' science are outdated and even a hindrance to scientific progress as researchers are brought to a severe competition to publish as many papers as possible and the quality of the achievements are yet to be difficult to fairly assess. In addition, disaster science is quite multidisciplinary in nature, ranging from human and social to physical and engineering science, etc. Evaluation across the different filed has been a challenge.

### Panellists of the Session:

- Roles of science and technology in enhancing disaster resilience and sustainability by all by Prof. Toshio Koike, Executive Director, International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO
- 2. How can science support decision-making in risk assessment? by Dr. Gary Wilson, GNS Science, New Zealand
- 3. How can we better evaluate DRR research? by Prof. Yuichi Ono, IRIDeS, Tohoku University, Japan
- Challenges and Requirements towards Implementing DRR Science in Public Sector Development: Experience from Bangladesh, by Dr. Shibly Sadik, Center for Environmental and Geographic Information Services (CEGIS), Bangladesh

### Conflict over science

- Conflicts among scientists or within an individual scientist
- Over-reliance on science as a means for decision-making solution
- The merits and demerits of propaganda for implementation

- Capacity Building of Multi-stakeholders for Disaster Risk Reduction: Some Experiences from Malaysia by Dr. Minhaz Farid Ahmed, Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia, Malaysia
- Implementation science overcoming conflicts over science by Dr. Masamitsu Onishi, Disaster Prevention Research Institute (DPRI), Kyoto University, Japan
- Social Science Perspectives on Policy, Practice and Assimilation of Scientific Data by Prof. John Clammer, O.P. Jindal Global University, India; Visiting Professor, DPRI, Kyoto University, Japan



Dr. Subhajyoti Samaddar



Prof. Toshio Koike



Dr. Gary Wilson



Prof. Yuichi Ono





Dr. Shibly Sadik



Dr, Minhaz Farid Ahmed

INSTITUT ALAM SEKITAR



Prof. John Clammer



Prof. Mohsen Ashtiany, IIEES, Iran



Prof. Mazlin Mokhtar, LESTARI, UKM, Malaysia

Dr. Masamitsu Onishi

Panel Discussion Session IV: Session 4 : Implementation of Science for DRR Actions (S & T Roadmaps Realizing SFDRR) Chaired by: Dr. Subhajyoti Samaddar

### Two conflictive positions among scientists community

- Methodologists: The position that scientists should use • scientific methodology to identify phenomena of interest and provide useful information for decision-making, but should not be involved in the behavior of decision-makers.
- Activists: The position that scientists should not only provide information, but should also be involved in the actual field and actively participate in improving society.

### Conflictive positions among scientists' community

- **Criticizes to Methodologists:** 
  - No contribution to society, lacking the relevancy to the real society
  - They do nothing but analysis, and lack the attitude of seriously trying to be of use to society (despite receiving salary)
- **Criticizes to Activists** 
  - With the authority of science as a backdrop, they try to impose solutions derived only from within the methodological world in which they specialize.
  - Many papers based on field cases are lacking scientific fundamentals.
  - Reproducibility of success case of a field cannot be guaranteed.

### Over-reliance on science as a means for the goal – DRR –

- Science and technology may develop independently of their purpose, or without sufficient scrutiny 雨雲ズームレーダ the implications of of their
- development.
- Criticize to high-resolution rain cloud radar and real-time forecast (250 m mesh)

 $\rightarrow$  Over-reliance on science

- technology Science and is not almighty.
- Need communicative platforms to make sense the information for decision-makers.





### Disaster Prevention Research Institute Kvoto University

Project governance, Public Private Partnerships Emergency response and recovery policy for natural disaster



 Assessment framework for investment prioritization Framework agreement for disaster response public

works Policy for the sustainability of construction industry to maintain the post-disaster recoverability

**Emergency Response of Aviation Networks** for a Large-scale Eruption



- Timeline operation plan based on
- precursory phenomena of eruption Aircraft evacuation strategy and its governance

#### **Cross-jurisdictional Evacuation for Mega Disaster**

- · Mega-disaster: Flood of Tokyo metropolitan area; Large-eruption of Mt. Sakurajima
- How to utilize multiple transport means for efficient cross-jurisdictional evacuation?

### Not an Optimal, but Viable Solution



Manifesting communicative platform

Co-creation of alert level



### "Disaster Response Switch" (Takenouchi and Yamori)

No manifested scientific fundamentals for designing the communicative place for co-creation

### The merits and demerits of propaganda

- Obviously, propaganda towards the needs of scientists' com-• mitment to implementation contributes to
- Scientists are conscripted for politically determined purposes.
- Possible lack of diversity in academia, especially in the context • of disasters, attention needs to be paid to disasters that have not yet occurred.
- Too much emphasis on implementation as scientific outcome may give scientists distorted incentive such as pushing attitude towards communities.
- Superficial performance indicators may have the opposite effect.
- Need for maintain propaganda-free academic community ٠

### Transition of R&D Budget for DRR

(0.1 bill. JPY) 400 300	arthquake &Tsun /olcano Vater and Wild Re	ami lated (126)	S-net: o seismograp the Ja	cean-bottom h network alon pan Trench	g	Oce Seisn Nation	an Bottom nograph for nal Resiliene	(120)	
200		275	00	108	114	112	104	237	130
94	74		90 19 34	27 45	16	22	34 60	80	76
2010	2011	2012	2013	2014	2015	2016	2017	2018	2019

Source: Disaster Prevention Research Institute, Kyoto University and Tokio Marine & Nichido Risk Consulting Co., Ltd. (2021)

The Government seems to allocate transient budgets after major disasters occurred.

 $\rightarrow$  Locking the stable door after the horse has bolted.

### Perspectives expected of implementation science

- Dealing systemic thing as science even disaster risk is one of
- Implementation process is inevitably dynamic
- Dealing the dynamics of systems
  - Norms of implementation dynamics
  - How should professional scientists approach to the field?
  - Mechanism design to create the desired dynamism
  - Sense-making
- Diversity in academics
- Long-term perspective and commitment
- We do not yet have a manifested scientific view of the above subject.
  - $\rightarrow$  Needs implementation science as a cognitive system for activist scientists
  - $\rightarrow$  Appreciate and Evaluate scientists those who take on tough challenges







First step: Proposing a survey to GADRI members (Year 2021)

To see how GADRI members consider this issue (if there is a need to develop a new evaluation system)
 To see if there is any other existing evaluation system to evaluate social contribution/social implementation/practical work

- To see if it is possible to quantify activities of social contribution/social implementation/practical work

Second step: Analyzing the survey and proposing a new evaluation system to the GADRI Board members (Year 2022)

Third step: Conducting pilot studies by implementing the system in some members (Year 2022)

Final step: Reviewing the pilot studies and develop the system and launch it at the next GADRI Summit in 2023  $$\hfill \begin{tabular}{ll} \label{eq:gamma} \begin{tabular}{ll} \begin{ta$ 

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Way Forward- Role of Academia as the Memory Ke Facilitate the Decision-making processes of Lo Government towards Sustainable Development



Source: Modified from (Mokhtar and Ahmed, 2019).

Dr. Minhaz Farid Ahmed, LESTARI, UKM presented @ 5<sup>th</sup> Global Summit of GADRI, Japan on 1<sup>st</sup> Sept. 2021.

Conflictive positions among scientists community



- Criticizes to Methodologists:
  - No contribution to society, lacking the relevancy to the real society
  - They do nothing but analysis, and lack the attitude of seriously trying to be of use to society (despite receiving salary)
- Criticizes to Activists
  - With the authority of science as a backdrop, they try to impose solutions derived only from within the methodological world in which they specialize.
  - Many papers based on field cases are lacking scientific fundamentals.
  - Reproducibility of success case of a field cannot be guaranteed.

## Hour 19 — 16:00 JST 1<sup>st</sup> September 2021

# Europe with Africa and the Middle-East Exploring Solutions to Bridge the Gaps for Implementation of Science in Action

The Europe, Africa and Middle East time zone session of the conference Explored Solutions to Bridge the Gaps for Implementation of Science in Action. Moving a step forward from the previous sessions, and recognising that DRR is, all encompassing, very complex topic, there are a number of gaps that the research community still need to tackle to bridge or improve the connectivity between different components of DRR. The session discussed the urgent need to implement ideas, solutions and findings in disaster risk reduction (DRR).

The session included two keynotes by two distinguished guests, and followed by four discussion sessions.

The session opened with two keynotes by Dr. Tom De Groeve, Deputy Head of Unit, Disaster Risk Management Unit, European Commission, Joint Research Centre (EC-JRC), Italy on Engaging Sciences with Action: Results from the first five years of the Sendai Framework; and Prof. Nico Elema, Director, PeriPeri U, Stellenbosh University International, South Africa on Exploring solutions to bridge the gaps for implementation of Science in Action. Keynote session was chaired by Prof. Andrew Collins, Northumbria University, UK.

Topics of the discussion sessions included:

- Bridging the Collaboration Gaps : Integrating DRR and CCA for a Science in Action Agenda
- Bridging the knowledge Gaps: Exploring solutions for Transforming Data into Action
- Bridging the Science-Policy Gaps: Contextualising Governance to Explore Opportunities for Action
- Bridging the Generational Gap: Catalysing Science in Action by Youth Engagement

The first discussion panel on bridging the collaboration gaps: collaboration can be thought of in many dimensions and horizontally and vertically and between different tops, etc. Considering the upcoming COP26, this session, in particular, focused the importance of connections between disaster risk reduction and climate change adaptation and the integration between disciplines and different societal spheres.

The second discussion panel was about bridging the knowledge gaps. There are a lot of information and data in the research community and in institutions worldwide. Although the data is collected, this is not put into action. This session focused on useful ways to implement this data and information.

Third session on the science policy gaps; scientific evidence is becoming more and more important now more than before. The session looked at the successes of different global agreements such as the Sendai Framework; and how best science policy actions are put into use in different parts of the of the world.

The fourth discussion session was about bridging the generational gap; a most unique and fascinating session – listening to the voices of the young. The solutions to disaster risks and climate change cannot be solved today, and probably not tomorrow. But in the coming decades. Tor this reason, it is very important to hear from the young researchers and young activists their opinions and suggestions.

This panel presentation and discussion brought in 16 specialists including the Deputy Head, Adaptation Unit, European Directorate General for Climate Action; a Member of Parliament, Scottish Government, Shadow SNP Spokesperson for Environment, Food and Rural Affairs.

The session was closed with a final wrap-up session.

Within the six hours, nearly 150 participants from around the world attended the session.

Organising Committee Members of the Europe, Africa and the Middle East session. All three members are representatives of the Global and European Science and Technology Advisory Group, United Nations Office for Disaster Risk Reduction.



Prof. Jörgen Sparf, Associate Professor in Sociology and a founding member of the Risk and Crisis Research Centre, Mid Sweden University, Sweden



Dr. Tom De Groeve, Deputy Head of Unit, Disaster Risk Management Unit, European Commission, Joint Research Centre (EC-JRC), Italy



Prof. Andrew Collins; Disaster and Development Network, Northumbria University, UK

Dr. Tom De Groeve, Deputy Head, Disaster Risk Management Unit of the European Commission Joint Research Centre (EC JRC), Italy

Dr. Tom De Groeve opened his remarks by stating how the 5<sup>th</sup> Global Summit which was initially planned to be held at the EC JRC, Milan, Italy and it had to be cancelled due the to corona virus global pandemic. With the pandemic, the global science community and academia are brought together opulently to work together as well as within the political sphere and to discuss what is needed to bring science into action.

Based on the recently published IPCC report, the UN Secretary-General called the world climate change situation a code-red for humanity. There are more disasters for the future. In this context, Dr. De Groeve emphasized on opportunity as a force of positivity and the importance to think of the action and the impact that is necessary to the situation. The 2015 Sendai Framework Agenda changed world and how it looked at disaster risk. During the past five-six years, many positive things have taken place, for example, in 2016, the Science and Technology Roadmap was drawn up to support the Sendai Framework and put the priorities of the scientific world in order to achieve the goals of the Sendai Framework. It is about multidisciplinary research, open data, connecting with users, etc. making the science actionable.

Focusing on Europe, Dr. De Groeve shared information on the European Green Deal which is a flagship project for policy and which is trying to achieve climate goals, and attain a sustainable society while balancing the needs of the environment, economy and the people. He continued to stress how the EC JRC works with the European overarching policies on communities, disaster risk reduction and climate change adaption. As an outcome of the Sendai Framework, the Disaster Risk Management Knowledge Center was set up. It is the first knowledge center of the Commission that tries to bring together many stakeholders, many director generals, many scientific units and partners into a coherent group. It is a continuous dialogue to bring science where it is needed and continued to explain how the Knowledge Centre works connecting and improve risk knowledge, risk management and transfer of knowledge to science policy interfaces, and practitioners.

He referred to the new revisions to the European Union Civil Protection Mechanism legislature which added the establishment of a knowledge network to share, learn and tackle the challenges. Two new challenges specifically he focused was on understanding risk management by setting resilience goals collectively among Member States across all sectors; and to develop common scenarios; scenarios as complex as the current COVID crisis as a multi-threat environment multi-sectoral, wnere preparedness can be done. Along this context, he applauded GADRI and other institutions for all the work that has been done during the past years and continued to highlight the efforts by JRC relating to better communicating and managing knowledge, to sharing data openly, to transform science into services which are concrete, and to engage in mission-oriented research.

importance to reach out to the other communities and make sure knowledge is useful and used.

On open data, Dr. De Groeve mentioned their successful project on the global human settlement layer, a long-term effort of their group with many collaborators to bring data on settlements through satellite data. This data has been opened from the start and has been used by many partners to derive messages and to look at all kinds of aspects of disaster risk.

Another example he cited was on risk informed risk suite. It is again, open process with participation from many actors and also the results are open data. Transforming science into services is crucial and here he mentioned the Copernicus Emergency Management service which is a flagship space application program in the European Union where all the satellite data is open as well as the after services on early warning and rapid mapping.

The data is always open to other communities. There are many research projects that contribute to improving those services and they are trying to work closely with organizations through research projects and strive to always keep the system up to date. The service element is important element to bring and make science very actionable.

He finalized his speech with following messages. The political policy framework is there, ready to absorb science with many opportunities. The coming 10 years are very crucial and much is needed to be done. Everyone should go in the same direction and should contribute as much as possible. The Horizon Europe program, the research funding program in Europe, offers grants in this approach to deliver science and to innovate. There are new elements focused on innovation on mission-oriented research, trying to achieve clear goals in the next 7 to 10 years which will make a difference with the research. Open science policy is crucial and is a new approach to partnerships.



He continued to state that it is not only about knowledge production, it is not only about doing a piece of research and leaving it as accomplished. The ultimate goal should be to how it needs to be managed; emphasis is the need to be managed - to deliver it to the audience that can use it. He stressed out on the

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## Hour 20

## — 17:00 JST 1<sup>st</sup> September 2021

### Dr. Nico Elema, Director, Periperi U, Stellenbosh University International, South Africa



Dr. Elema opened his remarks with an observation he has made through all his travels globally is that often people refer to the continent, almost as a single country. It is not the case. Africa is a massive,

massive continent. Considering the relative size of various countries globally, it can very easily fit the United States in the western part of Africa; China within the central and southern part; India within the eastern part of Africa and the whole of Europe is about a third of the continent.

He shared their experiences, challenges and opportunities for the African continent and how to move forward considering diverse comparisons across the continent and the applicability of situations on the work that is done on disaster risk in various parts of Africa and the need to think of it as a homogeneous or on a regional level.

While the IPCC report came out code-red, it is time to accept that the climate change impact will continue to accelerate. In addition, there is the movement of people due to terrorism and refugees and other causes; and of course the impact of COVID-19. It is more severely felt and experienced within the African continent as well as the inequality in terms of vaccinations. According to reports, just over 1% of the African population have been vaccinated. Considering the vastness of the content, that is a challenge yet to be overcome.

Looking at the opportunities, Dr. Elema stressed that it lies within the education sector and youth. Quoting Nelson Mandela, the former President of South Africa "education is the most powerful weapon which you can use to change the world.", he said that the opportunities for Africa lies with the youth population. Almost 60% of the Africa's population is under the age of 25 and that is a resource that will come to maturity within the next 10, 15, 20, 30 odd years and it is necessary to tap into that resource.

He outlined a few of the challenges facing the African continent. Within the Periperi University network, there are 12 universities across the continent. Utulising the power of networking by bringing institutions together with their different capacities and resources, they intend to employ the available capitals to challenge DRR and capacity development. In addition, the institutions focus on various aspects of the Sendai Framework, investing in DRR for resilience, strengthening disaster risk governance, understanding disaster risks but also enhancing disaster preparedness and build back better.

term community outreach. That is one of the spirits of Africa community outreach, which is also strongly highlighted in the Sendai Framework. The communities are involved from inception of activities to every step of the way. It is also important strategically to engage communities. The Peri Peri partners with the African Union, importantly, build capacities and align themselves with the Agenda 2063: the Africa We Want - the Continental vision and Focus, which aligns with the SDG's, and other global goals and work closely with the UNDP, and UNDRR on integrated research for disaster risk, and its strategic labels. It also engages and provides a voice for potential platforms. Their academics have exposures and able to provide input to reports of the Africa Science and Technology Advisory Group F Stag, the Youth Board, (AYAB) as well.

It is necessary to recognize that climate change as a major factor in the future and the need to focus how to build the capacity around it, is a challenge. In addition, there are other challenges, for example, poor risk governance, social and political instability on the continent, economic and development fragility, fragile environments, and now the COVID pandemic which had major impacts. On a local level, many of the economies are very fragile including the global economies, and the need to find ways to navigate within these crisis spaces.

we all know that climate change and we need to adapt, you know, within that, and it's really going to affect the African continent. It's, uh, it's well known that the African continent average temperature has already increased by 1%. So I think it is a code red long ago for the continent. Then we must, you know, address this within alongside climate change action and see how we can respond.

Research priorities, is another area of importance where the African continent needs improvement. It is essential to raise the capacities and capabilities of research including locally relevant research within the continent, and to address these issues locally and regionally. Then policy relevant research - while most research does not contribute to informing national DRR and in climate change policies and planning, there is a responsibility within the research community as well to be aware and to align themselves and undertake research. And it need to translate the findings into citizen and decisions makers language.

Scientists and researchers are aware of the fact that the policy makers do not use their language. The awareness exists and it need further work. The science community have to constantly work to make science communication become very relevant.

There is research that speaks about productive interactions and not just at the end part when the research outputs are produced, but throughout the research process they need to involve policymakers, and various stakeholders. At the end of the day, the uptake is a lot easier and a lot better. The answer lies not in individual institutions, but through networks and these institutions bringing their strengths within initiatives across the continent.

IRDRICOE Risk Educatio

From an African perspective, the capacity to network and to use various dimensions of academic programmes available within institutions, has helped these institutions to build their programs to academic levels and be able to deliver training and short courses through capacity development. Due to COVID, the daunting prospect of online courses has become more feasible and a way of communication. Now, many of the courses are translated to online short courses. Perhaps, in the future, they may move to hybrid courses to improve interaction and to integrate disaster risk research as well.

There still remains other challenges to build research capacities for these institutions and for the need to maintain sustainable long-

3.	IMPLEMENTING THE AGENDA/SCIENCE IN ACTIONS	78. T
	Concern is that most research does not contribute towards informing national DRR or Climate	
	Change Adaptation (CCA) policy or planning	
	<ul> <li>Combat this through:</li> </ul>	
	Scientists and researchers need to translate their findings into citizen and decision makers	
	language	
	Scientists and researchers should be engaged with policy makers concerning with the	
	implementation of science findings into practice	
	increased support for developing capacity among locally based research and training	
	institutions to enhance expertise and human capital among DRR and CCA fields	

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## Hour 21

## — 18:00 JST 1<sup>st</sup> September 2021

### Discussion Panel Session I: Bridging the Collaboration Gaps : Integrating DRR and CCA for a Science in Action Agenda

Chair: Prof. Andrew Collins, Leader, Disaster and Development Network, Northumbria University, UK

The session focussed on the collaboration gaps and specifically dedicating the session to the integration between disaster risk reduction and climate change adaptation. It will discuss bridging the collaboration gaps, and integrating DRR and climate change adaptation. Putting those two things together, DRR and climate change adaptation can be seen as one example of where collaboration is clearly in demand and many would see these two was part of the same agenda. But in what way can we see bringing together climate change adaptation, change citation and disaster risk reduction?

# Liviu Stirbat, Deputy Head, Adaptation Unit, European Directorate General for Climate Action



Presentation by Dr. Liviu Stirbat highlighted some of the important components on the recently adopted EU strategy on adaptation to climate change. He gave an overview of the European Green Deal and how climate

change adaptation is integrated to all facets of society and how disaster risk management and disaster risk reduction has been one of the main directives and vectors of orientation when they designed the strategy and the Green Deal.

The European Green Deal, is the European climate law which came in to a legislative action in July 2021, which sets as a legally binding objective, climate neutrality for the European Union by 2050. It is also the first ever piece of legislation that sets binding objectives on adaptation as well and have made a lot of progress. It is the vision that by 2050 the EU will be a climate resilient society, and fully adapted to the unavoidable impacts of climate change.

But climate adaptation and the disaster management components are also in the EU biodiversity strategy, in the agricultural strategy, and also in the forest strategy. They were also adopted back in July 2021 as well as in sustainable finance. It goes beyond the usual collaboration between climate interpretation and disaster risk reduction and disaster risk research that happens in the research world.

A brief overview of the mechanisms of the adaptation strategy which are relevant to the bridges and the gaps to fill on the topic was given as well. The objective is to make adaptations smarter seeking to improve knowledge, but also to manage uncertainty by pushing the frontiers of knowledge on adaptation. It is a continuation of what the European Union has already been doing for quite a while, funding a lot of research into adaptation in conjunction with Disaster Risk Reduction. Several of the EU funded projects are setting standards at global levels and also trying to increase the quality and quantity of risk and lost data, and this extends beyond just a climate related event. But to disasters in general to allow for example, policymakers to make better informed decisions, to allow companies to better protect themselves better but also individuals. For example, when one buys a home, they should be able to not only have access to the past disaster data of that particular property, but also future accurate forecasts of what the property is scheduled to withstand. And also bringing all of this on climate adapt, which is the EU somehow flagship platform for knowledge which already exists, but are trying to make it even more useful and more connected. The

4th objective of the EU strategy is to speed up adaptation. They are also seeking to make adaptation more systemic, where the gaps exist. He shared information on their initiatives to increase international resilience and preparedness, but also to scale up finance and to foster exchanges on a global scale on adaptation so that all are able to learn from each other.

Adaptation is very relevant because this is where innovation comes into play and shared information on what they do on innovation in adaptation and disaster management.

They seek to accelerate the rollout of Adaptation Solutions. The Horizon Europe mission on adaptation to climate change, including societal transformation, flagship on research and innovation, will seek to reduce climate related risks. There are guidance for the public and the private sector on how to climate proof their infrastructure, for instance, to make sure that the infrastructure that is going to be there for at least half a decade is able not only to withstand the temperatures of tomorrow and the weather of today, but the climate of tomorrow.

On the protection gap, they work with insurers and not just on adaptation but also in disaster based management. In general to increase the penetration of insurance solutions in the European market, and to increase modelling to look at innovative solutions like parametric insurance or even the insurance of nature based solutions.

He closed his presentation with the flagship initiative, Horizon Europe, which is the European Union's funding mechanism for research and innovation. Five of these flagships have been identified. Four of them are related to climate action. The Green Deal is the one on adaptation to climate change. It has been designed as a big influx of funding resources, communications around adaptation with very clear numerical objectives that will be reachable within 10 years. They are supposed to be ambitious but feasible as well. It will start mostly as a collaboration inside the European Union. The goal is once tested, it will roll out globally. Partners will be invited to join. It will be started at the EU level with a global blanket

awareness increase in terms of the risks that EU will face and continue to helping communities to build pathways towards a

sustainable

adaptation.



For climate resilience, by

- Increasing support for international climate resilience and preparedness
- Scaling up international finance to build climate resilience
- Strengthen global engagement and exchanges on adaptation



14-3

Deidre Brock, Member of Parliament, Scottish Government, Shadow SNP Spokesperson for Environment, Food and Rural Affairs, Scotland



The Member of Parliament, Dr. Deidre Brock focused her presentation on actions taken by Scotland to tackle the twin crises of climate change and ecological decline.

In her presentation, Dr. Brock gave a

detailed and informative presentation on manging climate crisis which has been in the forefront of efforts by Scotland, and how they have set challenging targets to cut emissions, develop renewable power and funding schemes to increase energy efficiency in homes.

On the COP 26 to take place in Glasgow, Scotland in November 2021 she stated, is a critical moment for the world to deliver its most ambitious and tangible climate actions. The opportunity paves the way to Scotland to assist with shaping the narrative on climate change; and to show the world the work they are undertaking to manage the climate emergency.

Scotland is working closely with the UK Government and many other partners to deliver a safe, secure and successful Glasgow COP and strive to engage in particular with those who have been historically side lined in climate discussions and to ensure those most affected by the climate crisis, have their voices heard, young people, indigenous communities and disadvantaged groups. The indigenous communities are often those most affected by the activities that contribute to climate change, such as deforestation, and are more likely to live in the areas hardest hit. Young people are those who will have to live longest with the consequences of climate change and those from disadvantaged communities are less able to afford mitigation of its consequences. The Spanish Government sought to include the voices of young people at COP through their youth climate program. A series of events putting young people from around Scotland at the heart of the climate conversation and have recruited local champions from every local authority in Scotland to connect their communities in the fight against climate change. The Scottish government has also created the world's first climate justice Fund, which supports vulnerable communities in Malawi, Zambia and Rwanda to address the impact of climate change.

In closing, she stated that they look forward to COP with hope knowing just how important its outcomes will be to the country, the planet, and future generations. Collaboration between all the countries of the world is more crucial than ever before, and they really look forward to seeing the important work of GADRI Summit, helping to create the necessary pressure at COP to stimulate the urgent changes to government policy this climate crisis deserves.

### Desmond Manatsa, Africa Alliance of Disaster Research Institutes, Bindura University of Science, Zimbabwe



Prof. Manatsa's presentation focused on DRR and efforts to cope up with climate change in southern Africa. He stated that as far as the DRR and climate change adaptation are concerned, they are adhering to

adopting a more integrated approach to the issues. However, he highlighted, that they notice that there is no coordination and communication between adaptations disaster risk management within the communities, which includes institutional frameworks, political processes, funding mechanisms, information exchange. Further, practitioner communities have developed independently and remain largely separate to debts and there is no evidence of systematic integration of disaster risk management and climate change adaptation.

Projects related to climate change and disaster risk reduction operate in silos and independently of each other. This is mostly some international policy processes on climate change and DRR, in particular, discussions in negotiations under the UNFCCC despite the relevance and importance of DRR to adaptation agreements strategies and approaches.

As a result, key donors, and institutions, are struggling to ensure good communication and collaboration between their own disaster management in climate change departments and units affecting their ability to influence the common processes between the DRR and climate change. Therefore, they recommend that DRR must be a component of adaptation to sustainable approaches if sustainable approaches are to be achieved. By realizing that adaptation and DRR have similar names in terms of seeking to build resilience in the face of a climate change hazards, they should focus on both reducing peoples vulnerability hazards, and improving methods to anticipate, resist, cope with and recover from the impact. In so doing, climate change adaptation should focus on climate related hazards such as floods, droughts, and storms. Both adaptation and DRR assistance, as they both build resilience in hazards in the context of sustainable development, climate change adaptation requires to reshaping and designing development and connect practices to respond effectively to new, unscripted environmental changes. Likewise, DRR seeks to influence development decision making and protects development aspirations from environmental related risk effectiveness of both adaptations are limited if they are not viewed within the broader context of sustainable development

because climate change is, housed in a climate change government department and the disaster risk reduction is within the civil protection units. Therefore, to find the common ground for those two, is very difficult when they are being coordinated from different government agencies. For example, government department responsible for increasing resilience and DRR in some cases, are way over ability to extreme climate events, but they have no means of coordination. This leads to the development of parallel efforts in all areas. This lack of coordination is evident in

#### Sarah Webb, UK Research and Innovation



UKRI is one of the major funders of research and innovation and fund various collaborative interdisciplinary research programmes. Dr. Webb continued to state that DRR is a critical component in help

globally handle climate change issues and adapting and becoming more resilient to climate change in the run up to COP26 in Glasgow in November 2021.

UKRI as main research fund in the UK is also one of the main partners of the COP26. They contribute and facilitate to sustainable and inclusive climate adaptation and resilience. UKRI aims to demonstrate local leadership for the global good. Through Prof. Mark Pelling and IPCC, they have formed four core questions to bring coherence to the workshops. The collaboration gaps that needs to be addressed, and there is a need to bring evidence-based decision making into policy development. There is also a need to link disaster risk reduction with climate change adaptation and to link the disciplines, social sciences, engineering and innovation together for innovative solutions. This should be done in an action-oriented way which adapts from the national, to the regional, to the local.

First question, what research is needed to respond to the adaptation gap? - looks at the differences between the current adaptation actions and those needed to avoid, and the wellbeing in the future. One of the things that is clear from what UKRI done so far is there is not a single solution that will work for everyone, and not all are starting from the same place. Tackling climate change needs a bigger systems approach, and connect research globally, building trusted relationships and learning from each other.

Next question is around how to evaluate the feasibility of adaptation options and outcomes for resilient sustainable development and making sure that everyone knows what they are doing is possible and is actually the best thing to do. While there are very many overarching high-level common approaches to this, it needs a local adaptation and a local scale. Adaptation options must be codesigned with the end user at all scales and the feasibility and evaluation is required all the way through so that people do not actually create an extra burden on other people when doing this. It needs to be built in from the start from any research; and codesigned alongside all the participants so that the knowledge and experience; and local communities are actually built in not marginalized.

Question three is around examples of the transformative adaptation research, enabling action through addressing issues such as social justice, capability, and governance. And there are various examples from this. Prof. Mark Pelling will be covering some of this.

The last question is for UKRI - how can research funders, universities and data managers best champion inclusive, urgent and solution orientated adaptation research? And this is actually making us rethink our actual roles and is actually the topic of the next discussion panel.

UKRI is trying to build new partnerships while trying to maintain existing partnerships and making science actionable; and looking to provide evidence that can be used by policymakers both in the UK and globally. The core questions set aligned with the UK's COP ambitions will feed into various initiatives and developments. As Dr. Nico Elema said, working with networking is actually key to our success and we look forward to contributions from the GADRI community.

#### Mark Pelling - UK Research and Innovation



Prof. Pelling continued on the lessons learned from the Global Challenges Research Fund and GCRF principles which reflect the ambition of other initiatives going forward particularly, the Adaptation Research Alliance. These

focuses around research excellence and twining that also with solutions focused and equitable partnerships as the core way of developing capacity and deploying research. Responding in some way to Professor Manatsa's comment around the difficulty with which research is able to enable facilitate policymakers to do different things, and sometimes even make difficult decisions, science, then, according to the GCRF principles is not just about generating knowledge, but is about facilitating new partnerships. That means equity in partnerships, which is really difficult thing to do. That is one of the key lessons. There is considerable appetite opportunity for people-centred research on climate change risk. Very often climate change risk is driven by climate modelling, which sets the context within social research. This program asks the question that climate change risk can perhaps also be driven by social questions, by vulnerability, by capacity to adapt.

The second is a program called Multi Hazard and Systemic Risk. This really encourage researchers in their policy practice partners to place climate change risk in the context of other risks. There are many other projects placing climate change risk in the context of other natural hazards, i.e. geophysical hazards. But what they have really encouraged them to do is to move beyond the geophysical and the climate into other sources of harm and risk, particularly for low income and marginalized individuals and groups. And, of course, COVID is a prime example of that, where many of the lessons of building resilience to natural hazards including the climate change can also prepare the way for other unexpected shocks.

for equitable partnerships, and indeed new ways of working have really blossomed in the last five years. The management of partnerships cannot be taken for granted.

Resolving the climate crisis through the lens of social justice is perhaps not just about engaging with the existing set of stakeholders and their existing relationships, but provoking new conversations. Perhaps elevating the voices of those who might otherwise be marginalized in these policy conversations. Science is a key language to enable that conversation.

He shared information on two global challenges research fund programs. First programme is Equitable Resilience. It provides an In terms of climate change, it takes into what is called climate development resilient pathways. As a final comment he stated that there is recognition, that disaster risk reduction and its emphasis on development, its emphasis on bringing together vulnerability and hazard, does provide a resource of capacity and science and associated policy to give substance to climate resilient development pathways, which looks set to be a core agenda coming out of the IPCC and COP26. The ambition is to do everything, to bring together adaptation, mitigation, and social justice. But certainly, on disaster risk reduction, the GADRI community has been championing that for some time and it is well recognized.

# Hour 22 — 19:00 JST 1<sup>st</sup> September 2021

Discussion Panel Session II: Bridging the knowledge Gaps: Exploring solutions for Transforming Data into Action Chair: Dr. Tom De Groeve, Deputy Head of Unit, Disaster Risk Management Unit, European Commission, Joint Research Centre (EC-JRC), Italy

This session explored the 2021 new initiatives by the EU especially the launch of the Union Civil Protection Mechanism: A Knowledge Network. The Knowledge Network is thought up as a solution for pooling knowledge, expertise and experience across Participating States, as well as a place for debate on knowledge gaps and foresight for future disaster risk management. A further aspect of the session was to consider how communication and

media development enables the bridging of knowledge gaps through a whole of society objective, influencing social and behavioural change to enable disaster risk reduction. What are the keys to more comprehensive bridging of knowledge gaps through activating data and information for utilized knowledge? How might GADRI institutions use their disaster research data processes to have more impact in disaster risk reduction?

# EC-JRC: Science Pillar of the Knowledge Network by Dr. Marzia Santini



Dr. Marzia Santini discussed about the Disaster Risk Management Knowledge Centre of JRC which has been designated to be the leading entity for the science pillar of

the Union City Protection Knowledge Network.

Starting from the JRC Mission to be the providers of up-to-date, robust and high-quality scientific facts to back the European Union policies, Dr. Santini shared information on how they strive to be on top of things from policy areas at different stages of the policy cycle, and all the way from the agenda setting to the evaluation of the policies.

One of the first challenges, she stated, is to make sense of the vast amount of knowledge that is available in the world. There are hundreds and thousands of different sources from different sides and stakeholders and there is a need to be able to recognize the relevant information to filter them to validate, extract and distil the messages that are important for the decision makers to draft their policy agendas and implement them. What is self-evident for the scientific community is very often not such for the policy makers. For example, a scientific result that is self-explanatory for scientific community, needs to be translated into a language understandable by the policymakers. That has been the mandate of the Knowledge Centre of the Joint Research Centre for some time now, and they have excelled in it. The Disaster Risk Management Knowledge Centre is connected to the Union City Protection Mechanism to enable the Member States of the European Union to better cooperate among each other from cases of disaster to emergency response to prevention.

In order to reply to the global agreements on climate change and

collaborate with twelve different directory generals of the European Commission with periodical meeting to exchange on tools, methodologies and approaches, and to try to coordinate their perspectives on policies. They aim to serve not only the European Commission, but of course, the Member States, the participating States and the larger communities beyond the European Commission and the European Union.

She shared information of flagship reports on science for DRM. The latest one published in 2020, is a product in which they try to periodically evaluate the state-of-the-art of the knowledge in DRM, gaps with a multidisciplinary and multi-risk approach and tackle all the different phases of the integrated disaster risk management cycle.

In 2019, the Commission decided to establish the Union Civil Protection Knowledge Networks. They intend to reinforce the maintenance and building of the knowledge base. They will facilitate it with a networking approach to identify innovative solutions among the Member States and beyond it so that it will be an open platform where everyone is welcome to participate. There will be two different pillars: one for capacity development work for science; and the other for the science pillars. The Disaster Risk Management Centre as the leading entity, will be collecting and engaging with all existing networks and institutions inside and outside the EU to make it a scientific pillar as useful as possible for the decision makers. The integration of the Union Civil Protection Knowledge Network will include the national risk assessment recommendations, dataset explorers, risks and urban supports. In the second stage, they will step towards the future and will aim to launch new activities and establish new partnership to expand the science that would build a new face of this engagement with the Member States, with the different countries and also with their respective scientific communities.



the development of the sustainable development goals, it was deemed necessary to integrate the challenges and responses. Realising that there is an increased need for the systematic reviews of the knowledge, they have decided to increase and invest the effort for knowledge management. With examples of the Disaster Risk Management Knowledge Centre, various other knowledge centres were launched.

With the Union Disaster Resilience Course, they work on society resilience to the impacts of mega events such as COVID-19 pandemic. The Commission is also interested in identifying transboundary scenarios possibly with cascading effects, to exercise and plan against them. In addition, they closely

### Existing and foreseen activities/deliverables



JRC: Science Pillar of the Knowledge Network—Union Civil Protection Knowledge Network, UCPKN

### Dr. Zuzana Stanton-Geddes, The World Bank



Presentation by Dr. Zuzana Stanton-Geddes was on a collaborative effort between the European Commission, and the World Bank to explore ways to transform data into action

through the lens of recent analytics. It had contributions from many individual experts from research institutes and universities. The starting points and the main issues managed are investments in prevention and preparedness which are still much lower than the expenditures of post-disaster. She stated that this has to do with insufficient data, about disaster and climate risks and the impacts, but also limited information about costs and benefits in investing in prevention.

The work has also noticed that there is lack of linkages between the different aspects of disaster resilience, finance and investments; and the capacity. These elements were address in their study by analysing and comparing disaster risk within EU Member States.

She shared information on how they were able to give a better understanding of disaster and climate risks with the catastrophic modelling. The results generated were pitted again countries to find out what they have in place to protect themselves from financial impacts of disaster. They found that some countries use emergency reserves, where they might have contingent credit in place, or they rely on insurance mechanisms to be able to protect themselves from such impacts.

The analysis focused only on two hazards and there are many gaps in terms of the availability of data. It was noted that finance alone cannot solve all the challenges posed by disasters and climate change.

The second part on investment for which they have used the reports from the National Institute of Building Sciences, which has communicated the kind of benefits and costs of certain risk mitigation measures which they were aiming for in their study. By adopting the triple dividend of resilience, a methodology which was developed by the World Bank and the Overseas Development Institute, which considers avoided losses, which is quite traditional but also tries to look at unlocking economic potential and various core benefits.

The report also highlighted that smart investments that link disaster and climate change, can bring in substantial benefits. Some case studies and examples showed where and how countries really made efforts and taken actions in prevention and preparedness, and these included green measures, nature-based

### Ms. Lisa Robinson, BBC Media Action

The presentation by Ms. Lisa Robinson started

solutions, and early warning systems. It also highlighted, certain gaps, and steps that can be taken up by future action and research. Again, investment and data, especially for hazards, there is a need to apply this knowledge against actual investments that maximize core benefits and to learn from the implementation and gather information about the impacts on the core benefits as the available information quite standard and very much underestimated.

The third part of the study on capacity covered discussions with a range of civil protection representatives to understand their challenges, and their needs. Information was gathered about financial resources, limits or challenges for cross sectoral coordination; and these mainly highlighted the existing technical capacity gaps. Although these representatives wish to use risk assessments, they do not know how to include it into their work, planning for emergency preparedness or planning for risk reduction. In local levels, they lack capacity to continuously

update it, and knowledge on how to use new tools.

She reiterated throughout her presentation that there are many gaps and much needs to be done to continuously invest and to be able to provide sound



policy advice. The EU is a data rich region in comparison to others. However, there are still gaps, whether it has to do with the catastrophic modelling or even obtaining information about insurance penetration across EU Member States which is actually very hard to do. Related to this is also economic benefits and costs, and applied research is really critical for certain hazards and for certain core benefits to be able to capture. For example, they have looked at 74 case studies, and that is only a third of the case studies they looked at and identified many gaps. She stated that there is a huge opportunity to have a better framework or a knowledge network to track and evaluate a different kind of disaster investments and also be able to gather this kind of information in an open and transparent manner.

Finally, in the context of COVID-19, she said she believes resilient recovery is a great opportunity to promote both research and action for disaster resilience. Disaster risk management has been put in the spotlight and at least within the EU, they know that substantial resources will be available and therefore there are opportunities for all of them. Just as their study was a collaboration between different stakeholders, she underlined that only through collaboration that data can be transform into action.

That also means that everyone is an actor in this communication, in both talking about it, understanding it, and making sense of it to themselves, and in their own world. When thinking about knowledge, it is important to remember that what we might call audiences or general populations have their own knowledge and that knowledge itself is really important although it is often overlooked.



with the question: What do you think risk communication is? How would you describe it or how would you define it?

With the answers received from the audience, she stated, that it is about imparting information, sharing knowledge, telling people about risk, and helping them understand it. But way back in 1989, the National Research Council gave a definition - they described it as an interactive process of exchange of information and opinions among individuals, groups and institutions. Earlier in the previous session, Prof. Mark Pelling mentioned the word "conversation" and the idea is that risk communication is something that is ongoing, it is dynamic, and it involves everyone.

On the role of media and communication, and in the exchange amongst different actors, it is important to remember also that there is a very dynamic network in which everybody participates. People often thinks of media as where one picks up the phone, talk to somebody at the news station and hopefully they will broadcast the message. It does not quite work that way. There are a lot of factors, not only the one who controls the media, the major channels, but also who is participating in that media. In terms of social media, COVID has shown lots of false and misleading information, but that is not unique to COVID or even to social media. That happens when nobody at all is involved. It is the same with risk communication that complicates the situation.

There are also issues depending on with whom the messages are related to, which groups or communities; and the access to information, access to channels or platforms to be able to not just receive information, but to share back, talk back to whoever sharing that information. There are communities who may not have access to mobile phones and media or do not have the time or the ability or the resources to develop digital literacy, and not able to distinguish between the credibility of certain sources or information.

On the production side, one also need to consider the skills and the capacity of different media stations and different technical experts to be able to communicate about risk effectively. If there is a local media station who can barely pay their reporters, chances are, they do not have extra funding to really give them, or skill them up and help them understand the complexities of risk or even pair them up with the technical experts who do have that information. On the other side, those technical experts, with high level communication skills, are needed to match up with the people in the media side as well; to come together to be able to communicate in risk in a way that is interesting, relevant, and engaging; to get the message through so that it really resonates with the audience on the other side; and also to be able to prompt some of that open discussion and sometimes very heated topics and to manage those conversations well. Then to process the conversations that come out and take those towards really productive decision making.

Decision making around risk happens at so many different levels, political and policy levels, community levels, household and individual levels. In order to communicate risk more effectively, it is necessary to seek ways of collaborating in novel ways, across boundaries, across professional boundaries and scientists, media, policymakers, ordinary people, and need to find ways to communicate better amongst themselves and to communicate better with wider audiences.

She closed with an example of work they have done in East Africa. In this case, the dynamics between journalists and meteorological officers were not working and they avoided each other. The Met officers felt the journalists were not representing weather correctly. Journalists thought the scientists were looking down on them. They went through a long process of practical exercises building those relationships. A lot of times, it is about making those connections across boundaries long before one has to deal with an urgent crisis. The met officers and the journalists have for several years made radio programs together to communicate to farmers and fishermen in East Africa. Through the practical exercises, they found a way to communicate in a much more practical and engaging way. The audiences noticed the difference as well and their ratings for those radio programs

were much higher than anything they have done before. Taking inspiration from them, she stated, that we all need to push through those challenges that we already know exists; and find



ways to establish relationships, build collaborations, and just try to work a bit better together to communicate risk more effectively.

#### A few examples from the Q&A session:

**Chair:** Communication is a challenge for all of us, no matter where we are, whether we deal with policy or with economic actors or with citizens, etc. In the case of Joint Research Centre this is very true and has become an increasingly important aspect. They should not just be scientists, but also should be knowledge managers. Communication is seen as a strategic responsibility for the Joint Research Centre, to be more responsible in this area to bring the messages where they should be and to have more impact than more change. Whether you take a similar view on communication whether you feel it as a part of your responsibility from your institutes to communicate to the general public?

The role of open data: open data is being championed by the Bank for a very long time and the GFDRR program and etc Open data has been very important also in the European Commission, and open data is the default way of doing things. In Horizon Europe it will be about open science, and open data. Are there any specific remarks on the role of open data, the need for open data and why this is so important. principles of the open DRI is also that the data needs to be locally owned, locally generated. That is a huge undertaking and really important to connect. As Marzia and Lisa were saying, there are different holders of knowledge and they need to be involved. Today, if we think about what is the knowledge repository, it is not just the library or online catalogue of reports, it is everything possible. It includes those local communities and even their traditions. We need to think broader. It is a very important initiative. And the Bank supports it.

**Chair:** lately we use the acronym FAIR also for this. It is the kind of open data that has been around for awhile, but lately it is really this FAIR, findable, accessible, interoperable, and reusable – four keywords that are good. They do not mean the data has to be centrally available, it's just data is good if it is findable, accessible, interoperable and reusable. The FAIR principles are being rolled out also through all our work and hopefully other research institutes will follow the same FAIR principles. Zuzanna, you mentioned the central repository is not the way to perhaps collect knowledge.

### Answers:

**Zuzanna** - the bank promotes free access to development data and a big part of it is also initiated or supported by the Global Facility for Disaster Reduction and Recovery, which is called open DRI - open data for resilience. It is a collaborative effort or call for a cooperative effort to collect, to analyse, and to share data. There are several tools. There is also certain capacity building with training videos and other elements. The bottom line is the recommendation that data should be as open as possible. It should be transparent in the sense what it contains, and what it does not contain, and how it can be used. One of the key Marzia how are we in the knowledge center managing this knowledge. So how is this done? What about the risk data hub for instance?

**Marzia:** - First of all, all our platforms and services are of course making available all the data that we use. We are not actually storing all the data that we use from the multiple sources in our servers. We simply connect to them and this is probably the way to go. For example, having web services where you can visualize and also analyse and play with data. Even if they are not centrally located in the framework of the Union Civil Protection Knowledge Network, we hope that all the different countries and respective

The point is that the data should open as long as they are your data. Yet, this is very often the problem and this we hope to go beyond this with the knowledge network science



pillar and make really a collaborative environment where there are platforms that are online and can allow people to analyse and compare data from multiple sources, even if they are located in different places, physically.

**Prof. Charles Scawthorn**—Number of years ago we founded an organization called Agora the Alliance for Global Open Risk Analysis, and it was not very successful. One of the reasons was that we found there were many obstacles to open risk analysis, particularly open data. There were very few incentives for people to make their data open. Now that the world has evolved to some extent, sponsors are encouraging open data. For people who are paying for the data or encouraging it, and that is not a definite improvement.

One of GADRI's initiatives is to foster and try to create open databases, but there are still obstacles. Many of the countries, for example generate data, but do not make it open. In the US, all data that is generated by the federal government is, by definition, public domain which means it is not even owned by the government, it is public domain. But the states in the United States will still control their data and do not make it open.

**Chair:** – It is not a simple and easy task. Otherwise, it would have been done already so many times. But just to say one thing following that, is that the funders have a big influence and I think in the European context, for instance, a new program Horizon Europe will really make an effort. There will be so much new risk analysis done under this program that is funded now at a local

level, at regional level, and all with an incentive to make the data open and available where it is appropriate. Hopefully, through these initiatives and bigger awareness that open data actually has an added value, we will be able to generate more and make it available to many others and also cross sectors..

Charles - The only other point I was coming up with was how to incentivize. In the academic world, the publish or perish is the main incentive. If it has been mooted to try and elevate publication of data to the same level as publication of peer reviewed journals, but that really does not seem to be much of an incentive. We need to look for new incentives for opening the data. Money is an incentive and the sponsors are very powerful in this regard.

**Chair:**– The last comment from Lisa on the role GADRI. What would you recommend all the institutes to do on communication and do it strategically or ad hoc or collaborate, any recommendations from your side to be most impactful?

Lisa: – Although I cannot make a recommendation for all the institutes, but what I thought is that if you and your institute do not communicate, someone else will. Someone else will fill that vacuum with the technical information that perhaps you may or may not agree with. Think carefully about your own communication strategies and who will communicate in your absence. And is that a really credible source that you would be happy with communicating in your absence? Or would you really

like to step into that ring and sure that the really valuable data and information that you have can be shared more widely and can be put towards better use. make

If you and your institute do not communicate, someone else will.

### Hour 23

## — 20:00 JST 1<sup>st</sup> September 2021

### Discussion Panel Session III: Bridging the Science-Policy Gaps: Contextualising Governance to Explore Opportunities for Action

### Chair: Prof. Jörgen Sparf

The session will discuss the science policy gap: there has been an increase of the use of those terms science, evidence, research, in some of the major and global agreements. For instance, the Sendai Framework has a lot more of mentioning these things compared to the Hyogo framework. It is a sign of science becoming even more and more important than policy. At the same time, scientific evidence is great because it is conveying an impression of precision and prediction and control. At the same time, scientific evidence can be misinterpreted or tweaked in a lot of different ways. Depending on the context it is being used, it may have very different outcomes. These are some of the topics that will be touch upon in this session with short presentations by three distinguished guests.

### David Alexander, University College London, UK



Prof. Alexander presented on the nature and the use or the lack of use of evidence. He started with a diagram, which had its origins back in the 1930s. He stated that the question is not so much how basic facts

and statistics data are transformed into information, or indeed so much about how the information is interpreted in order to generate understanding. It is really a question of the upper part of the pyramid. How do we then derive action from the knowledge that is available, that we can either utilize or not utilize according to the cases? Looking at disaster risk reduction in the face fairly and squarely, the fact is that relatively few decisions are made on the basis of evidence and research. It is hoped that they are the key decisions and that there will be increasing use of evidence from research although it is not always easy to use. It is a time when disasters are increasingly common and they cannot be ignored. Unfortunately, it is done with a worldwide relief system and national relief systems that are extremely inefficient at a somewhat in crisis because of the increase in the scope, the range, the impact, the seriousness of the frequency of disasters. There is a need for better use of information, better use of evidence and in fact to a much more seriously, facing up to the problems caused by disaster.



One of the problems is "corruption" – there is evidence and clerical work done on it and even it is one of the principle causes of disaster. That does not bode well for the use of evidence. It is

nevertheless naïve to suppose that all we have to do is provide evidence, and governments and decision makers hungering for it will use it. It is naïve to suppose that all decisions will be based upon evidence. All the policy will be formulated necessarily on the basis of the best available evidence. It is also naïve to suppose that evidence necessarily matters, even if it is incontrovertible.

But what is evidence? It is a rather difficult concept. It can indeed be precise and decisive, although rarely so. More frequently it is equivocal. Just imagine the equivalencies that arose in trying to interpret COVID-19 about which we knew very little when it first arrived and had to learn as we went through it. There was therefore a huge degree of ambiguity in the evidence over COVID. It was much discussed and it led to much puzzlement.

There are indeed cases where evidence is simply uninterpretable, and that begs the question of what is it evidence and what does it mean? But there are frequently cases, and they are easy to identify around the world in some instances of evidence being ignored, distorted, or used selectively.

Now evidence is always used selectively. However, the question is exactly how is it used selectively and what are the criteria for selectivity. Most evidence is not proof. Some is, but that is relatively rare. It therefore points the direction, but it does not incontrovertibly say that things are as they seem to be. That means that it has to have an interpretation of evidence. It does not demonstrate itself mostly exactly what it is and it has to be able to interpret evidence in a way that does not mislead people. That leads us into a very difficult domain, which is exactly what is truth and exactly what do people think truth is.

Evidence can constrain uncertainty, and almost in all cases it cannot eradicate it. Anyone with a background in science knows that. In fact, in science, instead of searching for some revealed universal truth, it is very often a controversial process where there are viewpoints and opinions perhaps can contrast. Once again, all use of evidence is selective.

The question is which criteria is used in order to select the evidence that then may justify the decisions with. This is particularly difficult for irregular and trending time series. In other words, situations looking to the past to project it into the future, to

Mr. Dzhergalbek Ukashev, Director, Center for Emergency Situations and Disaster Risk Reduction. Kazakhstan

say what will happen next, which is very often done with the magnitude, frequency, return period issues associated with natural hazards. Among problems, there might also be that the past is not a guide to the future. That is particularly true with some of the three main hazards that threaten us in the future. One of those is climate change. One is instability and migration, and the other is the failure of technology. In no such cases is the evidence incontrovertible about what is likely to happen. There are some guestions associated with this.

One is to what extent is evidence the surrogate from actual practical experience. In other words, evidence is probably based upon someone else's experience, but does that allow it to be transmitted to get through to those who have not experienced? Whatever the phenomenon is, but have to make decisions about it.

Is evidence objective, or is it merely yet another perception of how the world is? And that also begs the opposite question of to what extent can we make decisions without the evidence? And are they likely to be reliable decisions if we do so?

In the modern world with the growth of information technology, there is an objective, measurable reality, and there are various, perhaps many perceived realities. But because the perceived realities give rise to actions, there is manufactured reality based upon those actions and the opinions that are behind them. In fact, we not merely have to deal with the objective reality, but with what people think is reality, and that is proving to be an enormous problem with social media.

He continued to that we live in a world that is characterized by turmoil, characterized by dynamic change and moving forward into domains that we hardly know. We are having to deal with that manufactured reality and that objective reality, and that perceived reality. Somehow meld all of these together in a way that we can interpret the evidence. What we have to avoid is all of this leading towards anomie and nihilism. In other words, to a situation where there is a breakdown of standards and values which then leads to a completely ungovernable state of affairs, where evidence becomes irrelevant, because there simply is not enough governance to put it into the context that we need to do so. So that is really the challenge of what we have got to fight against.

As a last point, he stated that in a time of the dominance of perception over objectivity, which is what we see as we struggle to understand how to get to grips with the challenges posed by modern media, we have to accept the fact that there are different realities and somehow out of that we have to be able to draw the evidence and utilize it in a rational way and to support rationality. But what we cannot do is to do that by putting our heads in the sand.

heads of emergency authorities in Central Asia. It also has a delegated regional resource on monitoring and implementation of Sendai Framework which is in Central Asia and South Kazakh region. Within the five states, Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan and Kyrgyzstan, they have implemented several strategies to work with and the coping capacity index or risk scale are quire different. Kyrgystan and Tajikistan are based in high mountainous areas and Kazakhstan, Uzbekistan and Turkmenistan are more in plane terrain. In the sub-national risk index for 2021 which is averaged value for all Central Asian countries but Kyrgystan and Tajikistan which are high mountains area had a higher risk. Main risks of hazards that are happening in the region has the biggest share in earthquakes, floods and landslides.

Interpreted by Mr. Temur KHUJANAZAROV, PhD Student, DPRI, Kyoto University





The presentation by Mr. Ukashev, Director, Center for Emergency Situations and Disaster Risk Reduction in Kazakhstan was in Russian and was kindly translated by Mr.

Temur Khujanazarov. The Center for Emergency Situations and Disaster Risk Reduction which has a permanent state status as an interstate body, is also an international organization. It is a member of regional forums and In a context of current political and governmental decisions on bridging science and policy gaps today, he stated that there are political will and commitment to improve disaster risk management. In addition, there are additional institutional capacity and regulatory frameworks and governmental programs that are taking on in action to use achievements of science and technology in technical programs and projects to be implemented.

He stated that they support the global frameworks, for example Sendai Framework, in terms of bringing science together. They continue with scientific and field research work and there are many different monitoring, forecasting, early warning prevention systems and digital technologies that being introduced into place. At the center as well as all other disaster prevention agencies, are intensively using global navigation satellite system and geographic information systems. In this connection, Kazakhstan is in a better position compared to other countries.

Actions are also needed to assessing the current situation and identifying the gaps for all countries and especially the ones that are more vulnerable. It is necessary to implement different measures to broaden scientific and technological base which is quite low in the region. All of this needs political action and decisions to enhance and strengthen interaction between scientists and government agencies, and implementation.

### Dr. Valeria Drigo, Global Network of Civil Societal Organisations for Disaster Risk Reduction (GNDR) -Participatory data collection as a tool for actionable science

Dr. Valeria Drigo presented examples of how some of their



members have been collecting, gathering, analysing data and using it to influence and to create policies with it. She stated that it probably falls a bit more in line with what Professor Alexander was talking about on

perceived reality. She presented details of the programme "views from the frontline" and why it is interesting, its methodology and examples of how some countries, some members in countries have used this data for influencing policies and local risk assessment methodology.

She stated that they together with their members, have conducted interviews in about 49 countries around the world. It asks people who are in frontline of disasters, what is their perceived threats. Or do they think what are the key hazards that they are facing? How do they think things could be addressed? It is very much on the perceived reality.

The programme is structured in three main steps. First, there is collection of data at the local levels through interviews and surveys with communities, inside organizations and local governments. All of this is then shared into an online open-source database where people can access this data, disaggregated by country, community, age, gender and other factors. Their members at local and national levels go into analysing this data and they draw out findings. The findings are then used to inform actions at the local levels. For example, putting together local action plans to address residence issues and at the national level to support and influence government decisions around risk and residents. So far, they have conducted interviews in 49 countries and have collected more than 100,000 responses.

Out of the five Central Asian countries, Kazakhstan and Uzbekistan are more developed. They could provide more funding and finance to support scientific and technological side of the disaster prevention. All other countries, for example, Kyrgyzstan and Tajikistan, they do not have resources and cannot provided the same fundings or finance to support introduction of different satellite image and image processing introduction of different digital technologies such as use of drones and so forth and so on. The early warning system and center for disaster managements are not so well developed either. They do understand the need but lack of funding and human resources is a big challenge.

He closed his presentation by thanking all donors and funding organization for providing and supporting them in the region and implementing different technological and scientific knowhows. He stated that it is also important to note that it has to be continued

in the region and they will be happy to cooperate and continue working on these issues in Central Asian countries.

BRIDGING THE SCIENCE-POLICY GAPS: Contextualising governance to explore opportunities for Action	
ACTIONS TO FILL GAPS	
<ul> <li>assess the current situation, identify gaps, dete revise policies, strategies, programs and action p</li> </ul>	ermine needs and priorities, plans
<ul> <li>implement measures to broaden the scientif strengthen research capacity and opportunities.</li> </ul>	fic and technical base and 
<ul> <li>to enhance the scientific and technical coo introducing innovative ICT</li> </ul>	pperation with the aim of
<ul> <li>strengthen interaction between scientists an maximize the convergence of science and practice</li> </ul>	d government agencies to ce
<ul> <li>enhance cooperation between scientists and scientific and technical programs, research and a</li> </ul>	practitioners by promoting activities
serentine and continent programs, resource and a	

information and lastly analysing and using the data. She highlighted some lessons learned or key factors that enabled ownership and use of this data throughout the process. One of the key challenges, she stated, that often data is available, but it might not be using or might not be given to government in the most relevant format. Or in some cases it might not address the most pressing issues. When they were selecting the communities to be part of the project, they work with the national partners who are responsible for understanding what would be the areas of the country that were most at risk; or what would be communities from that were at the front line of disaster which is part of the program. What was interesting is that there was quite a lot of freedom for national partners to come and identify their own indicators of vulnerability and exposure. What made sense in the country and what makes sense according to the key priorities that national partners would identify through multistakeholder process and they were able to own the process from the storage and to lead. The data collected afterwards became a lot more valuable to their partners in the country because they could decide what would be the basis for collecting this data. There are survey rollouts too.

In each community the local organizations or the local partners would either hold interviews with or focus in group discussions or do random household surveys. Some of the main threats that have been identified – floods, storms, drought, and disease and

On the methodology, there are three main aspects. One is the selection of the communities at risk from which to gather the data. Second is rolling out the surveys and collecting this

epidemics - most of this data were collected in 2019, which was quite interesting. Down the list, pollution is listed as being a key threat; unemployment and then scrolling down, there is poverty sometimes identified as a risk or as a threat and similarly alcoholism in some communities. There is a very diverse range of risks that people felt that were impacting them. This gave the flexibility to the respondents to identify what they thought would be the main hazards or the main risk, rather than having to pickup from somewhere and being able to debate in a group where they thought they all had the same understanding of what the priority risks in that community was. There was quite an impact in terms of the community level; in terms of what this data covered and the focus. Dr. Drigo continued to explain what is done with the data. First there is a data analysis that is conducted by national and local partners. One of the key points here is that the findings from this analysis are then validated with the communities. They go back to the local level. They make sure that the conclusions or findings makes sense to them. This data is then used to inform local action plans to address some of the key challenges; and at national level, partners use it to influence policy making processes.

In terms of using the data, she used some examples on how the data has been used at the local and at the national levels. One example is of the uptake from communities and local governments in the Pacific - they set up committees at the local level who are now part of the national disaster management structure in each district, and they use the data coming from this service to identify the priorities that had to be addressed by working with the disaster management office. Communities were directly involved in these activities and they were part of this committee and would work with the authorities at the local level. Similarly, in Kyrgyzstan, an example of that data that were used by a group of local women activists. They were able to use this data to come back to support the priorities that they were voicing to their local government that was often not seen as a main priority. The data collected at local levels show that water pollution was a main threat, and this was often a threat disregarded by local authorities who instead were focusing on other threats that people did not define as a priority for their community.

At the national levels, she shared an example of how data give credibility to ask organizations and also support to make their voice stronger. What our members have been saying is that being involved in identifying the baseline for this data, is what information they would cover later and the information part of this survey, helped in building the local ownership, but then contributed to stronger focus at the local level as well as in the national level.

To conclude, some lessons learned from views from the frontline program; we have implemented this program for several years. There is a fourth or fifth iteration. What we have learned at participatory processes is to help to make the data and information actionable. It is a validation that gathering data is relevant for the communities and letting communities decide what is relevant in their context is also a way to increase ownership, to increase buying and then use of data not only by communities, but by policymakers as well. By validating this information with communities at the local level and not just using this data for national policymaking or policy influencing, it is possible to look at how extract information afterwards and how it can be used for actionable planning at the local levels.



#### A few examples from the Q&A session:

Chair: Do you think that the scientific community should necessarily be engaged, or is it more important that we, for instance, have good quality, open data to let the data play an active role?

**David:** - I do believe we should be engaged and I think it is part of our mission in academia to write both for other scientists and for a much wider audience. Currently I do a lot of advocacy. I feel I have been driven to that position by seeing a need and having a desire to change things to improve. But this is not being done and it could and should be done. Perhaps we can divide between those scientists who would rather pursue a pure science course and there is nothing wrong with that. But providing a contingent of scientists to fully interact with the users and people in need and the decision makers and politicians and so on. Then I think we will be capable of achieving our aims.

Integration of both risk and the solution maybe one. In terms of data, collection of data is not as scientific as a lot of technical organizations do, but I do think there is value in trying to connect to more between academia and practitioners on the ground.

Ukashev: - To address the harzards or disasters, and climate change, I also agree with that having data monitoring for forecasting and analysis, we would need scientific research as a basis for getting the data right. Integration of both of these parts in scientific research and scientists doing the research, would provide outcomes to address these disasters or hazards.

David: - we need to promote to launch disaster science. The quality of planning and management is very poor worldwide. We have a transverse discipline that has a 100-year history. It

Valeria: - We put a lot of emphasis in what communities perceive as community collected data, I think scientific information, especially in addressing some of these challenges, is essential. We can get from communities what their main risks are and what they perceive as being the main threats, but they might not necessarily have the best solutions, especially when we think of the world as it is today. If you ask a village and how to address the COVID-19 pandemic, then why not have the solutions, and they might instead have solutions for more local risks like the floods.

embraces parts of at least 42 disciplines and professions and its task is to connect things to be able to create a common language and dialogue with the specialists. But it needs a seat at the top table. It needs to be promoted as something that is serious. It needs to be a career more than it is a present.

## Hour 24 — 21:00 JST 1<sup>st</sup> September 2021

### Discussion Panel Session IV: Bridging the Generational Gap: Catalysing Science in Action by Youth Engagement Chair: Prof. Chipo Mudhavanhu



This session, Chaired by Prof. Chipo Mudhavanhu, looked at bridging the generational gaps by catalysing science in action by youth engagement. Current session

### Fang Lian, IRDR Young Scientists Programme, China



Fang Lian's presented DRR programmes within the IRDR. The programmes are formulated considering the voices and opinions of young people, and more opportunities are provided to young

professionals. There are investments especially in for disaster science communication. The young professional expertise in using social media. She stressed the importance to increase opportunities for high quality mentorship from senior scientists and for on-the-job training, for example in scientific expedition for fact finding and problem solving. They also need more seed bonding or start-up funds for young scientists, especially who do not have much visibility. Young professionals should be exposed

### Alinne Olvera, The United Nations Major Group for Children and Youth: The Science Policy Interface



Aileen Olvera represented the youth stakeholders group as a focal point from the UN Major Group for Children and Youth in the science policy interface and in particular in young scientists platform on disaster risk

reduction. While they regard science as a fundamental source of knowledge, it must also be properly identified and acknowledged. As part of their efforts to make science available and foster new talent, young scientists should be given the opportunity to share their experiences and perspectives in a meaningful space. They should be given the chance to communicate on international objectives, advances and progress; and to be active participants of young advocates like in local, regional and international events. One of the biggest gaps that persists in scientific research is that most of the large scale research predominantly happens in the most developed countries where technology funding under efficient scientific progress-oriented mindsets facilitates development and practical implementation. This often implies the existence of uneven conditions and scarce opportunities for less developed countries to partake in science, and results in the perpetration of the solid technical experimental models testing and frameworks. This situation is of particular interest because least development countries are usually the most prone to damage and losses during disasters. Under these circumstances, within young scientific communities, we face a complex challenge involved in operating scientific research in a strategic zones and vulnerable areas. Economists protect themselves with autonomously generated knowledge, reducing their dependence on foreign countries as in every area of study. Traditional knowledge and practices tend to be preferred over innovations and involvement of younger generations. Nevertheless, we are in a point in time where epistemic knowledge is changing faster than ever and faster than some scientific communities can keep up with. New, but not precisely unpredictable conditions are reaching a turning point and a holistic approach shall prevail over other strategies. So is the case of climate change. It is hindering systemic and multi-hazard associated risk by failing to engage youth in scientific research. We are failing to interact with

is on disaster research and advocacy and on how can to support the youth to become the change the future generations need? And how to integrate the youth in this process? How can youth participate in disaster research?

to more challenging roles such as principal investigators, projecting leaders and community scientific member, code designer and co-development in DRR programmes. It is necessary to establish more platforms for multidisciplinary and transdisciplinary corporations.

At the same time, young professionals should aspire to be more vocal and assertive in demanding more meaningful participation in solving problems and should be more proactive in reaching out to policy makers, and practitioners. In their conference, young scientists play important roles and were exposes to visibility in science and policy dialogue. They at IRDR will continue their efforts to support the youth engagement in DRR development, safety and also they look forward to having more corporations at all national, regional and global levels.

generations that have progressively and unconsciously adapted to previously non-existing conditions. Young people compromised to experience unfortunately and first-hand unstable system caused by global warming and climate change. Young people should be invited at the international efforts to mitigate such phenomena through policies and agreements. Therefore, their perception of risk varies greatly compared to the previous generation's perceptions.

Following this idea of a sense of urgency and responsibility that are entirely different approach to lead profound science-based change in an otherwise unsustainable system, such as deep change, involves the compromise and level of consciousness. In order to engage youth in scientific research and experimentation, we must reinvent the idea of experts leading and already paved way. With this in mind, we must restructure lines of action and better for accomplished specialists creating opportunities for innovative thinking within their work. Getting to consciously organize forums or conferences that congregate people with similar interests and diverse backgrounds can be a useful tool to exchange ideas among certain specialists, and the frequently unheard voice of young talent.

Given the previously mentioned challenge of uneven opportunities due to regional disadvantages, the creation of global online space, or young scientists can exchange perspectives and later transform them into consolidated projects, team working, networking and being able to learn from each other. Engage youth in an organised and beneficial way that can result in concrete tools for original work. Every proposal will be destined to fail if we do not embrace a paradigm shift towards a dynamic space. The idea of knowledge sharing comes from a accomplished specialists, not experts, and is integrated with an innovative and systemic thinking left by demographic representation of a society. While the integration of such synergistic approach may require serious compromise from both parties and investment of time in the long run, the generational gap will become narrower and surely will generate unexplored and unexpected perspectives that will integrate a better response towards contemporary global issues.

#### Ida Ngurah, Plan International, Indonesia



With examples, Ms. Ida Ngurah's presentation covered the activities of the Plan International Indonesia as an empowerment of the adolescents and youth, and in particular, girls, to take collective action for systemic, social

and political change that contribute to the realization of their rights and achieve gender equality.

She shared information on gender equality and how and what is done in Indonesia. Most oftenly, and in particular, girls are not consulted or being informed with proper information. However, she stated that with the proper capacity building, they can lead to identify their own problems, stresses and their own restorations. They were able to come-up with a possible solution and action in fairly local and low-cost approach. For example, in Jakarta, youth was facilitated to identify their problems through participatory outreach activities on why people suffer and not be prepared for annual flood. The flood is happening every year. But people and communities are not prepared for the floods.

They developed a simple, low-cost early warning tool for flood warning which can provide faster signal for communities and provide ample time for the communities to be prepared. The tool has been selected as a finalist in Global Award organized by Safe Step and Prudence Foundation.

The second one is how and what we are doing. As an agent of change and ensuring that their efforts contribute to the strengthening of community restorations and shape their own lives and society, it is important to provide safe space and opportunity for youth with all their diversity to be active citizens and their collective action to tackle community issue are taken into account. Plan Indonesia facilitate youth particularly, they are given a seat and their voices are heard in community development meetings. The third one they concentrate is on right and commitments. Young people have tried to participate and to be heard on issues they are facing or concerned most. In June 2021, PLAN Indonesia conducted a national essay competition on climate change. It was participated by more than 150 youth across Indonesia. At the end of the competition, 25 best essays were selected and published as a book. This book is about specific issues from their eyes and perspectives on climate change and on what they want people to hear.

There are a few challenges in the youth engagement. For example, under the current pandemic conditions, youth engagement can be difficult and to interact with each other on a daily basis. They do have peer groups that provide psychosocial support. But limited access to devices, Internet, and social media are also gaps and challenges to youth, particularly girls and marginalized groups.

In addition, there are limited capacity building for youth and the right to engage, organize, participate, and communicate to influence the political and social structure. This was also stated in a study conducted by young researchers in 2021 2021. She found the young researchers. Found that very limited youth engagement and capacity building available for for youth are being mentioned in our

She closed her remarks with the recommendation to provide more accessible and improved collaboration with youth networks and to adapt to their needs, including reducing the technocratic procedures and processes; recommended as well to campaign to make a world where, particularly girls and young women, in all their diversity, are equally able to make decisions on their lives. They would also like to see, particularly girls, have equal power and they can be leaders to take part in all decision-making processes, and there is equal representation to call out discrimination, and equal freedom online and in public.

### Marie-Claire Graf, YOUNGO



Marie-Claire Graf presented on behalf of YANGO – the acronym is a combination of two words, youth, NGO's and it is a network. The UN climate Change secretariat has been hosting the international climate conference,

and have a mandated youth space where all the young people can come together to do capacity building and most importantly come forward with policy recommendations. They work on disaster risk reduction under the theme of loss and damage and is one of the working themes discussed in the UN climate change negotiations.

Within the YANGO structure, they have two global focal points, Global North and Global South and their network includes anyone up to the age of 35. Through YOUNGO, they can become part of the international movement towards the climate of the UN Climate topics. For example, when it comes to disaster risk reduction and loss and damage, young people are sent directly to the negotiations. Within the UN, the young people cannot vote or make decisions. But they are able to inform the process. Although it is not done directly by sitting at decision-making tables but it is as good as it can be in government driven processes. or example, if attending conferences or important meetings, they can raise the ambitions within the stakeholders during coffee breaks or afterwards by the young people moving around to interact with them. They try to bring across their own points through giving written statement, or an intervention and in various instances, there are evidence of them being on the negotiations. Informally there is a lot of lobbying and advocacy work with young people from different countries. Sometimes, the country stands integrated and they vote in favour of what young people want.

Secretariat. They can work independently or join groups to work on loss and damage which is covering disaster risk reduction and climate change issues. They specifically engage young people to bridge the gaps and encourage them to come forward with localised or regionalised recommendation on various aspects.

In YOUNGO, there are different active working groups working on different aspects around climate. These are either topic which are directly linked to the negotiations, for example loss and damage; adaptation; renewable energy, gender and climate, and so on. But it can also be more crosscutting topics like for example human rights or intergenerational equity. The working groups then focus on one aspect of the negotiations or give input to cross cutting Nevertheless, they are not yet there and much needs to be done.

There are many demands from young people which have not yet been integrated. They also engaged in capacity development activities and many young people are very interested in topics around education and gender. There is also a good many young people who are interested in DRR topics as well. They believe they need more younger people to engage to create larger group especially within the climate space. At least those who understand the rather technical negotiations. Sometimes, the young people are willing but they do not have the tools to actually become advocates in rather technical negotiations to bring across the message they want.

She also introduced the Conference of Youth, which is an event happening directly before the International Climate Conference. The conference is dedicated to the young people where they can come together to write and consolidate their positions collectively. Prior to the conference, they embark on a sophisticated policy gathering process, by starting with local youth conferences. The information and inputs from there are given to the next level, be it regional or international. They try to feed it into an international policy document under the theme of loss and damage at international conference levels. For instance, with the COP26, this document is given to all the delegations and also to the Climate Conference President and other relevant people. Although the young people are not able to sit at the tables, they try to ensure that the voice of young people are heard despite their absence, and they are able to influence the process and that young people are actually part of the delegation at least in the

climate space. From a youth's perspective, it is very important to have a variety of entry points either through national government representative channels or international. They also need young people, especially outspoken young people. to be part of the delegation and pushing for topics and working closely together with the governments to be able to bring across the messages. Only through such initiatives the young people can show the full value and potential to bridge the intergenerational gap. She commended the previous panellists who stated that "nothing about the young people should be ever done without the young people at the core leading the whole process". The young people should be engaged from the beginning to the end and need to be part of the delegations in the climate change negotiations. The youth need to be given space and voice in climate change negotiations.

### A few examples from the Q&A session:

Chair: The views about what matters for the progress in reducing disasters and providing the means to better quality of life for future generations. What we need to understand this view that matters most when it comes to or may be viewed or may be prioritized differently by youth?

For those who can offer greater influence - how can we catalyse that? How can we address that challenge where we tend to have youth views or priorities different from the priorities of those in our greater influence. How can we address that gap?

**Marie-Claire:** - What we currently see is that at the negotiations, even a study done by the UNFCCC, the UN Climate Change Secretariat, that there was only three young people in a leadership position. The young, it is below the age of 35 though not particularly young, but it is kind of like very wide span to be in any leadership positions in the climate change process where all others have been older. Therefore, these rather young people in the leading process may not be able to actually bring across their own opinion, but rather to support other opinions. There is a lot of hesitation, especially from the older generation, to give this space and give the trust to young people and really give them the opportunity to lead but we have to face them proactively.

**Aileen:** - I completely agree with the fact that as young people, we are not given the same opportunities in politics even though we have demonstrated as I mentioned before, the drive and the sensibility to understand complex situations. We are not given the trust. I completely agree with that part. I do believe that, particularly, in disaster risk reduction, this generation is the first one to fully understand the phenomena happening on earth. Missing this opportunity of engaging youth and progressively understanding the points of view of youth, could be a such good practice in this area of knowledge. Because we are so different from previous generations that we can provide different and diverse points of view.

people from these countries should be given opportunities to be included in climate actions and other places. These are the countries where people are hard hit and very much affected by disasters and hazards and these kinds of things. Therefore, youth should be actively involved in participation and being given trust and at some places and positions in the international organizations so that they can be helpful in combating hazards.

Chair: - What would you recommend the scientists community to do to support youth engagement for DRR? The scientists are not necessarily engaged politically. Is there anything else we can do to bridge the generational gap down in one sentence?

Fang: - I think that from IRDR perspectives, we try to provide more programs that cover young researchers and senior researchers so that they can have a platform to discuss with each other and communicate opinions and research. I think that the platform is very important. The platform to communicate could be a solution.

Ida: - With proper capacity building, the youth or young researchers or young scientists can use the space or use the opportunity that has been given to them. If there is no capacity building for these young people, then the space or opportunity provided to them cannot be effectively used. Therefore, although the space and opportunities for young people to lead their action or to lead their research or whatever the effort that they would like to do, are given, there is also a need to provide them with the basic knowledge and with the proper capacity building for them to be able to use the opportunities effectively.

**Aileen:** – We, the young people, are not politically involved in general. We are decision makers in some cases. These positions of making decisions sometimes allows us opportunities to join-up with people even if we are not currently the power that moves most decisions. But creating and giving opportunities to younger

Fang: - I totally agree with you all on the trust of the young professionals and provide opportunities. I agree that we need to support the innovations or the initiatives of young professionals though their thoughts are different with our research priorities. I think we need to provide space, provide opportunity for them to come to speak out, and to do the research and findings can be adopted in the new research agendas or global frameworks. The priorities of young generation can be the priorities of all the DRR community as well.

Participant from India: - A recommendation. For youth there is a scarcity of trust. I also want to say that people specially from Africa, and in least developed countries and Asia, the young

generations, when it is in their hands to make a difference, could be possibly the solution to work with the young and being young.

Marie-Claire: - I just want to reiterate that yes, I do agree that we are not doing this on a political view, but the topics around DRR and at least in the climate space are highly political. I think it is really important to also support young people when they are young researchers, but also young people who are interested in their journey, to not only write a scientific report, but also make them relevant for society. Make this relevant for the international negotiations, relevant for decision makers to pick them up because this can be a very, very important space. We need more of these reports which support the politicians to take correct decisions at the end of the day.

### Wrap-up Session for Europe with Africa and Middle East Session Chair: Prof. Jörgen Sparf

Prof. Sparf welcomed chairs of the four panel discussion sessions to reiterate and share a few highlights from the discussion sessions.

### Session I: Chaired by Prof. Andrew Collins:

In drawing together solutions to bridging gaps between science and action, the session focused on collaboration and the pressing issues; and the need to integrate disaster risk reduction and climate change adaptation for more urgent and effective science in action. And it was stimulated by four contributions that spanned research policy and practice,

Liviu Stirbat presented in relation to adaptation and the European Green Deal initiative, including steps towards the mission on climate change adaptation and societal transformation as part of its vision for 2050. Amongst the range of strategic moves, it was clear the direction is for more systematic adaptation on faster adaptation amongst other properties. Faster adaptation formed part of the rationale to this session itself, since DRR for addressing the climate emergency cannot lead to business as usual with only small adaptations.

Deidre Brock MP referenced, that as a Member of Parliament, referenced to COP26 and Scotland contribution, including a range of targets that devolved and other orientations. Scotland is prioritizing climate change adaptation and is seen as an opportunity to work on the focus reflected through COP26 hosted in Glasgow in November 2021. She particularly emphasized the need to open this up to those whose voices need to be heard flagging indigenous groups, the young, and the disadvantage people. Building on the solutions driven approach of this session, she referred to the use of climate justice perspectives in the agenda and indicated various initiatives at the local level they are supporting, including a world first climate justice fund.

Desmond Manatsa provided perspectives on interlinked DRR and climate change adaptation as he considered it in the Southern African context. These are regarded as separate agendas and neither are integrated at the local level or be it local adaptive capacity is prevalent such as in the relation to flood and drought. The concept and investments are not embedded. One of the limitations is that these remain separate sectors within governing bodies, often appearing in different ministries. The discussion showed that whilst the conceptual challenge may be overcome in combining these fields, including chances for better levels of local and global engagement, the structures of government and society are not yet orientated or benefiting from it. targeted and some of its research calls on the theme of equitable resilience which is vulnerability orientated. Other investments have been exemplified by support for research on multi-hazard and systemic risk. It is keen to maintain a focussed agenda emerging in the research environment in the context of COP26 and equitable resilience focuses on attention, though. In the chat Mark actually further added that when asked whether can resilience to climate change and other hazards enable equity in development processes and outcomes, and also, if not, then does resilience for some generate risk for others. We have one underlying question for this, which I think is probably an underlying question in other parts of the programme as well, but about how can we use the GADRI network of collaborating institutions to speed-up disaster risk and climate change adaptation solutions based on evidence based agenda.

There was not really time to gain a lot of input from that, but there were comments on this and they are very much already coming out along the line that GADRI has a unique lead in this agenda through the interlinking of institutions, which brings added value. This adds influence to academic institutes to be able to influence policy with varying opportunities for its development and ultimately more science going into action.

### Session II – Chaired by Dr. Tom De Groeve

Dr. De Groeve explained the background painting which is done by an artist who is working with them in the secretariat. She is constantly exposed to the science work and the art is about droughts and many other societal aspects. Art and science has a very strong link. Art is a way to communicate to, to talk to the emotions of people and the artist does that spontaneously. Dr. De Groeve stated that they like the concept and what comes out is indeed one way to communicate. It also comes back to what was discussed in the group, how to bridge the knowledge gaps and there was excellent panel discussion sessions with the panelists, Marzia, Zuzanna, and Lisa.

He shared the following three messages:

- first is that bridging the knowledge gaps require very close collaboration between the stakeholders. It was reiterated all the time and there is a need to build a common understanding between scientists, policymakers, economic actors and citizens.
- Secondly, a more qualitative data and evidence are still necessary. When they are created in some of the products that were shown, they do have an influence. They must be

And lastly, input from UK Research and Innovation in the form of Sarah Webb and Mark Pelling. Sarah Webb built on the action orientated theme as addressed in both horizontal and vertical gaps in governance and implementation; and how UK Research and Innovation is orientated with support as a research funder. The work of UKRI includes work on adaptation and resilience, including steps to facilitation of core research-based topics in the context of COP26. Sarah noted the importance of the GADRI link in helping with this agenda and presented four core questions that are being used in the adaptation and resilience theories. Mark Pelling added to the UKRI input from his experience of steering the GCRF research initiative in a co-produced manner with certain partners, in particular the UKRI investment notably curated and delivered. The data must be fair, findable, accessible, interoperable and reusable. It must be delivered in the right format and at the right time and a lot more emphasis has to be given to that.

Thirdly, narratives are so important, and perhaps this painting comes back to that. The narrative to put things into a context. The context for the evidence. It is being heard several times to get wisdom from evidence. For instance, it is crucial that these narratives must be collectively designed and communicated. The GADRI institutes can play a role in this by having an active role in their communication, be there on the stage and bringing these narratives to play.

### Session III – Chaired by Prof. Jörgen Sparf

This session had a discussion about science policy gaps presented by David Alexander, Dzhergalbek Ukashev, and Valeria Drigo. They had very strong and different resonating messages from each other.

The first one from David was talking about the evidence and truth. What is truth really? He talked about evidence-based, but evidence can both be interpreted in different ways and what is a truth really. It varies overtime and it varies between people etc. He presented a model for objective reality, perceived reality and manufactured reality. All of these prompted thought-provoking discussion about truth, reality and evidence. He also advertised his upcoming publication which is under review currently.

Second presentation from Ukashev and interpreted by Temor: he presented the perspectives from Central Asia. He works in Kazakhstan and he is the Director for Emergency Management Center. They are certainly facing a different set of challenges in Central Asia in terms of general development, very uneven risk distribution and vulnerability distribution. But at the same time, the gaps that he identified between science and policy were pretty similar to the ones we are facing in other parts of the world. Also given the general need for development in Central Asia, there is the possibility to actually include or build in DRR in that process.

Finally the presentation by Valeria Drigo from the GNDR, Global Network for the Civil Society for DRR: she was telling about the fascinating empirical work that they are conducting. It is called "Views from the Frontline" - similar to a very large interview study in a research project. They have interviewed more than 100,000 people in 49 countries. Very impressive, and about the perceived risk in their everyday life. Kind of sociological take on it and she provided some data and analysis from that. It is at the GNDR website. Very fascinated work from Valeria.

Finally complimenting on what Tom was saying, there is a need for qualitative data and not of quantitative data, that is needed throughout the world in this field of study.

### Session IV: Chaired by Prof. Chipo Mudhavanhu

The main recommendations from the discussion on bridging the generational gap—this requires a participation of youth in the space.

- the need to increase opportunity for the young scientists through mentorship with the senior scientist. Why? Because sometimes we have the youth, they have different priority from those with greater influence; and there is a need to increase the mentorship by senior scientists;
- to expose youth to more challenging roles as part of capacitybuilding;
- provide opportunities for young people to be heard in the DRR space and in climate change adaptation space; and young people need to be heard.
- youth also need to be part of the delegation in climate change negotiations. Their voices needed to be heard;
- the voice of young people should influence the research process. Why? Failing to engage the youth may mean the failing to interact with the future generations.

So if we want our disaster research to be sustained in the future generation, there is need to make sure that the voice of young people are heard; and they are given opportunities to influence the research process.

a need for qualitative data and not of quantitative data a need to make sure that the voice of young people are heard

the voice of young people should influence the research process

## Hour 25

## - 22:00 JST 1<sup>st</sup> September 2021

### **E-Poster Session:**

All members of GADRI are requested to actively take part in the e-poster session especially young scientists are encouraged to submit an outline/abstract of the posters along the lines of the on the proposed conference themes/group discussion sessions.

GADRI members were allowed to utilize the e-poster session to present disaster reports, research results and their research achievements during the past two years, ongoing research projects and activities, and other related topics.

There were 48 e-posters presented during the 2-hour session.

This session was chaired by Dr. Hiroyuki Goto, Dr. Yokomatsu Muneta, and Dr. Masamitsu Onishi, all members of the GADRI Secretariat Committee and DPRI, Kyoto University.

### **Networking with Institutions Session:**

This session was chaired by Dr. Kenji Tanaka, Prof. Tetsuya Sumi, Dr. Yukitoshi Fukahata, all members of the GADRI Secretariat Committee and DPRI, Kyoto University.

GADRI encouraged the members to use this opportunity to interact closely with each other and provided the institutes with opportunities:

- to network and connect with other institutes, and showcase each institute's resources; t
- to find potential partners among GADRI members
- to collaborate, and to engage and enhance ongoing or new research project activities.

For instance, some institutes may have their own methodologies, datasets, experimental equipment, computer resources, but lack users, application fields, in-situ data for validation, and other difficulties. Other institutes may have enough human resources (researchers) but many unsolved issues and in need of scientific knowledge, experience, experimental and observation equipment, and technological supports and vice versa.

This session, in particularly, explored research seeds and needs and assist to realize the effective/active collaboration among GADRI members.

In order to prepare for the session, those who are interested in this session are requested to submit a PPT slide to explain "Seeds & Needs" for collaboration; and expectation from a future partner within 300 words.

In addition to the regional time zone sessions, there were two other sessions on Networking with Institutes; and an e-poster session.

During the two hour period, 17 institutes participated in the Networking with Institutes session and 48 e-posters were presented

This session was held in parallel within two hours and attended by

### Hour 26

# - 23:00 JST 1<sup>st</sup> September 2021

Institutes participated at the Networking with Institutes Session:

- Dr. Ailsa Mackay, National Centre for Resilience, University of Glasgow, UK
- Prof. Zieaoddin Shoaei, Soil Conservation and Watershed Management Research Institute, Iran
- Dr. Sonephet PHOSALATH, Department of Climate Change, Ministry of Natural Resource and Environment in Lao PDR.

University, Japan

- Dr. Garry Stevens, Humanitarian and Development Research Initiative (HADRI), Western Sydney University, Australia
- Prof. Qiuhua Liang, School of Architecture, Building and Civil Engineering, Loughborough University, UK

- Dr. Hiroyuki Goto, Disaster Prevention Research Institute, • Kyoto University, Japan
- Dr. Christian Resch, Disaster Competence Network Austria (DCNA), Austria
- Dr. Lata Shakya, Ritsumeikan University, Institute of Disaster Mitigation for Urban Cultural Heritage (DMUCH), Japan
- Prof. Kishor Mehta, Texas Tech University, USA •
- Dr. Yoshihiro Ito, Disaster Prevention Research Institute, Kyoto ٠

- Prof. Towhida Rashid, Department of Meteorology, University of Dhaka, Bangladesh
- Prof. Nicola Casagli, UNESCO Chair on Prevention and Sustainable Management of Geo-Hydrological Hazards, University of Florence, Italy
- Dr. Lubna Alam, LESTARI, Universiti Kebangsaan Malaysia, Malaysia
- Prof. Ekkehard Holzbecher, German University of Technology in Oman (GUtech), Oman
- Dr. Kenji Tanaka, Disaster Prevention Research Institute, Kyoto ٠ University, Japan

# Hour 27 — 00:00 JST 2<sup>nd</sup> September 2021

## Final Wrap-up and Closing Session Achievements and Recommendations

### Chaired by: Prof. Hirokazu Tatano, Secretary-General, GADRI; and DPRI, Kyoto University

Closing wrap-up session included reports from all three regional session organising committees to share the final outcomes of each session. Each representative of the session shared achievements and recommendations of their respective sessions.

During the closing Ceremony, Dr. Jenty Kirsch-Wood, Chief of Section, Global Risk Analysis and Reporting, UNDRR, Switzerland; Prof. Qunli Han, Executive Director, IRDR-IPO, China; and Prof. Andrew Collins, Leader, Disaster and Development Network, Northumbria University, UK congratulated on the success of the conference. The 5th Global Summit of GADRI was closed by Prof. Paul Kovacs and Prof. Eiichi Nakakita, Director, Disaster Prevention Research Institute (DPRI), Kyoto University, Japan at 01:23 hours of 2nd September 2021 covering 28 hours and 23 minutes.

An amazing number of 640 participants from 77 economies registered for the conference; and nearly 568 members from 73 economies logged in via zoom meeting to attend the 27-hour long conference.

### Americas covering North and South America Multidisciplinary Modeling Progress and the Role of Community Engagement in Resilience Planning

### Reported by Dr. Grace Yan, Missouri University of Science and Technology, USA

Dr. Grace Yan, Missouri University Science and Technology delivered the final report on behalf of the organizing Committee. While everyone is passionate and motivated, it is apparent that climate change is taking place at an unprecedented pace, causing an increased number of natural disasters in North and South America as well as in the rest of the world, and the communication on resilience is not effectively delivered to the communities. The American session covering North America and South America, brought together 25 nationwide and international experts in different natural hazards from government and the industry to talk about enabling effective ways to communicate resilience in a changing climate.

The Americas Session looked into the increasing number of natural hazards in North and South America and shared views, opinions and measures in place to combat the disasters. The following four topics were identified by the North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI), and debated during the discussion sessions to enable resilience by preventing natural hazards from becoming disasters:

- Q1: What goals do we want achieve?
- Q2: How to achieve the goal? What innovative approaches do we need?
- Q3: How to reduce barriers when implementing the developer

and wildfire - of the physical as well as the non-physical systems. It requires inter-disciplines, multi-disciplines, but also cross-disciplines working at their seams as well as in the overlaps;

- the practical application of the theoretical resilience concepts to facilitate actionable strategies requires partnerships, and communication to make sure that the tools that come out into communities are useful and usable; and
- finally, perhaps most importantly, is that there are many, many challenges that remain related to constraints and resources and number of other challenges. But with the engagement partnerships, with the researchers working with community leaders, these are all solvable.

Prof. Paul Kovacs shared the recommendations from his presentation in the panel discussion session:

• Resilience in recovery: "build it back better" mentality

The presentation was based on the priority for action four in the Sendai Framework, "build back better". In the recovery process, although the communities are aware of the need to do better, it is not being done even under favourable economic conditions. This trend is shifting and a lot of good action is actually being implemented. In the pre-conference survey undertaken by GADRI, it showed that many of the scientific researchers have

- approaches?
- Q4: How to upgrade resilience to equitable resilience to reduce the hazard impacts by vulnerable populations?

The session was opened by Prof. John van de Lindt with a keynote speech on the topic of "Multidisciplinary Modeling Progress and the Role of Community Engagement in Resilience Planning".

Recommendations from the keynote speech was shared by Prof. Van de Lindt:

• resilience analysis requires the modeling before, during, and after an event: like in Florida hurricane and typhoon, tornado,

started to focus on this area, relatively new, and presenting opportunities to tie science into how to use this opportunity in recovery to achieve some of the broader goals as a community. It

was also endorsed by the session participants that this is an opportunity to do better. There is not only an opportunity to do better but to get some transformative improvements not just incremental, but real material change in the recovery process.

#### Recommendations

1.0

- "All disasters are local": resilience is a local issue that must be addressed at that scale – using a combination of technical and community engagement efforts
- Risk modeling: multi-hazards. Encourage interdisciplinary efforts
- Impacts on civil structures: physics-based modeling to get the design loading
- Retrofit houses by leveraging insurance
- Resilience in recovery: "build it back better" mentality

- Dr. Yan continued to share the recommendations from the four panel discussion sessions:
- "All disasters are local": resilience is a local issue that must be addressed at that scale – using a combination of technical and community engagement efforts - for example there may be a need to downscaling climate model to project the global climate change to the local area.
- Risk modeling: multi-hazards. Encourage interdisciplinary efforts - while appreciating the research investment in each individual hazard risk modeling, in order for the risk modeling to be able to better predict the risk to a specific region, it is necessary to do multi-hazard risk modelling.
- Impacts on civil structures: physics-based modeling to get the design loading - For example: the force of tornado exerted on a 21-flour is completely different to a straight-line winds flow. With this type of situation, it is possible to use computer dynamics to simulate the tornado effects and the design may be estimated more accurately.
- Retrofit houses by leveraging insurance- to reduce the damage during a disaster, an idea was promoted to retrofit the individual houses by leveraging on the insurance. If the house owners use certified roof, the insurance premium will be reduced. By using this type of incentive, eventually, the general public will also be contributing to community resilience.
- Create, support, and find mechanisms to facilitate researchto-practice partnerships (like the NSF Civic program, companies that can do the translation). and successful model. - In order to promote the implementation of resilient solutions, it was recommended to create and support and find mechanisms to facilitate research-to-practice partnerships. For example: the US National Science Foundation's Civic program on ready to implement - the research program focus on the implementation of the fundamental research to address community resilience. It would be good to see similar programs introduced by research agencies or even from the government.
- Engage decision-makers (those who control the funds) in trying to implement resilience solutions. To promote the implementation of a resilient solutions, it is necessary to engage the government and decision-makers from the very beginning. Find new ways to share information.
- Improve the communication between engineers and physical and social scientists, and decision-makers. When communicating with them the benefits of resilient solutions, it is necessary to find an innovative way to communicate the risk information to them.
- Educate to improve broad-based public understanding and

necessary to educate the general public, for them to work together to achieve community resilience. For example: as a homeowner if they retrofit their own home, the total economic loss from each natural disaster will be significantly reduced.

Further recommendations included:

- In order to upgrade resilience into equitable resilience, it was recommended to identify which aspects of inequality that have not been captured before and which communities are slower in recovery and under what conditions?
- to incorporate equity in resilience measurement.
- to incorporate equity in the state hazard mitigation plan.
- proposed to partner with non-traditional partners and the multiagency coordination to leverage funds.
- proposed to input the voice of behavioural scientists in the weather service and the weather forecast.
- It is important to understand that the institutional mechanisms that create inequitable outcomes for public housing after disasters; and
- on outreach activities, to take a whole community perspective to include all ages, races, renters and all other different stakeholders.

In conclusion:

- to respond to the increase in natural disasters, it is necessary to implement resilient solutions.
- This requires the collaboration among different parties including the government decision-makers, the academia or the government that provides resilient solutions, and also the communities and the general public.
- Be proactive and work towards the slowing down of the increasing number of natural disasters.
- To achieve this, it is necessary to slow down climate change which requires also to slow down global warming.
- No single country can do this alone. It takes all countries to work together.

The question is, do we have any kind of mechanism to do this? There is an opportunity, for example with the February 2021 announcement by the National Science Foundation, to work on one of the "smart and connect to community collaborative" projects with the counterpart of Japan. They are calling for proposals to respond to the mitigation of Covid-19. Perhaps, by promoting the idea for research agencies to work together in this type of international collaborations, and then it is possible to address the

support. Besides the government decision-makers, it is also global warming and climate change together.

### Asia and Oceania

### Engaging Sciences with Action: Voices form Asia and Oceania

Reported by Prof. Mahua Mukherjee, Indian Institute of Technology (IIT), Roorkee, India

This part of the 5<sup>th</sup> Global Summit of GADRI was organized by the GADRI Secretariat Committee members at the Disaster Prevention Research Institute (DPRI), Kyoto University, and the newly established South Asian Alliance of Disaster Research Institutes (SAADRI).



The Asia and Oceania time zone session was kicked-off by four keynotes by Prof. Haruo Hayashi; Prof. Yang Saini, Dr. Gill Jolly; and Prof. M. L. Sharma.

A few important highlights from the keynote speeches:

# Prof. Haruo Hayashi, National Research Institute for Earth Science and Disaster Resilience (NIED), Japan

- to be sustainable, it is fundamental to strengthen DRR in the basic premise; and the online synthesis system (OSS), a webbased knowledge integration system, enabled to promote the idea. By having this kind of reciprocal work or activities between OSS and facilitators, the online synthesis system will continue to grow by itself, and at the same time facilitators will be improving their ongoing capacities.
- A good relationship with private sector will not come up from nothing. It is necessary to have a lead time to develop a collaborative relationship between science technology sector and the private, and apply it with the practitioner side.

### Prof. Yang Saini, Beijing Normal University, China

- On a small project on people-oriented resilience building, it highlighted the need to have different early warning systems and prompted discussion on the different warming thresholds for individual, community and country level. There is a need for more scientific evidence to develop tolerable early warning systems that can be used by different stakeholders.
- On another project conducted on road early warning systems, it was questioned on how to balance investments in high standard construction or to invest in service system. Upon performing quantitative analysis on the cost benefit ratio of early warning systems, it was clear that there is a very high return ratio for investment in service. When talking about resilience building and engaging science into action, this type

- The importance of the social science and community engagement to develop a good message to respond to emergencies and build a level of understanding before the event occurs.
- Health or safety of staff is paramount to the response situation. Often staff will be going into fairly risky situations to collect data importers, and having that long term investment in hazard and risk science enabled to rapidly do risk assessment to support the management decisions.
- It is critical to be able to coordinate the science during large scale disasters that impact large areas.
- It is important to learn the lessons from each event and then focus on continuous improvement for future events.
- Most importantly, building relationships with local communities, understanding different sources of knowledge, listen and learn, being humble and showing that humility goes a long way to building relationships even when one is in a highly stressed situation.

### Prof. M. L. Sharma, IIT, Roorkee; and SAADRI, India

- to achieve global and regional level support, it is important to promote cooperation between academic, scientific and research entities and networks; and the private sector to develop new products and services to help to reduce disaster risk.
- proposed nations with successful earthquake early warning systems should consider sharing the knowledge with countries that cannot afford to invest on such instruments or by means of funding, or by providing scientific assistance, and also by trying to increase the willpower of the political systems.
- The hazards and disasters do not recognize the political boundaries. Such instruments should also be placed in the global frameworks.

The Asia and Oceania Session bought together 33 experts from different institutes of development, governmental authorities, industrial group and the UN.

Prof. Mahua Mukherjee from IIT, Roorkee, India shared the final outcomes and recommendations of the four parallel group

of quantitative scientific evidence is needed to promote fundamental new concepts.

• Risk assessment outcome data shared with decision-makers should be applicable and practical.

### Dr. Gill Jolly, GNS Science, New Zealand:

• The importance of close engagement with the responding agency, especially at a senior government level all the way up to ministers and prime minister. It helps to know the people on the end of the phone. Therefore, it is important to build trusts before the event occurs.

discussion sessions.

Thematic Group 1: Regional Alliances- Improving Collaboration to support global stakeholders of DRR and DRM – Session was led by Prof. Srikantha Herath, Prof. Kenji Kawaike, Prof. Gretchen Kalonji and Prof. Wei-Sen Li.

- How can the different regional initiatives collaborate, what avenues are available?
  - ⇒ There is a need to find overarching themes to connect different programs (because it is a very varied society from many different perspectives of risk) to discuss findings to identify commonalities and disparities and learn from each other.
  - ⇒ Early warning, climate change adaptation and infrastructure safety were **themes** that were addressed by most groups. **Workshops** under these topics can be another approach for initiatives in this region.
- To build **connection and collaboration between universities and national platforms** to enable an environment for both researchers and disaster managers.
- Community engagement
  - ⇒ It may be worthwhile to explore how GADRI can support and develop a program to synthesize rich experiences of small islands and other countries as well as the programs conducted by different institutes, to develop education and practice guidelines for engagement of communities to create a long-term effective dialogue between researchers and affected communities.
  - ⇒ Endorsement of such a program by important organisations such as the UN organization so that it would make it effective.
  - ⇒ The most important point under community engagement is the inclusion of diversities of disciplines, languages, cultures and hazards for DRM education to the youth

Many youth-related discussions also took place under that particular group.

# Thematic Group 2: Target E - Disaster Risk Governance and Contribution for Policy Making

Led by Dr. Toshio Fujimi, Dr. Genta Nakano, Ms. Ritsuko Yamazaki-Honda

- In Asia and Oceania region, many research institutes have contributed **to making and implementing DRR policies** in line with the Sendai Framework.
- Implementation of national and local DRR polices can be further improved by the following efforts:
- \_\_\_\_\_\_

- Individual and institutional capacity building at regional, national to local level for informed decision-making for enhancing adaptive capacity for climate and disaster resilience
- Data and knowledge sharing both at national-level and international-level, transboundary collaboration because risk has no boundaries
  - Evidence from observations in-situ and remotesensing observations
  - Weather and climate monitoring: DRR and CCA
  - Third Pole: important weather & climate driver; Regional Climate Centre (RCC) for South Asia & South Asia Seasonal Climate Outlook Form (SASCOF)
- Impact-based forecasting, early warning and rapid information dissemination
- Knowledge and insight building on emerging tools and techniques for
  - Integrated multi-hazard risk assessment for different type of hazards such as hydro-met, geotechnical, air pollution and other hazards
  - Resilience approach for resilient infrastructure, water security, urban transformation
- Attention to specific ecosystem zones mountain, coast, Antarctic, Tibetan plateau, HKH, Small Island
- Sharing learnings from successes and challenges in implementation

Thematic Group 4: Implementation of Science for DRR Actions (S&T Roadmaps realizing SFDRR)

Led by Dr. Subhajyoti Samaddar, Dr. Masamitsu Onishi, and Prof. Yuichi Ono

- **Key Question :** Why we failed to put our knowledge into action (it is not a dearth of knowledge in the Asia and Oceania regions; but there are so many failures when action do not take place.); and what can be done to improve the status-quo for effective, improved DRR?
- Key Understanding: We not only failed to translate knowledge into action, but we also failed to comprehend why we failed!!
- Key Recommendations (particularly for engaging DRR science with action)
  - These ideas/parameters /understandings are derived from projects, practices, research studies, case-studies and communications, experiences
- **Improved Communications** mechanism, mode, language, tools, fairness and participation.
- Dealing with multi-hazards and new risk landscapes
- Involving multi-stakeholder and inter-sector corporations
- Making win-win relationships among residents, governments, practitioners, and researchers

Thematic Group 3: Contributions to Climate Change Adaption

• Led by Prof. Tetsuya Takemi, Dr. Kenji Tanaka, Prof. Andrew Collins; and Prof. Mahua Mukherjee

- Effective Facilitation/Coaching: training and coaching facilities, infrastructure, tools and human resources (coach)
- Identity / Recognition and Rewards for Implementation
- **Evaluation Criteria**: Implementation impacts/degree as an evaluation creation of the performance of DRR researchers
- Diversity / Pluralism disciplines, approaches, tools, understandings and actions (No single knowledge/tool/ approach/tool/method works) to tackle DRR issues.

### Europe with Africa and the Middle-East

### Exploring Solutions to Bridge the Gaps for Implementation of Science in Action

Reported by Prof. Jörgen Sparf, Risk and Crisis Research Centre, Mid Sweden University, Sweden

The organising committee members for the Europe with Africa and the Middle-East time zone session included Dr. Jörgen Sparf, Regional Organising Committee, Associate Professor in Sociology and a founding member of the Risk and Crisis Research Centre, Mid Sweden University, Sweden, Prof. Andrew Collins, Leader, Disaster and Development Network, Northumbria University,UK, Dr. Tom De Groeve, Deputy Head of Unit, Disaster Risk Management Unit, European Commission, Joint Research Centre (EC-JRC); and Prof. Desmond Manatsa and Prof. Chipo Mudhavanhu, Bindura University of Science Education; and the African Alliance of Disaster Research Institutes (AADRI), Zimbabwe.

The session theme **Exploring Solutions to Bridge the Gaps for Implementation of Science in Action** targeted the implementation stages of science into action. The session identified a number of gaps and invited speakers from different sciences, countries and regions to address the identified issues.

The session was opened with two keynote speeches by Dr. Tom De Groeve and Dr. Nico Elema, Director, PeriPeri U, Stellenbosh University International, South Africa.

The first keynote speech was by Dr. Tom De Groeve. The Joint Research Centre is driving the science policy interface at the European commission and Dr, De Groeve is heavily involved in this process. His presentation on the Joint Research Centre activities and especially on its Disaster Risk Management Knowledge Centre, shared information on the collecting of data and its dissemination; and their various initiatives, networks, conferences, engagements with the policymakers and decisionmakers.

Key takeaway points from Dr. De Groeve's message from the disaster risk management to the scientific community is summarised below:

- to continue research efforts on DRM and in all its dimensions.
- It is essential to interact with other communities to acquire additional knowledge. We have to avoid becoming siloed within our own research field even if we are many disciplines, we should make an effort to interact with other research communities as well.
- to make sure that the knowledge that we produced in the Academia is useful and is being used. Of course, it is possible to always debate to what extent the researchers should do that or should allow for other brokers to take part of that phase.

Instead of building parallel tracts, but rather collaborate in that respect and there is a need to combine capacities in this respect too.

 to involve communities: it is really important to involve communities because the distance between science and people, might even be greater in many parts of Africa than in some other parts of the world.

The keynote sessions were followed by four panel discussion sessions on:

- Collaboration gaps
- Knowledge gaps
- Science-policy gaps
- Generational gaps

Panel Session one on Collaboration Gaps was dedicated to climate change and disaster risk reduction and how they interact and how we need to see that interaction within research activities. The session included Liviu Stirbat, Deputy Head, Adaptation Unit, European Directorate General for Climate Action; Deidre Brock, Member of Parliament, Scottish Government, Shadow SNP Spokesperson for Environment, Food and Rural Affairs; Desmond Manatsa, African Alliance of Disaster Research Institutes, and Sarah Webb and Mark Pelling from the UK Research and Innovation, funding institute .

Panel session on Knowledge Gaps discussion focused to finding solutions for transforming data into action. This was covered by Marzia Santini, JRC: Science Pillar of the Knowledge Network; Zuzana Stanton-Geddes, The World Bank; and Lisa Robinson, BBC Media Action covered an inspiring talk about how we can communicate better.

The third discussion panel was on Science Policy Gaps. This session was enlightened by Prof. David Alexander, University College London, Mr. Dzhergalbek Ukashev who presented the situation in Central Asia and the challenges of the Center for Emergency Situations and Disaster Risk Reduction, Kazakhstan. Speaker Valeria Drigo, Global Network of Civil Societal Organisations for Disaster Risk Reduction (GNDR).

Dr. Nico Elema started his presentation by actually reminding us about the vastness of the African continent because Africa is by no stretch one coherent environment. In his illustration, once can actually fit quite a many of the large countries within the African continent. It is very important that Africa is not seen as one coherent place.

Starting from that point that Dr. Elema moved on to highlight:

 how important it is to create these networks throughout the continent and that probably GADRI and also the African Alliance represented by Prof. Desmond Manatsa and colleagues, can serve as a vehicle towards more collaboration.



The final session was on Bridging Generational Gaps. As disaster risk reduction is closely tide to climate change solutions and it is not possible to solve problems here today nor in the coming years or if in decades and in generations to come. For this reason alone, it is really crucial that young researchers and young activists are involved all the way. There were several representatives from different youth organisations: Alinne Olvera, The United Nations Major Group for Children and Youth: The Science Policy Interface; Marie-Claire Graf, YOUNGO; Fang Lian, IRDR Young Scientists Programme, China; and Ida Ngurah, Plan International, Indonesia.

### **Outcomes and Recommendations:**

- requires Bridging gaps close and continuous collaboration between stakeholders to build shared understanding: populations, researchers, policymakers, economic actors. Ecosystems approach! If we want to bridge these gaps, we require close and continuous between stakeholders to collaboration build shared understanding; and not the common understanding. It is not necessary to agree or to think the same. It is necessary to understand each other's understanding among populations, researchers, policymakers, economic actors. One interesting suggestion from the European Commission, which is the Ecosystems approach! When we think about this, it might be easier to think of it in a systemic way like that.
- Objective, perceived, and manufactured realities evidence and truth – this came from David Alexander which was quite thought-provoking but interesting. It is necessary to think about evidence not being the truth. We might be aware of this as scholars and academics. But it is very important that

we remind ourselves about this and also remind other audiences. He talked about objective reality, perceived reality and manufactured reality.

- If we do not communicate, someone else does from Lisa Robertson from BBC Media Action. As scientists, as researchers, it is important to communicate. If we don't do it someone else will and someone else does. That is very important for an organization like GADRI to constantly make sure to communicate in good ways for different audiences and also through the regional alliances.
- Heterogeneity and diversity of all sorts narratives are essential to provide context for evidence. Quite importantly narratives are essential to provide context for evidence because what is true and relevant in one part of the world and relevant, may not be the same in other parts.
- More data and evidence are necessary: fine-grained and delivered in the right format at the right time. Several speakers touched upon this that we need more data and evidence. Of course, we cannot adjust to continually build and build more data. We need to make use of it. We need to think about the level of data. What it needs to be fine grained, connecting to the heterogeneity and diversity; and delivered in the right format at the right time.
- Make sure young people have a seat at the table youth engagement in GADRI? – This came from the last discussion panel on youth engagement. It is very important that young people have a seat at the table. Perhaps an involvement of youth engagement in GADRI too. How to make sure that young researchers and the next generation of researchers are included and involved and committed.

## Hour 28 — 01:00 JST 2<sup>nd</sup> September 2021

On behalf of UNDRR, Dr. Jenty

Kirsch-Wood congratulated the

organizers of the event and

thanked GADRI and each and

organisation for an insightful

and very deep and creative

in

the

everyone involved

### **Closing Ceremony**

The closing ceremony covered remarks by Dr. Jenty Kirsch-Wood and Prof. Qunli Han, Prof. Andrew Collins, Prof. Paul Kovacs and finally by Prof. Eiichi Nakakita.

### Dr. Jenty Kirsch-Wood, Chief of Section, Global Risk Analysis and Reporting, UNDRR, Switzerland



Fifth Global Summit.

She stated that "As heard from so many speakers yesterday and

from young population, from different parts of society, different indigenous people, into various dialogues and to see how they can also contribute. Therefore, it is really a great achievement today that so many of GADRI 200 committed member institutes have been actively involved in pushing for the dialogue, thinking about how to deepen, and further align and make more effective the research agenda and how communication can be even further strengthened. This conference on engaging sciences with action has proved a really unique opportunity to elevate sciences contribution to DRR and look for how science can accelerate risk reduction and spur Innovation that can also help drive climate Solutions and truly sustainable development. It has been very enlightening to hear the outcomes from the region's today and it is encouraging to see about the breadth of work but also the universal commitment to accelerate putting science and policy and practice to reduce risk. Once again she congratulated Prof. Hirokazu Tatano, Secretary-General GADRI and Prof. Paul Kovacs, Chair, Board of Directors of GADRI for putting together an impressive array of speakers and exciting agenda. She also used the opportunity to thank the Disaster Prevention Research Institute, Kyoto University for hosting the GADRI Secretariat. She concluded by saying that they look forward to receiving the recommendations from the summit to feed into GP22 workshop proceedings and to continue to work together.

today, disaster risk reduction connected and the impact of hazard cascading across, sectoral and geographical boundaries. The Sendai Framework for Disaster Risk Reduction and that Global Plan to reduce disaster losses adopted in 2015, emphasizes the importance of tackling risk drivers through improved governance and to a better understanding of risk, and through promoting that risk financing. But, of course, the issue of how you do this is still such a challenge. The science and technology community play the critical role in accelerating Sendai implementation as it enables to promote that inform decision-making based on scientific evidence in the better use of technology. It has also been able to bring new voices whether that is from the elderly,
Prof. Qunli Han, Executive Director, International Programme Office of Integrated Research on Disaster Risk (IRDR-IPO), China



Likewise, Prof. Qunli Han opened his remarks by congratulating the GADRI community, GADRI Secretrariat, and the organising teams of the summit, all the chiars, moderators, rapporteurs, for the

sessions. He noted that the summit enabled a broad participation especially researchers from different domains, different research institutions, regions, and bought in many young professionals. It brought in a strong sense of togetherness that could not have been seen physically in one place. The summit did not separate because of different time zones but rather kept everyone close even during the long discussion sessions. The summit was a record of 27-hour meeting.

Secondly, the overall theme of the summit, Engaging Sciences with Action, it was not about engaging sciences for action but rather on how to do it. What is felt strongly in particular is that the summit has managed to engage science in the changing risk context and in the risk landscape that has been shaped by the climate change, weather extremes, current pandemic, and many other systemic, compounding and cascading risks. This engages science across the research disciplines but also beyond science to technology to engineering. That is really a must to affect the action and for practical solutions with engagement between the countries and regions that share similar or common social, economic, cultural and technical conditions. This was clearly reflected in the discussions of the Small Islands, Europe, Africa, Asian Pacific on the North America or South America. lt underlined the engagements between the research institutions and further, it is extremely important to engage with young professionals and the practitioners on DRR.

There was not enough discussion on the engagement of science communication with the media, society and the social media. There were some discussions and there is a long way for many things to improve. There is a great general public, and behind it is media or societies. It is the duty of the scientific community to communicate effectively as has been highlighted by the previous speaker. He underlined a few points:

- first of all it is really the time to have a global research framework on DRR or risk research agenda for coherent actions. Led by the UNDRR, and the International Science Council, and through the facilitation of IRDR, last year, there has been a proposal on the research agenda to launch at the IRDR conference. He welcomed all colleagues in GADRI to become involved.
- It is extremely important that to continue to build a disaster risk capacity especially the institutional capacity. The expert

DRR can no longer be considered as a marginalized. It must be central or the mainstream item in the agenda. If we make that to be sustainable, that development has to be saved at the same time. In this direction, IRDR will continue mobilizing science actions and working with all the colleagues from GADRI, and from other DRR societies.

## Prof. Andrew Collins, Leader, Disaster and Development Network, Northumbria University, UK



He shared information relating to the event, COP26 to take place in November 2021 in the UK.

In the opening session, one of the keynote speakers, Loretta Hieber

Girardet, Chief, Risk Knowledge, Monitoring and Capacity-Development Branch, United Nations Office for Disaster Risk Reduction (UNDRR) flagged that 80 to 90% disasters caused by natural hazards are related to climate and that climate change adaptation needs to be risk informed. We can argue about the definition of disaster causality, the complexity of interrelationships and interpretations as to how risk impact and much-needed recovery processes are represented. However, there can be little doubt, the climate emergency is with disaster risk science policy and action must energize climate change mitigation and adaptation at all levels. Increase bringing together apparent relationships between DRR and climate change adaptation is in itself one of the ways of speeding up science into action with respect to current major emergencies.

The covid-19 context we are living in with globally, only serves to provide greater impetus giving the myriad of the further interconnections. This brings around a nexus of biohazards, vulnerabilities, and capacity demands. This is the case whether directly or indirectly experienced and magnified also by further hazards and vulnerabilities in at risk ecologist and societies.

The positive side of this is, there are greater opportunities to make a difference since you contribute to changing the course of history. Sessions in each of the time zones in this event have addressed the knowledge needed to address compounded demands for climate disaster risk resilience and response. Some specific reference to the climate change aspect and it will be used that with presenter's permission to feed into the COP26 environment as best as possible. Some GADRI members are already half linked. UK hosting COP26 in November represent one of the opportunities to consolidate comments by the hosting Regional Alliance links within the initiative of UK Research and Innovation (UKRI) and that process is already in progress. It will help to make a wider voice heard but the process includes other events in various parts of the world that GADRI members can contribute to focusing on COP26 themes in particular, its venture into greater emphasis on adaptation of resilience.

groups are able to evolve and adapt to the new settings prioritizing the environment and the requirements.

 There is a need to see a new way of capacity development especially on how to engage with young researchers and practitioners and to be innovative.

In his concluding remarks he stated that when talking about disaster risk reduction and science actions, we should think all the time of the effectiveness of the actions. Have to think about the development and the safety of the developments or briefly the development safety. The development safety will help us to build a policy connection with disaster science, with development interests, and goals that transpires with all sectors of science. Finally, GADRI is a partner in of the UKRI and will be kept updated on progress and feed in some of the efforts of this current Summit to register in the neighbouring climate change policy environment. Existing connections with the United Nations and GADRI enjoy and others will only help to perpetuate that also. We hope this should become standard item of GADRI contributions to research policy and practice through the inevitable ongoing rounds of COP which itself will need to continue to adapt better in assisting with the delivery of greater outcomes for peace, health and environmental security.

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### Closing of the 5th Global Summit of GADRI: Engaging Sciences with Action

Prof. Paul Kovacs: Chair of the Board of Directors, GADRI, Canada



With a big WOW! Prof. Paul Kovacs stated that cannot get an opportunity to attend a conference of this size and the global pandemic has led to creative people, doing things differently and we just

experienced one of those different and positive things. There has never been anything like this before.

It was incredibly complex to conceive to put together, and implement. But it was done remarkably successfully. He sent a huge thank you to all of those involved in the organization, participation, speakers, participation for speaking up, and listening in and being involved. It was a fabulous event and a real show case for the Global Alliance for Disaster Research Institutes (GADRI). We have the capacity and a couple of hundred organizations around the world to make a real difference. It was very evident over period of time here as so many really creative and the thoughtful people shared their views about how we can do even better on one of those support issues of our time, global risk management and global risk reduction. We heard many very clever and thoughtful ideas on how to properly proceed going forward and all found in science.

The focus on action, it is one thing to sit at a university and write down some of the ideas, but to make sure that they actually are carefully thought through and how they can support implementation, where implementation is going well in another matter. During this summit, we had many speakers who gave positive, successful examples of good things that are going on around the world. We are pleased that we were able to report on more of those that are happening all the time and making a real positive difference. I am also concerned that we need to do better. There are losses being experienced that are continuing to rise. There is a trend that is been going on for several decades now that is unsustainable and unacceptable. While there are positive stories, there is a real sense that we do need to do better. We have yet to break this very disturbing trend science gives a foundation for that. It can only be broken only through action and by linking science to action. I think that there is this optimism many of us have that a lot of losses that are being experienced are indeed preventable. We can do better going forward. There is a reason to be optimistic. It is through these kinds of dialogues that we can do that. I want to close with just a really upbeat "wow" that was exciting, that was a wonderful concept idea, really well implemented, a huge thanks to everybody involved, and hand over here a huge thanks to the Secretariat, for organizing this and thank the Disaster Prevention Research Institute for being host

#### Prof. Eiichi Nakakita, Director, Disaster Prevention Research Institute (DPRI), Kyoto University, Japan



He started by stating that he conference went around the world during the past 27 plus hours making this event truly a global event of the Global Alliance of Disaster Research Institutes. He

congratulated to all the participants and organizers for successfully organizing one-of-a-kind event and thanked all the organising teams for their wonderful and remarkable efforts in putting together the agenda and coming-up with a stellar programme with 93 impressive speakers. He also mentioned his regret for not being able to welcome everyone at the Uji Campus, as has been done before, due to the ongoing global pandemic.

He pointed out to a comment made by the keynote speaker Loretta Hieber Girardet, UNDRR who acknowledged GADRI as a direct partner of the UNDRR, and he said that he and everyone at GADRI and Kyoto University is pleased to note it. Further, Ms. Hieber-Girardet and Prof. Virginia Murray, both emphasized on the importance of enhancing the interaction between policymakers and the scientist to achieve the global engagement of science interactions. Prof. Nakakita stated that these statements acknowledge the important role played by the GADRI community as a foundation of the international research networks in the area of disaster risk reduction and serving as an advocacy organizations with evidenced-based scientific results to influence decision-makers. It is an important aspect of the academics to be aware how science can directly contribute to the national and local disasters, for example the current global pandemic, earthquakes and volcanic eruption, etc. Such situations prompt scientists' intervention, expertise, and experience, and provide opportunity to effectively communicate with the emergency managers in crisis situations. As continually stressed during the past 27 hours by many of the speakers, communication is one crucial aspect of engaging science with action.

He also said that he looks forward to seeing the outcomes and the recommendations that will be fed into COP26 in November 2021 in the UK through the help of UKRI; and the UNDRR, GP22 in Bali, Indonesia in May 2022.

He concluded his remarks by reiterating that GADRI will always have the support of DPRI, Kyoto University and that they are proud to host its secretariat at DPRI, Uji campus. He looks forward to working together with GADRI community and continue to enhance and build on our objectives to contribute to the DRR, continue to educating the world to adapt to the changing climates and strengthen the disaster resilience to build back better. He

and for the role being played."



The GADRI Secretariat sincerely thank all the members of the organising teams starting from the GADRI Secretariat, the Committee members, all staff at the DPRI, all members of the Americas covering with North and South America organising team,

all members of NAAHDRI, Prof. John van de Lindt, Dr. Grace Yan, Prof. Paul Kovacs, Prof. Lori Peek, and all other members; and all members of the Europe with Africa and the Middle-East organising committee members, Prof. Jorgen Sparf, Prof. Andrew Collins, Dr. Tom De Groeve, and Prof. Desmond Manatsa and Prof. Chipo Mudhavanhu, Bindura University of Science Education; and the African Alliance of Disaster Research Institutes (AADRI) – and everyone who provided the technical support and other assistance behind the scenes too. When the idea was proposed to hold the summit via Zoom meeting, it sounded impossible but with your dedicated support, we managed to make it a reality. THANK YOU!

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## New Members of GADRI

University of Management and Technology (UMT), Center for Disaster Management Lahore, Pakistan

The University of Management and Technology (UMT) was established in 1990 and has evolved into a premier institution of higher education in the country. Recognized by the Higher Education Commission (HEC) of Pakistan as a "W4" category (highest rank) university, UMT distinguishes itself with 400+ full-time faculty members including more than 200+ PhDs, 26,000+ alumni and 25,000+ students from Pakistan and various countries around the globe. The Center for Disaster Management established under the ambit of University of Management and Technology, Lahore, Pakistan has been mandated to lead research and education in the field of Disaster Management in Pakistan.

For further details, visit the website: http://cdm.umt.edu.pk/

University of Glasgow, National Centre for Resilience Dumfries, United Kingdom

The University of Glasgow, National Centre for Resilience (NCR) is an academic research hub, using evidence to inform policy and practice. It bridges the gap between academia, policy and practice by promoting cross sector partnerships, encouraging each to learn from the other to improve resilience when planning for, responding to and recovering from natural hazard events in Scotland.

The NCR utilises existing knowledge, commissions demand led research projects and funds practical projects to address real life issues faced by resilience practitioners and communities. Using its networks, it creates links for researchers to help them adapt their project outputs into tailored briefings and tools for end users and then maximises the potential use and impacts of this work by disseminating research outputs.

For further details, visit the website: https://www.gla.ac.uk/research/az/ncr/

The University of Alabama, Center for Sustainable Infrastructure

Alabama, USA

The mission of the Center for Sustainable Infrastructure (CSI) is to conduct research associated with constructing, expanding, maintaining, and rehabilitating all aspects of physical infrastructure. The Center facilitates and leads multi-disciplinary, collaborative







programs and explores linkages between different infrastructure systems that are traditionally studied in separate specialty areas. The Center is particularly focused on the safe and efficient creation of resilient infrastructure, including assessment of infrastructure condition, vulnerability, and recovery from disaster. Four key research themes of the CSI are 1) multi-hazards community-based resilience, 2) energy simulation and retrofitting of buildings, 3) accelerated and automated construction, and 4) advanced materials for civil infrastructure. Its Large Scale Structures Laboratory (LSSL) contains a 75-foot by 40-foot test floor with a 3-foot thick strong floor, two 15-ton capacity overhead cranes, and 2-foot thick reconfigurable reinforced-concrete blocks that can be stacked and post-tensioned to the strong floor to provide reaction walls on the testing floor. The sponsors of research projects include National Science Foundation, Federal Highway Administration, National Institute of Standards and Technology, Department of Defense, Department of Energy, State DOTs, and the industry.

For further details, visit the website: https://csi.eng.ua.edu/

# **GADRI** Members

Geographical Distribution of GADRI as of 31 December 2021

Established in March 2015, the Global Alliance of Disaster Research Institutes support the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) and the work of the Scientific and Technical Advisory Group of the United Nations Office for Disaster Risk Reduction (UNDRR).

In line with its vision, GADRI strives to deepen the understanding of disasters and find implementable solutions to achieve disaster resilience; i.e. human, technical system and infrastructure resilience, survivability and well-being, by integrating knowledge and technologies from around the world. Over 200 institutions have joined GADRI.

GADRI membership is free; and completely voluntary and non-binding.

GADRI Secretariat is currently headquartered and hosted by the Disaster Prevention Research Institute (DPRI), Kyoto University, Kyoto, Japan.

To join GADRI, please contact the GADRI Secretariat: secretariat-gadri@dpri.kyoto-u.ac.jp

Area	Members	Economies
Africa	12	7
Americas	36	8
Asia (Excluding Japan)	81	23
Europe	36	12
Japan	33	1
Oceania	10	2
Total Institutes	208	53
	53 economies	





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