

Future Earth Knowledge-Action Network (KAN) on Disaster Risk Reduction
- Disaster Risks under Environmental Change

Jointly proposed by Future Earth, IRDR and WCRP

For the next round of discussion, I would propose shorter title with sub-title.

Global issues to be addressed

Based on the interactive comments, I would suggest starting from several options for the scope of the KAN, as thinking practices:

Option 1)

Addressing research themes and scope, where our synergetic and synthetic activities are strongly needed or possible

Option 2)

Developing loose network of individual programmes and their projects to share knowledge and stakeholder engagement practices

Option 3)

Creating research centers with different research topics in different locations in the world

I do not think Option 3 is not our intention. Having three programmes and their projects and other internal structures being active in independent shape, our aim to jointly establish this KAN would be Option 1. However, if we cannot find common collaborative area in rather a short timeframe, we have to be settled in Option 2.

I agree that climate extremes and climate change-driven disasters are very serious, but also understand that they are already major research targets of E3S and WCRP. On the other hand, geological and hydrological or even economical disasters are being studied by IRDR and IRG. Each programme/project has more advantages than in research targets but in research scopes and approaches. I think we cannot focus on some types of disasters, but should cover complex aspects of each type of disaster and also challenge systemic, complex and sometimes cascade-shaped disasters, which single programme/project cannot tackle with but only synthesis of various scientific approaches and products can. This would be a meaningful output from Option 1. Actually I was impressed by Robert Glasser's speech that mentioned this.

Your draft or suggestion is welcome, otherwise, I will draft this part tomorrow.

[Thank you, Markus, for a nice explanatory figure. It is useful and I hope we will use it when we develop some more concrete documents. I think we could think of the combination of

different type of disasters now, so I cut it out at this stage.]

Despite of the development of science and technology in understanding and predicting natural hazards, and in supporting preventative actions against disasters, people are still seriously suffering from various impacts from disasters, both in the developing and in industrialized countries. This is partly due to fundamental lack of understanding of risk cycle - cascades and feedbacks and partly due to missing governance structures and legislation considering emergent and complex risk. The global environmental change has increased climate associated extreme events, which have huge impacts on human society, and rapid social changes and human factors – urbanization, lifestyle, land use, socio-economic inequality. The socio-economic development itself has also increased exposure of human society to the disaster hazards, both climate and non-climate (e.g. geophysical, biological, technological, financial). Too rapid and un-coordinated development and socio-economic inequality increases vulnerability of human society against various types of disasters. As a result, disaster risk has become increased, more complicated and sometimes cascade-shaped. In order to contribute to Sendai Framework for Disaster Risk Reduction (SFDRR), UN SDGs, UNFCCC and other UN framework from science and technology, unique and dynamic change in scientific collaboration among multiple existing excellences and with the stakeholders in the society is urgently needed, to address reduction of complex, actual and present disaster risk in an integrated manner. In this context, three of ICSU programmes, World Climate Research Programme (WCRP), Integrated Research on Disaster Risk (IRDR) and Future Earth, are establishing a new Knowledge-Action Network (KAN) on Disaster Risk Reduction.

Objectives of the KAN

There were comments:

Working Principles should be separated from Objectives.

The value of this KAN should come from the synergy of WCRP, FE and IRDR!

- To build a global partnership and network of science excellence across disciplines to accelerate ground breaking and solution in the agenda of disaster risk reduction and governance under global environmental and societal change
- To jointly identify priorities and support complementarity of research in the interaction of climate-change induced extreme events and other disasters
- To enhance science advocacy on policy and in the society, by synergetic activities

among diverse science communities and collaboration with stakeholders

Working principles of the KAN

According to comments from some of you, I separated this section from the Objective, and I brought the first bullet point from Anne-Sophie's comment on research examples.

- Provide a platform for scientific communities from across science disciplines and engineering working on extreme events and disaster risk reduction and governance under the ICSU programmes, to exchange information, knowledge and data, for co-development of research.
- Define scientific focus with key principles being adding value and addressing key policy and practice knowledge needs that are not currently tackled by one of the partner.
- Engage with societal actors from local/national/international policy communities, business sector, practitioners, civil society and UN frameworks to co-design research agendas and deliver new knowledge for effectively reducing disaster risks through partnerships and joint outputs.
- Stimulate groundbreaking and solution-oriented scientific research with major impact on the development of effective strategies for embedding risk into development planning and practice.
- Follow a common risk framing and terminology across the communities, if applicable, and make efforts to provide or generate the necessary data and knowledge to feed into those communities (This would involve tailoring climate data and scenarios to very regional to localized exposure and vulnerability aspects, and scaling up case studies from the IRDR data bases, e.g. PERC).
- Address systemic, complex and sometimes cascade disasters by synthesis of various scientific approaches and products, in addition to small-scale frequent disasters and large-scale geophysical and climate extremes, in order to contribute to Sustainable Development Goals.
- Support informed decision-making by multiple-actors seeking social-ecological resilience or transformation by enhancing understanding and prediction of and open data and knowledge bases for risk cycle and its management.
- Support society enhancing the resistance, resilience, and adaptive capacity of socio-ecological systems to climate change across spatial, temporal and institutional scales, by promoting and strengthening the development of a system like national platforms for disaster risk reduction, and contribute to Sendai Framework for Disaster Risk Reduction (SFDRR).

Co-proposing programmes – individual strength and limitations

I think this part should be a little bit shorter.

ICSU Programmes which co-propose this KAN have following strength;

- IRDR: international programme on integrated research on risks and disasters looking at both the natural (biophysical and hydro-meteorological hazards) and social determinants of risks (vulnerability, risk creation processes, risk perception...) with an emphasis on understanding the root causes of disasters (i.e. disasters triggered by natural events but fundamentally socially-constructed). It has a strong connection with the UNISDR. Through its International Centres of Excellence (ICoE), the IRDR family also has strong connections to other UN agencies, government, the private sector, humanitarian agencies and community organisations. ICoEs act as knowledge hubs on thematic issues (health, building infrastructures and codes, etc.) and national structures focused on local topics linking the global science of IRDR to local practical contexts for science rich problem solving.

Strengths where IRDR might offer leadership in a KAN include: monitoring and modeling of disaster risk and loss; early warning and preparedness for risk reduction; decision-making and risk perception; risk root cause analysis; urban planning and risk management governance; multi-hazard risk management.

Areas of interest where IRDR is building capacity include, ethics, humanitarian practice, integrating DRR/M into health, food, water and energy systems and insurance/financial services.

- WCRP: long years' established research communities in climate research, supported also by national structures, having Core Projects on cryosphere, ocean, air and energy transition, and conducting co-designed research with WMO and other associated programmes such as the World Weather Research Programme across Core Projects (e.g., High Impact Weather Project (HIWeather))

Of particular relevance is the WCRP Grand Challenge on 'Weather and Climate Extremes' organized around four overarching research themes: Document (focusing on observational requirements), Understand (focusing on the relative roles of different spatial scales and their interactions), Simulate (focusing on model reliability and improvement), and Attribute (focusing on unraveling the contributors to extreme events). Underlying all research themes is a focus on four core types of extreme events, Heavy

Precipitation, Heatwaves, Droughts, and Storms, and their link to societal impacts.

- Future Earth: having various research agendas and experts including social sciences within Global Research Projects, Cluster Initiatives and KANs, stakeholder engagement, focusing on longer-term development and associated risk scenarios, a broader sustainability perspective to risk and vulnerability, having foundation from E3S scoping workshop in Berlin, Feb 2016.

However, every programme has also challenges, such as budget deficiencies, difficulties in prioritizing research themes, actualizing transdisciplinary researches by stakeholder engagements, etc.

Strength in collaboration

By collaborating through the KAN, the programmes can

- cover wide range of scientific expertise
- provide integrative synthesis capacity across disciplines by a mix of inter-/trans-disciplinary expertise
- jointly engage and contribute to international stakeholders we have already
 - Future Earth: ISSC, UNESCO, WMO, UNU, SDSN, UNEP, STS forum, Belmont Forum, IPCC, IPBES and Strategic Partners and Partners
 - IRDR: ISSC, UNISDR, SFDRR, Asian Ministerial Conference on Disaster Risk Reduction, *and more?*
 - WCRP: WMO, UNESCO-IOC, IPCC, and Partners, *and more?* and through ICSU
 - *Which organization should we indicate here?*
- share experiences and methodologies in research and stakeholder engagement, and regional and national structures
- share resources including secretariat supports and budgets in some of the operations
- coordinate outreach to funders they have in common (e.g. Belmont Forum)
- collaborate in capacity building of young researchers and professionals and also of the supporting national systems
- align and coordinate joint research agendas

Possible research agenda examples

I have moved Anne-Sophie's comment to 'Working Principles', but still wonder if it may be too early to provide this details. But if we need to present some examples of what we are

going to do, we should limit to 4-5 examples. How do you think? Originally these below were picked up from some documents of the 3 programmes.

- How do you define an extreme event, and what is the relation to “tipping points” if at all?
- Improved conceptual mapping of global systemic risk, its production through development processes and its potential, distributed consequences.
- What are the most important measures to cope with these impacts and underlying hazard and vulnerability factors to achieve resilience and transformation (prediction, infrastructure, education, economic and social policy and disaster response etc.)?
- What are the largest obstacles to overcome across and between sectors (lack of knowledge, lack of governance, etc.) in order to find and establish sustainable and just solutions?
- What are the expected most serious potential impacts that might be caused by extreme events in the future across different sectors?
- What kind of data needs urgent attention in order to better identify the factors and mechanisms that determine the location, intensity, and frequency of various extremes
- Developing new methodologies, such as case studies, scenario analysis, modeling and theoretical studies
- What are meaningful indices to describe and quantify impact-relevant extremes that can support or feed into the risk framework
- How to develop a mechanism for reliable international assessment on the status of scientific and technological knowledge on disaster risk, resilience and the progress towards a safe and secure society
- What are the key interactions between global urbanization processes, extreme events, and social and infrastructure vulnerability and resilience
- How to examine interactions and potential extreme impacts fed through supply chains and production systems – water, food in particular
- How to incorporate existing disaster prevention and risk reduction models by integrating governments, business, public and academia
- How to incorporate knowledge into social regulation to better deal with global systematic risks with unintended consequences

Possible initial leaderships

Anne-Sophie suggested to keep quite small for nimbleness – then I suppose perhaps about 2 people from each programme, with facilitating secretariat support

Development Team should be selected from broader communities and have specified ToR

to clarify expectations. For instance, lead a consultation with key scientific and stakeholder communities to identify a common set of knowledge gaps, scope for fundraising opportunities, coordinate engagement in the BF CRA, etc.

Suggestions here are small group of people who would serve at least until Development Team is formed.

- Future Earth (*those who have been involved so far*)
 - Cluster Activity “Extreme events and environments: from climate to society (E3S)”
 - Global Research Project “Integrated Risk Governance (IRG) Project”
 - Secretariat Co-Coordinator: Thorsten Kiefer and Fumiko Kasuga
(Secretariat is not leading discussions but facilitate. Therefore, we hesitate to be written first.)
- IRDR
 - Link to IRDR SC (Science Committee) members, NC (National Committees) and ICoE (International Center of Excellence)
 - Link to IRDR working groups: FORIN, DATA and RIA
 - Link to IRDR Young Scientist network
 - Feedback through science and other stakeholders dialogues at regional and global levels
- WCRP
 - Co-lead (Jana Sillmann) and co-chair (Sonia Seneviratne) of the WCRP Grand Challenge on Weather and Climate Extremes

Planned steps forward

1. IRDR Science Committee meeting: 22-23 May, 2017 in Cancun, Mexico
2. UNISDR global platform: 22-26 May 2017 in Cancun, Mexico
3. Belmont Forum Scoping Workshop on D3R: 5-7 June, 2017 in Florence, Italy
4. ICSS International Conference on Sustainable Sciences: 24-26 Aug 2017 in Stockholm
5. Global Forum on Science and Technology for Disaster Resilience 2017, 23-25 November 2017, Tokyo, Japan
 - KAN Scoping workshop (tbd)
6. Davos-Sendai World Bosai Forum (IDRC 2017): 25-28 November, 2017, Sendai, Japan
7. Establishing Development Team: by the end of 3rd quarter, 2017
8. WCRP/GEWEX Open Science Conference: 30 April – May 5, 2018, Banff, AB, Canada
9. WCRP meeting: May 1-3, 2018 in Barcelona

10. Preparatory development tasks: 4th quarter, 2017 to 3rd quarter, 2018

e.g.

- Elaboration of research agendas with stakeholders
- Structuring collaboration across existing programmes/projects
- Identifying stakeholders and engaging them
- Developing fundraising strategies and governance principles

11. The Adaptation Futures meeting in Cape Town, 11-14 June, 2018

12. Establishing Steering Group and formal launching the KAN: by 4th quarter, 2018

DRAFT