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MOVING FROM 2015 TO 2030: CHALLENGES AND OPPORTUNITIES FOR HIGHER EDUCATION IN DEVELOPING RESILIENCE TO DISASTERS

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Abstract. In recent years, the higher education community has played an increasingly important role in moving disaster science from a responsive, primarily technical discipline, to a broad, multi-disciplinary movement that seeks to build societal resilience to disaster. This study sets out some of the key challenges and opportunities for higher education towards tackling the challenges set out in the Sendai Framework for Disaster Risk Reduction 2015 - 2030, which was adopted by 187 UN member states in March 2015.

The study brings together existing literature in the field, as well as the results of various analysis and study projects undertaken by a European network project.

Five key areas of focus are identified in working towards 2030: Link research, education and action; Integrate all hazards, stakeholders and disciplines; Collaborate regionally and globally; Facilitate policy dialogue, knowledge sharing and capacity development; Develop flexible and customisable education programmes.

Keywords. *Disaster resilience; higher education; challenges; opportunities.*

1. Introduction

In recent years, the European higher education community has played an increasingly important role in moving disaster science from a responsive, primarily technical discipline, to a broad, multi-disciplinary movement that seeks to build societal resilience to disaster. This movement coincides with the increasing global emphasis on the need to tackle the inter-related challenges of disaster risk reduction, sustainable development and climate change.

The ANDROID disaster resilience network was established in 2011 (Academic Network for Disaster Resilience to Optimise EducatIonal Development). The network was set up to promote co-operation and innovation

among European Higher Education and in doing so, to increase society's resilience to disasters of human and natural origin. An underlying tenet of ANDROID is that higher education should be more innovative, providing opportunities to work in close collaboration with industry, communities, humanitarian agencies, private sectors and other higher education institutions.

This study presents a roadmap produced by the network that sets out some of the key challenges and opportunities for higher education towards tackling the challenges set out in the Sendai Framework for Disaster Risk Reduction 2015 - 2030, which was adopted by 187 UN member states in March 2015. A more detailed account of the study and supporting survey projects can be downloaded from www.disaster-resilience.net.

2. Background to the study

Among many communities disasters pose significant concerns and challenges. With growing population and infrastructures, the world's exposure to disaster related hazards is increasing. In addition to loss of life, disasters greatly hamper the social-economic capacity of the member countries and also of the union as a whole. Swiss Re's latest sigma report (2014) highlights 308 disaster events in 2013, of which 150 were natural catastrophes and 158 man-made. Almost 26,000 people lost their lives or went missing in the disasters.

The frequency, scale and distribution of disasters in recent years is also evidence that disaster related hazards are a global problem, threatening to disrupt communities in developed, newly industrialised and developing countries. As the 21st century unfolds, an increasing majority of the world's population will live in cities. By 2050, the UN expects 80% of world's population to live in urban areas. Half of these are in small and medium size cities (United Nations, 2014). In the East Asia region alone, the urban population is expected to double between 1994 and 2025 (World Bank, 2011).

The importance of international cooperation and global partnership to tackle disaster risk is explicitly recognised in the Sendai Framework for Disaster Risk Reduction 2015-2030 that representatives from 187 UN member States adopted in March 2015 as the first major agreement of the post-2015 development agenda. The framework will govern the next 15 years of disaster risk reduction globally. The framework acknowledges that given their different capacities as well as the linkage between the level of support provided to them and the extent to which they will be able to implement the present framework, developing countries require enhanced provisions of means of implementation, including adequate, sustainable, and timely resources,

through international cooperation and global partnership for development. It recognises that in addressing economic disparity and disparity in technological innovation and research capacity among countries, it is crucial to enhance technology transfer involving a process of enabling and facilitating flows of skill, knowledge, ideas, know-how and technology from developed to developing countries in the implementation of the present framework.

The Sendai Framework also recongises the vital role of academia, scientific and research entities in tackling disaster risk. It urges them to focus on the: disaster risk factors and scenarios, including emerging disaster risks, in the medium and long term; increase research for regional, national and local application; support action by local communities and authorities; and support on the interface between policy and science for decision-making. In a similar vein, the Science and Technology Major Group that informed Member States and Stakeholders' submission (STMG, 2014) identified the need to promote scientific research into risk patterns and trends, as well as the causes and effects of disaster risk in society; and engage with the national/sub-national research and practitioner community to strengthen the science-policy interface.

3. Methodology

This roadmap brings together existing literature in the field, as well as the results of various analysis and study projects undertaken by project partners (Faber et al, 2014; Indirli et al, 2014; Kaluarachchi et al, 2014; Knezic et al, 2014; Perdikou et al, 2014).

A survey was carried out by means of a questionnaire which collected 57 responses from more than twenty European higher education institutes. The survey focused on disaster-resilience projects and on the main challenges faced in interdisciplinary working (Faber et al, 2014). A second survey set out to establish the current teaching and research capacity among European HEIs in the field (Perdikou et al, 2014). 96 participants directly related to disaster resilience education responded. A third survey studied existing capacity at both national and local levels. The survey respondents represented organisations with total disaster resilience personnel of approximately 19,000 people. Finally, a series of special interest groups studied emerging research and teaching concerns in disaster resilience, selecting Venice and its territory as an emblematic case study of a region that could be affected by crossborder disastrous events. A case study was carried out not only as an engaging exercise, but with the purpose to provide a reference point for scientists and teachers interested to translate multifaceted knowledge into spe-

cific solutions. A series of papers have been written (Indirli et al, 2014; Knezic, 2014; Borg, 2014; Kaluarachchi, 2014).

This paper collates the results from these various sub-projects to present the major challenges and opportunities for higher education in contributing to increased societal resilience. The detailed methodologies associated with the individual sub-projects and surveys are described in the respective papers.

4. Results

5.1 LINK RESEARCH, EDUCATION AND ACTION

The Sendai Framework for Disaster Risk Reduction 2015-2030 aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and health, and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries over the next 15 years.

It has been recognised that the success of this post- 2015 framework hinges on creating and implementing policies that are built on the best available knowledge. Higher education has a vital role in supporting this move to a more disaster resilient society by 2030.

This roadmap considers the challenges and opportunities that must be addressed by higher education in Europe if it to effectively support Sendai Framework for Disaster Risk Reduction 2015-2030.

The prime focus must be that the policy-science gap is closed with research that can be translated to action. Research studies document a trend of increasing disaster losses, but the translation of research findings into practical actions has proven difficult and remains a barrier that prevents the best use of science.

There remains a recognised need for higher education, through researchers and educators, to provide and communicate actionable knowledge with explicit links to inform effective, evidence-based decision-making. As well as creating new knowledge, higher education has a vital to play in capacity development and in doing so, providing a means by which effective knowledge transfer can take place.

5.2. INTEGRATE ALL HAZARDS, STAKEHOLDERS AND DISCIPLINES

Higher education will need to develop multi-actor and multi-sector alliances to tackle the type of emerging priorities in areas such as understanding disaster risk, governance arrangements, investment decisions, preparedness,

and rehabilitation and reconstruction. These alliances will support the development of problem-based education and research programmes, and thereby help to create and implement evidence based, resilience building policies and practices.

An all-hazard, problem-focused approach should be used in resilience building research and education to address the complexity of disaster risk. This will require collaboration and communication across the scientific disciplines. Higher education can promote this approach by providing researchers and students with:

- Exposure to a variety of disciplinary work
- Exposure to interdisciplinary work
- Exposure to and experience with tools and methods from a variety of disciplines
- Exposure to and experience with interdisciplinary tools and methods
- Experience working with others in an interdisciplinary mode

Higher education programmes and research training must develop the skills to shift perspectives easily, and continually see things in new ways. Researchers and students must be comfortable with multiple languages and a variety of ontologies, epistemologies, methods, tools, and theoretical perspectives, and shift easily among them.

Funders, publishers and editors must not reinforce disciplinary silos, and should promote and encourage the development and publication of multi- and interdisciplinary research. The scope of scientific panels and peer-reviewed journals should reflect the importance of problem-focused research, rather than be defined by traditional academic disciplines.

Review panels, editorial boards and scientific committees should reflect the diverse array of disciplines required to address major societal challenges such as building disaster resilience.

Researchers and educators must interact and collaborate with policy-makers and practice based actors at the local, national, regional and global levels. Collectively they must work to identify and address problems and knowledge gaps from the field. Rather than being passive recipients of new knowledge, policy makers and practitioners should join with higher education to form multi-stakeholder groups that work together from the outset to design and deliver new knowledge. The scientific results will be more relevant and actionable.

There are already a number of regional initiatives that promote collaboration among higher education towards building resilience. The ANDROID conferences provided a showcase of the type of international, multi-disciplinary and multi-sector engagement that is required. These networks and events have helped to gather a wide and advanced set of competencies in

the field of disaster resilience, sharing knowledge, discussing methodologies, disseminating good practices and producing and promoting innovation. These networks should be supported and encouraged to grow.

Given their different capacities, the EU must continue to strengthen its engagement with developing countries through international cooperation and global partnership for development, and continued international support, to strengthen their efforts to reduce disaster risk. In supporting this, the current regional networks should collaborate to form a global higher education network that can influence strategic agendas.

This global network should collaborate with existing bodies such as the UN ISDR Scientific and Technical Advisory Group to ensure that the role of higher education is understood and can be exploited towards achieving the objectives of the Sendai Framework.

5.3 COLLABORATE REGIONALLY AND GLOBALLY

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Funding bodies for science should coordinate their efforts to ensure that resource are being deployed effectively and efficiently, and to promote collaboration across disciplines, as well as regionally and internationally. This will help to avoid duplication of effort and integrate funding.

5.4 FACILITATE POLICY DIALOGUE, KNOWLEDGE SHARING AND CAPACITY DEVELOPMENT

Greater priority should be put on sharing and disseminating scientific information. The research community must make more effort to translate traditional outputs into practical methods that can readily be integrated into policies, regulations and implementation plans towards building resilience.

National research assessment exercises, the European Union and national funding bodies, and higher education promotion policies, which often emphasise traditional academic outputs (e.g., peer reviewed journal articles), should appropriately incentivise and reward non-standard scientific outputs, such as research summaries and policy briefs.

The recent shift towards open access of research outputs and education is to be welcomed and should continue to be encouraged.

The high levels of disaster risk found in low-income countries make it an imperative that European research and education is made widely available. The European Union and other research funding bodies should require all funded scientific outputs to be made available as open access. This includes the use of green publishing routes where possible, or financially supporting gold publishing as necessary.

Higher education should be supported to develop open educational resources that are freely accessible and openly licensed, for use in teaching, learning, and assessing as well as for research purposes linked to building resilience.

Educators and the research community must take time and effort to understand the audience they are seeking to inform.

Scientific results are often subject to misunderstanding due to poor comprehension of numbers and statistics, as well as conflicting languages and terminology. Correct comprehension depends not only on the skills and knowledge of the reader, but also on the way the information is presented. By assuming a weaker background knowledge (e.g. of scientific language) and low “statistical literacy”, evidence summaries can add information to help readers better understand the strengths and limitations of the scientific evidence being summarised. Adding meta-information that explains concepts such as the quality of the evidence may help eliminate frustration and trigger reflection.

The volume of research activity and associated outputs has rapidly increased over recent decades. While expanding the knowledgebase may be considered positive in one sense, it has made the field increasingly difficult to navigate, whether it be for experienced researchers and educators, early career researchers and students, or other stakeholders, including policy mak-

ers. Identifying and accessing the most recent and high quality science is proving increasingly challenging despite the advance of technology.

Methods and tools for aggregating knowledge must be developed to facilitate access to science, technology and innovation outputs that help inform policy-making and practice, and also ensure that educational programmes and researchers have access to and can build upon the state of the art.

Science provides an evidence base that can be relevant to and therefore draw together different areas of policy. Knowledge integration provides a starting point for building and operationalizing resilience through the co-design of policies and interventions by scientists, practitioners, policy makers and communities themselves. Standardised definitions are essential to the operationalization of concepts such as resilience for research, monitoring and implementation purposes. For example, in epidemiology, case ascertainment/ definition is essential to accurately understanding the causal relationship between a disease exposure and its outcome.

Common understanding amongst all actors is essential for effective disaster risk reduction and management. Approaching towards 2015, the Joint Research Centre of the European Commission has been contributing to identifying the most common terms and definitions used in disaster risk reduction. This background information would provide a solid basis to continue updating the terminology and contribute to the implementation of the post-2015 framework on disaster risk reduction.

5.5 DEVELOP FLEXIBLE AND CUSTOMISABLE EDUCATION PROGRAMMES

There is an expanding field of disaster management, but simultaneously, a lack of young professionals with appropriate skills and knowledge to support the building of resilience within relevant stakeholders. There is a need to maintain and expand the network of key persons, including change agents and facilitators.

ANDROID's survey on education supply and demand found that despite considerable need for programmes to support the building of resilience, there is currently a lack of programmes that meet employer needs. It also found that the availability of programmes differed greatly across Europe, and that most programmes are recent developments, with very few having been in operation for over 5 years. This emphasises the immaturity of the discipline and the needs for further studies to better understand market needs.

Higher education within Europe must develop flexible and customised programmes and curricular, whether a module in regular Masters or Undergraduate curriculum, or as dedicated postgraduate programmes.

Detailed market research is required to understand the need and interest in potential students, with clear linkages to future job markets.

This will help to ensure that educational programme address the problems from the field and can promote affordable solutions, as per local context, including the cultural calibration of technology.

Educational programmes should promote a multi-disciplinary approach and understanding, drawing upon a combination of different faculty.

The problem-based nature of the field determines that programmes should offer an appropriate balance of theory and field experiences. Internship programmes for students in government, NGOs, UN agencies, private sectors, research institutions should be strongly promoted.

At the same time, the pace of scientific discoveries demands that programmes are research linked to ensure that what is being taught by higher education is consistent with the state of the art. Improving the link between research, education and action will require the transfer of research knowledge into teaching but also recognising that the research and teaching link as a two-way knowledge transfer process. In a ‘knowledge society’ all graduates have to be researchers. Not only are they engaged in production of knowledge; they must also be educated to cope with risks and uncertainties generated by the advance of science.

5. Conclusion

Scientific data and information, and effective capacity building from higher education are critical to underpinning well-informed policies and decisions across the public, private and voluntary sectors. Much scientific evidence exists but better links to decision-making in policy and planning are needed to continuously enhance our ability to forecast, reduce and respond to disaster risks thereby building resilience.

Science and technology can assist in identifying a problem, developing understanding from research, informing policy and practice and making a difference that can be objectively demonstrated when evaluated.

The new Sendai framework for disaster risk reduction includes a strong call for the research and education communities to support the understanding of disaster risk and promote risk-informed decisions and risk sensitive planning from the local to the global levels. It also calls for the coordination of existing networks and scientific research institutions at all levels and all re-

gions. The goal is to strengthen the evidence-base in support of the implementation of the new framework.

Researchers and educators must work with policy-makers and practitioners to co-design and co-produce research that can be used effectively. Higher education must also play a vital role in translating that research into action through its educational programmes.

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