

INPUT PAPER

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**STRATEGIC MOBILISATION OF HIGHER EDUCATION INSTITUTIONS IN DISASTER
RISK REDUCTION CAPACITY BUILDING : EXPERIENCE OF PERIPERI U**

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Introduction

This background paper's focus on the role of higher education institutions in advancing disaster risk reduction is underpinned by a growing recognition that a well-educated population is a prerequisite for a "productive, prosperous and resilient country" (Group of Eight, 2013). It also reflects awareness that disaster risk-related higher education is essential for promoting a culture of prevention and is directly applicable to a wide range of disciplines and sectors (including agriculture, business studies, education, environmental management, engineering, public health, urban planning, public administration and governance,). Specifically, higher education institutions (HEIs) play crucial roles in advancing skilled human capacity in the disaster risk domain and supporting disaster risk research and policy at all scales. This is especially the case for those HEIs located in developing countries where their core mission includes public engagement to advance national development goals (Koehn, 2013). But, it equally applies to all societies facing disaster risks and where rapidly growing and more concentrated populations continue to expose more people to multiple threats.

Although Priority 3 of the Hyogo Framework for Action (HFA) explicitly underlined the value of 'knowledge, innovation and education to build a culture of safety and resilience', its primary emphasis was on the integration of disaster risk reduction into school curricula, and on educating younger generations.¹ This necessary focus to protect children, while simultaneously advancing a culture of prevention, was clearly aligned with Millennium Development Goals 2 and 3, which respectively sought to achieve universal primary education as well as promote gender equality and empower women.² Higher education and applied research, while not explicitly excluded from the HFA knowledge, innovation and education theme, were more narrowly framed as a source of 'practical endeavours in building disaster reduction capacities.'³

Yet, the higher education enterprise implicitly exercises wide-ranging influence in the disaster risk domain, dating back for almost a century and extending far beyond this circumscribed role. In addition to their core responsibilities of teaching, learning and research, higher education institutions also maintain risk-related data bases, as well as analyse disaster risks and support disaster risk-related policy and planning – with this involvement traceable to the ground-breaking flood studies of Gilbert White (White, 1945). More recently, their active engagement was materially reflected in the insights and expertise of around 50 contributors associated with institutions of higher learning in the 2013 Global Assessment of Risk.⁴ Similarly, more than 200 contributors and expert reviewers drawn from 156 higher education institutions were acknowledged in the Intergovernmental Panel on Climate Change's Special Report on Extreme Events (IPCC, 2012:545-553).⁵

¹ www.unisdr.org/ Accessed: 4 February 2014

² www.unmillenniumproject.org/ Accessed: 4 February 2014

³ www.unisdr.org/ Accessed: 4 February 2014

⁴ www.preventionweb.net/ Accessed: 4 February 2014

⁵ <http://ipcc-wg2.gov/> Accessed: 4 February 2014

This input paper examines the contribution of purposive, collective higher education engagement in advancing disaster risk reduction education regionally from the perspective of the Periperi U⁶ consortium in Africa. It is underpinned by the assumption that disaster risk reduction is an integral element of sustainable development and that HEIs play central roles in advancing knowledge and human capital developmentally. The paper begins by revisiting the roles of higher education in development, and the resulting trends in HEI engagement with the disaster risk domain. It reflects on the process and achievements of the Periperi U consortium, as well as those of a similar partnership, the Asian University Network for Environment and Disaster Management (AUEDM).⁷ The paper continues by reflecting on the HFA and concludes by opening a conversation on indicators.

Higher Education and Development

The increasing engagement of higher education institutions globally in the disaster risk domain reflects a growing scholarly focus on risk and resilience. While this trend is broadly aligned with the thrust and objectives of the Hyogo Framework for Action (HFA), developments in higher education internationally have been shaped historically by powerful forces and currents that extend far beyond any single global agenda. Specifically, the advancement of disaster risk scholarship as a distinct focus of the global academic enterprise is embedded in the more wide-ranging trends in international development cooperation which increasingly include 'transnational academic ventures' (Obamba, 2013).

Although contemporary views on higher education stress its crucial contribution to development (McGrath, 2010; Obamba, 2013; Koehn, 2013), almost inexplicably, this role was overlooked in the framing of the Millennium Development Goals. Citing Bloom (2003, 142; Hopper, *et. al*, (2008) and Yusuf, *et. al*, (2009), Koehn (2013) noted that higher education was 'not mentioned as an instrument of achieving even one of the eight Millennium Development Goals ...[although] attainment of every single one of them ... [would have been] much easier if a country has a strong and productive higher education system'. In the case of sub-Saharan Africa, the diminished focus on tertiary education also reinforced 1980s' and 1990s' patterns of university neglect and under-investment due to brutal structural adjustment programming. This, Obamba (2013) argues, served to profoundly marginalise Africa developmentally despite 'explosive public demand for university education' across the continent.

The extraordinary surge in demand for higher education in the 21st Century represents an international phenomenon, that extends well beyond sub-Saharan Africa (Varghese, 2013). In part, it reflects a growing recognition that vigorous higher education and associated research capabilities strengthen a country's competitiveness in a globalised knowledge economy. Between 2000 and 2010, it was reflected materially in an increase in higher education enrolment worldwide from 100 to 177.7 million students (UIS, 2012; Varghese, 2013; 5). This was paralleled by an increase in average Gross Enrolment Ratio (GER) from 19%⁸ in 2000 to 29% in 2010 (Varghese, *ibid*). However, higher education enrolment values

⁶ Periperi U stands for 'Partners enhancing resilience for people exposed to risks' (with a focus on universities)

⁷ www.auedm.net/ Accessed: 4 February 2014

⁸ <http://stats.uis.unesco.org/> Accessed: 4 February 2014

were wide-ranging, with sub-Saharan Africa's GER of 7% falling staggeringly behind the 76% enrolment levels of North America and Western Europe or 24% and 17% respectively for the Arab region as well as South and West Asia (Varghese, *ibid*).

Unsurprisingly, the revival and reinvigoration of the higher education enterprise is increasingly interwoven with the changing threads in international development policy and practice. This was perhaps inevitable, given intensifying global economic and social interconnectedness. However, it also reflects the capacity of universities 'with their boundary-spanning knowledge partnerships and networks' (Obamba, 2013) to expedite social and economic development, including in the global South (McGrath, 2010). Obamba (*ibid*) also identifies two clear reasons for higher education's growing influence in international development cooperation. First, the emergence of a dominant partnership paradigm in international development aligns closely with well-established HEI capabilities to mobilise transnational academic consortia. Second, the complex and multifaceted character of today's (and tomorrow's) development problems calls for new, cross-disciplinary, transboundary and collaborative forms of knowledge production. This mission is centrally relevant to contemporary scholarship. Obamba suggests that it is this confluence of the 'partnership and knowledge paradigms in contemporary development discourses' (2013, *ibid*) that has redefined higher education as a key player in advancing development cooperation. This engagement is not limited exclusively to high-profile, donor-funded global or intra-regional academic initiatives. Perhaps even more relevant to the focus on disaster risk reduction, it includes locally situated university collaborations with 'government, industry and civil society' to promote the sustainable development of a specific geographic area or community (Trencher, *et. al*, 2013).

The trend towards new knowledge relationships

The purposive mobilisation of knowledge to address complex development problems globally has also served as a catalyst for new forms of interdisciplinary and transdisciplinary scholarship. While higher education institutions have typically generated knowledge within disciplinary silos, contemporary demand for innovative, cross-sectoral solutions to development problems implies a capacity to 'transcend' established disciplinary boundaries (Horlick-Jones and Sime, 2004; Max-Neef, 2005). It is argued that this 'transdisciplinary' approach, referred to as Mode 2 knowledge generation (Gibbons, 1994), emerges only through the interaction of both disciplinary and non-disciplinary sources of knowledge, that integrate the insights of multiple stakeholders within the context of application (Gibbons, 1994:3). During the past decade, a growing number of academic initiatives and programmes have sought creative solutions to balance the need for internal disciplinary rigour with societal calls for transdisciplinary relevance. The influence of transnational knowledge consortia, combined with a growing focus on global environmental change, has amplified these trends. This has helped 'paved the way' for new cross-disciplinary curricula including Education for Sustainable Development (ESD), climate change adaptation and disaster risk reduction.

Recent Currents in Higher Education and the Disaster Risk Discourse

The higher education enterprise has long played a crucial role in the disaster risk domain. This includes the management of specialist data bases (eg EM-DAT : The OFDA/CRED International Disaster Database, located at the Universite de Louvain, Brussels, Belgium)⁹, dedicated natural hazards research centres (eg Natural Hazards Centre, the University of Colorado at Boulder¹⁰) and the generation of thought leaders who have advanced the domain conceptually, methodologically and empirically. Historically, however, disaster risk-related education programmes have been difficult to implement within institutions of higher learning, because of their complex, cross-disciplinary and applied character. Moreover, like sustainability science (Yarime, *et. al*, 2012), the disaster risk domain's reach across a complex interdisciplinary and applied terrain, has hindered its recognition as a legitimate field of scholarship. They further argue that the introduction of new academic programmes in sustainability science (and related fields) should incorporate elements of interdisciplinarity and transdisciplinarity. New academic programmes also require a coordinated adjustment of institutional arrangements 'across a diverse array of academic programs, scientific journals, associations and societies, networks and alliances, workshops and conferences' (Yarime, *et. al*, 2012, *ibid*; Yarime 2011).

Over recent years, such changes have become apparent in the disaster risk domain, as HEIs have become more purposefully engaged in the field (van der Waldt, 2013). This is signalled by the number, variety and geographic spread of academic programmes now offering disaster risk-related qualifications. Similarly, it is reflected in a surge of new academic journals that step beyond previous preoccupations with natural hazards and emergency management into the domains of risk and resilience. And, there are new transnational platforms for collaboration and knowledge consortia that include academic as well as other stake-holders.

Status of disaster risk-related masters-level academic programmes

While a detailed global study on university-based disaster risk-related courses exceeds the scope of this paper, an indicative desk review of academic courses with titles related to 'disaster risk', 'resilience' and 'disaster reduction' signalled around 100 masters-level programmes currently on offer in 48 countries (Figure 2).¹¹ It is noteworthy to track the shifting emphases over time, as the 1990s' emphases on 'emergency management', are set aside in favour of courses that foreground 'risk' and resilience (eg Masters in Design Studies/Risk and Resilience at Harvard Graduate School of Design¹² or Masters in Disaster

⁹ www.emdat.be Accessed: 4 February 2014

¹⁰ www.colorado.edu/ Accessed: 4 February 2014

¹¹ This however, under-represents the many academic programmes that contain a nested disaster risk-related module. It also excludes the sweep of academic programmes in Business Studies and associated disciplines that give attention to financial risk management. For an overview of the methodology used to conduct this scan of available master programmes, refer to Annex 1.

¹² www.gsd.harvard.edu/ Accessed: 4 February 2014

Risk Studies, Development and Management at North West University, South Africa¹³). A complete list of the masters programmes identified is available in Annex 1.

Most encouragingly, there is a rising trend towards post-graduate disaster risk-related education in countries exposed to recurrent natural and other threats. This shift is not restricted to developed nations. Even in resource-constrained but recurrently exposed countries, post-graduate disaster risk-related degrees are increasingly possible (eg the University of Tribhuvan in Nepal, Bahir Dar University in Ethiopia or the University of Gadjah Mada in Indonesia). In the Philippines, the virtual destruction of the former Camarines Sur State Agricultural College (now known as the Central Bicol State University of Agriculture) in 2006 by Typhoons Milenyo and Reming not only resulted in physical reconstruction of the college's facilities. It also prompted the 2008 introduction of a Masters in Disaster Risk Management.¹⁴ Such developments underline a growing institutional capacity that is 'locally owned' (Hagelsteen and Becker, 2013) to sustainably generate strategic human capital to address recurrent risks. This increasingly applies in at-risk countries at all stages of the development continuum.

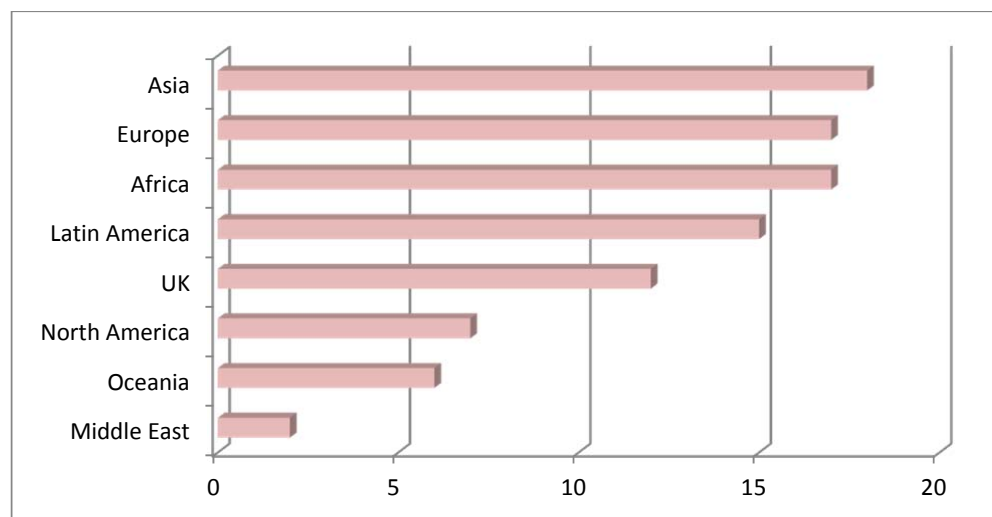


Figure 1: Number of universities with masters level academic programmes related to disaster risk¹⁵

It is also instructive that several mid-level developing countries have invested heavily in building strategic human capital level in disaster risk management. For instance, in both India and Nigeria, between six-seven universities offer masters-level programmes, while Columbia, Peru and South Africa have each introduced three-four disaster risk-related masters courses. As is the case in many other countries, these programmes have been largely established with negligible international assistance, and enabled over several years through the perseverance of dedicated individuals. This gradual introduction of new programmes illustrates the value of an 'incremental' approach to disaster risk capacity development in higher education settings (Brinkerhoff, D. 2010). It is a strategy that allows

¹³ <http://acds.co.za/> Accessed: 4 February 2014

¹⁴ www.cbsua.edu.ph/ Accessed: 4 February 2014

¹⁵ It was beyond the scope of this paper to undertake an exhaustive global study of all academic programmes related to disaster and risk reduction. The results presented are indicative only.

proponents of new disaster risk programmes to 'try different changes and try to learn what might work under different conditions' (Brinkerhoff, *ibid*).

Communicating new risk knowledge – trends in new journals

Changing trends in disaster risk-related academic offerings have also been paralleled and reinforced by the emergence of a diverse suite of relevant peer-reviewed journals. Table 1 gives an indicative snapshot of disaster risk-related journals introduced since 2000. These 20 new titles signal a shift beyond an earlier focus on hazards and disaster mitigation to increasingly address issues of risk and resilience. The introduction of peer-reviewed journals in the field not only widens the avenues for communicating disaster risk knowledge domain. It simultaneously advances education and research in the field, signalling the scholarly legitimacy of the disaster risk discourse in the higher education enterprise.

Table 1: Indicative list of disaster risk-related academic journals introduced since 2000

Journal title	Start year	Link
International Journal of Disaster Risk Reduction	2013	www.journals.elsevier.com/
International Journal of Disaster Resilience in the Built Environment	2012	www.emeraldinsight.com/
International Journal of Disaster Risk Science	2011	www.springer.com/
International Journal of Emergency Management	2011	www.inderscience.com/
International Journal of Health System and Disaster Management	2010	www.journalonweb.com/
International Journal of Disaster Medicine	2010	http://informahealthcare.com/
Journal of Disaster Prevention and Management	2010	www.emeraldinsight.com/
International Journal of Disaster Recovery and Business Continuity	2009	www.sersc.org/
Journal of Disaster Research	2009	www.fujipress.jp/JDR/
Disaster Research	2008	www.colorado.edu/
International Journal of Mass Emergencies and Disasters	2008	http://ijmed.org/
Journal of Disaster Risk Studies	2007	www.jamba.org.za
Disaster Advances	2006	http://shankargargh.org/
Journal of Disasters	2006	http://onlinelibrary.wiley.com/
Disaster Management & Response	2005	www.sciencedirect.com/
Disaster Recovery Journal	2004	www.drj.com/
Environmental Hazards	2003	www.sciencedirect.com/
Journal of Hazardous Materials	2003	www.journals.elsevier.com/
Iranian Journal of Environmental Hazards	2003	http://ijeh.scu.ac.ir/
Journal of the International Society for the Prevention and Mitigation of Natural Hazards	2001	www.emeraldinsight.com/

Mobilising transnational and transdisciplinary knowledge

Although the broader disaster risk domain is characterised by a long tradition of disciplinary and professional networking, a defining element of the past decade has been the increasing mobilisation of multi-stakeholder networks, alliances and processes that incorporate academics and institutions of higher learning.

The 2007 establishment of the Global Network for Disaster Reduction (GNDR) constitutes one such example (Gibson, 2012).¹⁶ Although the network primarily comprises civil society organisations, higher education institutions are also members, playing coordination roles in Latin America and southern Africa. ELRHRA (Enhancing Learning and Research for Humanitarian Assistance) represents another global partnership that explicitly comprises both universities and humanitarian agencies.¹⁷ Launched in 2009, this collaborative network aims to strengthen global humanitarian action by providing a bridge between the humanitarian practitioners and higher education institutions.

At regional scale, an illustrative example of a recently constituted academic network to advance societal 'resilience to disasters of natural and human origin' is the ANDROID partnership^{18, 19}. Representing a collaboration of 64 HEIs from 28 European Union States as well as three non-European countries, the network aims to generate a clearer understanding of the factors that enable physical, socio-cultural, politico-economic and natural systems to adapt and sustain.

These initiatives illustrate the growing range of opportunities now available to universities to both broaden and deepen understanding of contemporary disaster risk issues. Such mechanisms augment more technically-oriented global vehicles, including those associated with the Integrated Research on Disaster Risk initiative (IRDR)²⁰, collaborations on the Global Assessment of Risk and the recently published IPCC's Special Report on Extreme Events.²¹ Encouragingly, these mechanisms are also increasingly accessible to academics in developing countries, including in Africa – thus closing previous gaps in risk knowledge and strengthening capacity for local research and education.

HEI Advances in the Disaster Risk Domain: A focus on Peripheri U in Africa

Despite previously limited international support advancing disaster risk-related tertiary education in Africa, innovative programmes have emerged in recent years. These include courses based in South Africa at the University of the Free State²², as well as Stenden²³ and North-West Universities²⁴. Disaster risk management (DRM) academic programmes have also evolved with government support at Zimbabwe's National University of Science and Technology²⁵ and Bindura University²⁶. In another creative venture, collaborations between Nigeria's National Emergency Management Authority and six regional universities have led to

¹⁶ www.globalnetwork-dr.org/ Accessed: 4 February 2014

¹⁷ www.elrha.org/ Accessed: 4 February 2014

¹⁸ www.disaster-resilience.net/ Accessed: 4 February 2014

¹⁹ www.disaster-resilience.net/ Accessed: 4 February 2014

²⁰ www.irdrinternational.org/ Accessed: 4 February 2014

²¹ <http://ipcc-wg2.gov/> Accessed: 4 February 2014

²² The University of the Free State (UFS) Disaster Management Training and Education Centre for Africa (DiMTEC) <http://natagri.ufs.ac.za/> Accessed: 4 February 2014

²³ Stenden South Africa School of Disaster Management www.stenden.ac.za/ Accessed: 4 February 2014

²⁴ African Centre for Disaster Studies (ACDS) <http://acds.co.za/> Accessed: 4 February 2014

²⁵ Institute of Development Studies www.nust.ac.zw/ Accessed: 4 February 2014

²⁶ www.buse.ac.zw/ Accessed: 4 February 2014

accessible one-year DRM masters degrees²⁷. These initiatives, while not yet widely dispersed, signal a nascent, but encouraging capacity to strengthen strategic human capital to better manage local and national risks, even as they are still to be distributed more widely across the continent.

A complementary, multi-country disaster risk-related HEI collaboration known as Periperi U²⁸ also unfolded in Africa during the past decade. While transnational knowledge consortia have long constituted an integral element of the global higher education enterprise, purposive HEI partnerships to advance disaster risk scholarship are relatively recent innovations. This is particularly the case in Africa, where (until the last decade) limited university resources and protracted dependence on international humanitarian assistance deterred meaningful scholarly engagement in the disaster risk domain. The emergence of the Periperi U academic partnership in Africa while not global, also speaks to the challenges faced and innovations adopted in introducing sustainable 'novel', cross-disciplinary, applied Disaster Risk Reduction (DRR) higher education programmes under severe resource constraints. In this context, the case-study potentially offers useful insights for introducing, then sustainably embedding new forms of scholarship in higher education institutions located in disaster-prone countries.

Periperi U: History and brief background

Periperi U constitutes a purposive HEI partnership to promote strategic human and institutional capital in the disaster risk domain by explicitly integrating disaster risk-related concepts and practice into higher education curricula.²⁹ Beginning in 2006, it now represents a self-organising consortium of ten African universities that has worked collaboratively to 'jump-start' formal higher education programmes in the broader disaster risk reduction domain, transgressing disciplines, languages and national/regional divisions (see Figure 2). The partnership has also sought to systematically advance a culture of prevention in the participating countries through the institutional integration of academically robust, yet socially responsive undergraduate and postgraduate disaster risk-related academic programmes. The rationale underpinning the consortium recognised the crucial role played by higher education institutions in advancing strategic human capital to address complex risks. Acknowledging the emerging expansion of academic expertise in Africa, Periperi U was conceptualised to leverage and collaboratively develop this continental capacity by strengthening risk knowledge and strategic human capital to support national and local disaster risk reduction efforts.

The partnership now involves more than 70 academic staff and offers 20 disaster risk-related academic modules and programmes across a range of applied disciplines and practice fields. It has also generated hundreds of graduates, many of whom have taken up employment in government, as well as nongovernmental and other organisations. These activities have been complemented by numerous local short courses for practitioners, applied, 'service learning' in at-risk communities as part of formal coursework, as well as the provision of local expertise for commissioned research and DRR policy development. Box 1.1 summarises the focal areas that guide consortium action. These are aligned broadly with recognised scholarly

²⁷ www.dailytimes.com.ng/ Accessed: 4 February 2014

²⁸ *Periperi U* stands for 'Partners enhancing resilience for people exposed to risks' (with a focus on universities)

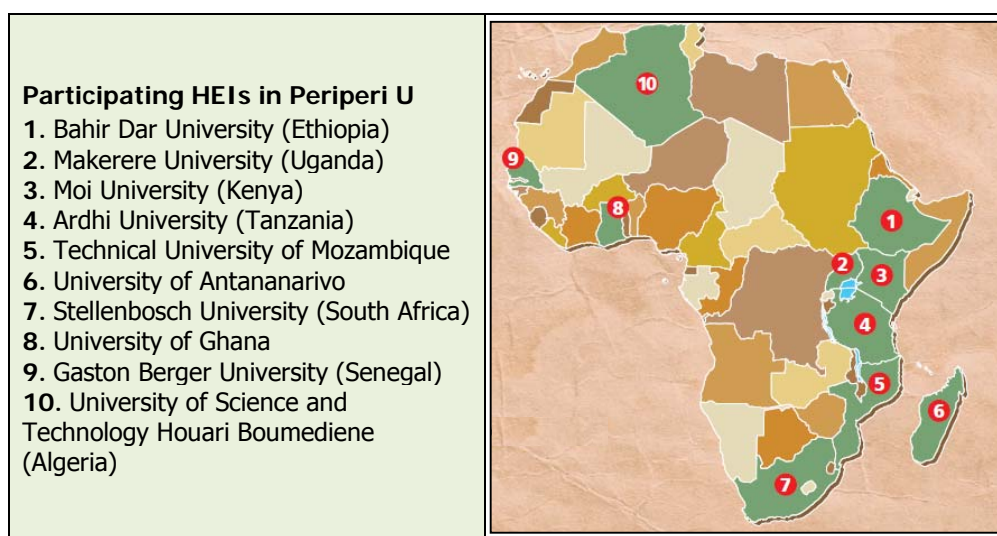
²⁹ www.riskreductionafrica.org

missions of teaching and learning, research and community engagement/outreach. They are augmented further by providing attention to institutional capacity building and transboundary mobilisation.

Box 1.1 Specific focal areas for Periperi U consortium members

- Institutional embedding of active disaster risk-related teaching and training, research and policy advocacy capacity in Africa
- Capacity for all partners to provide short disaster risk-related courses
- Growth and sustainability of new undergraduate and/or graduate programmes related to reducing/managing risk and vulnerability
- Generation and communication of applied research outputs related to risks and vulnerabilities that increase local understanding and improve risk management
- Mobilisation to advance disaster-risk reduction efforts through the strategic engagement by each unit/programme, at national/sub-national, continental and international scales

Figure 2: Distribution of Periperi U Partner Universities³⁰



Commitment to African disaster risk scholarship and capacity-building

Periperi U was originally motivated by a shared recognition that disaster risk domain constituted a field of core scholarship and practice in Africa. The partners acknowledged that strengthened educational capacity to reduce local risks was an underpinning requirement of social and economic development, and that there was urgency to build strategic and technically competent human capital in the field. The consortium also committed itself bridging the divide between Africa’s institutions of higher learning and the practice fields of disaster risk reduction and humanitarian action. These imperatives have been the driving force behind the consortium’s achievements in making accessible, socially responsive disaster risk education, training, research and community outreach.

³⁰ www.riskreductionafrica.org Accessed: 4 February 2014

Specifically, there was a shared appreciation that poorly understood and managed risk accumulation processes were disrupting and undermining development potential in Africa. This not only applied to more widely-known famines and protracted armed conflicts that have led to large internal as well as refugee displacements. It was also relevant to the smaller, highly frequent, 'hidden' events that seldom attract international attention, but which exact significant hardships and set-backs to local development. Examples included the high occurrence of market and informal settlement fires in Africa's rapidly growing towns and cities that spread quickly and led to deaths and property loss. They included outbreaks of communicable disease, associated with weak public health systems and poor water and sanitation service, underlining the need for strengthened risk management capacity.³¹

Developing new curricula

Robust, yet imaginative risk management is an important development priority in Africa that requires strong interdisciplinary thinking and applied problem-solving skills. This is particularly important, given the continent's various and complex risk conditions, along with its accelerating urban growth trajectory, demographic profile and climate change projections. These realities required that Periperi U consortium members created innovative, cross-disciplinary and applied disaster risk curricula that were grounded with solid disciplinary foundations. Partners also aligned curricula with their local risk conditions, identifying their teaching and learning programmes with socially responsive imperatives.

There is now a growing portfolio of relevant cross-disciplinary disaster risk academic programmes across the continent offered in diverse languages (eg Afrikaans, Amharic, Arabic, English, French, Kiswahili, Malagasy, Portuguese). Their various disciplines include agriculture, engineering, economics, environmental science, public health and urban planning. (Table 2). For instance, Bahir Dar University introduced the first postgraduate disaster risk-related course ever offered in Ethiopia, an MSc in Disaster Risk Science and Sustainable Development (DRSSD).³²

Table 2: Periperi U disaster-risk related academic programmes 2013

INSTITUTION	PERIPERI U ACADEMIC PROGRAMMES/MODULES OFFERED IN 2013	NO. STUDENTS ENROLLED
Antananarivo	Multidisciplinary Disaster and Risk Governance Masters Programme	40
	Introduction to Disaster Economics (Module at Honours level)	91
Ardhi	Masters of Disaster Risk Management (MDRM)	24
	MSc Disaster Risk Management (MSc. DRM)	22
Bahir Dar	MSc Disaster Risk Science and Sustainable Development	64
	BSc Disaster Risk Management & Sustainable Development	152
DiMP/RADAR	Disaster Risk Studies Module (Geography & Environmental Studies Honours Degree)	11
	Masters by dissertation with DRR theme	4
	PhD	1

³¹ <http://riskreductionafrica.org/> Accessed: 4 February 2014

³² www.bdu.edu/ Accessed: 4 February 2014

INSTITUTION	PERIPERI U ACADEMIC PROGRAMMES/MODULES OFFERED IN 2013	NO. STUDENTS ENROLLED
Gaston-Berger	Not yet launched	0
Ghana	Theories and Analytical Methods for Integrated Disaster Risk Reduction (IDRR)	42
	Concepts and Methods in Advanced Integrated Risk Reduction	15
Makerere	MPH	145
Moi	MPH with DRR-focused dissertations	8
UDM	Environmental Engineering and DRR (Honours Degree)	26
	MSc Education and Development, including a DRR component	23
USTHB	MSc Science in Earthquake Engineering and Disaster Risk Management	1
Total		669

Similarly, the University of Ghana became Ghana's first institution of higher learning to offer applied DRR-related academic courses, despite long recognised needs for local capacity to manage climatic and disaster risks. From 2010, the University of Antananarivo in Madagascar began offering an MSc in Multidisciplinary Disaster and Risk Management (Randrianalijaona and Holloway, 2014). Students at Ardhi University in Tanzania became able to complete a Master's degree in Disaster Risk Management. In Mozambique, an innovative MSc qualification in Education and Development directed to school teachers was launched in 2013. At Moi University's School of Public Health, a new *Department of Disaster Risk Reduction and Management* was established to implement DRR curricula (Zweig & Fortune, 2013).³³

The rising demand for teaching offered through the consortium underlines the relevance and perceived value of the courses. Even while the new MSc programme in Algeria³⁴ was being reviewed for implementation in the 2014/15 academic year, the university team helped develop a Master's degree in Disaster Risk Management at the University of Mostaganem in Eastern Algeria. During 2010, the University of Ghana, introduced the option for students to complete BA/BSc courses in Integrated Environmental Health (IEH) and Disaster Risk Reduction in Urban Areas. Although only 15 students completed the IEH and DRR module when it was first offered, in 2012, the course convenor was obliged to 'cap' the course at 50 students, because of its high demand. In Ethiopia, 80 applicants applied for entry to the 2012 MSc Disaster Risk Science programme, despite the availability of only 20 openings. The same pattern has prevailed in Madagascar where, 35 students completed the new multidisciplinary masters degree in disaster and risk management at the University of Antananarivo in 2011. Subsequently, 100 applicants tried to secure places for the 2012 postgraduate disaster risk degree intake.

With stable disaster risk-related teaching and learning architectures now in place in most participating universities, a further iteration of postgraduate courses is possible (see Table 3). This signals growing capabilities to integrate disaster risk concerns into a range of applied practice fields that are directly relevant to African conditions (Zweig & Fortune, *ibid*).

³³ <http://riskreductionafrica.org/> Accessed: 4 February 2014 (Download 2013 document at Universidade Técnica de Moçambique in Geneva, Switzerland)

³⁴ At the University of Science and Technology Houari Boumediene, Algiers

Table 3: Periperi U post-graduate courses planned for 2014-2015

INSTITUTION	PERIPERI U ACADEMIC PROGRAMMES ANTICIPATED TO LAUNCH IN 2014-2015	ANTICIPATED LAUNCH
Ardhi	Masters in Disaster Risk Management and Engineering (DRM&E)	
DiMP/RADAR	Master of Philosophy in Disaster Risk Science and Development	2015
Gaston-Berger	Masters in Disaster Prevention & Disaster Risk Management (offered in French)	2014
Makerere	Masters of Public Health Disaster Management (MDM)	2014
Moi	Master of Science (Disaster Risk Reduction)	2014
	Executive Masters of Public Health, Disaster Management	Proposed
UDM	Masters in Humanitarian Operations Management and Logistics (offered in Portuguese)	2014
	Masters in Agriculture Engineering and Food Security	2014
USTHB	Masters in Earthquake Engineering and Disaster Risk Reduction (offered in French)	2015

These programmes would have been simply unthinkable ten years ago, when African students keen to strengthen their knowledge in the disaster risk field were obliged to study in northern institutions at prohibitive costs. By the end of 2013, there were more than 600 under-graduate and postgraduate students enrolled in disaster risk-related academic programmes across the consortium.

Making risk-reduction training locally accessible

Because disaster risk management is a multi-disciplinary field spanning issues as diverse as food security and urban risk, it involves many stake-holder groups. These include specialised professionals such as architects and public health workers, as well as emergency responders and community development workers. Periperi U has attempted not to overlook these groups in its capacity-building work, recognising that practitioners are at the forefront of local risk management.

Between 2008 and 2013, Periperi U partners reached 2,200 professionals and practitioners through more than 80 short courses across the continent. This is a wide audience, including community health practitioners, local government officials, as well as health and social programme animators. Increasingly, local and national authorities are drawing on HEI expertise for customised training of government officials (eg Ardhi's 'Introduction to Disaster Risk Reduction' course for Temeke Municipality in Tanzania). The provision of accessible short courses for government and other stakeholders has already generated tangible benefits. Box 1.2 below illustrates one such achievement from Mozambique.³⁵

³⁵ <http://ochaonline.un.org/> Accessed: 4 February 2014

Box 1.2 The value of accessible risk reduction capacity-building: averting cholera losses in Mozambique

In 2008, the Technical University of Mozambique (UDM) took the initiative for senior staff members of Mozambique’s Ministry of Health to attend **Makerere’s School of Public Health’s annual course on Public Health in Complex Emergencies (PHCE)**. This had life-saving benefits in 2008-2009 during southern Africa’s worst cholera epidemic in 15 years. Region-wide, the epidemic resulted in over **167,000 cholera cases**, with more than 19,000 cases being reported in Mozambique alone. However, despite this large number of cases, **only 155 lives were lost in Mozambique**, with a case-fatality rate below 1%. This was due to dramatically **improved local response capabilities** enabled by the Ministry of Health. Such strengthened local capabilities were in part attributed to senior MOH staff attendance at the Makerere PHCE course which provided **specific training on the identification and management of cholera** outbreaks. In comparison, in Zimbabwe, where the epidemic resulted in almost 100,000 cases and claimed more than 4,000 lives, the case fatality rate exceeded 4.35%.

Advancing disaster risk research

One of Periperi U’s leading priorities has been to strengthen national and local risk management through robust, applied disaster risk research. This has taken several forms, including postgraduate studies, commissioned research and dedicated faculty projects. These efforts have produced a wealth of information about previously under-researched and poorly understood risks within Africa. Table 4 provides an illustrative snapshot from the University of Antananarivo of the impressive range of MSc topics studied in 2013 to highlight the value of student research in generating robust, context-specific risk knowledge. It underlines the benefits of applied disaster risk scholarship, not only for generating urgently needed local knowledge on evolving risks but also for addressing shortfalls in skilled human capacity.

Table 4: Illustrative list of MSc research topics from the University of Antananarivo

Indicative MSc thesis topics, 2013 University of Antananarivo
Analyse de la vulnérabilité face aux risques sanitaires liés à l’inondation : Cas de la plaine de Laniera – Belanitra Ilafy
Contribution à l’évaluation des actions relatives à la Réduction des Risques de Catastrophes dans la commune rurale de Marofarihy, district de Manakara, région Vatovavy Fitovinany
Agricultural production and the Marovoay district climate
Les risques d’épidémie expansive du paludisme liés au contexte climatique dans les Hautes terres centrales : Cas de la Région Analamanga
Evaluation et essai de réduction des risques liés aux dépôts d’hydrocarbures en milieu urbain : cas du dépôt d’Ankorondrano
Etudes préliminaires sur les risques et dangers associés aux barrages de Tsiacompaniry
Analyse de l’évolution des cyclones et des inondations à Madagascar depuis 1960 et proposition de stratégie d’intervention pour la Croix Rouge Malagasy
Sécurité et gestion des risques et des catastrophes à M/car à travers le Cadre d’Action de Hyogo
Effectivité de l’application des principes et normes juridiques ratifiés par M/car en matière de Gestion des Risques et des Catastrophes
Impacts de l’existence des comités Gestion des Risques et des Catastrophes sur la résilience de la

Indicative MSc thesis topics, 2013 University of Antananarivo
communauté : cas de la zone d'intervention du programme SALOHI
Problématique de l'insécurité routière urbaine : cas du Fokontany Ambohidahy Ankadindramamy
Vers une optimisation de la qualité des interventions de réponse d'urgence post-catastrophes par l'adoption d'une démarche qualitative : cas de la Croix Rouge Malagasy
Vers une stratégie pour l'intégration effective de la RRC dans les politiques sectorielles de M/car : cas de la politique sectorielle de l'eau
Adaptation aux conséquences des changements de l'environnement : cas des riverains du lac Itasy
Sécurité alimentaire : Stratégie de mise à l'échelle des activités de Réduction de risques et de catastrophes à l'échelle locale de SAFFJKM, Cas du district de Mananjary
Recherche actions pour la réduction des risques et des catastrophes liées aux déchets industriels : cas de la décharge d'Andramiarana / CR Antehiroka
Evaluation multicritères multi acteurs d'une stratégie de RRC : le cas du projet sécurité humaine à Anosizato-Est I
Les micro et petites entreprises, moyens de réduire les vulnérabilités contre les risques urbains
Gouvernance locale des risques et des catastrophes: capacité des acteurs locaux
L'utilité de l'intégration de la dimension RRC dans les outils de planification urbaine : cas du guide d'élaboration PALOS
Impacts du changement climatique : cas de la région Alaotra Mangoro
Vangaindrano, un site commun pour la Réduction des Risques de Catastrophes
Culture et gestion des risques et des catastrophes. Les enjeux des activités de réponse dans la GRC au sein des sociétés traditionnelles : cas de la localité d'Antsiravana dans le district d'Ambatolampy
Gestion des matériaux dangereux dans la société du port à gestion autonome de Toamasina (SPAT) : quelles perspectives ?
Enjeux des remblaiements dans la commune urbaine d'Antananarivo

The importance of engaged scholarship

The concept of 'engaged scholarship' in the disaster risk field constitutes a crucial dimension for all Periperi U members. It speaks to the outreach dimension of contemporary scholarship, variously referred to as 'community engagement', 'social responsiveness', 'community interaction', or 'service'. It draws on the early work by Michigan State University (1993, 2009)³⁶, Boyer (1990, 1996) and Etzkowitz (1998), as well as Cooper (2009, 2011), among others. Engaged scholarship recognises the 'mutuality and reciprocity between university and society' (Cooper, 2011) and the opportunity this affords to simultaneously advance knowledge as well as the public good. Kruss (2012) suggests that engaged scholarship also 'cuts across teaching, research and services in an integrated way' and advances 'substantive growth' (eg related to knowledge and research) that is consistent with the broader mission of the university and its units.

Since 2006, the focus on engaged scholarship in diverse risk contexts, and the multiple disciplinary lenses of Periperi U have resulted in numerous collaborations at local, national, regional and continental scales. They underline a commitment to multi-stakeholder engagement often in difficult and complex risk settings. The work recognises that these

³⁶ <http://outreach.msu.edu/> Accessed 11 February, 2013

processes also co-produce risk knowledge – thus directly benefitting disaster risk-related teaching, learning and research. Table 5 below provides a glimpse of some of the collaborative processes that Periperi U members undertook jointly in 2013 with governmental, ngo and UN stakeholders that both strengthened local risk management knowledge and capacity as well as 'fed-into' subsequent university teaching, learning and research.

Table 5: Examples of engaged disaster risk scholarship by Periperi U partners in 2013

<p>DiMP/RADAR (Stellenbosch, South Africa) was commissioned by a district authority to develop a customised, university-accredited disaster risk management training course. The seven-week course was attended by 25 local government staff drawn from five local municipalities two days a week to reduce the participants' work absences. After attending classroom and field-based training, participants undertook ward-based risk assessments to inform integrated development planning.</p>
<p>UDM (Mozambique) and UGB (Senegal) have begun to collaborate with a US NGO (IDE) in a pilot project to train farmers to use drought resistant crops. The project intends to train some 330 rural extension workers and famers, encouraging the use of 10 000 ha of fertile land in Mozambique to improve food security and income generation for rural communities.</p>
<p>Bahir Dar (Ethiopia) has established partnerships with CORDAID, Wageningen University, UNDP, South-South Cooperation, Mercy Corps and the Federal Food Security Sector of Ethiopia. Research and commissioned training has been conducted for Plan International, HelpAge International, OXFAM, ACCRA, and the World Society for the Protection of Animals among others. At a more local scale, Bahir Dar is in discussions with the Addis Ababa Municipality to provide training and research on urban disaster risk reduction and resilience building.</p>
<p>Ardhi University (Tanzania) teamed up with the Tanzanian Ministry of Health and other partners to carry out Vulnerability Assessment and Mapping (VRAM) for the health sector. It also contributed a chapter on naturally triggered disasters in the Tanzanian National State of the Environment Report and conducted a study commissioned by the Office of the Vice President, Department of the Environment. The Ministry of Water has commissioned Ardhi to develop strategies for mitigating flood hazards in the water resource management sector.</p>
<p>Makerere (Uganda) is currently in discussion with UNDP to extend in-service training for personnel in disaster risk management in Uganda. It is also working with WHO to develop training curricula for basic, intermediate and advanced courses in disaster risk management in Africa</p>
<p>The University of Ghana's PI of the Periperi U team participates in a National Research Technical Working Group (RTWG) on community resilience through early warning. This is a joint project involving UNDP, National Disaster Management and the Norwegian Embassy in Ghana aimed at facilitating the provision and analysis of disaster risk information for early warning with respect to floods and drought disasters in Ghana. The first set of studies will involve vulnerability assessments in deprived communities.</p>
<p>GBU (Senegal) The Periperi U PI attended the world's largest gathering of mayors and municipal leaders hosted by UCLG. In a presentation entitled <i>Access to risk information for citizens, local governments and partners</i>, he highlighted the importance of increasing university engagement with vulnerable communities and the need for academics to help empower local disaster managers in their efforts.</p>

Transboundary mobilisation

A less conventional element of the Periperi U partnership model is the emphasis it places on collective strategic engagement with stake-holders at regional, continental and even global scales. The consortium is privileged to represent the continent's higher education interests as a member of the African Working Group on Disaster Risk Reduction, and at both regional and continental levels. It collaborates closely with governmental, intergovernmental and United Nations representatives. During 2013, this intensive engagement was reflected in consortium representation at the Africa Regional Forum in Arusha as well as attendance at the 4th Global Platform for Disaster Risk Reduction in Geneva. Periperi U participants also participated in regional consultative meetings organised by UNISDR and Regional Economic Commissions. This ongoing participation has proved beneficial for identifying opportunities for cooperation. It has also enabled synergies which add value to the relationships between African HEIs and other continental actors.

The consortium's ability to mobilise its members at various scales and in different disciplines has been encouraged by the flexibility of funding afforded by USAID's Office of Foreign Disaster Assistance (USAID/OFDA). Since 2006, USAID/OFDA has co-financed Periperi U, with its current funding assured until 2015.³⁷ This continued support has provided essential financing while the new academic programmes are developed, approved and implemented. This complex and rigorous institutional process can take from three-five years or longer for African HEIs.³⁸

The Asian University Network of Environment and Disaster Management (AUEDM)

The Asian University Network of Environment and Disaster Management (AUEDM) was established in 2008.³⁹ It is 'a unique initiative of prominent Asian universities that [have] come together to share knowledge resources related to the environment and disaster risk management with the larger group of stake-holders working on these issues' (Shaw, *et. al*, 2011). As with Periperi U, the AUEDM partnership strives to mobilise higher education capabilities in response to a social imperative to alleviate disaster- and risk-related hardship aimed at 'bridging academic research, education and field practice' (Shaw, *ibid*).⁴⁰

The network's specific objectives are shown in Box 1.3.

³⁷ The University of Antananarivo in Madagascar is currently unsupported by USAID/OFDA funding

³⁸ For one example from Madagascar, see Randrianalijaona and Holloway, 2014

³⁹ www.auedm.net/ Accessed: 11 February 2014

⁴⁰ www.auedm.net/ Accessed: 11 February 2014

Box 1.3 Objectives of the AUEDM Partnership

1. Share and work together in promoting environment and disaster risk reduction in higher education
2. Collaborate on field-based and policy-oriented research focusing on different aspects of disaster risk reduction and environmental management
3. Broaden scope of education and learning in the environment and disaster risk reduction field through collaboration with diverse stakeholders including NGOs and local governments
4. Document, develop and disseminate knowledge products in the field of environment and disaster risk reduction
5. Provide a forum for consultation, information sharing and cooperation among universities on matters and themes of common interest
6. Enhance recognition of the vital role of universities in implementation-oriented education and research in environment and disaster risk reduction

Source : Shaw, *et. al*, (2011, *ibid*)

A partnership spanning Asia, with links to other networks

The AUEDM partnership spans Asia, from the University of Tokyo in Japan to Kabul University in Afghanistan, involving 24 HEIs as well as other observers and/or advisors. It covers countries with highly varied risk and development profiles as well as local risk management capabilities. The numerous universities of this network are listed in Table 6.

Table 6: Participating universities in the AUEDM partnership

University Name	University Name
Kabul University, Afghanistan	Tribhuvan University, Nepal
BRAC University, Bangladesh	University of Peshawar, Pakistan
Royal University of Phnom Penh, Cambodia	University of Philippines Los Baños, Philippines
Beijing Normal University, China	Nanyang Technological University, Singapore
Jadavpur University, India	Inje University, South Korea
Tata Institute of Social Sciences, India	University of Colombo, Sri Lanka
University of Madras, India	University of Peradeniya, Sri Lanka
Institute of Technology Bandung, Indonesia	National Yunlin University of Science and
Kyoto University, Japan	Chulalongkorn University, Thailand
Tokyo Polytechnic University, Japan	Danang University of Technology, Vietnam
Universiti Kebangsaan Malaysia, Malaysia	Hue College of Economics, Vietnam

AUEDM has established institutional links with other networks in Asia, including the Asian Disaster Reduction and Response Network, CityNET and the University Network for Climate and Ecosystems Change. Its involvement with nongovernmental organisations and civil society organisations allows 'field access and experiences in grass-root project implementation' (Shaw, *et. al*, 2011 *ibid*). This is viewed as a key element of effective disaster risk-related education and research undertaken by network members.

As with Periperi U, there is great variety in the ways through which AUEDM partners have developed their respective curricula and implemented disaster risk-related teaching and learning. These reflect specific contextual and university conditions for different network members, with some partner universities nesting a natural hazard or disaster-related module within an existing curriculum. In contrast, other partners have created and teach well-considered masters degree programmes. The courses of study include those offered by Kyoto University (Japan), Tribhuvan University (Nepal), BRAC University (Bangladesh), the National Yunlin University of Science and Technology (Taiwan), the University of Peradeniya (Sri Lanka) and the University of Peshawar (Pakistan).⁴¹ The Universiti Kebangsaan Malaysia has adopted a research masters/PhD in Hazard/Disaster Studies, while the University of Colombo (Sri Lanka) has introduced a Diploma in Disaster Management taught through e-learning.

Although the AUEDM partnership has not benefitted from high levels of sustained external funding, the progressive introduction of disaster-related courses and their sustainability signals possibilities for an emergent institutional model of education.

University Partnerships to Advance Disaster Risk Scholarship

These two examples drawn from Africa and Asia illustrate the value of active HEI engagement in capacity building within the disaster risk domain. They also show how a flexible, locally relevant approach to capacity building can work. Moreover, as seen in both the Periperi U and AUEDM models, the approaches can be applied in different cultural settings and political environments with shared potential to influence risk management at all administrative levels.

However, the successful introduction of disaster risk-related academic programmes in both the partnerships belies the true institutional complexity involved. The hierarchical approval process itself for new academic programmes – extending from faculty level to the National Ministry of Education - may take two to five years or even longer. This underlines the importance of identifying 'internal champions' within participating universities, especially their professional stature as well as navigational skill, social conscience and tenacity. Such qualities have proved essential when introducing new, applied, cross-disciplinary academic programmes that challenge established disciplinary boundaries and institutional arrangements. The consortium/network model is also a valuable platform for support, especially for overcoming internal institutional obstacles that face an emerging, interdisciplinary field. The adoption of collegial governance model provides scope for individual partners to develop contextually relevant education, research and outreach activities for local risks and to exchange this knowledge seamlessly.

The experience drawn from these two partnerships raises important questions about the role of higher education institutions in advancing disaster risk reduction, especially as this applies to developing countries. The primary motivations for the introduction of new disaster risk-related education programmes were to systematically strengthen strategic human capability to reduce nationally and locally relevant risks. In Madagascar, for instance, the selection of

⁴¹ www.auedm.net/ Accessed: 11 February 2014

students in the first masters degree intake was explicitly intended to address 'prevailing disaster risk management gaps as quickly as possible' (Randrianalijaona & Holloway, 2014). This speaks to a socio-economic development imperative, rather than a science and technology agenda oriented preferentially to economic competitiveness. Kruss argues that 'it is impossible to ignore issues of human and social development, poverty reduction and equitable distribution, when promoting the university's role in development' ... 'To build a national system of innovation in developing countries, universities should contribute to social and economic development and interact with a wide range of social partners – from firms to farmers, communities to civil society to government - at various levels, be it regional, national or global' (Kruss, 2012).

This comment resonates loudly with the social development mission of engaged risk scholarship in today's institutions of higher learning. For although HEIs have historically played central roles in hazards and disaster risk-related research and policy advocacy, these activities represent a narrow, constricting definition of possibilities for vigorous and engaged risk scholarship. Encouragingly, as the rising numbers of cross-disciplinary disaster risk-related academic programmes attest, HEIs are emerging as an increasingly important partner in efforts to reduce risk and vulnerability. This is reflected by growing numbers of graduates from cross-disciplinary, applied risk education programmes, as well as insights gained from an accumulating body of locally nuanced risk research. The insights drawn from both the Periperi U and AUEDM partnerships illustrate these wide-ranging possibilities when higher education institutions become strategic partners in risk reduction, even when they are faced with severe resource constraints.

Higher Education and the HFA – Thoughts on Indicators

Although the HFA did not explicitly emphasise higher education's role in disaster risk reduction, scholarly engagement in the disaster risk domain accelerated markedly over the past decade. This was unsurprising, given rising concerns about the precarious prospects for global environmental sustainability, including the effects of climate change. The occurrence of large-scale naturally triggered calamities (including the 2004 Indian Ocean Tsunami, the Great East Japan Earthquake and Tsunami, the Pakistan floods and the Haiti and Canterbury Earthquakes) reinforced the need for focused risk scholarship. Indirectly, global processes such as the biannual Global Assessment of Risk and the IPCC's Special Report on Extreme Events (2012) have served as important catalysts for collaborative disaster risk research. Such global initiatives have directly engaged hundreds of academics in HEIs, with 'knock-on' implications for local disaster risk teaching, learning and research.

Going forward, there is clear scope for strengthening engagement with HEIs. However, the independence, institutional complexity, scale and disciplinary diversity that characterise the greater higher education enterprise caution against the hasty application of generic monitoring indicators. The past decade has been marked by a rising global trends in engaged risk scholarship with increasing involvement of higher education partners from regions that were previously excluded, especially sub-Saharan Africa (Holloway, 2012). While some form of thoughtful progress to track higher education engagement in this field may be necessary into the future, this should flow from a consultative process, rather than the reductionist application of generic indicators. In this, and to conclude, consideration should

be given to the insights shared by the late William Anderson. In an interview that took place at the 1999 Natural Hazards annual workshop in Boulder Colorado, he ventured the following thoughts on accomplishments made during his tenure at the National Science Foundation. The interview was published as a discussion paper in Environmental Hazards in 2000.

'In any endeavour you start off with certain goals and you are lucky if you achieve part of those goals'... 'Before the first assessment there was not a significant multidisciplinary (hazards research) community. You did not have a stable source of funding for the field. People at NSF (program officials from different disciplines that related to hazards mitigation) did not necessarily talk to one another. There were no centers of excellence established in the community. You had a fairly small number of women involved in the field. There were not many sources for publishing the results of research. Finally, there was little interaction between researchers and practitioners'... 'I think we've seen major advances in terms of all these aspects over the past 20 years'. (Anderson, et. al, 2000: 49).

Higher education is a dynamic, remarkably resilient enterprise, already subject to an array of impact and ranking indicators. For many decades it has made vital and ground-breaking contributions to the disaster risk reduction field, and will continue to do so. The challenge is to step beyond the rhetoric of capacity building and to materially support the advancement of engaged risk scholarship, especially in resource constrained countries that face multiple, accumulating and socially erosive risks.

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Appendix: Universities with a masters programme

COUNTRY	UNIVERSITY	PROGRAM
Algeria	University of Mostaganem	(Masters) Disaster Risk Management
	University of Science and Technology	(Masters) Earthquake Risk Reduction & Disaster Risk Science
Austria	University of Natural Resources and Life Sciences	(Masters) Alpine Natural Hazards
	Australian National University	(Masters) Natural Hazards and Disasters
	Royal Melbourne Institute of Technology (RMIT)	(Ph.D.) Disaster research
	University Western Sydney	(Ph.D.) Disaster Response and Resilience
Bangladesh	University of Dhaka	(Masters) Disaster Management
Bolivia	Universidad Andina Simón Bolívar	(Masters) Management for Risk Reduction and Disaster Response
Bangladesh	BRAC University	(Masters and Ph.D.) Disaster studies
Canada	Royal Roads University	(Masters) Disaster and Emergency Management
	York University	(MA.) Disaster and Emergency Management
	Universite du Quebec a Montreal	(Masters) management of major risks
Chile	Academia de Guerra	(Masters) Planning and Disaster Risk Management
Colombia	Antioquia University	(MSc.) Sustainable Development with Emphasis on "Prevention and Attention to Disasters"
	Universidad del Valle	(MSc.) in Sustainable Development Emphasis on Prevention and Disaster
	Central University	(MSc.) in Management for Risk Reduction and Disaster Prevention
	Escuela de Ingenieros Militares	(Masters) Risk Management and Development
Costa Rica	Universidad Central de Costa Rica	(MSc.) Management for Risk Reduction and Disaster Prevention
Denmark	University of Copenhagen	(Masters) Disaster Management
Ecuador	University of Guayaquil	(Masters) Disaster Risk Management
Ethiopia	Bahir Dar University	(MSc.) Disaster Risk Science & Sustainable Development
France	University of Nice Sophia-Antipolis (UNS)	(Masters) "Climate Risk, Environment, Health"
	Université Paul-Valéry Montpellier	(Masters) Management of disasters and natural hazards
Germany	Technical University of Dreden	(MSc.) Flood Risk Management (The Erasmus Mundus Programme)
	Universitat Bonn	(Masters) disaster preparedness and disaster management
	United Nations University	(Ph.D. block course) "From Vulnerability to Resilience in Disaster Risk Management"
Ghana	University of Ghana	(Mphil) Integrated Disaster Risk Reduction Urban Ghana
Greece	Harokopeion University	(Masters) Management of natural and human induced hazards
Guatemala	University of San Carlos of Guatemala	(MSc.) in Management for Risk Reduction
India	Guru Gobind Singh Indraprastha University (GGSIPU)	(MBA.) Disaster Management

COUNTRY	UNIVERSITY	PROGRAM
India	Tata Institute of Social Sciences (TISS)	(MA./MSc.) Disaster Management
	Madras University	(Masters and Ph.D.) Management Studies Research (Disaster Management)
	University of Pondicherry	(MSc. and Ph.D.) Coastal Disaster Management
	The Indian Institute of Information Technology Allahabad	(Ph.D.) Disaster Management
	Annamalai University	(MA.) Disaster Management
	Indian Institute of Remote Sensing	(MSc.) In Natural Hazards And Disaster Risk Management
Indonesia	Gadjah Mada University	(MSc.) Geo-information for Spatial Planning and Risk Management
Iran	Tehran University of Medical Sciences	(Masters) public health and disasters
Italy	Institute for Advanced Study in Pavia	(Masters) in Earthquake Engineering and/or Engineering Seismology
	Politecnico di Milano	(MCiv.Eng.) Risk Mitigation
Japan	National Graduate Institute for Policy Studies	(MSc and Ph.D.) in Disaster Management Policy Program
Kenya	Moi University	(MSc) Disaster Management
Madagascar	University of Antananarivo	(MSc.) Disaster Risk Management
Malaysia	Universiti Kebangsaan Malaysia (SEADPRI-UKM)	(Masters and Ph.D.) Disaster Mitigation
Mozambique	Technical University of Mozambique	(Masters) Technical Education, Risk Reduction & Development
Nepal	Tribhuvan University	(MSc. and Ph.D.) Disaster Risk Management
Netherlands	University of Twente	(MSc.) Earth Sciences: Specialization in Natural Hazards and Disaster Risk Management
	Wageningen UR	(Masters and Ph.D.) Disaster Studies
New Zealand	University of Auckland	(Masters) Disaster Risk Management
	University of Canterbury	(MSc. and Ph.D.) in Hazard and Disaster Management.
Nicaragua	National Autonomous University of Nicaragua	(Masters) Risk Assessment and Disaster Reduction
	National University of Engineering	(Masters) Environment, Disaster Prevention and Mitigation
Nigeria	Federal Univeristy of Technology	(Masters) Disaster Risk Management
	Ahmadu Bello University	(Masters) Disaster Risk Management
	University of Maiduguri	(Masters) Disaster Risk Management
	University of Ibadan	(Masters) Disaster Risk Management
	University of Port Harcourt	(Masters) Disaster Risk Management
	University if Nigeria	(Masters) Disaster Risk Management
Pakistan	University of Peshawar	(Masters and Ph.D.) Disaster Management
	Military College of Engineering	(Masters) Disaster Management
Peru	National University of Engineering	(Master) Disaster Management for Sustainable Development
	Catholic University of Santa Maria	(Master) Disaster Risk Management and Sustainable Development
	Santiago Antunez de Mayolo National University	(Master) Science and Engineering "Minor in Risk Management and Climate Change"

COUNTRY	UNIVERSITY	PROGRAM
Peru	Univeridad Continental	(Master) Disaster Risk Management
Philippines	Central Bicol State University of Agriculture	(MSc.) Disaster- Risk Management
Portugal	University of Coimbra	(Ph.D.) Territory, Risk and Public Policies
Senegal	Gaston Berger University	(Masters) Disaster Risk Reduction
South Africa	University of the Free State	(Masters) Disaster Management
	North-West University	(Masters) Disaster Risk Studies, Development and Management
	University of Stellenbosch	(Mphil) Disaster Risk Studies
Spain	University of Catalonia	(MSc.) Flood Risk Management
	University of Alicante	Master in Planning and Management of Natural Hazards
	University of Lleida	(MSc.) Masters in Forest Fires: Science and Management
Sweden	Lund University, (in association with Copenhagen University)	(MSc.) Disaster Management
Switzerland	Swiss Federal Institute of Technology	(MSc.) advanced studies in natural hazards management
Sri Lanka	University of Peradeniya	(MSc.) Disaster Management
Taiwan	National Yunlin University of Science & Technology	(Masters) Disaster Prevention and Environmental Engineering
Tanzania	Ardhi University	(MA./MSc.) Disaster Risk Management
Thailand	Chulalongkorn University	(Masters) Disaster risk reduction in Civil Engineering
	Pathumthani	(Masters) Disaster Preparedness, Mitigation and Management Program
Turkey	Istanbul Technical University (ITU)	(Masters) Disaster management
UK	Northumbria University Newcastle	(MSc.) Disaster Management and Sustainable Development
	Cranfield University	(MSc.) Resilience
	University of Manchester	(MA.) International Disaster Management
	Durham University	(MSc. and Ph.D.) in Risk & Environmental Hazard
	Kingston University	(MSc.) Hazards and Disaster Management MSc.
	University of Glamorgan	(MSc.) Disaster Healthcare.
	Salford University	(Masters and Ph.D.) Disaster Management
	University of Portsmouth	(MSc.) Crisis and disaster management/(MSc) Geological and Environmental Hazards
	Kings College	(MA.) Disasters, Adaptation and Development
	University College London	(MSc.) Risk and Disaster Reduction/ Earthquake Engineering with Disaster Management
	University of Huddersfield	(MSc.) Risk, Disaster and Environmental Management
University of South Wales	(MSc.) Disaster Management for Environmental Hazards	
USA	Colorado state University	Masters and Doctoral Research in Disaster field
	University of Delaware	(MSc. and Ph.D.) Disaster Science and Management
	Harvard University	(Masters) Design Studies : Risk and Resilience
	University of Washington	(Masters) Infrastructure, Planning and Management
	VirginiaTech	(Masters) Disaster Resilience IGEP
Zimbabwe	National University of Science and Technology (NUST)	(MSc.) Disaster Management

Methodology for Identifying Universities

Rationale for choice of indicator

The research methodology involved an internet search for university programmes which were centred on the concept of disaster risk reduction. The rationale underlying the selection of disaster risk-related masters level courses offered globally was prompted by the following considerations:

- 1) The team sought to distinguish more developmentally-oriented disaster risk-related courses from those that profiled 'emergency management'.
- 2) The choice of a Masters level identifier (rather than a Bachelors degree) was motivated by the understanding that masters-level qualifications explicitly advance strategic human capital. Such capabilities are essential for complex, cross-sectoral risk management. Additionally, masters-qualified graduates can pursue career paths into research (eg to PhD levels) or into strategic management positions.
- 3) This masters degree indicator could be applied to HEIs globally.
- 4) The team restricted the search to a multi-hazard/multi-risk cross-disciplinary qualification that was not biased in favour of specific hazards (eg droughts or floods). While this may have excluded academic programmes with hazard specificities, the approach ensured consistency in the key words searched.

Sources for information

These included the Google Search Engine in which to search for programmes and their details. The researcher often used academic course finder search engines such as Prevention web and MastersPortal to identify programs offered by universities. These search engines assisted in identifying the title of programs, and what universities and department they belonged to.

Criteria for inclusion

Only Masters and PhD level programmes were collected for this research. In addition, programmes needed to have a clear multidisciplinary background. Programmes also needed to be oriented to Disaster risk reduction, resilience, or prevention. Programmes based on disaster response and emergency management were not considered. Postgraduate courses (honours) or diplomas or certificates in this field were also not considered or included for the collection of data.

Central to selecting programmes was a search for programmes with specific names or important words in the title (see keywords). These specific keywords allowed the researcher to narrow the area of the search to programs with specific attributes.

Keywords used in the search online: Disaster, Disaster Risk Management, Resilience, Disaster Management, disaster prevention, University program, Masters, PhD. These keywords were translated into several languages (French, Spanish, Portuguese, German and

Italian) to search for non-English programmes. However, during the search many non-English programme titles and their details were translated by the Google search Engine.

Criteria for validation

Each programme was then validated by accessing university website or program guides to verify its details and determine if it was an actual existing programme, that it complied with the criteria for inclusion and to determine if it was still operational.

Appendix: Acronyms and abbreviations

ADRRN	Asian Disaster Reduction and Response Network
AUEDM	Asian University Network for Environment and Disaster Management
AUEDM	Asian University Network of Environment and Disaster Management
DiMP	Disaster Mitigation for Sustainable Livelihoods Programme
DRM	Disaster risk management
DRMG	Diplome d'études supérieures spécialisées Multidisciplinaire en Gestion des Risques et des Catastrophes (Multidisciplinary Disaster and Risk Governance Masters Programme)
DRR	Disaster Risk Reduction
DRSSD	Disaster Risk Science and Sustainable Development
ELRHA	Enhancing Learning and Research for Humanitarian Assistance
ESD	Education for Sustainable Development
GER	Gross Enrolment Ratio
GNDR	Global Network for Disaster Reduction
HEIs	Higher Education Institutions
HFA	Hyogo Framework for Action
IEH	Integrated Environmental Health
IPCC SREX	Intergovernmental Panel on Climate Change's Special Report on Extreme Events
IRDR	Integrated Research on Disaster Risk initiative
MDGs	Millennium Development Goals
MSc	Master of Science
Periperi U	Partners enhancing resilience for people exposed to risks
RADAR	Research Alliance for Disasters and Risk Reduction
UG	University of Ghana
UNCECAR	University Network for Climate and Ecosystems Change