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## The Implication of Hyogo Framework for Action for Disaster Resilience Education

Lei Zhou<sup>a</sup>, Srinath Perera<sup>a\*</sup>, Janaka Jayawickrama<sup>a</sup>, Onaopepo Adeniyi<sup>a</sup>

<sup>a</sup>*Faculty of Engineering and Environment, Northumbria University, Newcastle upon Tyne, United Kingdom*

### Abstract

The Hyogo Framework for Action (HFA) is the first global strategy to provide a detailed work plan for different sectors and actors to work on disaster risk reduction. The Priority Action 3 of the HFA demand for a global call to governments and others to use knowledge, innovation and education to build a culture of safety and resilience at all levels. Evidence suggests that there are only very few effective initiatives that have been implemented by stakeholders and especially in the higher education sector where the future policy makers and practitioners are educated and trained. This creates a significant challenge as the ten year plan of the HFA is coming to an end in 2015. This paper attempts to view the world in post-HFA and propose a framework on mapping and integrating disaster risk reduction into formal, informal and non-formal education at policy, practice and community levels. A case study approach was used to examine how the HFA has been embraced into a disaster resilience related higher education programme. The study argues that integrating disaster resilience into education is a key factor for reducing the adverse impact of future disasters. The suggested framework provides an insight into current gaps in knowledge, innovation and education and proposes solutions for effective integration of disaster resilience education at all levels.

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*Keywords:* Hyogo Framework for Action, Disaster Resilience, Disaster Preparedness, Educational Programme

\*Corresponding author. Tel.: +44 (0)781 7682897  
E-mail address: [srinath.perera@northumbria.ac.uk](mailto:srinath.perera@northumbria.ac.uk)

## 1. Introduction

In the first fifteen years of 21st century, natural and man-made disasters have caused serious damages to the human habitats and society across the world. The earthquake in Haiti, Russian heat wave, earthquake in Japan and China among others have increased the degree of uncertainty and as well increased pressures on policy makers, local authorities, private sectors and researchers. According to UNISDR (2013a), 310 disasters killed over 9,300 people in 2012, affected 106 million others, cost amounting to 138 billion US dollars, and from 2010 – 2012, economic losses from disasters were estimated to have exceeded \$100bn every year. In January 2005, the World Conference on Disaster Reduction adopted the ‘Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters’ (UNISDR, 2005). The Priority Action 3 of the HFA placed a global call to governments and others to use knowledge, innovation and education to build a culture of safety and resilience at all levels. It is clear that the mortality rates have reduced noticeably (Kahn, 2005; Kellenberg & Mobarak, 2008; UNISDR, 2013) with the increasing levels of awareness of disaster risk prevention. However, even though there are pockets of success there are still global challenges in achieving universal reductions in mortality rates while minimizing economic losses (IRIN, 2005). One typical example of major challenge is the lack of relevant disaster management and emergency management education and training. Alexander (2013) mentioned the importance of developing standards of emergency and disaster management training and education among Higher Education Institutions (HEIs). It is indeed necessary to identify how the HFA has been incorporated in the existing education programmes. The purpose of this paper is to examine the implementation of HFA at the tertiary level of education (university) in disaster management and explore the knowledge and skills required for next decade’s disaster resilience capacity building. It therefore develops a framework on mapping and integrating disaster risk reduction into the higher education at policy, practice and community levels. This paper argues that integrating disaster resilience into education is a key factor for mitigating the adverse impact of future disasters. It identifies the current gaps in knowledge, innovation and education and made recommendations for better integration of HFA in higher education.

## 2. Disaster resilience and Hyogo Framework for Action

### 2.1 Disaster Resilience

Although there are many definitions of disaster resilience, UNISDR (2009) defined disaster resilience as the ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. Resilience was described by Tainter and Taylor (2014) as the ability to recover from a setback; it is also seen to help achieve sustainability goals. Invariably, resilient societies or systems must have reserve problem-solving capacity to adjust to challenges without distortion. Although the interdisciplinary attribute and the existence of many definitions for resilience has been acknowledged (Alexander, 2013), Twigg (2007) said that it could be ‘confusing’, having a closer look at all the definitions even across variety of disciplines, one can draw a high level of similarity and consistence in the practical implication of the different definitions. A new paradigm was however introduced when Manyena (2009) viewed and described disaster resilience as the ability to ‘bounce forward’ and move on following a disaster. A note of caution was however attached as the ‘bounce forward’ idea is the author’s conception. Further development on how it will be interpreted by stakeholders especially, humanitarian intervention providers and intervention beneficiaries, is necessary (Manyena, 2009).

### 2.2 Hyogo Framework for Action

The International Decade for Natural Disaster Reduction (IDNDR) was based on UN General Assembly Resolution 42/169 of 1987, Yokohama Strategy and Plan of Action for a Safer World in 1994, International Strategy for Disaster Reduction (ISDR) in 2000, the Millennium Declaration also made in the year 2000 (UNISDR, 2004). The World Conference on Disaster Risk Reduction and the Hyogo Declaration in 2005 gave birth to Hyogo Framework for Action 2005-2015. The ultimate target of these actions and declarations remain the achievement of resilience of communities and nations to disasters. A comprehensive approach to reduce disaster risks are established in the

Hyogo Framework for Action (HFA) endorsed by over 162 countries and adopted in 2005. The HFA was developed to ensure reduction in social, economic, and environmental losses of communities and countries from disasters (UNISDR, 2005). It is an international blueprint for disaster risk reduction. Its comprehensive goal is to build the resilience of nations and communities to disasters towards 2015 (UNISDR, 2005). The HFA contains five priorities for action towards achieving the earlier stated comprehensive goal. These priority areas are: making disaster risk reduction a priority; knowing the risks and taking actions i.e. identifying, assessing and monitoring disaster risks; building the culture of resilience using all possible knowledge, innovation and as well increase understanding and awareness; reducing risk factors through adequate risk management techniques; always be prepared and respond appropriately when necessary. Twigg (2007) simplified the HFA into five thematic areas, they are: governance, knowledge and education, risk management and vulnerability reduction, risk assessment, disaster preparedness and response. According to the study, the sub-themes of the themes are more or less the characteristics of resilient communities. The HFA identified some issues that need to be considered while carrying out the key activities expected under the priority actions, the issues are: the importance of multi hazard approach to all actions; gender perspective or influence as well as cultural diversity; community and volunteers participation; and capacity building and technology transfer.

State governments, regional organizations and institutions, and international organizations (including United Nations System and International Financial Institutions) were identified as major actors by the HFA. There might be a modification to this in the post 2015 edition as the significant role of the community as well as local and international private sector actors have been identified (Ki-Moon, 2013; UNISDR, 2013; United Nations, 2013). As the implementation of Hyogo framework draws to a close, UNISDR (2013) identified some relevant context towards a successful post 2015 framework. The need to better address underlying risk factors and as well engage more actors like the private sector and local government leaders has been identified. Also, it was pointed out that most of the issues being raised now have been raised in international declarations made earlier; therefore it should be made clear if the issues are still being mentioned for the sake of reaffirmation or a step towards pointing out the gaps in how previous instruments handled the issues. Other contexts identified are how cross cutting issues such as gender contributes to the effective implementation of the existing frameworks. It is also being mentioned that an improved implementation and a follow up mechanism is needed (UNISDR, 2013). Even as the continued relevance and usefulness of the existing framework has been identified, a call for a deeper look especially into the priority action four has been made. Consultations are already in progress in achieving a better as well as a successful implementation of post-2015 framework. There is also the need for empirical evaluation of how the existing framework relates to disaster resilience education towards achieving a better fusion between policy framework, academics and reality in post-2015.

### **3. Disaster Resilience Education**

#### *3.1. University Education in Disaster Resilience*

In 2014 the world faces the first famine of the 21st Century in the Horn of Africa, multiple earthquakes, tsunamis and other natural hazards around the world. Over the coming decades it is expected that both the frequency and intensity of disasters will continue to increase as a result of climate change, urban migration, population growth and increased scarcity of natural resources. Disaster resilience is the term used to describe the process of helping communities and countries to be better prepared to withstand and rapidly recover from a shock such as an earthquake, drought, flood or cyclone. In this light, including the concepts of resilience in higher professional education programme at university level is becoming increasingly important. The future professionals such as engineers, architects, surveyors, disaster managers, health professionals and teachers need to be aware of the ways and means to reduce disaster risks. Haigh and Amaratunga (2010) has conducted an integrative review of the role of built environment professionals and disaster resilience development and recognized that the higher education institutes (HEIs) who deliver relevant programmes has major responsibility to provide specific skills and knowledge to the society.

### 3.2. Case Study: University - DMSD Programme

Established in the year 2000, the MSc Disaster Management and Sustainable Development programme (DMSD) at University A is the first of its kind that link the concepts of sustainable development into disaster risk reduction. The argument of the DMSD is that by implementing sustainable development strategies would reduce future disaster risks at community, national, regional and international levels.

This programme uses an interdisciplinary approach to examine both disaster management and sustainable development on the basis that best practice in one is increasingly dependent on best practice in the other. There is an ongoing need for strengthening capacity to respond to disasters with every contemporary crisis. Those needing to address hazards, disasters and complex emergencies at a more advanced level include people working with relief and development organisations, regional and local authorities, the emergency services, and some elements of public and private utilities. The issue of disaster management and sustainable development is underpinned with reference to the developing or developed worlds and through knowledge and skills for project planning. The programme aims to build capacity of professionals who are required to cope with disasters and the risk of disasters. The interdisciplinary approach is needed because no single discipline can successfully address the complexity of the links between disaster management and sustainable development.

The 21<sup>st</sup> century presents an increasing need for expertise in the convergent fields of disaster management and sustainable development. The programme is designed to fill a widely sought after but sparsely provided focus at the postgraduate level and is specifically international in its scope. Whilst the programme deals with topics of international relevance, it also focuses on details of crucial importance at the local level in both the minority ('developed') and majority ('developing') worlds. To these ends it was proposed that the programme continue to be developed with an open-minded approach to a rapidly expanding field, whilst providing an agenda guided by state-of-the-art literature and staff experience in applying this knowledge to current world issues. The DMSD programme aims to enable its participants to be better equipped to carry out academic analysis, project negotiations, and applied evaluations within the context of current development debates in disaster avoidance and response, and for sustainable development in changing 'natural' and anthropogenic contexts of risk. The qualification of MSc will be awarded based on the successful completion of 120 credits from modules that are guided by teaching and a Masters Dissertation that contributes a further 60 credits. Successful completion of the 120 credits without completion of a Masters dissertation qualifies the candidate for the qualification of Postgraduate Diploma. Awards can be made for completion of a programme within a maximum of two years of starting.

### 4. Methodology

This study used a case study approach to examine how the HFA has been embraced into a disaster resilience related higher education programme. Bromley (1990) defined case study as a “systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest”. Case study data could come from variety of sources: such as archival documents, records, personal interviews, direct observations, participant observation and physical artifacts (Yin, 2003). The exploratory approach has been chosen to explore those situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2003)

In order to understand better how the HFA has been integrated into the university education, particularly in the postgraduate level, this study carried out a detailed HFA mapping exercise with one of world leading Disaster Management master programme. This involved mapping HFA Priorities of Actions to the individual module specifications of the respective DMSD programme. The depth of coverage of content (depth measure) indicates the time (hours) spent on acquiring knowledge related to each HFA action. The time spent on achieving module outcome is stipulated as Credits, where 10 hours spent is considered as 1 Credit, a typical 20 Credits point module reflects 200 hours of learning. The total amount of time spent consists of lectures, seminars, tutorials and also students' self-learning/study time on the module content. A percentage score is used to indicate the proportion of time spent on each action cross the programme. It would provide some reflections how the study time distribute among the actions. The mapping exercise is initially conducted as a desktop study based on the module specifications. It is then followed by a review based on a detailed consultation with the programme leader of the MSc programme concerned for the necessary revision and ratifications of the data.

Presented in Table 1 below are the outlines of modules to which HFA priority actions were mapped. The HFA five priority areas of action are:

1. Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation
2. Identify, assess and monitor disaster risks and enhance early warning
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response at all levels

These five priorities have been broken down into a number of sub-actions. The DMSD programme has 8 modules, 4 compulsory and 4 option modules (Table 1). The students have to study all 4 compulsory modules and choose 2 option modules, after that, they need do a dissertation. However, one of the option modules: GE0230 Subject Exploration: Disaster and Development is a flexible module and the contents of the module will be explored and designed by the students within what was not covered by other modules, therefore, this module and the dissertation module were excluded from the mapping exercise. Hence, the mapping exercise include 6 modules, all available modules are listed in table 1 below.

Table 1. Outline of modules

Modules	Semester	Credit Weight	Level
Semester One Core Modules (compulsory)			
1. GE 0234 Themes in Sustainable Development	1	20	M
2. GE 0235 Disaster Risk Reduction and Response	1	20	M
3. GE 0170 Project Management: Approaches and Methods	1	20	M
		60	
Semester Two Core Module (compulsory)			
4. GE 0214 Research Methods	2	20	M
Semester Two Option Modules (choose maximum of two)			
5. GE 0172 Physical and Mental Health	2	20	M
6. GE 0271 Integrated Emergency Management	2	20	M
7. GE 0264 Concepts of Community Care	2	20	M
8. GE 0230 Subject Exploration: Disaster and Development	2	20	M
DIPLOMA (PgD)		120	
9. GE 0173 Masters Dissertation		60	M
MASTER OF SCIENCE (MSc)		180	

Based on the modules listed in Table 1, there are three types of study plans, they are: Plan A: Compulsory modules + GE0172 & GE0271; Plan B: Compulsory modules + GE0172 & GE0264; Plan C: Compulsory modules + GE00271 & GE0264.

#### 4. Data Analysis

The contents of the three study plans were mapped with the HFA Priorities for Action separately and then compared to cross check their respective coverage (Table 2). The mapping was carried out by allocating number of hours spent on HFA priorities for actions to module topics. At the top of the mapping matrix all selected modules are listed with the module level (M: master level), total credits (20), and total hours (200) for each module. In the left, all HFA priorities for actions are listed under the five main themes.

Table 2 presents the results of study plan A. The result shows the different times spent on each theme, for example, 264 hours (24.3%) is spent on theme one: disaster risk reduction (DRR), also, 205 hours (18.8%) is spent on theme two, and 285 hours (26.2%) of total time was allocated to theme three – it is the highest. Similar amount of time, 281 hours (25.8%) is spent on theme four, but only 53 hours (4.9%) is spent on theme five – it is the lowest. The total number of hours spent on each module in relation to the HFA themes is indicated at the bottom row of the table. Module GE0235 is almost fully mapped with the HFA, even the module with lowest mapping ‘GE0214 Research methods for disaster and development’ has over 150 hours spent on the HFA.

Table 2. HFA-module mapping matrix for Plan A

Level:	7	7	7	7	7	7	
Credits:	20	20	20	20	20	20	120



Hours:	200	200	200	200	200	200	1200		
Module Type	Comp.	Comp.	Comp.	Comp.	Opt.	Opt.			
Module Code	GE0234	GE0235	GE0170	GE 0214	GE 0172	GE 0271			
							Sum	%	
<b>Hyogo Framework Priorities for action</b>									
1. Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation	40	36	52	43	46	47	<b>264</b>	<b>24.3%</b>	
DRR institutional mechanisms (national platforms); designated responsibilities	0	6	5	5	7	7	30	2.8%	
DRR part of development policies and planning, sector wise and multi-sector	15	5	3	5	5	5	38	3.5%	
Legislation to support DRR	5	4	10	5	5	6	35	3.2%	
Decentralisation of responsibilities and resources	5	5	6	5	7	7	35	3.2%	
Assessment of human resources and capacities	5	5	18	10	8	8	54	5.0%	
Foster political commitment	5	6	5	5	6	6	33	3.0%	
Community participation	5	5	5	8	8	8	39	3.6%	
2. Identify, assess and monitor disaster risks and enhance early warning	13	37	39	37	45	34	<b>205</b>	<b>18.8%</b>	
Risk assessments and maps, multi-risk: elaboration and dissemination	0	6	15	10	5	8	44	4.0%	
Indicators on DRR and vulnerability	8	7	8	10	6	4	43	4.0%	
Data & statistical loss information	0	7	5	5	9	4	30	2.8%	
Early warning: people centred; information systems; public policy	0	9	5	5	9	4	32	2.9%	
Scientific and technological development; data sharing, space based earth observation, climate modelling and forecasting; early warning	0	0	0	0	9	7	16	1.5%	
Regional and emerging risks	5	8	6	7	7	7	40	3.7%	
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels	32	53	68	55	42	35	<b>285</b>	<b>26.2%</b>	
Information sharing and cooperation	7	8	5	5	5	5	35	3.2%	
Networks across disciplines and regions; dialogue	20	10	15	10	7	4	66	6.1%	
Use of standard DRR terminology	0	10	10	10	7	4	41	3.8%	
Inclusion of DRR into school curricula, formal and informal education	0	8	15	0	8	7	38	3.5%	
Training and learning on DRR: community level, local authorities, targeted sectors; equal access	0	7	5	5	5	5	27	2.5%	
Research capacity: multi-risk; socioeconomic; application	5	5	10	20	5	5	50	4.6%	
Public awareness and media	0	5	8	5	5	5	28	2.6%	
4. Reduce the underlying risk factors	102	56	31	20	42	30	<b>281</b>	<b>25.8%</b>	
Sustainable ecosystems and environmental management	15	8	5	5	5	5	43	4.0%	
DRR strategies integrated with climate change adaptation	5	5	5	5	5	5	30	2.8%	
Food security for resilience	5	8	4	4	6	0	27	2.5%	
DRR integrated into health sector and safe hospitals	0	5	3	0	10	5	23	2.1%	
Protection of critical public facilities	10	2	0	2	5	2	21	1.9%	
Recovery schemes and social safety- nets	3	3	0	0	3	3	12	1.1%	

Vulnerability reduction with diversified income options	22	6	2	2	2	2	36	3.3%
Financial risk-sharing mechanisms	2	3	5	0	0	3	13	1.2%
Public-private partnership	2	2	2	2	2	2	12	1.1%
Land use planning and building codes	20	8	3	0	2	3	36	3.3%
Rural development plans and DRR	18	6	2	0	2	0	28	2.6%
5. Strengthen disaster preparedness for effective response at all levels	6	15	5	2	10	15	<b>53</b>	<b>4.9%</b>
Disaster management capacities: policy, technical and institutional capacities	2	6	1	0	2	2	13	1.2%
Dialogue, coordination & information exchange between disaster managers and development sectors	2	2	2	2	2	2	12	1.1%
Regional approaches to disaster response, with risk reduction focus	2	2	0	0	2	2	8	0.7%
Review & and exercise preparedness and contingency plans	0	0	0	0	2	5	7	0.6%
Emergency funds	0	3	0	0	0	2	5	0.5%
Voluntarism & participation	0	2	2	0	2	2	8	0.7%
	193	197	195	157	185	161	1088	100%

Table 2 clearly shows that the Hyogo Framework has been well embedded into the DMSD programme curriculum. However, there are still some sub-actions that are not fully integrated in the programme, one of the sub-actions is emergency funds; it took only 0.5% of the total time set aside for the programme. Table 3 is the summary table of all three study plans (A, B and C). Comparing the study plans with regards to their respective coverage of the HFA, it can be deduced that there is no significant difference, this implies that each of the study plans offer students similar coverage level of the HFA.

Table 3. Summary of the HFA-module mapping

Hyogo Framework	MSc Disaster Management and Sustainable Development					
	Plan A		Plan B		Plan C	
<b>Priorities of Action</b>	Hours	%	Hours	%	Hours	%
1. Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation	264	24.3%	278	25.7%	279	26.4%
2. Identify, assess and monitor disaster risks and enhance early warning	205	18.8%	194	18.0%	183	17.3%
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels	285	26.2%	297	27.5%	290	27.5%
4. Reduce the underlying risk factors	281	25.8%	257	23.8%	245	23.2%
5. Strengthen disaster preparedness for effective response at all levels	53	4.9%	54	5.0%	59	5.6%
<b>Total</b>	<b>1088</b>	<b>100%</b>	<b>1080</b>	<b>100%</b>	<b>1056</b>	<b>100%</b>

## 5. Conclusion

Since the launch of the Hyogo framework for action (HFA) in 2005, many countries have adopted this framework at national or local level to develop their own action plans towards reducing disaster risks. Therefore there is an urgent and global need for multi-disaster, multi-sectorial and multi-disciplinary approaches towards achieving disaster resilience and capacity development through the greater understanding of the HFA, its principles and action plans. A number of universities worldwide have developed their own curricula to fulfill their own perceived needs, whereas, these programmes require greater congruence with the HFA so as to generate the full impact envisaged by the HFA goals. This paper therefore, for the first time developed a HFA mapping framework, that could be applied to any

disaster management related undergraduate and postgraduate programme to evaluate the level of HFA compliance of their curriculum. Furthermore, it emphasizes the role of education as a critical factor for disaster risk reduction. The DMSD programme (case study) demonstrated a high congruence with most priority actions of the HFA but a few, particularly in theme five: strengthen disaster preparedness for effective response at all levels, the theme was not fully covered within the programme. One of the reasons for that was because the sub-actions such as emergency funds are mainly actions for developed countries; they are therefore not prioritized for the master's programme studied. However, it is clear that there is a lower coverage of HFA theme five in the master programme, this need to be reappraised. On the other hand, there are some gaps in HFA, such as, culture, religion, traditions, community-based mechanisms, private sector and local government roles; they are covered in the master programme except private sector roles and are indeed worthy of prominent appearance in the HFA. This study argues for the need to integrate disaster resilience education into undergraduate and postgraduate education, it is seen as a key factor for reducing the adverse impact of future disasters. The HFA mapping framework proposed by this paper provides an insight into current gaps in knowledge, innovation and education and identify solutions for effective integration of disaster resilience education at all levels. It further suggests the use of the HFA mapping framework as a means of analyzing level of HFA compliance of curricular related to disaster management programmes as well as in future programme development.

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