DISASTER RISK REDUCTION AS A PROFESSIONAL COMPETENCY: A REVIEW OF RELATED TRAINING AND EDUCATION PROVISION FOR BUILT ENVIRONMENT PRACTITIONERS IN THE UK AND AUSTRALIA

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ABSTRACT

The UN's Sendai Framework for Disaster Risk Reduction 2015-2030 highlights the importance of engaging multiple stakeholders in Disaster Risk Reduction (DRR). However, questions remain about whether the increasingly broad range of people who are required to make more informed decisions about risk reduction actually have the professional competencies to do so. DRR in the UK is a part of the resilience agenda, which implies a proactive approach to managing disasters and reducing the risks. In Australia, DRR is integrated within national disaster management policy, shifting responsibility away from government towards a proactive private sector, community and individual. When analysed closely it becomes apparent that despite the presence of legislation that encourages integrating such considerations into built environment processes, many built environment practitioners have not received the training required for dealing with DRR. In addition, proactively dealing with disaster risk in both countries is primarily implemented by emergency managers that typically have not been trained to deal with the required range of DRR approaches. These observations suggest that if DRR considerations are going to become better integrated into the (re)development of increasingly urbanised world, then there is a need to better integrate DRR principles into the core professional training (or at least continued professional development) of some of these key built environment practitioners. Therefore with the aim of assessing the extent to which DRR is (or can be) a core professional competency, this paper a) presents a critical review of the current core competency requirements for members of professional institutions, and b) provides an overview of the training of built environment practitioners in the UK and Australia.

Keywords: Disaster Risk Reduction; built environment; professional competencies

INTRODUCTION

The last century has witnessed mass urbanisation that has occurred in the context of neo-liberal 'free-market' policies, with the role of the state as an urban custodian gradually being diluted (Johnson et al. 2013). This has resulted in a reduction in regulatory control and a perspective that the role of the state is primarily to enable 'free' markets to work. For the construction sector this has enabled investments in construction through the provision of infrastructure, financial mechanisms and making land available for development. However, reduced (or ineffectively applied) regulatory controls have meant that disaster risks, and other environmental concerns, are often poorly considered in urban development decisions (UNISDR 2011; Johnson et al. 2013). This has been further exacerbated by the lack of appropriate training among built environment practitioners.

The UN's Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2015) highlights the importance of engaging multiple stakeholders in Disaster Risk Reduction (DRR), with the specific role of built environment practitioners highlighted in literature (e.g. Bosher et al. 2007; Chmutina et al., 2014). However, questions remain about whether the increasingly broad range of people who are required to make more informed decisions about risk reduction actually have the competencies to do so.

A number of authors argues (e.g. Bosher et al., 2015; Siriwardena et al., 2013) that despite the presence of legislation that encourages DRR and resilience agendas to be integrated into built environment processes (i.e. design, construction and operation of the built environment), it becomes apparent that many built environment practitioners have not received the training required for dealing with DRR. In addition, proactively dealing with disaster risk is primarily implemented by emergency managers that typically have not been trained to deal with the required range of DRR approaches. These observations suggest that if DRR considerations are going to become better integrated into the (re)development of increasingly urbanised world, then there is a need to better integrate DRR principles into the core training (or at least continued professional development) of some of these key built environment practitioners (i.e. civil engineers, architects, surveyors and facilities managers).

Therefore with the aim of assessing the extent to which DRR is (or can be) a core professional competency, this paper a) presents a critical review of the current core competency requirements for members of professional institutions (e.g. the Institute of Civil Engineers (ICE), Institute of Structural Engineers (IStructE), Chartered Institute of Building (CIOB), Royal Institution of Chartered Surveyors (RICS), Royal Institute of British Architects (RIBA), Institute of Engineers Australia (EA), Australian Institute of Architects (AIA)) and, b) provides an overview of the

professional training of built environment practitioners in the UK and Australia.

DRR COMPETENCIES AND PROFESSIONAL TRAINING

Why are DRR competencies important?

There is a potential for the private sector to play a critical role in proactively addressing DRR. However the realities of free-market economics (that often places a value on hazard prone land and a competitive market for insurers to provide insurance as standard) and the lack of incentives for the private (and even the public-private) sector to proactively consider DRR have resulted in a legacy of inappropriately considered developments. These developmental practices have occurred to promote economic development, but not necessarily to enable appropriate sustainable development.

Nonetheless, Bosher (2014) believes that there is scope for utilising an approach to DRR that is less dependent on governmental regulation. For instance, possibly through forward thinking private sector developers that can grasp the business opportunity (even if it is just driven by free-market fundamentalism). For some 'new build' developments, particular developers are recognising that it could actually be a good idea to become a market leader in incorporating DRR into commercial developments, with the hope that it will give them the cutting edge over competitors in the short term (i.e. under risk-blind legislative conditions) and the long term. This has already happened in the area of sustainability, which is becoming more and more mainstreamed into the construction sector's activities; many developers charge premium rates for the project that have a potential to receive outstanding environmental ratings (e.g. LEED or BREEAM). The greater engagement of built environment practitioners with DRR activities provides a similar opportunity not just to increase revenue and profitability, but also to contribute towards the betterment of sustainability, and community, environmental and other social outcomes (Bosher and Dainty, 2011).

The involvement of built environment practitioners in DRR has in the past largely been associated with a range of critical activities such as temporary shelter before and after the disaster, restoration of public services (e.g. hospitals, schools power lines) etc. (World Bank, 2001). In reality, however, built environment practitioners have a much broader role to anticipate, assess, prevent, prepare, respond and recover (Keraminiyage et al. 2007). Figure 1 illustrates that for DRR ideologies to be made more influential, they need to be considered in the 'project concept' and maybe even made a core component of 'Company Policy' (Bosher and Chmutina, 2017). The approach to how cities, infrastructure and buildings are developed needs to be change, by not merely mainstreaming DRR into practice but by making DRR part of the

'developmental DNA' (UNISDR, 2015). If DRR is only considered in the planning and detailed design stages then there is hope that DRR measures will be included but they may not be highly effective. If DRR is not considered or only considered once construction or reconstruction has started then the creation of disaster risk is much more likely.

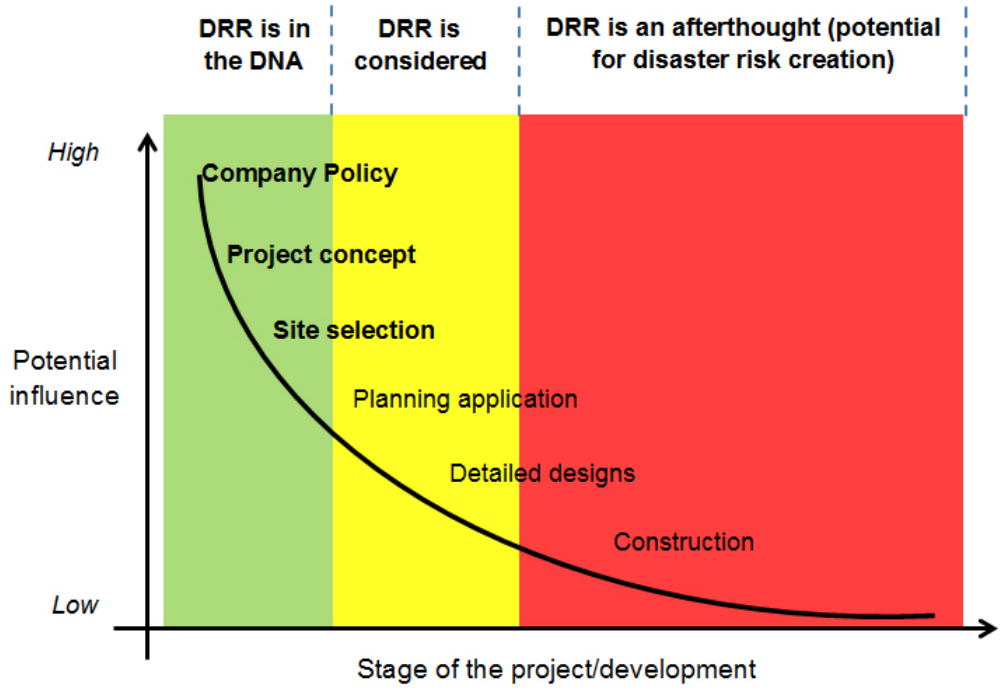

Figure 1: The 'Project influence curve' (Bosher and Chmutina, 2017)

This vision will need to be supported by many other non-structural activities, and in particular by incorporating DRR into the professional training (formal and informal) of built environment practitioners and raising awareness of proactive risk reduction to deal with the current and longer-term impacts of climate change.

As advocated by Russell (2013) and Janda and Pareg (2013) new skills are required as core competencies to enable a better understanding of the societal aspects of built environment practices and improved engagement /empowerment with stakeholders (such as clients and local communities). Bosher et al. (2015) take this idea further stating that the professional institutions that provide education to, and accredit courses for, built environment practitioners should take the lead in educating current and future built environment practitioner about their roles in DRR. While admittedly this is not a panacea it would definitely be a move in the right direction.

DRR competencies and professional development in the UK[1][2]

[1] This section is largely based on the research conducted by Mark Mayers as a part of his final year dissertation project for the School of Civil and Building Engineering, Loughborough University and supervised by Dr Lee Bosher and Dr Ksenia Chmutina.

Whilst there is an opportunity for the introduction of DRR as a part of professional competencies, current situation in the UK demonstrates that this opportunity has not yet been fully realised.

The role of Higher Education Institutions in enhancing DRR-related knowledge and skills through the development of relevant curricular and modules is recognised (Malalgoda et al., 2015). Currently, a number of engineering courses in the UK provide DRR-related modules, however a predominant number of these modules are optional (see Table 1). These modules mainly cover flood management, seismic hazards and tectonics. The majority of the DRR-related programmes are largely offered at a post-graduate level, with the main focus being on emergency management (i.e. reactive rather than proactive approach to DRR).

Table 1: Overview of the DRR-related modules

Subject area	**Number of Universities offering the subject area**	**Number of compulsory DRR-related modules**	**Number of optional DRR-Related modules**
Civil and Building Engineering	52	1	19
Town and Country Planning	26	0	2

Siriwardena et al. (2013) point out that due to the complexity of DRR, relevant competencies have to be developed continuously. The underpinning principles of the professional institutes that accredit built environment courses provide an excellent opportunity for the integration of DRR into the professional competencies, as their Codes of Conduct already emphasise the importance of welfare, health and safety, and sufficient professional knowledge (e.g. ICE, 2014; CIOB, 2015).

Whilst none of the engineering chartered institutes see DRR as a core competency, in recent years a number of the Continuing Professional Development (CDP) events focused on DRR (particularly natural hazards) (e.g. flood management, resilience, risk assessment) has increased. For instance, in 2016 RIBA ran a 'Disaster Day' workshop aimed at developing preparedness and built in resilience approaches for the cities located in disaster prone areas (RIBA, 2016).

[2] Data collection for this and the following section involved the exploratory analysis of the online information in order to identify what DRR-related courses are currently available as a part of civil engineering programmes, and whether DRR competencies are covered by the professional development offered by various professional bodies.

The IStructE has a dedicated Earthquake Engineering Field Team (EEFIT) that collects and analyses data on geology and seismology, and make technical evaluations. EEFIT offers an opportunity to the members of the IStructE to join the team to expand their personal competence and development their understanding of DRR measures and the perceived importance of resilience in the built environment (IStructE, 2016).

DRR competencies and professional development in Australia

Australian society has extensive lived experience of disaster. However, in recent years, it has become apparent that risk has been often misunderstood by communities, industries and various government bodies (Forino et al. 2015). This is sometimes attributed to the highly professional nature of emergency response and a resulting complacency displayed by those at risk. There is a pervasive technocratic mind-set that asserts that more development and innovation will solve all of our concerns. In this context, built environment professionals are being trained overwhelmingly to prioritise economic rationale over all other factors and students are generally positioning themselves for a competitive neo-liberal job market.

Of the 37 universities training civil engineers in Australia, none explicitly require students to focus on DRR, but around half include DRR-related content, similar to the UK situation. Several of these have DRR-focused electives, with the standout being James Cook University. EA integrates many of the core skills and behaviours associated with DRR into its competency standards and while ‘disaster’ is not included explicitly, ‘risk’ is a critical term that is embedded strongly.

With regards to Construction Management degrees, the University of Newcastle offers an elective module on Disaster Resilience in its undergraduate programme. However among the 12 universities awarding CM degrees (which is a highly commercially focussed discipline), DRR is clearly not a priority. The Australian Institute of Building, which accredits all of these programmes, does not make any reference to ‘disaster’, ‘risk’ or ‘resilience’ in their competency standards (AIB, 2015). There is a related focus on environmental standards and health & safety more broadly.

The 18 Schools of Architecture in Australia boast numerous social good initiatives, and while this can lead graduates into DRR-related pathways, within the curriculum students are generally expected to develop their own interests and DRR is not prescribed as a core area of competence. The AIA provides various CPD opportunities in related areas and features ‘disaster relief’ as an example of the relevant application of the profession (AIA, 2016). A $10 million endowment was made to UNSW in 2015 to fund research in disasters within the architectural field and will surely raise the national profile significantly (Cheng, 2015).

Urban Planning undergraduate degrees are offered by 26 universities and deal more broadly with disaster risk management, but stop short of targeting risk reduction specifically in curricula. Planning Australia has a long standing relationship with the Australian Emergency Management Institute and seems the most active discipline in terms of shaping policy with an appreciation for DRR (Kelly, 2013). More specifically targeted DRR modules are indeed taught in Australia, across Environmental Science, Human Geography, Emergency Management, Public Policy and Development Studies but built environment disciplines do appear to be slow on the uptake with regards to graduate competency profiles.

CONCLUSIONS

This paper emphasises that for the built environment to become resilient, DRR competencies of the built environment practitioners should be improved. During the last few decades a paradigmatic shift has contributed towards an increased focus on disaster preparedness, hazard mitigation and vulnerability reduction rather than the often reactive focus on disaster management and relief. Despite this new emphasis, the construction industry at various scales is arguably poorly positioned to embrace the tenets of DRR. The construction industry's structural fragmentation sustained by ingrained practices which have emerged from the temporal nature of projects arguably present a problematic arena within which to enact the joined-up thinking necessary to mainstream DRR (Bosher and Dainty 2011), let alone the more ambitious aim of DRR becoming part of the 'developmental DNA'.

It is apparent that the broad range of built environment practitioners need to do a better job at transferring existing knowledge; many of the problems being encountered in hazard prone developments are not about knowledge/information not existing (i.e. technical information on how to build flood resistant structures), it is primarily about the knowledge not being applied (for instance due to poor knowledge transfer, poor training, commercial self-interests or poor regulation). Thus there is a need for broadening the core skills base (the breadth of multi-hazard DRR considerations, rather than just specialising in specifics such as earthquake or wind engineering) so that non-structural approaches to DRR can be given as much credence as some of the more technical structural considerations.

It is thus argued by Bosher et al. (2015), and reiterated in this paper, that proactively dealing with disaster risk should not merely be a 'bolt on' consideration, otherwise it tends to be more expensive, poorly integrated and less effective than if incorporated into earlier designs. This raises implications for the core education and continued professional training of the built environment practitioners that are involved in the design, planning, construction, operation and maintenance of our increasingly urbanised world. Consequently, it is increasingly being argued that the

institutions that provide built environment related education/training programmes should take the lead in educating students about their roles in DRR. This would need the support of key professional institutions (such as the ICE, EA, RIBA, AIA, CIOB, AIB and RICS) including an open dialogue about the feasibility of including DRR as a professional competency though core undergraduate training, on-the-job practical training and/or Continued Professional Development courses.

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