

CADRE (Collaborative Action towards Disaster Resilience Education)

Background

Among many communities in the EU and beyond, disasters pose significant concerns and challenges. With growing population and infrastructures, the world's exposure to hazards - of both natural and man-made origin - is increasing. A major contributory factor to disaster risk is capacity. This capacity needs to be deployed before the hazard visits a community in the form of pre-disaster planning. Effective mitigation and preparedness can greatly reduce the threat posed by hazards of all types. Likewise, capacity can also be deployed following a major disruptive event. The post-disaster response can impact the loss of life, while timely reconstruction can minimise the broader economic and social damage that may otherwise result.

The Sendai framework for disaster risk reduction 2015–2030ⁱ, endorsed by 187 UN states in 2015, recognises that disaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective. The Framework also identifies:

- A need for the private sector, including the construction industry, to work more closely with other stakeholders and to create opportunities for collaboration, and for businesses to integrate disaster risk into their management practices
- A need to promote the incorporation of disaster risk knowledge, including disaster prevention, mitigation, preparedness, response, recovery and rehabilitation, in formal and professional education and training

There has been growing recognition that the construction industry and associated built environment professions are a vital component of this capacity. The scale, size and impact of the built environment cannot be ignored. In the UK for example, construction is one of the largest sectors of the economy. It contributes almost £90 billion to the UK economy (or 6.7%) in value added, comprises over 280,000 businesses covering some 2.93 million jobs, which is equivalent to about 10% of total UK employmentⁱⁱ. It generates about 9% of gross domestic product (GDP) in the European Union and provides 18 million direct jobs. The European Union's internal market offers international partners access to more than 500 million people and approximately EUR 13 trillion in GDPⁱⁱⁱ. As a major consumer of services and intermediate products such as raw materials, chemicals or electrical equipment, construction impacts many other economic sectors.

The vital role of the built environment in serving human endeavours means that when elements of it are damaged or destroyed, the ability of society to function – economically and socially – is severely disrupted. The protective characteristics of the built environment offer an important means by which humanity can reduce the risk posed by hazards, thereby preventing a disaster. Conversely, post-disaster, the loss of critical buildings and infrastructure can greatly increase a community's vulnerability to hazards in the future. Finally, the individual and local nature of the built environment, shaped by context, restricts our ability to apply generic solutions. The consequences outlined above serve to underline and support the growing recognition that those responsible for the built environment have a vital role to play in developing societal resilience to disasters. Supporting this view, one of the construction sector's professional bodies, the Royal Institute of Chartered Surveyors^{iv}, recently identified the need for, "...a massive rethink around how we build up skills across our sector to meet the challenges we're facing and how we ensure economic viability for land and real estate firms while delivering on social needs and managing finite resources."

In recognition of these challenges, a EU funded project entitled CADRE (Collaborative Action towards Disaster Resilience Education), which was launched in 2014, will identify mechanisms to mainstream disaster resilience in the construction process. In doing so, the project is directly contributing to the goals of the Sendai framework for disaster risk reduction 2015–2030, including three of the agreed seven global targets:

- Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030
- Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030
- Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020

The research team have already conducted a detailed study to capture labour market requirements for disaster resilience and its interface with the construction industry and its professionals. The initial investigation aimed at capturing the needs of 5 stakeholder groups (local and national government, the community, NGOs,

INGOs and other international agencies, academia and research organisations, and the private sector) involved in disaster resilience and management, and current and emerging skills for built environment professionals that could contribute to enhancing societal resilience to disasters across the property cycle (appraisal, brief, concept, development, design, tender, construct, operate and maintain). All needs and skills are categorised into five dimensions of resilience (Social, Economic, Institutional, Environmental, Technological).

CADRE is also developing an innovative professional doctoral programme (DProf) that integrates professional and academic knowledge in the construction industry to develop societal resilience to disasters. In doing so, the project is seeking to improve the quality and relevance of higher education through active cooperation between Higher Education Institutes and partners from outside academia, including construction professional bodies, local/national/international bodies and social partners. Through the development of an innovative and timely curricular and learning materials, the project seeks to update the knowledge and skills of construction professionals.

Aim and objectives

CADRE aims to address current and emerging labour market demands in the construction industry to increase societal resilience to disasters. It is seeking to achieve this by:

- 1) Capturing labour market requirements for disaster resilience and its interface with the construction industry and its professionals.
- 2) Identifying stakeholder requirements helping to mainstream disaster resilience within the construction process.
- 3) Refining and validating the needs and skills and identify key themes that need further investigations.
- 4) Developing and testing an innovative professional doctoral programme that integrates professional and academic knowledge in the construction industry to develop societal resilience to disasters.
- 5) Creating world-class curricula and modules to support the programme and address current and emerging capacity gaps in the development of societal resilience to disasters.
- 6) Exploiting ICT to enable cross-border cooperation in the sharing and delivery of educational resources that support the professional doctoral programme.

Methodology

CADRE is addressing these objectives by: Managing partners to deliver outputs and achieve intended outcomes (WP1&2); Identifying market needs across a range of stakeholders (WP3); Developing a professional doctorate programme based on a clear demand and involvement from industry and communities (WP3); Testing and validating the professional doctorate programme within the framework of lifelong learning and PCU interaction (WP4); Developing industry and community informed Open Educational Resources (OERs) for disaster resilience education (WP5); Planning to deliver the programme and sustain its impact beyond its initial funding (WP6); and, Raising awareness and promoting a common understanding among stakeholders of the importance of disaster resilience education and the essential role of European HEIs in improving society's ability to withstand the threat posed by hazards (WP7).

Preliminary research findings

87 semi-structured interviews were conducted with: national and local government organisations; community representatives; NGOs, INGOs and other international agencies; academia and research organisations; and the private sector. In parallel, an extensive policy analysis was conducted to capture the emerging policy level needs. Together, these have been used to identify the needs of various stakeholder groups in relation to current and emerging skills in the construction sector. The primary and secondary data generated a long list of needs and skills. Finally, the identified needs and skills were combined 'like-for-like' to produce broader stakeholder requirements and/or knowledge gaps. Some of the key areas identified are: Governance, legal frameworks and compliance; Business continuity management; Disaster response; Contracts and procurement; Resilience technologies, engineering and infrastructure; Knowledge management; Social and cultural awareness; Sustainability and resilience; Ethics and human rights; Innovative financing mechanisms; Multi stakeholder approach, inclusion and empowerment; Post disaster project management; and Multi hazard risk assessment. These will also form the basis for the initial programme specification for the proposed

DProf. Based on these a structured doctoral programme will be developed in order to reflect how the construction sector and its professionals can contribute to achieving resilience in the case of increasing threats from natural and human induced hazards.

CADRE Consortium

The CADRE consortium is composed of 7 partners from 5 different countries, representing organisations involved in research and development of improving the resilience of society to catastrophic natural hazards. The team will work together to pool their results, build inter-disciplinary explanations, discuss findings at conferences, write and publish papers, and inform policy development.

1. University of Huddersfield, UK (CADRE lead)
2. Vilnius Gediminas Technical University, Lithuania
3. Tallinn University of Technology, Estonia
4. Northumbria University, UK
5. United Nations International Strategy for Disaster Reduction, Switzerland
6. University of Moratuwa, Sri Lanka
7. Federation of Sri Lankan Local Government Authorities, Sri Lanka

Further information

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ⁱ United Nations International Strategy for Disaster Reduction (2015). Sendai framework for disaster risk reduction 2015–2030. Geneva: UNISDR.

ⁱⁱ Department for Business Innovation & Skills (2013) UK Construction: An economic analysis of the sector, July 2013.

ⁱⁱⁱ Internal Market, Industry, Entrepreneurship and SMEs Directorate (2016) The European construction sector: a global partner, European Union.

^{iv} RICS (2015) Our changing world: let's be ready, RICS.