Institution: University of Salford

Unit of Assessment: C16 Architecture, Planning and Built Environment

Title of case study: Centre for Disaster Resilience: The development of a disaster resilient built environment

1. Summary of the impact

The Centre for Disaster Resilience's (CDR) research is leading to a reduction in the vulnerability of communities world-wide to the threat posed by hazards of natural and human origin, demonstrating the following impact;

- Better-informed and more socially inclusive public policy-making and implementation in the development of a disaster resilient built environment;
- Shaping a global United Nations campaign;
- Contributing exponentially to the development of resources to enhance professional practice in the humanitarian sector, including post-disaster reconstruction programmes in Sri Lanka, and;
- Leading the development of new partnerships in Europe and Southern Asia.

2. Underpinning research

The key researchers and positions they held at the institution at the time of the research are as follows: Professor Dilanthi Amaratunga, Head of Centre for Disaster Resilience, Associate Head of School (International), (from 2000), Professor Richard Haigh, (from 2002), Dr Udayangani Kulatunga, (from 2008), Dr Chaminda Pathirage, (from 2003), David Baldry (from 1992), School of the Built Environment.

Context: Researchers at the Centre for Disaster Resilience (CDR) have developed a range of research projects leading to the implementation of policies to reduce the vulnerability of communities to hazards of natural and human origin, supporting the development of a more resilient built environment:

- In 2005, the *Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters* was adopted at the *World Conference on Disaster Reduction* in Kobe, Hyogo, Japan, attended by delegations from more than 160 Member States of the United Nations. The Framework incorporated reduction in disaster risks into policies, plans and programmes for sustainable development and poverty reduction, building the resilience of nations and communities to disasters.
- CDR research has led to the identification and integration of disaster risk management practices into policies for post-disaster reconstruction of the built environment, developing an holistic approach that also promotes socially inclusive integration of disaster risk reduction in post disaster reconstruction:
    - Studies by Amaratunga and Haigh (2006 – 2010) have resulted in an improved conceptual understanding of resilience in the built environment, as well as a framework to integrate disaster risk reduction strategies within post-disaster reconstruction projects. The research identified those factors in infrastructure reconstruction projects most likely to impact community vulnerability.
    - Research has revealed ways in which the integration of disaster risk reduction strategies within post-disaster reconstruction projects can contribute towards the socio-economic development process.
    - A further study developed a model for the development of capacity towards greater resilience through the construction process. The model was based on four phases of capacity development for actors and stakeholders: assess; create; utilise and retain.
- Kulatunga, Amaratunga and Haigh (2006 – 2012) studied waste management strategies adopted, and issues and challenges encountered at both national and local levels in Sri Lanka following the 2004 Indian Ocean Tsunami. In a later study they also identified capacity gaps and the key factors influencing capacity building in post disaster construction and demolition waste management.
- A series of studies by Amaratunga, Pathirage, Haigh and Baldry (2005 – 2011) were used to develop variables for post-disaster scenarios, and platforms for creating and managing knowledge among major stakeholders, including government, industry and academe.

- Haigh and Amaratunga (2009 – 2012) undertook a study to understand how infrastructure reconstruction programmes have impacted on women, vulnerable groups, and social cohesion among local communities in conflict-affected areas of Sri Lanka. The research revealed that much infrastructure development is externally driven with inadequate consultation with affected groups. The resultant infrastructure does not meet the needs of marginalised groups, and can create or heighten tensions within and/or among ethnic/religious groups. Although the reconstruction activity has the potential to contribute to and stimulate the local economy, the study found that many local people and small construction firms feel excluded from the construction process and its benefits.

3. References to the research

Key outputs

1. Malalgoda, C., Amaratunga, D. & Haigh, R. (2013). *Creating a disaster resilient built environment in urban cities: the role of local governments in Sri Lanka*. International Journal of Disaster Resilience in the Built Environment. Vol 4 (1). pp. 72-94. DOI **(REF 2)**
2. Haigh, R. & Amaratunga, D. (2010) *An integrative review of the built environment discipline's role in the development of society's resilience to disasters*. International Journal of Disaster Resilience in the Built Environment, 1, 11-24.1. DOI **(REF 2)**
3. Pathirage, C., Seneviratne, K., Amaratunga, D. & Haigh, R. (2012), *Managing disaster knowledge: identification of knowledge factors and challenges*, International Journal of Disaster Resilience in the Built Environment, Vol 3 (3), pp. 237 – 252. DOI **(REF 2)**
4. Palliyaguru, R., Amaratunga, D. & Haigh, R. (2012) *Impact of integrating disaster risk reduction philosophies into infrastructure reconstruction projects in Sri Lanka,* Journal of Civil Engineering and Management, Vol. 18 (5). pp. 685-700. 2011. DOI **(REF 2)**
5. Karunasena, G., Amaratunga, D. & Haigh, R. (2012), *Post disaster construction & demolition debris management: A Sri Lanka Case Study*. Journal of Civil Engineering and Management, Vol. 18 (4). pp. 457-468. 2011. DOI **(REF 2)**
6. Ginige, K., Amaratunga, D. & Haigh, R. (2009) *Mainstreaming gender in disaster reduction: why and how?* Disaster Prevention and Management, Vol. 18 (1), pp. 23-34. DOI
7. Ginige, K, Amaratunga, D. & Haigh, R. (2010) *Developing capacities for disaster risk reduction in the built environment: capacity analysis in Sri Lanka*. International Journal of Strategic Property Management. Vol. 14 (4). pp. 287-303. 2011 DOI **(REF 2)**

Key grants

8. **2011–2014:** ANDROID: Academic Network for Disaster Resilience to Optimise Educational Development, EC (Non-Framework), £536,447.00. Principal Investigator: R Haigh (50%). Co-Investigator: D Amaratunga (50%).
9. **2011–2014:** Community Based Disaster Risk Reduction and Climate Change Adaption, British Council, £39,921.00. Principal Investigator: D Amaratunga (34%). Co-Investigators: R Haigh (33%), U Kulatunga (33%).
10. **2011–2012:** Conflict Prevention through Youth Engagement in Infrastructure Reconstruction, British High Commission - Sri Lanka, £74,905.00. Principal Investigator: R Haigh (50%). Co-Investigator: D Amaratunga (50%).
11. **2009–2012:** Bell Curve, EC - EACEA: Lifelong Learning Programme, £237,337.00. Principal Investigator: D Amaratunga (40%). Co-Investigators: C Pathirage (30%), U Kulatunga (10%), K Keraminiyage (10%), M Siriwardena (10%).
12. **2008–2011:** ISLAND II - Inspiring Sri Lankan Renewal and Development (Phase II), RICS Education Trust, £7,500.00. C Pathirage (30%), R Haigh (30%), D Amaratunga (40%).
13. **2006–2007:** ISLAND, RICS Foundation, £6,500.00. R Haigh (50%), D Amaratunga (50%).
14. **2005–2008:** Asia Link Project: EURASIA - European and Asian Infrastructure Advantage (Asian Link Contract LK-ASIE/2005/109088, EC (Framework), £238,915.00. R Haigh (50%), D Amaratunga (50%).

4. Details of the impact

CDR research has had a significant influence on policy making and the implementation of practices that promote socially inclusive integration of disaster risk reduction in post disaster

reconstruction activity, internationally:

- Research on the integration of disaster risk reduction and post disaster reconstruction has shaped and influenced policy making by government and quasi-government bodies by Contributing to the United Nations *International Strategy for Disaster Reduction (UNISDR) Making Cities Resilient: 'My City is getting ready!'* campaign, launched in May 2010, which addresses issues of local governance and urban risk.
  - Amaratunga and Haigh are members of UNISDR *Making Cities Resilient* Campaign's Advisory Panel (2009–present). Using CDR research as the basis, they advised the Campaign with respect to the application of resilience and disaster risk reduction in different urban contexts, with particular attention to the gender perspective; community participation; stakeholder engagement; capacity building; training and education; and technology transfer.
  - These principles were incorporated into the ten essential areas for resilience that are being promoted to mayors and local government from over 1350 participant cities across the world (total in April 2013). In doing so, CDR research is supporting local government officials faced with continuous threat of disasters who need better access to policies and tools to effectively deal with these threats.
- CDR research on the integration of disaster risk reduction into post disaster reconstruction has been used to develop resources to enhance professional practice in the humanitarian sector, where there is a need to address the learning and capacity building needs of workers, identified in ELHRA's 2010 study on *Professionalising the Humanitarian Sector*.
- Amaratunga and Haigh provided technical input to the UNESCO *Intergovernmental Oceanographic Commission Manual and Guide on Enhancing Tsunami Risk Assessment and Management, Strengthening Policy Support and Developing Guidelines for Tsunami Exercises in Indian Ocean Countries (TRATE)*. The CDR work in the manual included:
  - Resources to enhance professional practice on the social dimensions of vulnerability and promoting the concept of resilient cities;
  - Guidance on identifying stakeholders, understanding their relationship to the intervention and their needs, and selecting an engagement strategy for each, by building and implementing an effective stakeholder communication plan;
  - Research findings on social dimensions of vulnerability towards the conduct of professional work and practice.
- CDR research has influenced professional standards and training in Sri Lanka, a country subject to several large scale disasters in recent years, including the 2004 Indian Ocean Tsunami and a civil war spanning three decades. Sri Lanka is implementing a highly accelerated post conflict reconstruction programme. Less than three years after the end of the civil war, a construction boom is under way driven by high levels of investment in the tourism and leisure sectors, the resettlement of shanty dwellers, large-scale housing development, and unprecedented construction activity in road and water development.
- Amaratunga, Haigh, Kulatunga and Pathirage have been working alongside local stakeholders to develop their capacity to create a built environment that is more resilient to the threats posed by natural and human hazards. Capacity development has been improved through a series of international conferences in Sri Lanka (2008, 2011, 2013) organised by CDR, and training workshops held in conjunction with the Chamber of Construction Industry Sri Lanka, United Nations Development Programme, the Ministry of Disaster Management, UNESCO, the UK Foreign and Commonwealth Office, and the city of Batticaloa's local government (2009–2013). The events provided guidance for council officers, construction and humanitarian professionals working on respective policy changes and plans incorporating disaster risk reduction concepts in their city development plans.
  - In particular, CDR research informed a revision of the *Sri Lankan National Policy on Local Government (Act No. 1632/26, 2009)*.
- As a result of CDR initiatives, the post-disaster reconstruction programmes in Sri Lanka are reducing vulnerability to hazards, being more sensitive to the varying needs of different groups, and addressing inequalities in access to infrastructure.

- The CDR has been nominated by the Federation of Sri Lankan Local Govt. Authorities for the UN 2013 Sasakawa Award for Disaster Risk Reduction which recognises excellence in reducing disaster risk for a safer, more sustainable world under the theme *Acting As One*.
- The significant influence achieved by CDR on policymaking and implementation of practices continues through CDR's on-going research and engagement activities. Haigh and Amaratunga are leading ANDROID *Academic Network for Disaster Resilience to Optimise Educational Development*, c.€800,000 and funded by the European Union, an international consortium comprising partners from 64 universities across Europe, as well as three institutions from Australia, Canada and Sri Lanka to promote co-operation and innovation in European higher education institutions to increase society's resilience to disasters of human and natural origin, such as earthquakes or wars.
- CDR is currently also engaged in CEREBELLA *Community Engagement for Risk Erosion in Bangladesh to Enhance LifeLong Advantage*, funded by the British Council. The goal of this partnership between the School of the Built Environment's CDR and Patuakhali Science and Technology University (PSTU) in Bangladesh is to share skills, knowledge and experience on climate change and disaster management. In 2013, CDR held a capacity development workshop in conjunction with PSTU, the University of Dhaka, the British Council, and the Asian Disaster Preparedness Center.

5. Sources to corroborate the impact

Reports, reviews, web links or other documented sources of information:

a) "Making Cities Safer and Resilient - Before Disaster Strikes", A Mayors Handbook on implementing the 10 essentials for making cities resilient and ready, produced by the UNISDR Campaign on Making Cities Resilient. http://www.unisdr.org/files/26462_handbookfinalonlineversion.pdf

b) Build Back Better says visiting Disaster Resilience DUO. 16/06/2009. http://www.thecolombotimes.com/index.php?option=com_content&view=article&id=5471:build-back-better-says-visiting-disaster-resilience-duo&catid=4:featured-news&Itemid=5

c) Local governments come together to build safer communities in Sri Lanka, commit to World Disaster Reduction campaign http://www.unisdr.org/archive/20615

Factual statements already provided to the HEI by key users/beneficiaries:

d) UN-Habitat (United Nations Human Settlements Programme) Programme Manager for Sri Lanka

e) Chief Executive Officer, Chamber of Construction Industry Sri Lanka

f) Chairman of Working Group on Risk Assessment and Reduction of UNESCO/IOC/Intergovernmental Coordination Group for the establishment of the Indian Ocean Tsunami Warning System

Individual users who could be contacted by the REF team to corroborate claims:

g) Director General, Advocacy and Outreach Section, United Nations Office for Disaster Risk Reduction (UNISDR),

h) Executive Director, Asian Disaster Preparedness Center,