

Economic impact of disasters and the role of disaster resilience

Disasters continue to cause a serious problem all over the world, and, unfortunately, there are no signs of this tendency diminishing. According to the UNISDR, in the past 10 years, more than 1.5 billion people have been affected by disasters in various ways, and the total economic loss was more than \$1.3tn (UNISDR, 2015). Although there has been considerable progress in protecting human lives, economic consequences of disasters remain a major concern. Disaster-related economic losses have long-lasting effects on society, and their significance therefore cannot be underestimated. The resilience of the built environment is crucial for mitigating the economic consequences of disasters and enabling the affected societies to recover. The focus of this special issue is on investment in disaster resilience and minimising the economic losses caused by disasters.

Disaster resilience is determined by “the degree to which the social system is capable of organising itself to increase its capacity for learning from past disasters for better future protection and to improve its risk reduction measures” (UNISDR, 2005). The ANDROID disaster resilience network which was launched in 2011 brought together people from different universities, organisations and governmental institutions from over 30 countries. They were united by concern for the need to enhance resilience and how researchers could contribute to the development of disaster resilience. Long-lasting cooperation and several projects have grown from this network. One example is CADRE (Collaborative Action Towards Disaster Resilience Education), a project with an educational emphasis aimed at developing an innovative professional doctoral programme that integrates professional and academic knowledge in the construction industry to develop societal resilience to disasters.

As a result of the shared experiences, this special issue was launched with a focus on analysing the economic loss and need for investments in property development and integration of the concepts of sustainability and resilience in the built environment. There are six papers in this current issue of the *International Journal of Disaster Resilience in the Built Environment (IJDRBE)*. The authors and problems addressed here cover different parts of the world: the Americas, Europe, Asia, Africa and Australia.

In the first paper, Ongkowijoyo and Dolo from the University of Melbourne present their work on development of a novel risk analysis method, namely, Fuzzy Critical Risk Analysis (FCRA) for assessing the infrastructure risks from a risk-community network perspective. The basis of this method is the integration of existing risk magnitude analysis with the novel risk impact propagation analysis. The authors assess the criticality of risk within a specific social-infrastructure interrelated network boundary. The proposed method does not require criteria weighting or accurate quantitative calculation, as it simplifies the decision-making process by solving problems based on both qualitative and quantitative information. Eventually, the assessment can be repeated and applied to any general urban infrastructure case. The application of the model will potentially assist the evaluation of decision-making related to risk governance, managing the vulnerability of infrastructure and increasing both infrastructure and community resilience.

Luuu, Von Meding and Kanjanabootra from the University of Newcastle are concerned about the vulnerability of hydropower developments in Vietnam. Their paper



aims to broaden the perspective of decision-makers in the hydropower industry regarding the environmental and social impact and the critical need to reduce disaster risk for communities. The authors critique Vietnamese public policy in relation to the hydropower industry to identify barriers to socially responsible models of operation for energy demand. With the intention to structure the debate and decision-making process towards socio-economic community resilience, the three main aspects of public policy concerning hydropower industry development in Vietnam have been investigated. These are: energy security and economic viability; hydropower industry stakeholders; hydropower development and investment appraisal. The positive and negative effects of hydropower development over the past decade were assessed simultaneously keeping in mind the need for hydropower improvement in national energy security. The authors conclude that current pricing policies are not aligned with the hydropower development management, and this creates barriers to environmentally and socially conscious decision-making. The practical implications for investors include that small hydropower investment should be delayed until measures are put in place to ensure that multi-stakeholder risk is a central component of the investment dialogue.

In the third paper, Kundak from Istanbul Technical University describes the improvement of risk reduction activities at the household level in Turkey. She presents the findings of two surveys conducted in 2008 and 2013 to reveal the risk perceptions of Istanbul's inhabitants and prevention and preparedness measures which they had taken in their households. The results of the surveys highlight the effect of academic qualification on the willingness to carry out risk-reduction activities. It appeared that the regulations set by governmental bodies were not accessible or clear for average people who did not actually realize what to do in light of the new amendments. Furthermore, the number of people trained in relation to earthquake risk is still low considering the total population of Istanbul. The findings of this paper can be considered to facilitate understanding how different socioeconomic groups respond to earthquake risk. The obstacles in achieving household resilience are likely to be related to financial limitations, lack of knowledge, loss of control, a fatalistic outlook or the other priorities of individuals.

Nirupama and Dumbuya from York University in Canada explore the case of Sierra Leone and its experience in dealing with the Ebola virus epidemic in which thousands of people lost their lives. This paper analyses the underlying causes for concern with regard to economic sustainability in a post-Ebola recovery phase. The authors have surveyed a range of literature sources on historical and ongoing disasters in Sierra Leone and analysed the underlying causes of economic sustainability. The crisis highlighted the economic vulnerability of the country and that its dependence on foreign investment in the single key sector of iron ore was not a wise strategy. Natural resources can and should form a robust foundation upon which to base its long-term goal of diversifying the economy across several sectors and promoting private investment from overseas. The authors also emphasise that major economic drivers, such as agriculture, industry and the service sector of Sierra Leone must be restored, re-established and protected.

The paper by Bignami from Fondazione Politecnico di Milano is an example of applied research where a building certification approach is applied in the field of disaster assessment. The author introduces a multidisciplinary study, conducted by merging different fields of research, such as disaster-risk analysis, sustainable land-use

and urban planning, environmental assessment methods, different buildings' safety topics, certification and auditing management systems tools. The research was carried out in Italy, focusing on the coastal regions of Liguria and Tuscany to confirm the previously developed certification scheme of assessment of the most significant natural and manmade hazards in the different territories. Inclusion of new hazards in the certification process proved that the certification procedure was adaptable to operate even when disaster scenarios change. There is an intention to extend this research to large-scale experimental applications in collaboration with public administrations, civil protection services, public housing agencies, building enterprises and insurance companies.

The final paper by Sapeciay, Wilkinson and Costello, from the University of Auckland describes New Zealand construction practitioners' approaches to organisational resilience practice in the built environment. Improving the resilience of construction organisations to natural disasters can minimise the negative consequences to their organisations. The survey was developed and conducted with the intention of developing a resilience assessment tool specifically for construction organisations. The authors conclude that the construction industry lacks resilience practice, especially from an organisational perspective. The findings suggest that the industry would benefit from a resilience assessment tool to help improve resilience. The adoption of the suggested tool could enhance organisational capacity to recover quickly from crises and disasters and help to improve community resilience and overall post-disaster recovery.

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