

Guest Editorial: The impacts of the construction industry's increasing focus on disaster resilience

Dr Greg Watts, Dr Gayan Wedawatta

Introduction

Both disaster resilience and the wider social responsibility of construction organisations are increasingly important and increasingly under stakeholder scrutiny. This is not limited to a single country or geographical region with all nations experiencing the negative impacts of increasing prevalent disasters. Knowledge of the resilience of the built environment, including preparedness, response, and recovery, has advanced significantly over recent years. We are now in an era where resilience is seen as a key constituent of the built environment. But the recurring and devastating impacts of disasters constantly challenge us to improve our practices and seek ways of reaching greater heights in the quest of achieving a resilient built environment. Many of the initiatives to enhance resilience in the built environment carry financial implications. The increasing need for built environment organisations to focus on, and be seen to focus on, creating social value also carries financial implications. Such implications must be balanced with the need to make a profit or often to simply ensure business survival. This Special Issue serves to capitalise on the growing importance of the twin contemporary demands placed upon construction finance – creating a positive impact in society and ensuring both built assets and the construction companies themselves are disaster resilient. These demands need to be better understood and explored in the context of construction finance so benefits can be maximised for all stakeholders.

This timely Special Issue is intended to reinforce the increasing importance of disaster resilience and its prominent place in construction management research and practice. Focussing on a wide range of interconnected topics, from a wide range of countries, this Special Issue, brings together new knowledge, theories and practice related to disaster resilience from a truly global perspective. The topic of disaster resilience spans countries, professions, and technologies. It permeates its way onto the agenda of all construction industry stakeholders and impacts nearly aspects of the industry itself, from how assets are designed, constructed, maintained, and ultimately demolished. As Guest Editors our overall aim is to advance the emerging body of knowledge in the disaster management practices of the Built Environment, especially shedding light on the multi-faceted challenge of enhancing disaster resilience in the built environment. The papers selected for this special issue each serves to enhance our understanding of the impacts disasters can have upon communities and the built environment. However, more than simply identifying and articulating these disaster impacts, the selected papers identify rays of hope, ideas of innovation, and best practices. These can be, and are, currently adopted by built environment practitioners to enhance disaster resilience around the globe, from Indonesia to Iran, India to Sri Lanka, and the United Arab Emirates.

Overview of the special issue

This special issue comprises 6 of articles. After reviewing these papers and aligning the findings presented and arguments illustrated with the themes of the special issue, the guest editors aimed to provide a progressive flow of information and an overview of the impacts that result from the construction industry's increasing focus on disaster resilience. The following research papers provide

important knowledge and illustrate essential themes for consideration in the disaster resilience discourse.

The first paper “Dimension of community capability and its effect on the social vulnerability at Semarang coastal area” by Nany Yulastuti, Ega Varian Okta, Vica Gitya Haryanti and Farhan Afif focus on the urban village of Tanjung Mas in Indonesia. The researchers use the Social Vulnerability Index (SoVI) to synthesize relevant social vulnerability indicators and community capability indicators to understand how well Tanjung Mas’ population can recover from tidal floods in the future. Across the coastal areas, the study considered the social vulnerability and community capability levels to see which areas had high social vulnerability and low community capability levels. Unfortunately, some were identified to have this worst combination and so at high risk of negative flood impacts in future. Hopefully, the findings of this study can inform the strategic direction of the local disaster risk reduction efforts and mobilise other developing countries to consider the same approach in analysing their flood risk levels. Whilst the study has specifically focused on a localised context, the findings highlight the often intertwined nature of social vulnerability and community capability.

Zeeshan Aziz, Ebrahim Alzaabi and Mohamad Syazli Fathi develop a crisis readiness framework for road traffic crisis response for law enforcement agencies in the United Arab Emirates (UAE). In their paper “Prioritisation of resilience criteria and performance indicators for road emergencies crisis response: an analytic hierarchy process (AHP) approach” the authors adopt a case study approach that results in guidance being provided to optimise different dimensions of crisis readiness at a strategic and operational level. By utilising a Delphi method that combines a questionnaire-based survey and the analytical hierarchy process to collect data from an expert panel of crisis readiness professionals the study identifies key criteria and performance indicators of crisis readiness for road traffic situations that can enhance response times of police to road traffic crises. The readiness of first responders plays a key role in effective disaster response and the resilience of the traffic system is an important cog in urban resilience. The study by Aziz et al sheds light on how these can be effectively managed before and during a disaster event.

In “The economic domino effect on housing and construction sector – a case of India” by Madhumitha B. and Preeti Onkar explore the domino effect on housing and the construction sector along the economic dimensions in light of COVID-19 pandemic. The paper traces the macro-economic events through to the micro-economic events and finds that the built environment is indeed resilient. However, a range of events can potentially serve to undermine and weaken the built environment’s resilience, including broader global issues such as COVID-19. The viewpoint article by Madhumitha and Onkar points us that disaster survival could lead to post-disaster growth, and how the survival/growth of the construction sector can create an economic domino effect on other sectors.

The issues in applying cost–benefit analysis (CBA) principles to the evaluation of technical mitigations to reduce earthquake-induced liquefaction risk are investigated by Nadeeshani Wanigarathna, Keith Jones, Federica Pascale Mariantonietta Morga and Abdelghani Meslem. In their paper “Cost–benefit analysis to appraise technical mitigation options for earthquake-induced liquefaction disaster events” the researchers test the CBA model in a multi-participant workshop and find that there is limited data available for CBA’s due to liquefaction risk reduction techniques being relatively new. The study, therefore, posts questions such as can a probabilistic approach be applied to localised rapid onset events, such as liquefaction, and argues that a deterministic approach for localised knowledge and context would be a better base for the cost-effectiveness mitigation interventions. Not only does this paper provide findings of substance and originality for earthquake-induced liquefaction events, but also further enhances the capabilities (and limitations) of mitigation

analysis techniques such as CBA. In an era where budgets are being constantly squeezed and disaster resilience investments are expected to justify their costs-benefits, value, the study points to the need for the sensible application of decision support tools such as CBA.

Miyami Dasandara, Bingunath Ingirige, Udayangani Kulatunga and Terrence Fernando in their paper “Climate financing barriers and strategies: the case of Sri Lanka” investigates the barriers to climate finance and how these can be overcome. Whilst the study focuses on the context of Sri Lanka, the qualitative semi-structured interview-led approach can be adopted and replicated across the globe to understand the same phenomena. In this study, the researchers identify six barriers (along with root causes) to climate finance. What’s more, the study reveals that connections exist amongst all six barriers which serves to create further barriers to finance. This study addresses a real gap in the area of climate financing and seeks to highlight its importance in realising a disaster-resilient built environment.

Finally, in “Investigating the relationship between human resource development and quality in building projects” by Mohammad Javad Abdolahi, Taimoor Marjanib, Behnod Barmayehvarc and Reza Esmaeilabadid, the complex challenges posed by high-rise buildings are considered. Through interviews and questionnaires, the study identifies the link between the training, motivation, and participation of stakeholders and the quality of building projects. Increased building project quality is linked to a more disaster-resilient built environment, and the findings reported are also of value to disaster preparedness and post-disaster reinstatement projects.

In summary, the articles reported in the special issue further highlight the multi-faceted nature of the challenges involved in realising a resilient built environment. It is heartening though to see how researchers from various parts of the world are taking the initiative to add to the knowledge domain on how these challenges can be addressed, thus broadening our horizons. We hope the collection of these articles will serve as useful resources for stakeholders involved in addressing the multi-faceted challenges of realising a resilient built environment.