EDITORIAL: BUILT ENVIRONMENT PERSPECTIVES ON POST-DISASTER RECONSTRUCTION

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Overview
It is with great pleasure that we would like to introduce this special issue of IJAR, a compilation of cutting-edge research that covers many of the key themes relevant to built environment researchers in disaster-related areas. This knowledge area is by its very nature absolutely multi-disciplinary and for this reason it is difficult to quantify built environment impacts, drivers and outcomes in isolation and disaggregate them from non-built environment factors.

However, regardless of certain limitations to research carried out from a built environment perspective, as would be the case from any specific disciplinary perspective, a significant body of work has emerged and is constantly growing and evolving in parallel with the research agenda. Built environment researchers around the globe are now, more than ever, exploring various problems that threaten humanity in the way of dire vulnerability and more frequent and powerful hazards.

This collection of papers will look specifically at one area of disaster management, post-disaster reconstruction. Reconstruction projects primarily occur during the recovery phase of the disaster cycle, playing a key role in bringing vulnerable communities back to normalcy, integrating disaster risk reduction and preparedness measures to increase resilience to future hazard events.

The special issue is broken into four thematic areas; Context and Culture, Theory, Resilience and Risk Reduction and Design. The three papers in Section 1 - Context and Culture deal with the impacts of disasters on places and the people that inhabit them, investigating the extent to which reconstruction projects can address social and cultural problems. Meanwhile, the two papers in Section 2 - Theory put forward new theoretical perspectives with regards to stakeholder engagement and management, representing the growth of alternative points of departure in this area. The three papers in Section 3 - Resilience and Risk Reduction explore various approaches to building in targeted measures to reconstruction projects that enhance risk reduction and resilience outcomes for communities. Finally, the two papers in Section 4 - Design are concerned with the delivery of low-cost sustainable housing solutions and the decisions that are made, leading implementing actors to certain shelter approaches.

Section 1 - Context and Culture
Over the past decade, natural disasters and civil conflicts have had disastrous effects on many regions of the world. Whilst the impacts of natural hazards and conflict on social, economic and environmental variables have been well documented, the impact that human- and nature-led catastrophic events have on cultural heritage remains relatively unexplored (Taboroff 2003, Jigyasu 2013). Catastrophic events brought about as a result of natural hazards pose a particular type of threat to cultural heritage due to its immediate and abrupt consequences. Preparedness for, and response to, such catastrophic events is a difficult and fraught issue, and the impacts of natural hazards on cultural heritage will be a reflection of preceding decisions that have been made over an extended period of time.
This section on Context and Culture looks at this issue from a number of perspectives. The first paper by Rohit Jigyasu builds upon a body of work that has looked at the impact of catastrophic events on cultural heritage. His paper explores the nature of decision-making in the post disaster phase in extraordinary circumstances that can have destructive effects. It is based on the case of Marathwada in Maharashtra, India after the 6.5 level earthquake in 1993 and the decisions taken to rebuild. His conclusions highlight the problem with cultural heritage in the face of disasters, that poor short-term decisions made can lead to long term vulnerabilities and risks while creating new problems, as was found to be the case in Marathwada. This is a situation that underlies the real impact on cultural heritage with much more that must be done to protect our heritage particularly in the most vulnerable areas such as in Asia.

Bernadette Deviat Loustalot has investigated one method of trying to address the problem of poor decision-making, in her paper looking at the impact of earthquakes on built heritage in Chile. Her idea is to look to the past for solutions when trying to reconstruct the past after a disaster that is by adopting sustainable building traditions. Loustalot reinforces her argument using case studies where buildings have been reconstructed after a catastrophic event losing much of the heritage character for which they were recognised. This is another serious problem facing the historic environment after a disaster. The reconstruction process throws up a number of issues regarding authenticity and significance that are often comprised when rebuilding after a disaster. Loustalot’s solution to this is based on her argument of utilising traditional construction techniques with modern materials and techniques. However there is still the need to have in place some strong policies regarding the general approach to the reconstruction of built heritage after a disaster.

Finally Yilmaz, Von Meding and Erk in their paper explore the issues in the development of an appropriate survey instrument for post-disaster reconstruction projects. The research focuses on the development of appropriate indicators for the post-earthquake permanent housing projects built by the state in the last two decades in rural eastern Turkey. There were 65 indicators from 30 studies for investigating research into post-disaster reconstruction. This extensive list covered a range of social, planning and constructional issues associated with housing. The idea behind this exhaustive list is that these then were to become the Selected Success Factors (SSFs) for the study with some of these becoming Critical Success Factors (CSFs). Their work in developing these SSFs and CSFs for post-disaster housing while extensive and enlightening provides lessons for the areas explored by all three papers in this theme. The problems of social and cultural issues overlap and are both impacted by early and poor decisions made in haste. The underlying issue of this final paper, that of evaluation, highlights the potential of the need to be able to evaluate to support decision-making that would improve the situations explored in these papers.

The message from this section is twofold; firstly that there is a lack of work dedicated to understanding the impact of disasters on culture and society and secondly that work in the area of decision-making and evaluation can significantly improve the situation should be regarded as a valuable contribution to best practice.

**Section 2- Theory**

The two papers in this section explore the application of alternative theoretical approaches, specifically ‘institutional transformation’ and ‘actor network’ processes, to analyze stakeholder relationships in the context of post disaster management. This is paramount in the light of calls for more active stakeholder engagement and community consultation in managing disasters, that demands better understanding of relationships between human and non-human elements in a system.

The paper by Camilla Cociña Varas and Camillo Boano bring complex formal and informal transformation concepts together - in the context of political process, policy environment, market orientation, and social order - to analyse the housing provision in post disaster environment. In this context they pool diverse concepts for a unique and complex analysis of intuitional and civil
society transformation process and review the changes to the post disaster housing policy in Chile, with specific reference to the post 2010 Chilean earthquake. They discuss the changes in housing policy over a 2010-12, and its association to changes in social order and roles of actors'. This study employs a case study approach focused on post 2010 Chilean earthquake the disaster events.

They suggest the relationships among different actors/stakeholders require rethinking in a post disaster environment as it provides unique conditions for emergent political process that may generate momentum for institutional transformation. Their findings suggests the observed trend was that citizens to act collectively, even if institutions promote the contrary. This means that the civil society can capitalize on this trend and force of radical transformation, through the organisation and creation of collective intelligence, in reciprocity and self-determination.

This form of analysis develops further understanding into the implications of transformations ‘led by civil society’ and ‘government led institutional responses’, and the influence of such transformation on the potential opportunities for housing policy. This is a very valuable contribution to the theoretical discourses into understanding roles of two key actors in the transformation process approached from multiple angles.

Brewer, McVeigh and von Meding explore the suitability and usefulness of Actor Network Theory (ANT) in exploring relationships among actors/actants during post disaster aid deployment in order to illuminate and tame the inherent complexities encountered during disaster relief and beyond, in relation to building resilience and minimising vulnerability. They propose that applying ANT based analysis of aid distribution network has the potential to improve effectiveness post-disaster aid distribution to achieve maximum benefit to recipients.

The point of departure for this paper was to investigate the suitability of ANT for deployment in a disaster-related context. By analysing the relationships between human actors and non-human actants, ascribing characteristics such as motives and behaviours, the authors postulate that we can ultimately better explain the worldly consequences of their interaction. The research methodology is based on two case studies (disaster events in Haiti and Cuba), analysing the accounts of key actors, specifically selected individuals who had been pivotal in designing and directing the implementation of aid programs.

The findings of the study suggest that ANT analysis of disaster aid distribution situations, that led to both success with failure outcomes, can inform better practice in future recovery and reconstruction events. However, they identify three operational challenges in applying ANT: difficulty in defining the problem boundaries due the complex and dynamic nature of disaster situations; the vulnerable and disfranchised nature of disaster victims making it hard for full engagement as informants; potential for turf defending and lack of cooperation by NGO’s, government authorities and other organisations leading to less than desirable engagement in the ANT process.

In summary this section provides alternative theoretical points of departure to analyse relationships among different stakeholders during the post disaster reconstruction phase. First approach is based on developing a theoretical discourse for analysing transforming relationships among stakeholders, in this case between the civil and institutional stakeholders, leading to possible change. The second approach uses the actor network theory to analyse the relationships between different human actors and non-human actants to identify the critical relationships that impact on effective delivery of aim. These two theoretical approaches provide different theoretical lenses to create meaningful understanding into stakeholder relationships into complex post disaster environments.

**Section 3- Resilience and Risk Reduction**

The three papers in this section explore aspects of ‘resilience building’ specifically in the phase of reconstruction for improved built environment outcomes. A clear understanding of the processes underpinning the reconstruction phase will enable practicing managers to seek out alternative processes if necessary.
Ernst and Edwards explored ‘workshops’ centred the pedagogical aspects for educating for reducing disaster vulnerability and risk and as a catalyst for positive change. They suggest that the evolving pedagogy based on the Architecture Sans Frontières-UK (ASF-UK) workshop model can be used as a primary tool to explore international development issues and built environment related professional skill development. The authors have used a case study approach based on a reconstruction project in Almora, Uttarakhand explore the their proposition. The case study workshop marked the inception of a three year project which aims to facilitate improved building practices in symbiosis with disaster mitigation and wider development agendas through education, capacity building and prototype development.

Although such workshops have long-term implications for participants, they provide opportunity for immediate exposure to a real and challenging context issues through the exposure to other stakeholders and their experiences. It is only through the development and delivery of the longer-term programme that the impact on the vulnerability and risk within shelter construction in the area can be assessed. The results of this study suggested that the most effective way to build capacity and facilitate knowledge transfer would be through two platforms; an online, virtual building centre, and a physical centre.

Mannakkara and Wilkinson evaluate the extent of incorporation of “Building Back Better” (BBB) in the reconstruction during of post Tsunami recovery phase in Sri Lanka. BBB is an approach for resilient recovery, promoting collaborative approach to improve the physical, social and economic conditions of a community. Their study analysed multiple data sources including reports, and primary data collected from disaster sites. Although they identify a number of good BBB practices currently in effect, the absence of legislative support to implementation of BBB is seen as a practical hindrance. They suggests that recovery process did not execute non-BBB approach in the recovery process, despite stakeholders recognized the principles of BBB approach. However, it was encouraging to find that the lessons learnt from shortcomings recognised and improvements are made to disaster management practices.

Ali reza Fallahi, in his technical report, reviews the status of the shelter and reconstruction progress, a year into the 2010 East Azerbaijan Province Earthquake in the North-West of Iran. This disaster affected 327 villages and impacted approximately 250,000 people, leaving more than 300 residents dead, 4500 injured and 72,000 with damaged or destroyed properties. This technical report reviews on the initiatives and processes adopted for shelter provision using data collected a year after the disasters through qualitative field work based on the author’s observations.

Fallahi suggests that a “transitional accommodation” initiative using a “multi-functional shelter unit” provided much-needed protection for earthquake survivors from the cold weather during the reconstruction process. This initiative enabled accelerated support for earthquake survivors, minimizing the threats posed by the harsh climatic and topographic conditions of East Azerbaijan Province during the reconstruction phase. The report concludes that, despite significant progress in the reconstruction of permanent housing and social infrastructure, some survivors are still struggling with recovery from the impact the disasters had on their lives.

In summary this section provides valuable context specific accounts of three post disaster initiatives focused on disaster risk reduction and resilience building, focused on built environment. These three initiatives, ‘workshop pedagogy based education’, ‘build back better’ approach and accelerated ‘multi functional shelter’ support, can provide a sound basis for further development in the disaster risk reduction and resilience agenda in the built environment domain.

**Section 4- Design**

This section of the special issue explores an aspect of post-disaster reconstruction that resonates strongly with many built environment disciplines, the design of housing/shelter. The two papers that appear draw out some of the key issues facing actors implementing projects in such complex disaster scenarios, such as the budget restraints within the humanitarian sector, donor pressures and the lack of a professional skill base within agencies. Both papers recognize the responsibility...
of post-disaster actors to engage with the core problems facing societies and causing vulnerability to hazards; economic, social, political and cultural factors among others.

In the first instance, Bruen, von Meding and Hadjri present a case study of the design decision-making of an international NGO in post-tsunami Sri Lanka. A mixture of interview analysis and observational data are presented, culminating in a process flow chart, representing the design and delivery decision-making. This paper gives us an interesting look at the mechanisms that occur within an organization that is committed to both design and project management excellence.

The paper advocates for long-term engagement of beneficiary communities, allowing a detailed process to play out from pre-commencement stage, through research and feasibility, to design and implementation. As has been noted in literature (refs), post-disaster actors do not often implement projects in similar fashion to commercial construction firms, in the process losing out on overall quality, efficiency and budgetary know how. Experienced humanitarian actors are meanwhile more assured when managing the complex nature of disaster scenarios. In the case described in this study, the organization observed displays the best of both camps and sets a precedent for future NGO implementations.

The authors focus on the importance of delivering low cost housing options in developing nations and the essential need to embed long-term sustainable housing strategies that will be replicated beyond the duration of the operation. The paper also highlights the potential for post-disaster reconstruction to act as a catalyst for socio-economic recovery, providing a solid platform for vulnerability reduction, building resilience and disseminating knowledge.

While echoing the call for low-cost housing solutions that address post-disaster needs while contributing to broadly based positive outcomes, Fayazi and Lizarralde present a unique theoretical perspective using general systems theory to underpin a study that is devised to further our understanding of resilience and vulnerability. They develop a ‘Process of Enhancing Resilience (PER) Model’, defining subsystems and scales by which resilience might be measured.

Using a case study design, the authors go on to compile evidence regarding four typologies of housing reconstruction implemented in Bam, Iran, following the 2003 earthquake. Each housing approach is measured based on specific outcomes that impact resilience and vulnerability. By utilizing this framework, the strengths and weaknesses of each housing approach can be clearly documented.

This paper strongly supports the argument that housing should be conceptualised as a potential catalyst for the transition of communities from vulnerability to resilience. Fayazi and Lizarralde go on to present evidence that links particular housing strategies to elements of their 6 dimensions of resilience. The successful attainment of resilience indicators is discussed as a vital factor in developing adaptive capacity and increasing social capital within an affected community.

A common attribute of successful projects in both papers is owner-driver solutions, and the authors assert that such approaches should be preferred in most post-disaster scenarios. Various studies have provided evidence to demonstrate the positive impact of participatory process on outcomes (refs). All efforts must be made to allow beneficiaries to take ownership of projects and assume leadership roles in recovery. Bruen, von Meding and Hadjri further highlight the importance of local partnering, detailed assessment and contextual appreciation prior to any decisions being made.

**Conclusion**

We trust that you will enjoy all ten papers included in this special issue, and that you will be both challenged and informed as you read. Within this body of work new applications of theory have been explored and compelling evidence has been produced to support significantly bold arguments. This issue will enhance the discourse on post-disaster reconstruction by challenging the way that we think in its underlying philosophical messages and providing evidence from the field to potentially enhance practice.
We would like to thank each author who has contributed to this compilation for their dedication and cooperation over the past 12 months. In addition, we appreciate the faith shown by IJAR and its Editor-in-Chief, Ashraf Salama, in providing the platform for a publication of this nature to a relatively new audience. We hope the readers of IJAR will receive it with enthusiasm.

SPECIAL ISSUE EDITORIAL TEAM

Dr. Jason von Meding is a Senior Lecturer at the University of Newcastle and was previously a Lecturer at Queen’s University Belfast, UK. His research background includes a honed expertise in decision-making processes and predictive tools for modelling human behaviour and environments, as well as the assessment of building performance in extreme conditions.

He has researched widely in the humanitarian sector and within developing country contexts, supervising several current doctoral projects in disaster management and post-disaster reconstruction. He has been awarded over $1 million in research funding in the past 12 months (in the UK) and both publishes and reviews widely in the areas of disasters and construction management.

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He has researched extensively in Asia where he taught in Universities and worked in private practice. He worked on Tsunami relief in Sri Lanka in the aftermath of the 2004 Asian Tsunami sourcing funding for and constructing health facilitations in response to the devastation. He acts as a peer reviewer for numerous academic journals and is involved in several international research networks.

Dr. Thayaparan Gajendran is a Senior Lecturer at the University of Newcastle. His research is focused on process analysis and process improvement of the built environment as viewed through sociological lenses. His broader research interests include technology integration, supply chain management, collaboration, governance, organisational capabilities and cultural analysis in the context of project organisations and disaster management.

Dr. Gajendran has worked on a number of research grants and has published more than 60 journal and conference articles. He has received numerous awards for his research and teaching work and is a reviewer for a number of academic journals and is also regularly invited to review conferences. He is the program convenor for the Masters of Disaster Preparedness and Reconstruction program.