



2013 International i-Rec Conference Proceedings

Sustainable Post-Disaster Reconstruction: From Recovery to Risk Reduction

26 - 30 May 2013

Ascona, Switzerland

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WITH THE CONTRIBUTION OF THE CONFERENCE SCIENTIFIC COMMITTEE

Published by:

Groupe de Recherche IF (grif),
Faculté de l'aménagement, Université de Montréal
C.P. 6128, succursale Centre-ville, Montréal (Québec) Canada H3C3J7
www.grif.umontreal.ca

ISBN: 978-2-9815234-0-2

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Introduction

Bridging the Gap between Research and Practice

i-Rec brings together academics and practitioners from all over the world concerned with the challenges posed by natural hazards and disasters, and aims at exchanging and contributing knowledge and project experience in the fields of reconstruction, disaster risk reduction and risk mitigation. This is achieved principally through international conferences that i-Rec organises every two to three years since 2002. The conferences, held in different countries (Canada, Italy, UK, India, etc.), are accompanied by an international student competition calling for innovative ideas on reconstruction, resilience mechanisms and mitigation strategies. i-Rec encourages new research and innovation, among others by assigning three awards to the best paper, best oral presentation and best student design project.

In 2013, the World Habitat Research Centre (WHRC) of the University of Applied Sciences and Arts in Southern Switzerland (SUPSI) organised the 6th i-Rec conference in Ascona, Switzerland. The conference's main objective was to consolidate knowledge and encourage future research in selected areas relevant to enhancing resilience to disasters. A number of speakers from prominent agencies involved in post-disaster reconstruction were invited to participate, and discussion workshops and a panel debate on this subject were organised. A major and constant concern of most presentations and articles submitted to the conference was to bridge the gap between theory and practice. This is necessary for making scientific research more relevant to decision-makers and agencies involved in post-disaster reconstruction and risk reduction.

This online publication was prepared by the *Observatoire universitaire de la vulnérabilité et la reconstruction durable*, a research program funded by the Quebec Government's *Fonds de la recherche du Québec, société et culture* (FQRSC). About thirty articles were considered for the publication, but a selection of only fifteen papers was made. The selection

committee selected the papers according to their capacity to contribute to the objective of bridging the gap between research and practice. The process of publication included a blind peer-review of both abstracts and final papers and a series of editorial revisions conducted in 2014 and 2015. Covering a range of different geographic areas and topics, the authors of these selected papers present compelling arguments for and against different reconstruction policies, programs, and projects and report on valuable lessons learned. The papers are organised according to the four research areas of the 2013 conference, which are described below.

Linking Reconstruction with Disaster Risk Reduction

Policy-makers and humanitarian agencies consider reconstruction as an opportunity for reducing the vulnerability of affected communities. Relocating affected settlements to safer sites, introducing new building technologies, updating building codes, and enhancing disaster preparedness are some of the strategies of the so called 'building back better' approach. Yet, research shows that the outcomes of such strategies are mixed and highly dependent on local contingency factors. The conference gathered research-based evidence on technical, institutional, socio-economic and cultural factors affecting the outcomes of different reconstruction strategies, analysed approaches to post-disaster reconstruction in relation to disaster risk reduction, and promoted a debate between policy-makers, professionals and academics on related subjects.

The first two papers in this research area serve as an introduction to key concepts in disaster management and risk reduction. Drawing from expertise in the fields of strategic management and post-disaster reconstruction, von Meding and Campbell investigate key drivers in strategy formation in post-disaster reconstruction in the first paper entitled "Strategy Formation in Post-Disaster Reconstruction." Collecting data from humanitarian professionals in the field, the authors identify key strategic issues that can help improve outcomes in post-disaster reconstruction for both beneficiaries and NGOs. Leadership, but also the capacity to reach consensus on a dynamic plan, seem to play an important role in this endeavour. In the second paper, "Small Scale Disasters and the Recovery Process," Shrestha and Gaillard critically discuss the relationship between small-scale disasters and vulnerability as well as the disaster recovery process after a small-scale disaster, highlighting (and eventually deploring) that most documented experience in the literature draws from large-scale disasters. Noting that small-scale disasters are regrettably overlooked by scholars, unrecognised by key national and international actors, and understated in disaster policies, the authors put forward a compelling argument for a better understanding of small-scale disruptions in the fragile relationships between the natural, social and built environments.

The following two papers in this section illustrate specific cases of reconstruction in which issues of risk reduction were at stake. Just as the first two papers in this section revealed underemphasised areas of research in post-disaster reconstruction (strategy formation and small-scale disasters), Asgary and Rowell also point to an emerging area of research. In "Post-disaster Reconstruction and World Trade Mechanisms: An Agenda for Enquiry," the authors explore the nexus between post-disaster reconstruction and international trade, arguably a topic rarely addressed in disaster management literature. Drawing on a literature review and a case study in Pakistan, they challenge the reader to consider the important role that international trade may play in guaranteeing quality materials, stabilising costs, and speeding up the reconstruction process.

The concept of resilience is increasingly present in disaster risk reduction, and it is addressed in the last paper of this section. While Shrestha and Gaillard's conceptualise resilience as the ability to recover from disasters, this last paper shows how resilience often implies 'building back better,' and thus affected communities may strive for transformation. Based on a case study in Assam, India, authors Krishnan, Twigg and Johnson propose a new framework and indicator set for water, sanitation, and hygiene (WaSH) in order to enhance disaster resilience and promote transformation. They argue that through learning and knowledge, institutional capacities, participation and integration, communities may enhance disaster resilience with respect to water, sanitation, and hygiene.

Long-term Impacts of Reconstruction Programs

The impact of post-disaster reconstruction on affected communities' livelihoods and on their resilience to future disasters cannot be analysed immediately after the reconstruction period is over. Yet, much research draws conclusions about the appropriateness of various reconstruction approaches based on research carried out during, or shortly after, their implementation. Significantly less attention has been given to the long-term changes triggered by reconstruction, and on whether the vulnerability of the concerned communities to eventual future disasters is indeed mitigated. The conference aimed at filling this gap by inviting research-based papers on the long-term impacts of disaster responses. This provided the conference organisers an opportunity to share the findings of their ongoing research project on long-term impacts of reconstruction programs in India with the international scientific community, policy-makers, and professionals.

How do temporary and resettlement housing beneficiaries transform their environments to suit their needs over the long term? What impacts do temporary housing have on building long-term resilience and adaptive capacities? These are the types of questions answered by the authors in the second research area of the 2013 i-Rec conference proceedings. Five excellent papers explore long-term impacts of disasters in Asia. The first paper of this section examines the role that media can play in the post-disaster recovery and reconstruction phase and is interested especially in the media's impact on social capital, social constructs, and social change. Using quantitative content analysis, Asgary and Ayyvaziankari critique the role of the media in the reconstruction phase after the 2012 East Azerbaijan Earthquake. The second paper, "Temporary Housing: an Obstacle or an Opportunity for Enhancing Community Resilience in Bam, Iran," by Fayazi and Lizarralde, examines the impact of four different temporary housing strategies in Bam, Iran, through the lens of the authors' resilience framework. The authors make the link between temporary housing and long-term resilience and illustrate how various setbacks can hinder the adaptive recovery and resilience of a community over the long-term.

Whereas Fayazi and Lizarralde explore the long-term impacts of temporary housing in terms of vulnerability and resilience, the next three papers explore the long-term impacts of reconstructed permanent settlements, showing mixed results. These papers highlight the need for architects and NGOs to understand local culture and context, as well as the importance of engaging locals in the design process. In their paper, "Understanding Patterns of Physical Transformation in Reconstructed Settlements: the Case of Post-Earthquake Housing in Marathwada, India," Jigyasu and Upadhyay investigate the long-term impacts of adaptation strategies in post-disaster contexts. By comparing the patterns of transformation of four different communities in Marathwada, India, the authors describe how and why villagers physically transformed their reconstructed environment according to their socio-cultural needs. Similarly, Dwayne Barenstein's paper, "Patterns of Adaptation to Agency-built Villages: The Case of a Relocated Community in Gujarat, India" looks at a community's

adaptation to post-disaster relocated settlements in Gujarat, based on its own needs and cultural traditions. It fervently argues that agency-driven reconstruction approaches that do not take into account these needs ultimately enhance community's vulnerabilities and diminish its adaptive capacities. Also exploring the Indian context, Tauber builds on the themes of local knowledge integration and participative design – themes that surface in many of the conference proceedings papers – and questions the role of the architect in post-disaster reconstruction. By interviewing locals from three different villages in rural south India, Tauber exposes villagers' perceptions regarding the reconstruction design process, the projects' roles, and perceptions regarding the architect's role – a role that is not always valued or viewed as relevant by housing beneficiaries.

The last paper provides a long-term view of disasters in another part of the world. In "Persisting Power Structures, Leadership Capacities and Socio-Economic Inequality in Post-Disaster Resettlement," Leemann argues that housing resettlement and relocation projects rarely take into account users' needs and have several negative socio-economic impacts. The paper presents the results of ethnographic fieldwork in Nicaragua after the 1998 hurricane Mitch and highlights how the unequal distributions of power and resources tend to enhance or reinforce pre-disaster vulnerabilities. This article demonstrates that it is difficult to aim for long-term resilience without addressing the root causes of a community's vulnerabilities.

Sustainable Building Technologies

The devastating effects of disasters on the built environment, and the impacts of poorly built buildings on losses of human lives reinforce the idea that housing designs and technologies must be modified to achieve hazard resilience. Aspects such as the environment, economics, society, culture, institutions, and techniques, are often neglected, reducing the chances of meeting the needs of the concerned stakeholders and the long-term sustainability of interventions. The conference encouraged participants to analyse the appropriateness of specific housing designs and technologies for local conditions. Also, given the impact of the building sector on the environment, opportunities to repair or retrofit partially damaged houses (and thus avoid useless demolitions) were addressed. The debate focused on sustainable reconstruction technologies and effective instruments for conducting ex-ante environmental and social impact assessments. It also contributed to a conceptual and methodological advancement in assessing the environmental and social impacts of housing designs and building technologies.

The two papers in this research area particularly emphasise the social and cultural components of sustainable building practices. Félix, Branco and Feio's paper, "Improving Sustainability and Cultural Integration in Post-Disaster Temporary Housing" questions the importance of sustainable building technologies in the provision of temporary housing units. This paper describes the root causes of problems with temporary housing units, which have often been criticised in the literature for being unsustainable and culturally insensitive to local contexts. The paper elicits several important considerations for the design of temporary units, which then are used as the basis for analysing four different temporary housing prototypes. In doing so, the paper favours context-specific solutions over technical ones. This paper therefore highlights the limits of relying too much on sustainable building technologies, without respecting local contexts (socio-economic, climatic, geographic, etc.). In a similar manner, in their paper, "Community Engagement: Rebuilding Samoan Fale Post 2009 Tsunami," Waqabaca, Panko and Potangaroa explore the role of local culture and community engagement in rebuilding traditional houses by Unitec volunteers and Habitat for

Humanity in Samoa in 2010. The authors conduct interviews with housing beneficiaries in order to understand their satisfaction with the reconstruction process in all its phases, a process that in this case took great care in respecting and integrating significant features of the local culture.

Post-disaster Reconstruction in Urban Areas

The impact of natural and human disasters on cities is likely to be significant in the future due to high population densities, increasing poor people living in informal and highly vulnerable settlements, insecure tenure arrangements, land shortages, and severe socioeconomic impacts caused by the disruption of essential services. Although it is recognised that owner-driven reconstruction processes produce benefits, this strategy cannot be regarded as the only solution, especially in urban contexts. In fact, the majority of owner-driven approaches have been implemented in rural reconstruction programs, where social networks are stronger, tenure insecurity is a minor issue, and building technologies can be less complex. The conference objective for this research area was to exchange existing knowledge and experiences, and encourage new considerations about reconstruction in urban areas, addressing overall vulnerabilities, hazard risks, housing issues and reconstruction challenges. Reyes and Lizarralde's paper, "Urban Resilience: Short-term Recovery and Long-term Adaptation After the 2011 Floods in Saint-Jean sur Richelieu (Canada)," proposes an urban resilience framework that is tested in an urban case study in Canada. While the paper heralds the emergency response of various stakeholders after the floods, it admonishes the lack of response that could have enhanced long-term risk reduction. By integrating different urban resilience factors, time scales, and levels of intervention, the authors argue that more sustainable short-term and long-term responses can be implemented.

The next two papers focus on community governance mechanisms and development approaches and both draw on cases studies in Haiti after the 2010 earthquake. While the first paper explores barriers to implementing a 'community contract' approach, the second paper explores the relatively successful implementation of community governance mechanisms in a different project. Zuo, Potangaroa and Wilkinson explore the barriers to implementing a community contract approach to disaster reconstruction. The authors identify barriers through interviews with stakeholders in Port-au-Prince and provide insights into the benefits and obstacles of the community contract approach and identify important barriers between the theory and reality of such a development approach. Also drawing lessons from the reconstruction process in Haiti, Engle, Bornstein and Lizarralde's paper – "Constructing Community at the Epicenter: Collaborative Governance in Post-earthquake Haiti" – makes a powerful contribution to the literature on collaborative and adaptive governance. It investigates the community governance approaches used in a new housing settlement in Léogâne, Haiti, through the lens of collaborative rationality theory and the benefits accrued from employing these approaches.

The conference highlighted that bridging the gap between research and practice requires both enabling a dialogue between academics and professionals and relating decision-making processes with access to pertinent and reliable information. We hope that this publication will contribute to these purposes.

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