

2013 International i-Rec Conference Proceedings

Sustainable Post-Disaster Reconstruction: From Recovery to Risk Reduction

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Abstracts

Section 1: Linking Reconstruction with Disaster Risk Reduction

Strategy Formation in Post-disaster Reconstruction

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This study investigates the significant drivers of strategy formation in post-disaster reconstruction (PDR). It hypothesises that intentional strategic interventions have a significant bearing on successful disaster risk reduction. Several objectives were developed at the outset of the study: 1) analyse the significant topics in strategic management and PDR; 2) develop an understanding of existing strategy formation process in PDR; 3) construct a model for strategy formation in PDR; 4) measure and evaluate the significance of emerging themes in the research; 5) recommend how the findings of the research can be utilised to impact practice. Initially an in-depth review of strategy formation and PDR literature was undertaken. Following this, qualitative data were collected to address objective 2 and analysed using Decision Explorer and Microsoft Excel. Quantitative data based on the key themes emerging from objective 4 were then collected and analysed using Statistical Package for Social Sciences (SPSS) software. The study was conducted among humanitarian professionals as the primary data source. Participants worked for a variety of disaster actors, from local and national government to humanitarian implementing agencies to technical consultancies. Participants held broad global experience, primarily in developing country contexts. The data suggests that understanding the following key strategic and PDR issues can improve the outcomes of post-disaster reconstruction for both beneficiaries and Non-Government Organisations (NGOs); design considerations; collective ability of the organisation; top management team and CEO involvement; institution-based interface issues; theoretical control of strategy with the exception of the aspects of time and cost. This research provides a structured and in depth breakdown of the key themes concerned with strategic management and PDR, presenting key points for improvement in humanitarian practice and new avenues of research, thus serving as a significant contribution to knowledge.

Keywords: Strategy, Reconstruction, Management, Organisation, Disaster, Mitigation.

Small-Scale Disasters and the Recovery Process

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Disasters are recognised as less dependent on the severity of a physical event, and more on the degree of people's vulnerability and capacity to respond to that event. In effect, the poor and marginalised are the most affected by disasters because they are particularly vulnerable and lack access to means of protection. Whether small or big, any adverse event can therefore have a significant impact. Despite this, to date, understanding of disasters is largely limited to that garnered from large-scale disasters. Small-scale disasters have been largely unrecognised by aid donors, scholars and other authorities. Yet, small-scale disasters are undoubtedly important for those impacted, and there is accumulating evidence of the serious socio-economic impact of such disastrous events, which can result in death, economic loss and social disruption. Small-scale disasters can chronically damage local communities and make people more vulnerable. At the same time, studies have suggested that recovery is extremely challenging and even unattainable for marginal and poor communities that lack the resources to improve their condition. As a result, they may end up as exposed, or even more exposed to hazards than before. Understanding the disaster recovery process also remains based on the experience of large-scale disasters, and this remains the basis of practice and policy. The usefulness and appropriateness of these practices and policies in explaining the recovery process with respect to small-scale disasters is unclear. This paper elaborates these themes to highlight the need for a better understanding of small-scale disasters and recovery as perceived and experienced by the residents of those communities most directly affected.

Keywords: Small-Scale Disasters, Recovery, Resilience.

Post-disaster Reconstruction and World Trade Mechanisms: An Agenda for Enquiry

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Disasters' costs have risen dramatically in the last two decades, suggesting an increase in economic vulnerability. In 2011 alone worldwide disaster costs reached 380 billion dollars. Meanwhile, liberalisation of international trade has greatly increased economic interdependencies between countries. It is highly likely that trade liberalisation is linked to increased hazard vulnerability and costs but also represents opportunities for disaster recovery and reconstruction. This paper explores the nexus between international trade and disaster reconstruction. The focus is on the reconstruction market and how this relates to global trade arrangements. A review of international trade and disaster management literature was conducted and common themes were identified. The results were then applied to the case study of Pakistan. Almost no papers exist that specifically analyse how a country's trade situation impacts their capacity for post-disaster reconstruction. However, there is evidence that reconstruction costs rise following a disaster, quality of materials falls, and there are multiple resourcing challenges that delay reconstruction and increase costs. International trade could guarantee quality materials at international standards, stabilise costs, and speed up reconstruction. However, the evidence shows that international trade is rarely considered in the disaster management field, and disaster management is rarely considered in the formulation of trade policies. Therefore, mechanisms are needed to facilitate an international trade-based response to disasters. To be effective, these mechanisms need to be formulated and agreed upon prior to a disaster occurrence.

Keywords: International Trade, Post-disaster, Reconstruction, Pakistan Flood, World Trade Organization.

Building Community Resilience through Water, Sanitation, and Hygiene Programmes during Post-disaster Recovery

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Repeated occurrences of disasters pose a huge threat to community and infrastructural resilience. Hence recovery processes should go beyond the traditional notion of bouncing back and restoring normalcy, and should strive for a change or transformation, which will prepare the affected communities to face future hazards. This study particularly looks at the different approaches in water, sanitation, and hygiene in post-disaster recovery to promote disaster resilience and assesses their effectiveness. Using the case study approach, evidence is gathered from the recent floods in Assam, India in 2011. A resilience framework conceptualised through a literature review, and with input from experts through qualitative interviews, will be validated using a set of indicators through an empirical study that was conducted over visits at three different periods of time. The first two visits were conducted for an emergency assessment and a scoping study during the early recovery phase. The participatory appraisal tools were used for collecting information through affected members of the communities and various stakeholders and were complemented using documentation through photographs and field notes. The preliminary findings based on brief visits to the study site so far have highlighted water, sanitation and hygiene (WaSH) as a critical need and priority during the emergency, early recovery and longer-term recovery efforts. Some of the structural measures undertaken include installation of new tube wells over the flood-levels, construction of latrines, construction of raised flood platforms while reconstructing previously damaged hand pumps, increase of the plinth level, and non-structural measures under hygiene promotion include promotion of the use of latrines, hand washing, safe food hygiene and water hygiene practices. The processes followed in villages that are frequently flooded were found to be inclusive, leading to learning and integration. Additionally, through institutional capacity building, recovery processes could potentially lead to transformational changes.

Keywords: Disaster Recovery, Water, Sanitation and Hygiene Programmes, Community Resilience, Linking Recovery with Disaster Risk Reduction.

An Evaluation Framework for Assessing Resilience of Post-Disaster Housing

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After disasters, significant resources are often allocated by international agencies for housing reconstruction. With widespread claims by agencies of having “built back better”,

though providing disaster resilient housing, it is important to establish an evaluation framework that allows understanding to what extent resilience has been successfully achieved in such housing reconstruction projects. In a study commissioned by the Australian Shelter Reference Group (SRG), the authors have developed an evaluation tool for assessing resilience in housing and tested it in several projects in the Asia-Pacific region. Various evaluation frameworks were reviewed to develop the tool. An approach derived from the log frame was adapted in alignment with other key approaches. The tool is practical and targeted for: (i) Staff of agencies who are involved in housing projects in disaster-prone areas; (ii) Evaluators who are tasked with assessing and advising post-disaster housing projects and programs in terms of disaster risk reduction; (iii) Communities themselves to support their own investigations and learning, and action-planning and lobbying for disaster risk reduction. This paper discusses the evaluation tool which comprises three main stages of an assessment process. The tool was tested through case studies in the Cook Islands and Sri Lanka, and the key findings are discussed to demonstrate the prospects of the tool. It is hoped that such a tool could be refined and used more broadly, where needed in the post-disaster housing arena.

Keywords: Asia-Pacific; Evaluation; Housing; Reconstruction; Resilience.

International NGOs' Competencies towards Reconstruction of the Built Environment in the Region of Tohoku, Japan

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The Great East Japan Earthquake and Tsunami, one of the most devastating natural disasters that stroke Japan in modern times, caused more than 23 000 casualties, and a huge impact with the lost of the built environment: 118 640 homes destroyed and 183 033 homes damaged. This unprecedented scenario engaged diverse national and international actors willing to support on recovery process; in this study International NGOs working on reconstruction and rehabilitation of the built environment are the main concern, which addressed affected areas with different capacities, expertise and orientations for their activities. NGOs interventions in Tohoku are analyzed considering the crucial issues identified in the field: Adaptation to local environment, Construction of operational networks and Building of operational capacities. Subsequently, each organization established strategic advantages obtained through the development of their operations, defining competences that lead the participation on reconstruction projects and achieve success on their major objectives where the access of local communities is the priority to attend the emerging needs.

Keywords: International NGOs, Housing rehabilitation, inter-organisational coordination.

Section 2: Long-term Impacts of Reconstruction Programs

Media Coverage of Post-disaster Recovery and Reconstruction: The Case of the 2012 East Azerbaijan Earthquake

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The media's role in disaster and emergency management has been very much limited to the disaster response phase, and post-disaster recovery is rarely covered in a planned and systematic manner. Furthermore, the actual and potential role of the media in post-disaster reconstruction has not been adequately studied. This paper examines the roles that media can play in post-disaster recovery and reconstruction in the context of social capital, social constructs and social changes. A quantitative content analysis of media coverage regarding recovery and reconstruction following the East Azerbaijan (Iran) earthquakes in August 2012 was conducted. Our results show that the media's coverage of the recovery and reconstruction has been very basic, limited, and occasionally contradictory.

Keywords: Post-disaster Recovery and Reconstruction, East Azerbaijan Earthquake, Media Coverage, Disaster Reporting.

Temporary Housing: an Obstacle or an Opportunity for Enhancing Community Resilience in Bam, Iran?

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The 2003 earthquake in Bam, Iran, killed 25,514 people. Building temporary houses became a key component of the recovery phase; yet, it also led to several drawbacks in the development of disaster resilience. This study examines the impact of four types of strategies of housing provision that were used in this process. They include: (a) temporary camps developed by the national government, (b) temporary camps built by international donors and agencies, (c) prefabricated units built in dispersed areas, and (d) units made of masonry and permanent materials. This detailed case study is analysed through the lens of a resilience framework, in order to identify the impacts of the different strategies and their outcomes for the adaptive recovery of the affected community. The results show that certain strategies had negative consequences in the just distribution of resources and in the development of social capital. As a consequence, it is estimated that nearly 3,100 shelters were never occupied. The delivery of temporary shelters raised the survivors' expectations about the permanent units that they were supposed to receive, postponed the construction of permanent houses, and reduced their participation in the permanent reconstruction phase. The conclusions suggest that temporary housing programs have a crucial effect in building long-term community resilience. They provide insightful information that can help decision-makers identify the appropriate strategy of temporary housing to be implemented.

Keywords: Iran, Temporary Housing, Permanent Housing, Post-disaster Reconstruction, Recovery Phases, Resilience.

Understanding Patterns of Physical Transformation in Reconstructed Settlements: the Case of Post-Earthquake Housing in Marathwada, India

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This paper describes how planning and design of reconstructed settlements after disasters impacts the way people make changes to their living environment. It also elaborates on the design parameters that influence culturally appropriate and sustainable housing. The paper further attempts to understand the long-term impact of rapid changes in the post-disaster built environment and the adaptation strategies of communities for meeting their socio-culturally and climate specific needs. It also illustrates how new house designs and building technologies have influenced people's own building practices and their implications on disaster vulnerability, especially to earthquakes. All these issues are illustrated through the case of post-earthquake reconstruction in the Marathwada region, in India. Four relocated villages and one traditional village were studied. Patterns of transformation of both traditional and relocated settlements were analysed by mapping built and open spaces, vegetation, street furniture, infrastructure and sacred spaces at the settlement and neighbourhood levels. The social structure of the settlements was spatially recorded. At the housing level, changes in the layout, space usage, materials and construction technologies for additions were analysed to understand the patterns of transformations and their socio-cultural and environmental impacts on the inhabitants. The implications of different combinations of materials and technologies were analyzed with respect to structures' safety and durability. This data was recorded through drawings and photographs and consequently related to socio-economic variables. The paper concludes by highlighting essential considerations for the planning and design of post-disaster settlements and housing to enhance long-term sustainability and disaster risk reduction of communities.

Keywords: Transformations, Reconstruction, Adaption, Vulnerability, Sustainability.

Patterns of Adaptation to Agency-Built Villages: A Relocated Community in Gujarat, India

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Reconstruction often entails dramatic changes in settlement location and morphologies, housing designs, building materials and construction processes. This paper examines people's strategies to adapt and transform agency-built culturally insensitive houses and villages to meet their needs and preferences. The paper is based on a 3 year interdisciplinary research project that focused on community adaptation to post-disaster settlements' relocation in Maharashtra, Gujarat, and Tamil Nadu, India, funded by the Swiss National Science Foundation. It focuses on one particular case study, a village named Fadsar that was relocated and rebuilt by an external agency after the earthquake that hit Gujarat in January 2001. A first phase of research in Fadsar was conducted in 2004, when we carried out detailed structured observations of the agency-built houses, interviews with key informants, focus group discussions with a stratified sample of villagers and a household survey. Fieldwork over a period of three months was further carried out in 2013 by during

which we documented and analysed the individual and collective adaptation and transformations processes of the built environment carried out by the villagers over the last decade. The paper shows that following a disaster, people are not passive recipients of external agencies' reconstruction projects and that they have the capacity to transform housing designs externally to meet their culturally- and livelihood-specific needs. Based on a micro-level case study of a village in Gujarat, it is argued that underestimating communities' capacity to rebuild their own houses and villages and the failure to recognise the inherent functionality of local housing and building culture often leads to increasing communities' vulnerability.

Keywords: Relocation, Adaptation, Transformation, House Designs, Vulnerability, Settlement Patterns.

Can Architects Contribute to Making a Difference in Post-Disaster Reconstruction? Post-Disaster Housing and the Role of Architects: a Case Study in Rural South India

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The key to the acceptance of post-disaster housing lies in meeting people' wishes and needs, and in integrating local know-how into the course of a project process (a premise intensively discussed in theory). After the 2004 tsunami in rural Tamil Nadu, many NGOs appointed architects, assuming that these professionals would be qualified to facilitate the implementation of people-oriented housing (and villages). In this intricate set-up, however, most NGOs ignored the importance, as argued here, of defining precisely the architect's role and scope of work. This research examines three housing projects implemented by local NGOs and planned by local architects after the Indian Ocean tsunami in rural South India. However, their approaches and the architects' scope of work vary significantly. A comparative analysis examines three different projects' processes, within the same legal and cultural framework, to comprehend the villagers' perspective on the projects' process, the projects' outcome and the villagers' perceptions of an architect's role. Five phases of each project are studied, juxtaposing what and how things were done by the architect with the results obtained in the village. This seeks to illustrate that in a, predominantly, hegemonic context, villagers need a 'mediator' advocating between two divergent cultures of knowledge: the 'local' and the 'modern'. Yet local aspirations and know-how with regard to housing need to be identified, translated and incorporated into the course of the project process. Architects, as discussed here, can be a valuable resource. However, it will be argued that a key element is, among others, a strategic interplay of the 'right' personnel in the course of a complex building process, and not necessarily the appointment of an architect. Primary data for this study was gathered through household questionnaires, informal interaction, participant-observation, and semi-structured interviews with NGO representatives and project architects. Secondary literature was studied on post-disaster housing and cultures of knowledge.

Keywords: Permanent Post-Disaster Housing, NGOs, Architect, Cultures of Knowledge.

Persisting Power Structures, Leadership Capacities and Socio-economic Inequality in Post-disaster Resettlement

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Disasters are sometimes the consequence of site-specific vulnerabilities calling for the need to relocate affected settlements. In particular, after 1998 hurricane Mitch in Nicaragua, the government and international governmental and nongovernmental agencies engaged in resettlement projects. However, as pointed out decades ago by Epstein (1973), Turner (1977), and Oliver-Smith (1990), housing and resettlement projects are politically charged processes that often have little to do with the needs and priorities of affected communities, can entail risks of material and cultural impoverishment, and destroy local communities' fabrics and social life (Cernea, 1997; Oliver-Smith, 1990, 2009a, 2010). The case studies presented here focus on the multiple impacts of relocation and confirm that resettlement often has dramatic impacts on affected communities. The paper discusses how pre-disaster conditions affect post-disaster recovery outcomes, namely, how persisting pre-disaster power structures, leadership capacities and socio-economic inequality impact equity and effectiveness of resettlement projects, which in turn have repercussions for the sustainability of interventions. It highlights that communities are neither passive nor homogeneous recipients of external aid. Local initiatives, however, tend to be overlooked by policy makers and external aid agencies, often with detrimental impacts. It is argued that idealist notions of communities, which tend to overplay harmony and cohesion and to downplay power differentials and processes of inequality and exclusion within communities, affect the projects' outcomes. The unequal distribution of power and resources within communities tends to be ignored, allowing the more powerful actors to adapt policies to their preferences, thus reinforcing pre-disaster vulnerabilities. The case studies presented focus on resettlement projects conducted in Nicaragua after the 1998 hurricane Mitch. They are based on several months of ethnographic fieldwork, which were carried out by the author and four of her Master-students within the framework of an international research project.

Keywords: Relocation projects, Vulnerability, Community, Post-Mitch Reconstruction, Governance, Nicaragua.

No Fixed Address: Housing, Land and Property Issues in a Stateless Somalia

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Effective reconstruction programs require wide stakeholder capacity and interaction to produce optimum results. Government is normally assumed to be a key stakeholder that provides the normative environment within which donors and non-government organisations (NGO's) implement projects: they provide authorisations to grant land, legislation, building codes and a regulatory environment, and act as the main counterpart for agencies to work with for, ideally, the benefit of its citizens. Even when strong and capable government exists, reconstruction programs are notoriously complicated and expensive. In countries like Somalia, without a functioning central government, donors and implementing agencies face challenges in all aspects of reconstruction programs. Housing, land and property issues are particularly challenging to resolve since a robust regulatory environment is assumed as a prerequisite for secure land tenure. Governance of such issues in Somalia is haphazard and inconsistent at best, relying on customary Law exerted through local clan---based networks and nascent local government. Although reconstruction programs are rarely attempted in such complex environments, analysis of a recent transitional shelter program in Puntland suggests that success is possible through careful understanding, identification and engagement of a wide group of stakeholders, including customary and religious authorities. Observation of results and feedback from communities and authorities has been examined to review the key social and cultural aspects that were prioritised in the project. Understanding these aspects helped strengthen *process* and *inclusion* over *product* – a key

ingredient to success often overlooked in shelter programs that tend to focus on the production of shelter units rather than the process by which they are produced and the families that will call them home.

Keywords: Somalia, Housing, Reconstruction, Property, Shelter.

Quantifying Sustainability in the Aftermath of Natural Disasters (QSAND)

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Currently, there are not many tools available to the humanitarian sector providing user-friendly information and holistic sustainability guidance which also incorporates the ability to measure the potential success of the shelter and settlements interventions undertaken in post-disaster context. The “Quantifying Sustainability in the Aftermath of Natural Disasters” Project attempts to address this gap by supporting the development of the Shelter and Settlement Sustainability Assessment Tool (SAT). The SAT is currently being developed using expertise from the humanitarian and built environment sectors, combining existing knowledge and innovative thinking to develop a tool with key features of Building Research Establishment Environmental Assessment Method (BREEAM) for use in post-disaster settings. It contains a number of key issues which are filtered and weighted, based on contextual priorities and the impacts of the disaster. The tool will also provide an indicative measure of potential performance of decisions made and act as a knowledge base for best practice and case studies. Ideally early decisions made should go on to influence positively the sustainable development of the disaster hit community/area in the long term. This system will create a flexible and responsive tool that can be applied in a wide range of situations. Easy-to-use, simple, flexible and ‘self-use’ are key strengths which will help support its uptake and application. The main output of the QSAND project, the SAT, will be available for use by aid agencies and other relevant humanitarian stakeholders as appropriate. It will build on and thereby act as a resource for; information sharing, best practice, collation of standard in the humanitarian sector which promote sustainability and case studies of examples of what has worked well in similar situations in the past. Inputting information into the tool will build a knowledge bank from which all will benefit as it develops.

Keywords: Reconstruction, Sustainable Redevelopment, Quantification, Collaboration.

Beyond The Appearance Of Heritage: A Discussion on Building Techniques Used in the Reconstruction of Historic Areas Affected by the 2010 Earthquake in Chile

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Earthquakes have progressively destroyed Chilean built heritage over the years, not only due to the initial devastation they produce, but also due to the applied reconstruction approaches that follow. Over the years, the reconstruction of housing in affected heritage areas has been addressed using non-specific instruments, such as social

housing subsidies, in which new houses are primarily designed to meet economic requirements and built by external contractors, excluding inhabitants from this process.

Moreover, reconstruction in historic settings often aims only to recreate the previous built form, dwellings that look *'as before'*, but using contemporary materials and building techniques, losing the progressive culture that used to characterize their buildings. This raises the question of authenticity and its social and normative corollaries. The objective of this paper is to explore this issue by discussing reconstruction projects that have been built in heritage areas after the 2010 earthquake in two ways. It considers their formal coherence in relation to the previous architecture, as well as their applied building techniques and the inhabitants' perception of the reconstruction process, based on interviews and data taken by the author in Chile¹. The results indicate that the sustainability that used to characterize dwellings is not present in their replacements, which use non-local materials and replicate architectural 'historic' elements that are no longer required. This paper follows the idea that heritage should be reconsidered as a sustainable way of designing, going beyond formal approaches in order to achieve a balance between vernacular and new technologies. This is relevant for informing future approaches in the context of the author's on going doctoral research², where the designs of new projects for heritage areas are being analysed using accurate recording technologies, such as 3D laser scanning.

Keywords: Earthquakes, Re-construction, Heritage, Building techniques, Sustainability.

Critical Factors for Sustainable Post Natural Disaster Reconstruction: Chinese Data

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While scientists continue to explore the level of climate change impact to new weather patterns and our environment in general, there have been some devastating natural disasters worldwide in the last two decades. Indeed natural disasters are becoming a major concern in our society. Yet in many previous examples, our reconstruction efforts only focused on providing short-term necessities. How to develop resilience in the long run is now a highlight for research and industry practice. This paper introduces a research project aimed at exploring the relationship between resilience building and sustainability in order to identify key factors during reconstruction efforts. From extensive literature study, the authors considered the inherent linkage between the two issues as evidenced from past research. They found that sustainability considerations can improve the level of resilience but are not currently given due attention. Reconstruction efforts need to focus on resilience factors but as part of urban development, they must also respond to the sustainability challenge. Sustainability issues in reconstruction projects need to be amplified, identified, processed, and managed properly. Ongoing research through empirical study aims to establish critical factors (CFs) for stakeholders in disaster prone areas to plan for and develop new building infrastructure through holistic considerations and balanced approaches to sustainability. A questionnaire survey examined a range of potential factors and the subsequent data analysis revealed six critical factors for sustainable Post Natural Disaster Reconstruction that include: considerable building materials and construction methods, good governance, multilateral coordination, appropriate land-use planning and policies, consideration of different social needs, and balanced combination of long-term and short-term needs.

Findings from this study should have an influence on policy development towards Post Natural Disaster Reconstruction and help with the achievement of sustainable objectives.

Keywords: Sustainability, Resilience Building, Natural Disasters, Reconstruction, Critical Factor (CF).

Emerging Stronger? Assessing the Impact of Habitat for Humanity's Housing Reconstruction Programme Following the Indian Ocean Tsunami

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Habitat for Humanity (HFH) built, rehabilitated or repaired homes for 25,000 families in four countries in the five years following the Indian Ocean tsunami in 2004. As part of a broader organisational and learning review in 2009-10, HFH commissioned Arup International Development to carry out an assessment of its post-tsunami housing reconstruction programmes in India, Sri Lanka, Thailand and Indonesia. The purpose of this assessment was to investigate the extent to which HFH's tsunami-response housing reconstruction programmes had contributed to the development of sustainable communities and livelihoods. Arup International Development undertook the assessment using the ASPIRE tool they had developed with Engineers Against Poverty. Basing their assessment on programme documentation and key informant interviews, household questionnaires and workshops with communities in each country, they completed one assessment for each country and a fifth assessment covering all four countries. This enabled comparison of both the impact of these four programmes and how the outcomes varied as a result of varying approaches and contextual issues. The assessment found that HFH's programme had made a significant contribution to the development of sustainable communities and livelihoods. The provision of high quality core homes had reduced household vulnerability and increased the standard of living, while HFH's participatory process had increased community cohesion and developed positive relationships between communities and a range of external actors. There were also areas for improvement such as: the incorporation of hazard assessment, settlement planning and infrastructure at settlement level; greater community participation in decision-making regarding settlement planning, house design and the choice of appropriate construction techniques and technologies; greater focus on livelihood support and

diversification both during construction and after completion of the housing programme; and complementing HFH's experience in housing construction with the specialist expertise of other actors to maximise the impact of its work.

Keywords: Disaster, Reconstruction, Housing, Impact, Asia.

Housing reconstruction after disasters in Iran: A case study of Gavazhin after the earthquake of November 2005

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Iran is one of the most seismically active countries in the world, being crossed by several major fault lines. Earthquakes in Iran occur often and are destructive. Unfortunately, reconstruction processes are faced with some problems. Most post-disaster housing reconstruction projects are done with many economic problems, lack of time and proper planning. In most cases; it leads to rejections by its inhabitants due to the fact that many inhabitants' needs and the role of inhabitant participation were ignored during reconstruction. This paper examines housing reconstruction in Gavarzin - Qeshm after the 2005 Earthquake. This was a powerful earthquake that occurred on November 27, 2005. Most houses in Gavarzin were destroyed. Therefore it needed to be reconstructed as soon as possible. As will be discussed, the most important criteria which were ignored in Gavarzin housing are investigated which finally made it unsuccessful experience. It reveals that the reasons for refusal of new settlements and opinion of the beneficiaries about new design homes. This research is based on interviews with permanent users of reconstructed houses who refused to move to the new settlements. Some data gained through the questionnaires was evaluated; while some were analyzed with the help of statistical tools to form up the research out comes. The paper aims to analyze the issues related to houses reconstruction in detail to arrive at strategies or policy based solutions that are necessary to support the development and reconstruction of human settlements like Gavarzin. As a result, it can be said that people's acceptance of reconstruction projects can be obtained if the following points are considered: rebuild in situ; minimum population relocation should take place, reconstruction is owner---driven, but assisted and supervised by the government; and relocation of settlements only takes place when necessary From sites that are hazardous.

Keywords: Disaster, Reconstruction Assessment, Housing Reconstruction.

Section 3: Sustainable Building Technologies

Improving Sustainability and Cultural Integration in Post-Disaster Temporary Housing

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Natural disasters have drastically increased over the last decades causing extensive material and non-material damages. The destruction of houses and the increasing number of homeless are some of the most visible effects of post-disaster scenarios. Housing is one of the people's most important needs and it is essential for their well-being. After a disaster, it is crucial to supply temporary accommodation in order to provide survivors with comfort, protection, and privacy until they have permanent houses. Temporary housing is, therefore, an extremely important solution of temporary accommodation allowing victims to gradually return to their normal life activities during the reconstruction process. Although it has been widely used, especially after large-scale disasters, temporary housing as a fast solution adopted in emergency situations has not always proved to be an effective option. Moreover, temporary housing has been greatly criticized mainly for being unsustainable, and culturally inadequate to local contexts. Through a literature review and case studies, the research

points out the main causes of problems in temporary housing units. It also discusses possible solutions to overcome or minimize these problems, offering recommendations based on concepts that have proved to be effective in previous studies. The recommendations focus on useful concepts in the development of more sustainable, locally sensitive and culturally integrated solutions. It is found that an essential change is needed in the development of temporary housing solutions. These solutions should be developed through a people-oriented strategy, rather than focusing on the technical aspects of the units.

Keywords: Temporary Housing, Sustainability, Local Integration, Cultural Adequacy, Post-Disaster Reconstruction.

Community Engagement: Rebuilding Samoan Fale Post 2009 Tsunami

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In 2010, a team of Unitec volunteers worked with Habitat for Humanity (HfH) in Samoa, rebuilding fale (traditional houses) alongside the villagers, using collaborative techniques derived from Samoan cultural customs. Experience at the time indicated that the Unitec's team acknowledgement of the villagers' existing knowledge of both traditional and modern carpentry skills encouraged a high level of local participation in the building process. This impression was later tested through research in 2012 that found that the buildings were still in good condition and that the villagers had been satisfied with the overall process conducted by the group. The study approach was qualitative interviews and observations, and was analysed through the application of two research frameworks: the Kestle Model (Kestle et al., 2008) and 'Talking to the Buildings' (Potangaroa, 2008). In addition, information was sought about the potential value of trade training skills and qualifications that some villagers had gained. Findings showed that 'value generation', 'knowledge integration', 'process integration' and 'timely decision-making' had overall been positive from the villagers' perspective, due to the cultural approach taken by the group. The villagers did, however, consider that they had not had sufficient input into the initial planning process, although the matai (village chiefs) had been consulted by the Samoan Government and HfH before the rebuilding project started. This paper concludes with a recommendation that disaster management organisations integrate local cultures as a fundamental aspect of any project, from the initial planning, to implementation.

Keywords: Disaster Relief, Cultural Values, Community Engagement.

People Centered Housing Recovery: An Analysis of Post-disaster Housing Reconstruction Case Studies using the Concept of Transitional Housing

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People centered housing recovery matches the housing needs of disaster survivors and supports the recovery of their lives and livelihoods, the ultimate goal of disaster recovery. The concept of transitional housing offers a way to evaluate people centered housing reconstruction on the level of the house itself, including design, implementation, onstruction, and outcomes for residents. As a response to the main issues and failures in housing reconstruction processes, many experts and organizations involved in post-disaster housing recovery increasingly support transitional housing as more accountable to residents and their housing needs. As opposed to 1 step (direct construction of permanent housing) or 2 step (separate phases for temporary housing and permanent) housing reconstruction, transitional housing advocates for an incremental process that bridges these phases and is more flexible. Instead of temporary housing that is built, used and disposed of, transitional housing preserves investment of time and materials. The principles and characteristics of transitional housing (reuseable, resaleable, recyclable, upgradable, and relocatable) can be applied broadly to a range of housing reconstruction projects. Although excluded from the narrow definition of transitional housing, the incrementally-expandable core house used in Yogyakarta, Indonesia, after the Center Java Earthquake of 2006, and the temporary-to-permanent Cottage used in Mississippi after 2005 Hurricane Katrina in the United States incorporate the principles of transitional housing. As evaluated by transitional housing principles, both cases have aspects that are more or less successful. Using the concept of transitional housing, this research applies the idea of people centered housing construction at the level of individual housing form and considers the implications of a people centered housing form in the context of the implementation of a post disaster reconstruction process.

Keywords: Housing Reconstruction, Transitional Housing, Mississippi Cottage, Core house, Great East Japan Earthquake.

Dwelling in Post Disaster Reconstruction: an Assessment Methodological Proposal

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The post disaster reconstruction processes are usually included into the so called "emergency phase programs"¹; these phases are articulated in early emergency and response, transitional and permanent or reconstruction. A dichotomy is generated: by one point of view the reconstruction projects correspond the end of process that is reached after several steps. Instead by communities' point of view the reconstruction process are perceived as a ground point to start up the processes that would be able to reduce vulnerability to future hazards. This interpretation is the only way to make the reconstruction an occasion of development for affected communities. Dwelling topic acquires a preponderant role in order to have a positive issue into reconstruction process: as a matter of fact the deep root of dissolution balance between person - community - environment is identified as social cultural and material link break with housing. The fast environmental change doesn't allow the community to recognise and recognise themselves. The foreign actors' interference affects traditional cultural models, but if the process is carried out in an unbalance way it's not possible an enrichment but an implicit imposition of inadequate models. Starting from this wide scenario, the paper aims to illustrate a Ph.D. research², developed in Step laboratory³. The research aims to design a methodological approach to assess the dwelling topic into reconstruction processes. The usefulness of this approach is linked with the necessity to identify several indicators that allow to detect several factors

characterised home dimension. The process tries to consider both the relationships between the house and environmental and contextual factors and the comparative relationships between the reconstruction housing and the local existent dwelling heritage. Through drawing up points tables and influence indicators matrix, it's possible to sketch the presence or absence of dwelling quality improving in order to establish if the reconstruction process entailed a development.

Keywords: Reconstruction Processes, Dwelling dimension, Vulnerability reduction.

Analysis of Long-term Post Earthquake Processes of Duzce City-Turkey

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The purpose of this research is the analysis of the long-term reconstruction of the province Duzce - Turkey, influenced by the 1999 earthquakes. In this study, the effect of post-earthquake reconstruction process on people is determined by taking its physical phases and the perception of the settlers on their new environment. For this purpose, quantitative and qualitative data were obtained from questionnaires and these data has been analyzed statistically. The population of the field study is limited by the most damaged five neighborhoods in the city center. Examination has been performed on a group of two hundred and ninety- four people who had to resettle because of the change in their destroyed or damaged environment to a new place or who has not resettled and continued to live in their existing places. The analysis of the data obtained from research clearly shows that the ongoing negative effects of complete displacement after the earthquake. The study proposes three solutions for the problem depending on the case; construction in the same place partially or completely displacement of the people and replacing the neighborhood and a close reconstruction close to the old center.

Keywords: Earthquake, Reconstruction, Place attachment.

Section 4: Post-disaster reconstruction in urban areas

Urban Resilience: Short-term Recovery and Long-term Adaptation After the 2011 Floods in Saint-Jean-sur-Richelieu (Canada)

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Recent studies address resilience - specifically urban resilience - from the point of view of the factors that contribute to the development of adaptation mechanisms. They often stress the physical, economic, institutional and socio-cultural dimensions of resilience. However, these factors are often considered independent of one another and the relations between them and the projects' time phases and scales of intervention are largely underestimated. This research project proposes a framework that examines the variables constituting

disaster resilience and the relationships between these variables. The framework is illustrated (and tested) with empirical results from the study of adaptation mechanisms and reactions developed after the 2011 floods that took place in Saint-Jean-sur-Richelieu in Canada. The research is supported by a detailed literature review on the subject, reports by local media and interviews with residents and local officials responsible for decision-making. The study finds that the actions carried out responded specifically to the emergency situation and benefited from a strong participation of the local government, provincial and local organisations. These actions ultimately mitigated imminent needs, but did not create sustainable resilience mechanisms to reduce the risks of future floods. There is an imbalance between efforts in emergency response and actions aimed at long-term risk reduction. It is concluded that an integration of the different factors of urban resilience, time scales and levels of intervention is required to produce more sustainable relationships between civil society, the city and the natural environment.

Keywords: Urban resilience, Emergency, Reconstruction, Risk, Canada, Floods.

The Barriers to a Community Contracts Approach in Post-disaster Reconstruction: the Case of Port-au-Prince (Haiti)

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The need to involve communities is often seen as an imperative for sustainable if not 'sensible' post-disaster reconstruction. One contractual approach is the use of 'community contracts'. Such type of arrangement aims at facilitating an integrated process whereby communities identify and prioritise their 'problems', set out agreements and then action plans to be realised through the guidance and technical assistance of implementing agencies (e.g. NGOs, UN agencies, government authorities). The obvious advantage of the community contract approach is that the expected community empowerment can ensure both social and economic accountability. The community and beneficiaries are supposed to be at the centre of the decision-making process, a characteristic that fosters a deeper sense of ownership and consequent long-term maintenance and sustainability. Nonetheless, in practice such an approach seemingly meets different obstacles within the implementing teams. What are these barriers, and why do they exist? This paper reviews the origin and theoretical background of the community contracts approach and researches the barriers that prevent its effective implementation. Based on a pattern and cluster analysis of structured interviews with the members of a significant implementation team working in Port-au-Prince (Haiti) in 2012, the paper examines what appears to be a gap between an 'attractive' theoretical approach and the difficulties of implementing it. Possible barriers are thus identified through the interviews and are subsequently summarised and discussed within the framework of the 'value adding' process, namely in terms of timely decision making, process integration, knowledge integration, and value generation aspects.

Keywords: Community Contracts, Post-Disaster Reconstruction, Haiti, Earthquake, Pattern and Clustering Analysis, Value.

Constructing Community at the Epicenter: Collaborative Governance in Post-earthquake Haiti

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The earthquake that struck Haiti on January 12 2010 resulted in one of the greatest human catastrophes of our time. The epicenter of the earthquake laid under the town of Léogâne, where about 80 percent of buildings and infrastructure were destroyed, 20,000 to 30,000 people were thought to have perished, and tens of thousands were left homeless. Relief and reconstruction efforts have focused primarily on the country's capital, Port-au-Prince, and have taken longer to reach Léogâne. As a consequence, reconstruction is slow, and most people have little to no access to basic services. In this difficult context, a housing settlement called "Habitat Santo Village" has been recently completed in Léogâne, adopting sophisticated community governance mechanisms. This research project investigates these community governance approaches and methods through the lens of collaborative rationality theory. The study draws on qualitative data gathered from interviews, observations, documentation, and participant narratives. Results show that the community governance system is seen as legitimate, functional, democratic, and owned by its participants. These findings contribute to the literature on governance by highlighting the way in which adaptive and collaborative governance can contribute to mitigating the lack of a strong and functional State in Haiti. The study also contributes to a better understanding of collaborative approaches to post-disaster reconstruction and community governance.

Keywords: Collaborative Rationality, Community Governance, Social Resilience, Haiti Earthquake, Post-disaster Reconstruction.

L'Aquila Post earthquake 2009. The Need for Community Restoration of Territory

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The 2009 earthquake in L'Aquila caused extensive damages to people and buildings and has sparked enormous conflicts in land use, contributing to urban sprawl and degradation of the landscape. Four years later, the historic centre is empty: houses and shops, work places and schools, churches and theatres are only a simulacrum where the facades can hardly hide the interior collapses. Even the outskirts are damaged. The large surface of municipality crushed down in a multiplicity and incoherent items: the so called "new town", abandoned industrial areas, nasty shopping malls, new temporary houses spread out everywhere. The physical identity of the territorial order is completely altered and the ancient structures lost their meaning. The environmental organization is now unrecognizable. The emergency construction of temporary houses and the relocation of economic activities have followed an illogical urban sprawl, with irreversible alterations of precious open spaces. Based on my personal experiences, the paper describes the hardship faced by the people after the urban devastation. The purpose of this paper is to make a critical assessment of the urban and territorial act in L'Aquila and to highlight the lack of a clear reconstruction plan by the Public Administration, which, through the construction of new emergency settlements, has caused

urban sprawl. These settlements have increased the dissolution of the existing city, have altered the agricultural landscape, and have disrupted the community. The old town, once the beating heart of the animation and the city economy, is now reduced to a ghost of rubble and shoring. The construction of housing programs and emergency relocation of economic activities have been trivially implemented through an illogical urban dispersion, which has irreversibly compromised every open space available. Our territory is fragile. It is a living organism to care for, not only for its seismic character but also because the abandoned agricultural activities were replaced by carelessness and environmental indifference. We need to renovate, instead, our personal and collective ethic of responsibility, to guide our effective capacity in order to restore the identity of places that had been damaged, and to recover the meaning of physical morphology as well as the value of emotion. Memory is also very fundamental: we should not forget the meaning of historic and social stratification. To recognise the thickness of a site, and his geography, to understand people living there and their stories, means to approach the project with care. The care practice, is a legacy of traditional women's work, and involves awareness, integrates emotional and empathetic dimension, helps to oppose the spread of the individualism pathologies, brings back a form of alliance and solidarity, and contrasts exclusion.

Keywords: Landscape, Ethic of responsibility, Earthquake, Urban renewal.

The Need for Integrated Rubble Management in the Aftermath of Disasters and Conflicts

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Rubble management is one of the most important challenges in the aftermath of disasters and conflicts. Experiences from a number of earthquakes and conflicts have indicated that there is a great need for management of building waste materials – not only in early recovery, but also during sustainable reconstruction. The Haiti earthquake of 12th January 2010 destroyed more than 400,000 buildings and generated more than 10 million m³ of building rubble. Almost 18 months went by before the removal of rubble was coordinated and controlled. However, the rubble management was not optimized; there was a failure to draw on experiences and lessons learnt from previous disasters and conflicts. Rubble management is a cross cutting issue which needs the attention of all stakeholders in post-disaster and post-conflict response. Lessons learnt from the past decades of natural disasters and conflicts, including experiences from working for the Haiti government and UNDP on a strategy for rubble management, indicate clearly that there are considerable opportunities for rubble management in sustainable post-disaster and post-conflict reconstruction management.

Keywords: Post-Disaster, Rubble Management, Demolition Reconstruction.

Titanyen: An Abiding Architecture in Peri-urban Haiti

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Today in Haiti 357,000 people remain in the squalid conditions of 496 camps, where the risk of cholera, malaria, and rape remain very high. Eighty-four percent of these residents have been there since January, 2010. Ninety-nine camps -- or 42,000 people-- are highly vulnerable to mudslides. All told 58% of the adults have no work, even though most of the

displaced remain in the metro area. The current policy of emptying the camps by promising rental subsidies will not work. In 2012 70,000 people were again on the move, either forced from camps or their lives upended by storms. Still, the city's population is expected to grow by three million in the next twenty years, doubling current figures. Seventy-five percent of this growth will be in informal settlements. For these reasons the price of wasting the peri-urban territories just beyond Port-au-Prince, which are critical to resilient development but fast becoming tragically missed opportunities, is inestimable. This paper explores new planning tools for peri-urban development in Titanyen, Haiti that recast our understanding and approach to scale as well as suggest new ways of working with modules that emerge from pertinent, manual gestures to become adaptive strategies within existing systems. For architects to have a place in recovery that is not rooted solely in building technologies, they must gain confidence to read the process differently--through an understanding of government, money, and land. Smarter choices and good decisions are the result of invested systems that can justify and leverage limited resources and capacities into a broad and coherent vision for reconstruction that is fair and equitable over time. We are exploring this process through constant acts of abiding.

Keywords: Haiti, Peri-Urban Development, Disaster Recovery, Whole-Systems Thinking.

Long-term Reconstruction in Christchurch: Learning from its Governance Structure

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New Zealand is prone to significant natural hazards. Past experience in New Zealand has demonstrated an ability to cope with small-scale natural disasters; but the recent Canterbury earthquake sequence, in particular, the September 4, 2010 and February 22, 2011 earthquakes in Christchurch, has tested the nation's capability of tackling a large-scale event. This article looks at the long-term reconstruction process following the Canterbury earthquake sequence. It identifies the organisations, institutions and critical decisions that likely govern and drive community recovery. The disaster and its impacts in Christchurch have created challenges and issues that distinguish its recovery from others. Liquefaction-related land zoning, insurance, and recovery planning for Central Christchurch dictate different approaches to reconstruction of housing, infrastructure, and commercial buildings. Institutional and technological innovations, such as alliance-like project management, emerging agencies for managing the recovery, and a new seismic design for building foundations, all feature in the post-earthquake recovery practice. Current reconstruction in Christchurch provides a laboratory showing how the distinctive governance structure affects the systems of community recovery. The lessons learned from this event provide insights which can improve the design of recovery planning in New Zealand, and beyond.

Keywords: The Canterbury Earthquake Sequence, Community Recovery, Reconstruction.