open house international
www.openhouse-int.com
Eastern Mediterranean University, Mersin 10, Turkey and
at Development Planning Unit, University College London, 34 Tavistock Square, London WC1H 9EZ, Great Britain

ISSN 0168 - 2601

open house international
Vol 39 No.3 2014 ISSN 0168-2601

open house international
www.openhouse-int.com
vol.39 no.3 2014
ISSN 0168-2601

POST-DISASTER HOUSING RECONSTRUCTION

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EBSCO publishing

a CIB encouraged journal

RESPONSIBLE RECONSTRUCTION: THE ARCHITECT'S ROLE

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Abstract

This paper investigates the role of the architect in post-disaster reconstruction and questions their ability to facilitate permanent building solutions. There is an ever-increasing population of refugees and internally displaced persons due to disasters and conflicts who have a basic need for shelter. To date, housing solutions for such people has tended to focus on short-term, temporary shelter solutions that have been largely unsuccessful. This increasing demand for shelter has led to an emerging group of architects skilled in post-disaster reconstruction. These architects acknowledge that shelter is critical to survival, but believe architects should focus on rebuilding in a manner that is quick, durable but permanent. They believe that an architect skilled in post-disaster reconstruction can produce solutions that meet the requirement of the emergency phase, through to semi-permanent and even permanent homes, without wasting time and money on interim shelters. Case Study Research was used to examine and evaluate the assistance provided by Emergency Architects Australia (EAA) to the Kei Gold community in the Solomon Islands after the 2007 earthquake and tsunami. The results indicate that an architect's response to a disaster must go beyond providing temporary shelter; they must create permanent building solutions that respond to the site and the culture while servicing the needs of the community. The vernacular reconstruction methods implemented by EAA in Kei Gold Village have been successful in developing permanent housing solutions. Further research and development is required to gain a broader understanding of the role of the architect in disasters of varying scales and typologies.

Keywords: *Disaster Reconstruction, Emergency Architects Australia, Solomon Islands, Urgenist Architects.*

INTRODUCTION

"Architects do not invent architectural realities; they rather reveal what exists and what are the natural potentials of the given condition, or what the given situation calls for" (Pallasmaa, 2009).

The basic need for shelter; the world's ever increasing population of refugees and internally displaced persons; the exponential growth of world disasters; and the current shortcomings of humanitarian organisations to provide adequate, effective and permanent shelter solutions validates the need for further research into the role of the architect in post-disaster reconstruction.

The continued urge of the modern designer to embrace the idealism of the industrial age, has resulted in increasingly technology-driven, often utopian shelter solutions that carry little resonance with aid workers and others wrestling with the day-to-day realities of providing a roof over the heads of families in need. If architects are to assist in meeting the increasing demand for disaster shelter, they must recall that *"Architecture is a process of giving form and pattern to the social life of a community...[it] is not an individual act performed by an artist-architect charged with his emotions,"* (Sinclair and Stohr, 2006). They must also realise that the success of a building project typically rests on the degree to which the community is involved in determining the quality and quantity of the services they receive (Ashmore, 2004).

This paper examines the role of the architect in post-disaster reconstruction, questioning how the architect can assist in creating permanent building solutions that increase the capacity of affected communities, incorporate vernacular building technologies and local materials, and mitigate future disaster risk. Qualitative field study methods were used to examine and evaluate the effects of the 2007 earthquake and tsunami in the reconstruction process in Kei Gold, Ranongga, Solomon Islands. The assistance provided by Emergency Architects Australia (EAA) to the Kei Gold community is examined as a case study for this research.

ARCHITECTURE AND DISASTER

Shelter is a critical determinant for survival in the initial stages of a disaster as shelter provides security, personal safety and protection from climate and assists resistance to ill health and disease (The Sphere Project, 2011). Shelter is also important for human dignity, to sustain family and community life, and to enable affected populations to recover from the impacts of disaster (The Sphere Project, 2011). Swift response at the time of the disaster is paramount, but it is also essential that the aid provided is both adequate and effective. Organisations such as the United Nations High Commissioner for Refugees (UNHCR), International Federation of Red Cross and Red Crescent Societies (IFRC) and Médecins Sans Frontières (MSF) are engaged in building shelters for victims of emergencies and war zones worldwide. However most of these initiatives are focused on the functional requirements of such structures (Lepik, 2010). Current emergency shelters are typically a blanket solution marketed to any disaster, they do not respond to the unique conditions of the culture, site or climate where they are being implemented nor do they engage the local community in the rebuilding process. Unfortunately the consequences of ignoring people's housing culture and livelihoods within the framework of post-disaster reconstruction are coming to light in failed projects around the world (Barenstein, 2010).

More than three decades ago Davis (1978) wrote that shelter is a process not a product. Thirty years on, this statement is still relevant; a house remains the end product of a long chain of social, economic, technological, environmental, political and other interactions. Therefore long-term reconstruction begins with understanding housing as a living system - an expression of a way of life - and precise specifications for shelter can only be given in a precise, local context.

The detrimental effects that post-disaster reconstruction can have on a community when culture, vernacular housing typology and livelihoods are ignored are examined by Barenstein (2010) in an anthropological research project carried out from 2005 to 2008 in Tamil Nadu, India following the Indian Ocean tsunami. Prior to the disaster, the men, women and children of these rural coastal communities spent most of their productive and leisure time in the open, a lifestyle made possible by the warm climate and thousands of trees providing shade. Generally the houses had thatch roofs and walls, and the doors, walls and floors were decorated with bright colours and geometric patterns giving each house a unique character and identity (see figure1). The houses usually consisted of two spaces - an internal room and the veranda.

The veranda was the most important part of the house as it modulated the climate and also acted as the intersection between the public and private realms. By day, the families would entertain their guests on the veranda and by night it transformed into a sleeping area for the family. The space around the home was also essential to livelihoods as it is where the families kept their goats and poultry, while fisherman would use it to dry their fish and store their nets.

Despite the home being such an integral part of this fishing community's lifestyle and livelihood, the recovery process progressed with a complete lack of understanding and disregard for the community's way of life. The reconstruction was carried out by non-governmental organisations (NGOs), private corporations and charity organisations, none of which had worked with the fishing communities of Tamil Nadu prior to the tsunami and many who had no prior experience in housing reconstruction. This lack of reconstruction experience, combined with the governments' prejudice against vernacular housing and the unprecedented availability of humanitarian aid for reconstruction led to the demolition of all traditional houses, whether they were damaged or not, and the felling of most trees. The villages were rebuilt with identical, flat roofed, reinforced concrete houses (see figure 2), which are typically divided into a dining room, two bedrooms, a kitchen and a bathroom, following typical modern urban housing patterns. The majority of these houses did not have a veranda.

The standardised housing styles and lot sizes fail to take into account family needs and differences. This has resulted in serious physical and mental health problems within the communities, the division of extended families, and the isolation of elderly people and widows from informal social security systems. The lack of consideration for the villages' traditional way of life has meant the locals no longer spend their leisure time together under the shade of the trees, children no longer play outside and men no longer mend their nets collectively outdoors. In spite of their discourses of empowerment, participation, sustainable and equitable development, many agencies involved in housing reconstruction remain in practice notoriously oblivious to these issues. In the case of Tamil Nadu, this lack of regard has dismantled livelihoods and led to social isolation. It must be recognised that helping communities restore their livelihoods after a disaster is a complex task, not fully resolved simply by building hazard-resistant houses.

If the needs of the growing housing emergency are to be met and resilient communities for the future to be created, functional homes and

Figure 1. Traditional housing, Tamil Nadu (photos: J. Barenstein).

communities have to be built. These should respond to cultural nuances, facilitate new or better communication within a community, and be environmentally sound, affordable and resistant to natural or created disasters (Coulombel, 2010).

RESPONSIBLE RECONSTRUCTION

In contrast to the story of Tamil Nadu, a growing number of organisations are employing architects and other built environment professionals who are working in close collaboration with affected communities to develop locally constructed shelter solutions. These organisations acknowledge that shelter is critical to survival, but also believe that short-term emergency shelter is not necessarily an architect's best response; rather, architects should be rebuilding in a manner that is quick, durable and permanent (Coulombel, 2010).

This method of post-disaster reconstruction is proving to be an empowering, collaborative and socially equitable development process as it values and forges synergistic partnerships rooted in local priorities (Coulombel, 2010). It rethinks the 'emergency shelter' framework that humanitarian organisations have typically followed and is leading to better housing solutions where better means more durable, sound, fit-for-purpose, buildings that serve their occupants in comfort and safety. This reconstruction approach is bringing development and construction to the fore as an integral part of disaster-risk-reduction as decreased vulnerability to disaster depends on resilience and on having long-

Figure 2. Post-tsunami housing, Tamil Nadu (photos: J. Barenstein).

term solutions (Harris, 2010). These organisations are instilling a sense of responsibility for the consequences of design (Bergdoll, 2010). Their conception of design extends beyond undertaking a building or a site plan to devising procedures for getting things done where no such procedures exist, to creating new models of involvement for local populations (Bergdoll, 2010). These professionals are finding solutions that make structures more efficient, cheaper, resilient, and better suited to their purpose (Harris, 2010). Architects are integral to this process as they are particularly skilled at helping turn aspirations and ideas into viable proposals that can be discussed, considered, and priced. After a disaster it is invaluable to help promote diverse opinions, enable active participation, and harness the ingenuity and entrepreneurship latent in communities (Stephensen, 2010).

Patrick Coulombel, director of Architectes De L'Urgence (Emergency Architects France), defines these professionals as 'Urgenist Architects' (Coulombel, 2010). It is believed that an architect educated in these methods of post-disaster reconstruction can produce solutions that meet the requirements of the emergency phase, through to semi-permanent and even permanent homes, without wasting time and money on interim shelters. These architects are organising their strengths and talents to respond with professional expertise to the constant, urgent crises that confront people displaced by natural disasters and conflict.

ACKNOWLEDGING PLACE

A critical element to the architectural design process is acknowledging the importance of place making (Arefi, 2004; Jackson, 1994; Trancik, 1986). It is out of lived experiences and through applied meaning that people as groups or as individuals change spaces into places (Carmona et al, 2010). When discussing place, phenomenology is often drawn upon as it refers to the phenomena that influence the experience of the human consciousness and it is this human experience that creates the understanding of place (Carmona et al, 2010).

Heath (2009) examines architecture according to the social process of place making, the multiplicity of cultural identities, issues of climatic response and the effects of dramatic social change. He demonstrates that architecture and design are inextricably linked to social and environmental processes; they are not just a technical or aesthetic exercise. He examines how architects and designers can employ a variety of tactics to achieve culturally and environmentally appropriate design solutions.

Ackerman (1980) makes three observations concerning the levels of experience involved in designing in accordance with the dynamics of place. The first is the experience of the culture, the second is personal experience with the locale, and the third is experience of the environments. He suggests that gaining experiential knowledge of a human setting is contingent upon acquiring the ability to understand how a society organises itself by collaborative interaction, internal support, and the basic human understanding of its developing needs. Designing for place requires immersion in a specific local condition in order to understand its environmental and cultural lessons; it involves effective communication with the user(s), and an informed awareness of the built, social and natural environments as collective determining factors.

Nina Maritz, a Namibian architect focusing on sustainable community projects, further reinforces this idea by stating, *"Architecture is not really an international skill. You cannot come to grips with [another setting] unless you totally immerse yourself, to understand its subtleties. Big societies can operate on the surface; [but] you really have to get in [these smaller] communities. It is not just a design in a community. You need to get to know the people; and understand the delicate nature of the environment"* (Heath, 2009).

Thus, the role of the architect in any situation anywhere in the world is to respond to the needs of the local community, to create spaces that are meaningful, useful, and enjoyable; to create place. Therefore the question remains why has it been so difficult for architects to react and enact in disaster reconstruction? The aim of this paper is to explore the meaning of the 'Urgenist Architect' and to promote their recognition and value within the field of disaster reconstruction, one that goes beyond only the design of emergency shelters.

METHODOLOGY

Case Study – Emergency Architects Australia (EAA)

To examine the role of the 'Urgenist Architect' in post disaster reconstruction, a case study was centred on the work of EAA in Kei Gold Village, Ranongga, Solomon Islands that included a site visit in July 2011. EAA is a not-for-profit agency that dispatches architects and built environment specialists to areas needing assistance in disaster reconstruction. EAA has been working with devastated communities in the Solomon Islands since the 2007 earthquake and tsunami. Kei Gold is a village on Ranongga, a 28 kilometre long narrow island located in the northeast of the Solomon Islands. In 2007 more than fifty people were killed and 7,000 were left homeless by the tsunami (Barry et al, 2008). Aid organisations provided tents, immediate emergency support and great promises of materials and homes in the future. The villages clung to this hope of promised support, which produced a victim mentality that consequently delayed the rebuilding of their communities. Permanent communities only began to reform when EAA arrived in the country and began to implement a post disaster reconstruction plan that engaged the local community and built resilience (Barry et al, 2008).

In addition to the field visit, qualitative interviews were conducted with industry professionals to question their perception of the role of the architect in the disaster reconstruction process. The participants were selected according to two criteria; professional experience in disaster response and/or reconstruction and experience working in the field on EAA rebuilding projects in Kei Gold Village. These participant groups were selected to give both a professional and practical dimension to the findings. The sample group consisted of eight participants of varying backgrounds. The transcripts were then individually formulated into mind maps to identify the participants' views in relation to two emerging themes: (a) The Role of the Architect and (b) The Reconstruction Process. The mind maps were amalgamated to determine the key findings from this component of the research. These findings, in conjunction with the field observations,

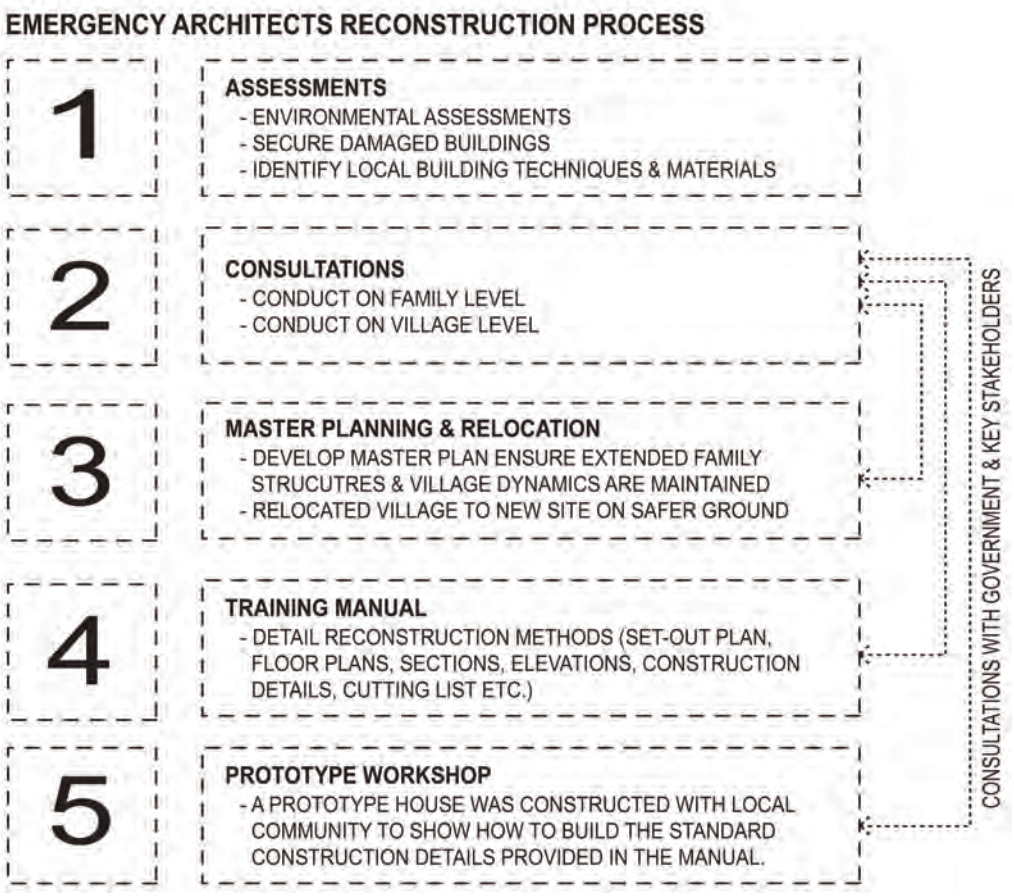

Figure 3. EAA's reconstruction process.

formed the basis for the discussion and recommendations on the role of the 'Urgenist Architect'.

FINDINGS

EAA Process

The post disaster assistance provided to Kei Gold village by EAA enabled the community to efficiently reconstruct their village. Figure 3 outlines the five critical steps to the approach EAA implemented; this method relied on a community consultation process to develop a housing prototype specific to the needs of the Kei Gold community.

By 2011, sixty houses had been constructed where a prototype had been adapted by the Kei Gold people to suit their own lifestyle, habits and preferences (see figure 4). Common adaptations included an increase in floor area, alterations to the internal layout and variations to the external cladding (illustrated in figure 5). The ability to adapt locally sourced materials such as the sago palm leaf to a variety of cladding applications reinforces the appropriateness of using locally sourced materials. It also increases the resilience of the community as it allows them to conduct any future repairs or modifications to their buildings without external assistance.

The process implemented by EAA not only assisted in the reconstruction of the homes, but also engaged the local population in a participatory approach that has met the needs and aspirations of the village and assisted in rebuilding a resilient community. The EAA master plan allowed extended families to rebuild their houses in close proximity to each other, thereby maintaining informal social security networks. The community has also rebuilt schools, childcare centres, a church and a medical centre and recommenced livelihood activities such as subsistence farming and fishing. Kei Gold is once again a vibrant, flourishing village and one can imagine that had a similar methodology been employed in Tamil Nadu the result there would have been more successful.

Role of the architect

Participants in this study acknowledged the important role architects have to play in disaster reconstruction. They identified the unique skills and qualities that architectural professionals tend to possess, while highlighting the importance of understanding and responding to the local culture.

Figure 4. EAA's initial prototype (left) and examples of subsequent shelters (centre and right).

Figure 5. Variations of the sago palm cladding.

A thematic analysis of the qualitative interviews identified four critical aspects to defining the 'Urgenist Architect':

The importance of responding to the local culture:

"…you cannot [reconstruct] without an understanding of the culture you are dealing with, and without conducting proper assessments and analysis of that particular disaster."

"…it takes a person who has a balance of many attributes; the cultural, physical, all those things need to come together to make a good practitioner and a good team."

"…one very important characteristic is the ability to listen, and understand what people actually need...rather than helicoptering in a solution that is not sustainable in the long-term."

The ability to work in different scales:

"…architects are able to forge the needs of towns and cities and also [work on] a very individual scale"; they are able to *"look at [multiple] aspects of a problem to develop very sophisticated solutions that encompass social, cultural, and economic*

aspects of the equation."
"…architects are good at dealing with buildings, with consultations, assessments and socio-cultural analysis."

The ability to translate the needs of the community into architecture:
"…it is [our role to] assist and emphasise [the communities'] needs and values, and translate these into architecture."
"…architects are most useful at coming up with designs that allow local people to easily build them. Designs that are suitable to local culture, local building practices, climate, society, law... and involving a consultation process in that."

The importance of building capacity within the community:
"…the main focus of architects needs to be on the capacity building of existing local builders to sustainably manage the transition between shelter and long term housing...it would be a good thing for every shelter program to have an architect as part of that."

"…the on-going capacity building and the relationships that are formed in that immediate stage are what will create a sustainable shelter program. You can't expect people to come in and build a relationship at each phase of a disaster...these are long term relationships that require a lot of investment of time and resources."

In the context of this study there was an absolute consensus that relationship-building is crucial to the success of a reconstruction project.

Reconstruction Process

Information collected in the study clearly highlights the importance of durable, sound, fit-for-purpose buildings that serve their occupants in comfort and safety. Participants also identified four key essentials to the success of any reconstruction project:

The need for immediate reconstruction response:
"…working immediately with individual families to develop shelter recovery plans [is very useful]; so that they are intrinsically involved right from the start, it is documented, they sign off on it and a plan is put in place as to how they are going to recover their shelter."

The importance of engaging the local community in the rebuilding process:
"If you haven't got everyone united in what the key goal is...then it will hinder [the outcome]".
"Kei Gold [achieved a good end result] because villages took responsibility for their recovery and their own development".

The creation of permanent solutions:
…architects' efforts need to be *"amalgamating all of the [existing disaster recovery steps], and pulling them together as one core process [so that] what we deal with actually does cover the permanent shelter for these affected communities".*

The acknowledgment of future disaster mitigation:
"Mitigation is the whole game...there is a lot more mitigation being done and a lot more awareness that mitigation needs to be done; a lot of it is linked to climate change".

"...in many situations we are too quick to try and repair and replace what was there rather than fundamentally review whether it was in the right place or whether it should be rebuilt at all."

DISCUSSION

It is evident in the research conducted by Barenstein (2010) that the housing project in Tamil Nadu, India focused on the functional requirements of a 'typical' family home rather than the specific needs of a family home of the fishing people. The project did not respond to the unique conditions of the site, climate, culture or vernacular architecture, nor was the community engaged in the reconstruction and planning process. This resulted in the loss of livelihoods, serious physical and mental health problems, and isolation just to name a few.

In contrast, the process of assessments, consultations, training and workshops adopted by EAA placed the Kei Gold community at the centre of the reconstruction process, ensuring the development was rooted in local priorities. While not formally documented, EAA acknowledged the importance of place in Kei Gold village by living in the village and experiencing the culture and environment first hand. The relationship and engagement that EAA established with the locals, allowed them to understand the diverse needs and opinions of the respective members of the village. Through both the consultation process and informal interactions with the local community they were able to understand how the society organised itself and thus understand their development needs. These were turned into a master plan and subsequently a reality.

The findings affirmed that it is not the role of the architect to physically fabricate a shelter solu-

tion; rather it is their role to assist the community in increasing their capacity to overcome the obstacles inhibiting them from commencing their own post-disaster reconstruction process. The training methods employed by EAA equipped the community with the skills they required to rebuild their village with minimal external assistance. Ensuring the community was intrinsically involved from the start and providing the community with a road map for reconstruction not only increased their resilience and sense of ownership of the project, it also ensured future plans for reconstruction met the needs of the community. This process was further reinforced by the ability of the individual families to modify the prototype shelter to suit their needs and requirements. Future disaster risk has been mitigated in this project by relocating the village to higher safer ground and optimising vernacular construction details to ensure the structures are able to withstand future earthquakes. The success of these reconstruction and planning efforts is evident in Kei Gold where they have successfully relocated and reconstructed the entire village in four years.

Conclusion

This article validates Davis' (1978) idea that a house is a process, that it is the end product of a long chain of responses to the built, social and natural environment. The contrasting outcomes of the shelter programs at Tamil Nadu and at Kei Gold village reinforce that there is a role for the architect in post-disaster reconstruction and that this role is to respond to the needs of the local community to assist in the creation of spaces that are meaningful, useful and enjoyable, to create place.

The methods employed by EAA are embedded in the discourses of empowerment, participation, and sustainable, equitable development. Their work with the Kei Gold community has avowed the critical role that architectural expertise has to make in the field of disaster reconstruction. The findings of this study confirm that the response to disaster must go beyond providing temporary, prefabricated shelter. It must create permanent building solutions that respond to the site, the culture and serve the needs of the community, which is more achievable through the inclusion of an architect in the process.

Further research and development is required to gain a broader understanding of the role of the architect in disasters of varying scales and typologies. Although this paper focuses on a case study in the Solomon Islands, the characteristics of an 'Urgenist Architect' and the reconstruction process are applicable to the rebuilding of any disaster-affected community.

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