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# Critical Factors for Successful Housing Reconstruction Projects Following a Major Disaster

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## Abstract

Post-disaster reconstruction projects are often considered ineffectual or unproductive because on many occasions in the past they have performed extremely poorly during post-contract occupation, or have failed altogether to deliver acceptable outcomes. In some cases, these projects have already failed even before their completion, leading many sponsor aid organisations to hold these projects up as examples of how not to deliver housing reconstruction. Research into some previous unsuccessful projects has revealed that often the lack of adequate knowledge regarding the context and complexity involved in the implementation of these projects is generally responsible for their failure. Post-disaster reconstruction projects are certainly very complex in nature, often very context-specific and they can vary widely in magnitude. Despite such complexity, reconstruction projects can still have a high likelihood of success if adequate consideration is given to the importance of factors which are known to positively influence reconstruction efforts. Good outcomes can be achieved when planners and practitioners ensure best practices are embedded in the design of reconstruction projects at the time reconstruction projects they are first instigated. This paper outlines and discusses factors that significantly contribute to the successful delivery of post-disaster housing reconstruction projects.

**Keywords:** Post-disaster housing reconstruction, success factors, project outcomes

## 1. Introduction

The reconstruction of domestic dwellings in large quantities after a significant disaster presents many challenges and is a daunting task (Blanco et al. 2009). Reconstruction projects are constantly threatened by such challenges right from their initiation through to their closure. Even though post-disaster reconstruction management and planning as a whole still remain quite under-researched, sporadic attempts have been made by both professional bodies and academic researchers to determine the most common factors contributing to the poor performance and reasons for failure of some of the least successful projects. For examples, Pyles (2007) in her study of “Community Organizing for Social Development” argues that poor consideration of community organising is a challenge for

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social development of affected communities after a disaster. Williams (2006) undertook a study of community participation in post-apartheid South Africa and revealed that the lack of existence of any community organisations was the main impediment to effective community participation in reconstruction. Hayles (2010) explored some of the main challenges for non-government organisations (NGOs) involved in post-disaster reconstruction. In another instance, Fayazi (2011) compared the outcome of two different methods used in the reconstruction of permanent houses after the Manjil earthquake in 1990. The author (ibid. 2011) identified that the absence of an appropriate reconstruction program, neglect of the main principles of traditional architecture and failure to consider environmental effects on buildings were some of the main problems encountered during the rebuilding of permanent houses. This paper, which forms part of a larger ongoing PhD research project, examines briefly the nature of post-disaster housing reconstruction projects and underlines some of the important factors that determine the outcomes of such projects. A comprehensive review of the extant literature was conducted to explore desirable practices in reconstruction projects that have already been successfully implemented. Case studies of past projects from around the world are examined and factors which positively support and influence post-disaster reconstruction outcomes are identified. QSR International's NVivo 9 qualitative data analysis software was used to organise and analyse the information.

## **2. Post-disaster housing reconstruction projects – success factors**

### **2.1 Community participation**

Although those people and communities directly affected by a disaster are the first to engage with the emergency, they are often perceived as being mere victims rather than the potential critical driving force behind reconstruction (Jha et al. 2010; Pius Mulwanda 1992). Local communities and the survivors of disasters play a crucial role in post-disaster reconstruction and their participation ultimately determines project success (Lawther 2009; Lyons 2009; IFRC and ICRC 1994; Lemanski 2008). Post-disaster reconstruction is a complex and highly demanding process that involves a number of different and well coordinated courses of action. Therefore, it is vital that these complex activities are well planned (Roseberry 2008) and subject to thorough consultation, and effective collaboration with a wide range of community members (John 2008; Pius Mulwanda 1992). Since community members have the most knowledge about their own communities and specific building requirements, often possessing a good technical knowledge of appropriate building techniques, it is critical to involve them when conducting community needs assessments and planning reconstruction projects (Lawther 2009). Communities must also be encouraged and supported to use their own reconstruction techniques when rebuilding their houses (Pomeroy et al. 2006; Jha et al. 2010; Gaillard and Texier 2010; Kaklauskas, Amaratunga and Haigh 2009; Geis 2000; Ganapati and Ganapati 2009).

Communities play a vital role in rescuing human lives during the immediate post-disaster emergency and humanitarian relief phases (Shaw 2006; Dikmen 2005) and in planning and developing the subsequent medium recovery and long-term reconstruction. One study of community participation in the aftermath of the 2004 Indian Ocean tsunami revealed the significant role that the Aceh-Indonesia community played in disseminating information about

the scale and effect of the disaster to relief agencies, when many government units did not function and could not provide this critical information. The information provided by local communities in Aceh-Indonesia, expedited relief efforts and established the way forward for planning of post-disaster reconstruction (Steinberg 2007). Affected communities in Aceh-Indonesia also played a key role in establishing the identities of those individuals and families affected by the Tsunami, and their eligibility for assistance (Da Silva and Batchelor 2010). An analysis of the factors contributing to success, failures and processes of two housing reconstruction policies adopted in the aftermath of the 2004 Indian Ocean Tsunami concluded that owner-driven programmes in Sri Lanka had higher success rates than donor-assisted programmes. While the number of dwellings produced by owner-driven programmes reached 48,981 (73% of all houses) by December 2006 (two years after the tsunami), the number of houses produced through donor-assisted programmes remained at only 12,207 (19% of all houses) (Lyons 2009).

Thus, it is clear that community participation is important at all stages of post-disaster reconstruction, and since a community is composed of different groups of people, suitable methods to include these groups proactively in the process of reconstruction need to be devised (Lloyd-Jones 2006). Attention must be paid to ensure that disadvantaged members of the affected communities, such as vulnerable women, children, the elderly and persons with disabilities (El-Masri and Tipple 2002; Pyles 2007; Lankatilleke 2010; Leon et al. 2009; Lloyd-Jones 2006) are properly included in the reconstruction process, and that the design of post-disaster reconstruction projects responds to their fundamental requirements (Barakat 2003; Snider and Takeda 2008; Krishnadas 2007). Effective participation must begin with, and be promoted by, effective community empowerment (El-Masri and Tipple 2002).

## **2.2 Community empowerment**

Empowering communities to participate in reconstruction can provide an opportunity for community members to contribute their knowledge and skills to the process that will in turn most deeply affect their future lives. Empowerment is made possible when affected communities are effectively involved in all stages of the post-disaster reconstruction (Jha et al. 2010). Davidson (2010) highlights the existing complex relationships between the multiple stakeholders and the significance of this in post-disaster reconstruction and argues that the selection of procurement strategies must best suit the requirements of the reconstruction programme. In the context of post-disaster reconstruction and disaster management, empowering local communities should not be perceived as merely a technical capacity-building exercise. Rather, it should be seriously accepted as a holistic approach towards utilising local knowledge and involving affected communities and local institutions in the process of reconstruction (Allen 2006).

Community empowerment in a post-disaster project must include improving community access to information and services, and thus enabling community participation in decision-making (Maier 2001; Boshier and Dainty 2011; Maginn 2007) and increasing control over the procurement and consumption of local and natural resources (Pomeroy et al. 2006; Alireza 2008). Building local capacity is vital for effective participation during reconstruction as well as for producing a more sustainable built environment (Pyles 2007; Allen 2006; Pomeroy et

al. 2006; Hayles 2010). After the 2006 Jogjakarta earthquake in Indonesia, a cash grant for construction materials and a skills exchange reconstruction project facilitated the building of 12,250 shelters in 10 months; and in Kenya after the 2008 election violence, the affected community was successful in building 255 transitional shelters. The Kenyan pilot shelter project was successful mainly because the community received technical training and also construction materials prior to project implementation (Leon et al. 2009). Case studies relating to the transitional settlement and shelter processes in Afghanistan, Democratic Republic of Congo, Eritrea, Honduras, India, Indonesia, Kenya, Liberia, Mozambique, Pakistan, Peru, Russia, Rwanda, Somalia, Sri Lanka and Sudan, which were compiled and analysed by these authors (ibid. 2009), revealed that empowerment enabled affected communities to participate more productively in a transitional settlement and building of sustainable houses. The work and involvement of Denise Thornton, a resident of New Orleans, provides a prominent example of community participation in reconstruction. In the aftermath of Hurricane Katrina in 2005, Thornton's dedication and motivation to rebuild her destroyed house inspired the entire community to return to their devastated homes and demonstrated to them that rebuilding was indeed possible (Maret and Amdal 2010). As part of the integrated approach to successful post-disaster reconstruction management, community participation and empowerment require a strong line of communication and information dissemination (Lawther 2009).

### **2.3 Communication and information dissemination**

In post-disaster situations, it is imperative to establish a strong and reliable line of communication and an information dissemination system. People's awareness of the existing opportunities for participation and their relevant importance for immediate recovery and long term housing reconstruction is crucial (Lawther 2009; Galtung and Tisné 2009). In May 2000, Roombeek, a city of Enschede in the Netherlands, was destroyed by the explosion of fireworks stock being stored in a warehouse (Denters and Klok 2010). A case study of the post-disaster reconstruction conducted by these authors (ibid. 2010) revealed that in the aftermath of the explosion, the established information rules had been successful in stimulating wider public participation in rebuilding Roombeek. These rules ensured that the rebuilding process was transparent and that residents were well informed of the participatory process and the available opportunities for participation. Chang et al. (2011), based on their investigation of reconstruction resourcing after the 2008 Wenchuan earthquake in China, concluded that post-disaster environments are complex and dynamic, necessitating a great degree of resources coordination and communication among stakeholders. These authors suggest that well established and successful resource coordination requires systematic data collection, information systems, and communication and coordination mechanisms. In relation to the significance of communication and information dissemination in post-disaster reconstruction, El-Masri and Tipple (2002) argue that local authorities should promote dissemination of knowledge about the cultural and social condition of the affected communities amongst stakeholders.

## **2.4 Community culture and beliefs**

An understanding of the community involved in reconstruction is of the utmost importance in establishing a constraint for delivering successful projects and managing community participation (Allen 2006). Housing design must meet both the socio-economic and cultural requirements of the affected communities and should also allow for future expansion of such accommodation based on people's changing needs (Diacon 1997; El-Masri and Tipple 2002). The role of religious groups can be vital in mobilising and persuading affected communities to return to the affected area and actively participate in rebuilding their houses (Denhart 2009). As a direct result of Hurricane Katrina, 1,300 people died and 1,000,000 were evacuated (Colten, Kates and Laska 2008). In order to rebuild New Orleans, the affected communities had to make the difficult decision to return to the devastated area, which largely depended on whether their displaced neighbours also returned. In this uncertain and difficult time, members of the Mary Queen of Vietnam (MQVN) Catholic Church in New Orleans East played a key role in organising and mobilising a wider displaced population through working with its lay leadership, facilitating a great level of social coordination and providing emergency assistance to returnees (Chamlee-Wright and Storr 2009). Alexander (2004) suggests that giving consideration to the affected communities' emotional and economic attachment to their home areas increases the chances of success as compared to adopting a more radical solution that has a propensity to remove past attachments. El-Masri and Kellett (2001) in their study of post-war reconstruction in the village of al Burjain in Lebanon, highlighted that even though the displaced members of the affected community had total control over the reconstruction of their new houses in the host village, most of them expressed strong positive attachment towards their original villages and dwellings and had a strong desire to return. The authors (ibid 2001) concluded that it is imperative to consider both the socio-economic and cultural aspects when planning reconstruction.

## **2.5 Support from local government**

Following large scale disasters, the rebuilding of houses requires a more contributive community capacity that may not be immediately available locally. So, the affected members may not be able to reconstruct their houses without substantial external support (Alam 2010). Local government plays a vital role in establishing budget priorities and is able to establish effective lines of information dissemination that can help other stakeholders make more informed and logical decisions (Olshansky et al. 2008). Therefore, incorporating the initiatives from local governments in disaster management is another important contributor to effective post-disaster response (Ye and Okada 2002). As mentioned previously, communities often possess great intellectual and physical resources; however, these resources may be obliterated by the existing event. While a community may still be able to transform itself without external aid, effective interaction with governments and non-governmental organisations through a well defined framework can substantially expedite the reconstruction process (Gauthamadas, Negi and Shyamprasad 2005). In the aftermath of the May 2000 fireworks store explosion, the role of the Roombeek-Netherlands local government in providing opportunities for participation in rebuilding the city was critical (Denters and Klok 2010). During the Indian Ocean Tsunami in 2004, the water that severely

devastated Tamil Nadu (India) penetrated almost 1.5 kms inland. An estimated 984,564 people were affected and 126,182 houses damaged or completely wiped out. In an effort to bring life back to normality, a massive reconstruction effort had to be undertaken. To effectively coordinate and strengthen the recovery mechanism, the state government selected personnel from different departments across the state. These personnel were placed at different managerial levels and were delegated considerable decision making and financial authorities. This level of administrative authority and the lack of political and bureaucratic influence over the recovery process led to a more effective response compared to other states and even countries (Srinivasan and Nagaraj 2006). Whilst it is true that local community participation is possible even without the commitment from local governments or non governmental agencies, often more successful participation is assured by such commitment from, and effective cooperation of, the external agencies (Lawther 2009). The role of local government is crucial in enhancing the resultant human settlements and developing resilient communities. Local authorities are responsible for the implementation of development projects and application of central government policies (El-Masri and Tipple 2002). Pyles (2007) advocates that community based reconstruction efforts must involve participation from the most vulnerable members in order to further strengthen the capacity of local community and government.

### **3. Conclusion**

The extant literature suggests that an absolute knowledge of the complexity of reconstruction, a detailed understanding of the factors contributing to failure, as well as those supporting reconstruction, are crucial for rebuilding domestic dwellings successfully after a major disaster. This paper touches upon five common factors that are believed to impact positively on the outcomes of post-disaster housing reconstruction projects. The findings reveal that reconstruction projects can be delivered satisfactorily when among others, factors such as community participation and community empowerment, effective communication among the stakeholders (in particular with members of the affected communities), community cultures and beliefs and support from the local government, are considered. Community participation that ensures the inclusion of beneficiaries from all sectors of the affected community and at all stages of post-disaster reconstruction is important and should be enhanced by effective community empowerment. Successful post-disaster reconstruction projects require a strong and reliable line of communication and an information dissemination system, which can be established with the support of the local government. Housing designs that are considerate of the socio-cultural and economic requirements of the affected communities are more acceptable and therefore stand a better chance of success. The uniqueness of post-disaster reconstruction projects and their contextual requirements mean that the sponsors and practitioners involved in these projects must adapt their practices to respond to the complexity inherent in these projects and so achieve more desirable outcomes.

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