ENGAGING THE COMMERCIAL CONSTRUCTION
INDUSTRY IN A POST-DISASTER CONTEXT

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ABSTRACT

One of the most critical problems for modern global society is vulnerability to disasters, occurring as a result of the interaction of hazards (natural and man-made) with vulnerable human populations. As the frequency and magnitude of hazards (and disasters) increase, recent reconstruction efforts have highlighted the need for a co-ordinated response among disaster actors, and an urgent requirement to tap into construction industry knowledge and capabilities to enhance disaster response and reconstruction. This research paper focuses on the engagement of the commercial construction industry in a post-disaster context, investigating the conditions that must be created in order to make direct industry involvement attractive to all stakeholders, including the company. The study found that the application of construction industry knowledge in a post-disaster situation can help to provide the necessary planning and co-ordination skills and expertise required to ensure that the reconstruction process is appropriate and sustainable for those directly affected by the disaster. Strategies are suggested that may lead to successful partnerships that are mutually beneficial. This research has the potential to impact general perceptions on construction industry involvement in the humanitarian sector, leading to significant changes in the frequency and nature of engagement and partnership.

Keywords: construction industry, engagement, knowledge transfer, partnering, post-disaster reconstruction.

INTRODUCTION

One of the most pressing issues of our age is vulnerability to increasingly powerful and frequent hazards, threatening our global society. As evidence mounts of the effect of human activity on our environment (Knutson and Tuleya, 2004), we are reminded of the need for co-ordinated help to quickly assist in recovery operations and to provide a
sustainable reconstruction process (Hidayat and Egbu, 2010; Berke et al., 1993).

The aim of the study is to achieve a better understanding of how the commercial construction industry can be more effectively engaged in post-disaster reconstruction activities and employed to offer their knowledge and expertise to enhance outcomes in such projects. This paper will examine the basis for enabling/encouraging collaboration and knowledge transfer between the construction sector and traditional disaster actors (non-governmental agencies and government departments) in post-disaster reconstruction projects.

**POST-DISASTER RECONSTRUCTION**

Disasters have had a disproportionately heavy toll on developing countries both in terms of loss of life and damage to the physical environment (Knutson and Tuleya, 2004), possessing less resilient infrastructure and housing in most cases. The built environment can offer a sense of security and does indeed have protective characteristics, which reduce the risks imposed by hazards. However, the built environment can conversely place inhabitants in conditions of great risk when standards are inadequate and disaster risk has not been taken into account in design and construction.

Some of the problems identified in existing literature are a lack of coordination among actors in post-disaster environments (Hidayat and Egbu, 2010), the absence of or inadequacy of planning for long-term disaster recovery (Norris and Stevens, 2007) and the issue of poor standards, building codes and design in disaster prone areas (Gostelow, 1999).

Built environment experts are best placed to address such challenges but often, in the absence of industry collaboration, humanitarian generalists are expected to respond. Several authors acknowledge that there is potential commercial merit for construction organisations to develop rapid response capabilities, for the purpose of engaging in post-disaster reconstruction activities (Bosher et al. 2007; Twigg, 2011; Bosher and Dainty, 2010). This suggests that there is a market or niche for the construction sector to tap into and eventually become a vital part of the reconstruction process in the post-disaster situation.

Some efforts have been made by NGOs to employ appropriately experienced built environment personnel who can operate in an emergency context at an international level (Telford, 2006). However, the fact that this type of professional is not necessarily ‘in demand’ outside of extraordinary circumstances leaves most employment opportunities as short-term deployments (Lloyd- Jones, 2006).
Unfortunately many organisations and individuals implementing post-disaster reconstruction projects have a limited knowledge of the design and construction process from concept to completion and, as a result, assumptions are made and mistakes and misjudgements are inevitable (Cage et al., 2009).

In a review undertaken by the RICS it was noted that governments and humanitarian agencies do not normally have the capability to deal with the long-term challenges of reconstructing the permanent built environment of a disaster hit area. It requires a “vast broad range of specialists” skills and funding which exceeds their mandate (Lloyd-Jones, 2006). Koria (2009) also notes that in a post-disaster situation there is a lack of appropriate technical and managerial expertise and that the knowledge of participants is currently deficient. This is clear evidence that there is an opportunity for construction professionals to help in the reconstruction efforts of many regions that are suffering from disasters.

ENGAGING INDUSTRY IN POST-DISASTER RECONSTRUCTION

There is strong evidence that suggests that the construction sector has invaluable expertise and a key role to play in the development of society’s resilience to disasters (Haigh and Amaratunga, 2010). Humanitarian agencies require a global vision with an agreed shared response (Amin and Goldstein, 2008). The commercial construction industry must be brought into this vision, since they possess the necessary knowledge and expertise in areas of co-ordination, planning, finance and construction.

The commercial construction industry has a significant part to play in post-disaster reconstruction. However, industry integration within disaster management has been largely overlooked in the past (Spence and Kelman, 2004). At times, construction professionals have been incorporated into disaster management through their involvement with NGOs and research teams, but this is not yet widespread. Saunders (2013) revealed that of the staff engaged in post-disaster shelter projects, an average of one member of staff per organisation possessed a built environment degree.

Construction companies recognise that becoming involved in the management and implementation of humanitarian work can be difficult and risky (Rotimi et al., 2006). Construction companies may see this as an opportunity to build a relationship with an established humanitarian agency in order to enhance their public standing and hope to gain more business in the future from doing so. They may therefore mitigate risk by forming partnerships. For a humanitarian agency, the decision to engage in reconstruction needs to be taken mindful of the complexities and must recognise the need for expert advice (Da Silva, 2010). Von Meding et al.
(2011) provided evidence of the competency gap present in post-disaster reconstruction and the potential for built environment professionals to be more widely engaged to compensate.

Twigg (2002) has recognised that the main concern of the commercial construction industry is bottom line profitability. However, corporate social responsibility also plays a major role (Johnston et al., 2005) as the way in which an organisation exceeds the minimum obligations to stakeholders. The ultimate aim of corporate social responsibility is to benefit the business concerned through enhancing the public image or perception of the company.

Thomas and Fritz, (2006) identify a trend in that many companies may want to get involved in well publicised emergencies; however, they cannot be depended on to assist in less ‘visible’ disaster situations. In this situation, the agenda for involvement is clearly based upon public perception and media opportunity. This paper argues that we must find more meaningful ways of engaging the industry, providing opportunities and incentives that satisfy business objectives while delivering humanitarian outcomes as part of the process.

**RESEARCH METHODOLOGY**

The study adopted a two-stage data collection procedure, with the findings of a series of semi-structured interviews combined with key factors from literature to develop a survey tool. This linked the qualitative and quantitative elements and allowed the authors to gain a wider view of perceptions on industry engagement within the construction and humanitarian sectors. Each factor within the questionnaire was rated on a five-point Likert scale, ascending from 1 to 5, where 1 represents ‘strongly disagree’ and 5 represents ‘strongly agree’. 220 questionnaires were sent out using convenience sampling and 52 responses were received. This represented a 24% response rate and included 30 construction industry responses and 22 humanitarian organisation responses.

**FINDINGS & DISCUSSION**

The qualitative analysis provided evidence for the need to improve the relationship between NGOs and construction sector. A disconnect was identified between the sectors, and various barriers to this relationship were identified. The differences in attitudes, cultures and organisational structures have a part to play in creating tensions between the sectors, and present difficulties in coming to a working relationship. This analysis helped the authors to develop an adequate survey tool.
In the subsequent quantitative data analysis, exploratory factor analysis (EFA) revealed four components with principal significance in terms of the engagement of the commercial construction industry by traditional disaster actors in post-disaster reconstruction activities.

The individual variables contained within these components are listed in Table 1. Each of the variables listed shows strong weighting on its particular component. The four components combine to explain 58% of variance within the dataset.

Table 1: Key components extracted by exploratory factor analysis (Source: Authors)

<table>
<thead>
<tr>
<th>Extracted Components</th>
<th>Eigen value</th>
<th>% Variance</th>
<th>Weighting in group</th>
<th>Mean value</th>
<th>Rank by mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills and Competencies</td>
<td>3.603</td>
<td>24.018</td>
<td>100%</td>
<td>4.4615</td>
<td>3</td>
</tr>
<tr>
<td>42. The employment of construction professionals in the humanitarian sector is essential for reconstruction success</td>
<td></td>
<td></td>
<td>55.50%</td>
<td>4.5769</td>
<td></td>
</tr>
<tr>
<td>43. The employment of construction professionals will streamline the reconstruction process</td>
<td></td>
<td></td>
<td>44.49%</td>
<td>4.3461</td>
<td></td>
</tr>
<tr>
<td>Collaborative Environment</td>
<td>1.982</td>
<td>13.211</td>
<td>100%</td>
<td>4.6443</td>
<td>2</td>
</tr>
<tr>
<td>32. Effective information and knowledge dissemination is critical to the reconstruction process</td>
<td></td>
<td></td>
<td>50.98%</td>
<td>4.4808</td>
<td></td>
</tr>
<tr>
<td>4. The post disaster reconstruction process should involve multiple organisations and sectors</td>
<td></td>
<td></td>
<td>49.01%</td>
<td>4.8077</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>1.580</td>
<td>10.535</td>
<td>100%</td>
<td>4.4423</td>
<td>4</td>
</tr>
<tr>
<td>16. Leadership is imperative for reconstruction to be successful</td>
<td></td>
<td></td>
<td>54.09%</td>
<td>4.4231</td>
<td></td>
</tr>
<tr>
<td>1. The construction sector has a vital role to play in the reconstruction process</td>
<td></td>
<td></td>
<td>45.91%</td>
<td>4.4615</td>
<td></td>
</tr>
<tr>
<td>Community Engagement</td>
<td>1.543</td>
<td>10.288</td>
<td>100%</td>
<td>4.7884</td>
<td>1</td>
</tr>
<tr>
<td>17. Communication with the affected community is important</td>
<td></td>
<td></td>
<td>31.13%</td>
<td>4.8077</td>
<td></td>
</tr>
<tr>
<td>30. It is important to give the victims of a disaster a voice when it comes to reconstruction</td>
<td></td>
<td></td>
<td>35.14%</td>
<td>4.8077</td>
<td></td>
</tr>
<tr>
<td>18. Participation by the local community is important in the reconstruction process</td>
<td></td>
<td></td>
<td>33.73%</td>
<td>4.7500</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.05%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Skills and Competencies
This component yielded only the third highest combined mean value for variables (4.46) but explained 24% of variance in the dataset. An alarming skill and competency gap exists in the implementation of post-disaster reconstruction projects, as highlighted by Von Meding et al. (2011, 2012). The environment is complex and fluid, requiring a comprehensive multidisciplinary approach. In this context, the commercial construction industry possesses resources, qualities and expertise that are much needed. This study suggests that engaging the industry will lead to more successful project outcomes and a more streamlined reconstruction process. The results validate the arguments of Fleming et al. (2009), Da Silva (2010) and Twigg (2011) which postulate that the engagement of construction professionals to address issues of design, construction, contractual transparency, coordination and communication will greatly enhance reconstruction project outcomes.

Collaborative Environment
The ‘collaborative environment’ component yielded the second highest combined mean value for variables (4.64) and explained 13.2% of variance in the dataset. This result reaffirms the need to engage multiple sectors in post-disaster reconstruction, as supported in literature particularly by Da Silva (2010). This type of collaboration will bring together diverse knowledge and expertise and enhance the reconstruction process. Although there is some evidence of built environment technical competence in the humanitarian sector, it is clear that not all implementing agencies are able to undertake the reconstruction process successfully. This is where a specific partnership framework is vital and timely, and indeed is being advocated for within the sector (Lloyd-Jones, 2009).

Leadership
The ‘leadership’ component yielded the lowest combined mean value for variables (4.44) but explained 10.5% of variance in the dataset. Bosher et al. (2007) and Fleming et al. (2009) strongly argue for an integrated reconstruction approach that fully engages a range of built environment professionals. The sector has the necessary skills and expertise to fulfil the demands of a post-disaster context. In fact, the sector is best placed to take the lead in many aspects of post-disaster project implementation. Such leadership would inspire confidence among stakeholders and help to initiate a coherent structure for efficient construction project coordination.

Community Engagement
This component yielded the highest combined mean value for variables (4.78) and explained 10.2% of variance in the dataset. Post-disaster reconstruction literature provides evidence of the impact of poor
community engagement (Barakat, 2003; Paton et al., 2000). This study builds upon this notion and suggests that any collaboration between the humanitarian and construction sectors must embed community consultation as a top priority. For a reconstruction project to achieve buy-in and acceptance among beneficiaries and achieve wider community outcomes, participation is vital. True participation will gradually devolve decision-making to the community (Hayles, 2010) and empower through training and education (Egbu, 2004; Lizarralde and Boucher, 2004), while promoting sustainable and sensitive development of the local economy (Berke et al., 1993).

**A Framework for Industry Engagement**

Utilizing the data generated from the interview mapping and analysis process and subsequent questionnaire survey, the following framework was devised to represent the post-disaster environment in relation to construction industry involvement (Figure 1).

The framework illustrates a type of partnering arrangement that the authors argue might significantly improve the post-disaster reconstruction process. The essence of the framework is that a commercial construction firm can partner with a traditional humanitarian actor, creating a formal link between sectors for knowledge and information sharing, targeted collaborative action and increased project efficiency.

![Figure 1: Framework for Engagement of Commercial Construction](Source: authors)
CONCLUSION

The rationale regarding private construction sector involvement, as discussed in the literature review, has been supported by the data collected. The construction industry must be provided with a commercial incentive to become engaged, and strive to embrace a humanitarian and ethical vision as a part of wider shared objectives. One the other hand, humanitarian organisations gain knowledge and expertise through such partnerships but must be willing to devolve a certain amount of control.

The partnering framework outlines a fresh approach that will potentially help to rationalise construction sector involvement in post-disaster reconstruction. The true value of the study can be realised in helping to strengthen the relationship between the construction and humanitarian sectors. This agenda can be advanced through the education system and by creating formal links between humanitarian organisations and academic bodies that provide construction related courses. Most of all, attitudes need to change both within the commercial construction industry and the humanitarian sector to create an enabling environment.

REFERENCES


