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Published in:
Proceedings 28th Annual ARCOM Conference

Published: 01/01/2012

Document Version:
Publisher's PDF, also known as Version of record

Link to publication in Bond University research repository.

BUILDING CAPABILITY FOR DISASTER RESILIENCE

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All levels of government recognise the widespread devastation of communities by natural or other disasters. They have responded with emergency management arrangements and policies to enhance government and community capacity to anticipate, withstand and recover from disastrous events. Although the construction industry has a significant role to play, particularly in recovery and reconstruction, it has not generally been considered as a key stakeholder in building capability for disaster resilience. One barrier to more active involvement of the construction industry in disaster response and management is that traditional methods of construction project management have been criticised as too time consuming and inflexible for use under circumstances of high uncertainty, requiring rapid response in complex multi-stakeholder environments. The 2011 Queensland floods represent one of the most disastrous extreme weather events of recent times. Using this event as a case study, this paper presents results of analysis of institutionalised discourse concerning structures, policies and procedures for disaster management, and official inquiry reports providing details of response and recovery activity. The aim of the research is to identify the positioning of project management in the disaster management discourse as a first step towards earlier and more proactive involvement by the construction industry and use of project management approaches that contribute to disaster resilience.

Keywords: project management, construction, disaster, response, resilience.

INTRODUCTION

In recent years the world has experienced a number of disastrous events both natural and man-made. The 2004 Indian Ocean Tsunami, and Hurricane Katrina in 2005 had far reaching consequences. In 2011, 185 people died as a result of an earthquake that severely damaged New Zealand's second-largest city, Christchurch. This event was closely followed by the earthquake and tsunami that devastated large areas of Japan. Disasters caused by extreme weather events including bushfires, floods, storms, and cyclones that have significant impacts on communities, the economy, infrastructure and the environment are regular occurrences in Australia. As a result, all levels of

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Australian government have developed emergency management arrangements and policies to enhance government and community capacity to anticipate, withstand and recover from disastrous events (National Emergency Management Committee, 2009). In response to the apparent frequency and inevitability of disastrous events such as the Black Saturday fires in Victoria, in 2009, and more recent widespread flooding in Queensland and other parts of Australia, there is a focus on development of community resilience.

It is generally recognised that disaster response and recovery is implemented through multiple projects, and it might be expected that project and program management capability would be an important contributor to disaster resilience.

The concept of project management is arguably best known in disaster management through the construction industry for which it is the primary management approach. However, traditional methods of project management, as used by the construction industry, have been criticised as too time consuming and inflexible for use under circumstances of high uncertainty, requiring rapid response in complex multi-stakeholder environments (Steinfort, 2010). Further, the involvement of the construction industry is primarily in recovery and extended reconstruction phases of disaster management, rather than in prevention, preparedness and response. It has been suggested that there is potential benefit in earlier involvement of the construction industry in the disaster management cycle (Bosher, Dainty, Carrillo, Glass, & Price, 2007).

The aim in this paper is to draw upon a specific case study to increase understanding of the treatment of project management in existing regulatory frameworks for disaster management as a basis for further research that would explore opportunities for increasing the role of project and program management in disaster management through innovation and development beyond traditional approaches.

LITERATURE REVIEW

Projects and project management

The term "project" is widely used and there is a general understanding that it implies a one-off endeavour or initiative as distinct to an on-going or repetitive task. Projects may be undertaken or managed in many ways but there are specific meanings for the term "project management" that have been developed first by communities of practitioners and since the 1980s by project management professional associations. Through these associations practitioners have worked to define distinct bodies of project management knowledge as the basis for standards and certification of project management knowledge and practice (for example PMI, 2008; International Project Management Association, 2006; APM, 2006; Australian Institute of Project Management, 2008).

These established understandings of project management are based on a linear and rational (Hodgson & Cicmil, 2006) and top down approach most suited to what are described by Crawford & Pollack (2004) as "hard" projects characterized by clear goals and boundaries, tangible end products, low permeability, and a focus on monitoring and control. In recent times, faced with changing societal values, persistent demand for improved performance, pressures towards sustainability, advances in technology and increasingly complex contractual arrangements including partnering and alliances, even projects in the construction industry have become less amenable to linear rational approaches.

This has led to questioning of the traditional project management approaches represented by professional standards in initiatives such as the Rethinking Project Management Network sponsored by the UK EPSRC (Winter, Smith, Morris, & Cicmil, 2006). Another interesting development in management of projects, is based on the Agile Manifesto for software development (Cockburn, 2006). Based on a process view of human collaboration, the Agile project management approach involves a series of relatively small tasks defined and implemented incrementally as the situation demands, in a flexible and adaptive manner, rather than as part of a fully pre-planned process.

Application of project management to disaster events

Disaster management has been described as a form of public project management (Tun & Pathranarakul, 2006). On this basis, all phases of disaster management, from prediction and prevention, to response, recovery and reconstruction may benefit from a project management approach.

Experienced contractors have commonly applied their established project management techniques to the physical reconstruction aspects of disaster events, and the Project Management Institute, responding to the Indian Ocean tsunami disaster of 2004, has developed a Project Management Methodology for Post Disaster Reconstruction (PMI, 2005; Curlee & Sterling, 2008). While this methodology has been recognised as helpful for rebuilding of simple infrastructure, it has been criticised in terms of its wider applicability to chaotic environments encountered in disaster-related contexts (Steinfort & Walker, 2008).

The Project Management Institute has sponsored research on aid relief projects with results showing several common traits in successful relief projects, including effective engagement enabling stakeholders to share a common vision of the project as the team works toward successful outcomes (Steinfort & Walker, 2011). In October 2011 the Project Management Institute presented testimony to a US Senate Subcommittee on accountability of the Federal Emergency Management Agency (FEMA), claiming that project management expertise has practical applications for FEMA in providing disaster relief efforts (Learnard, 2011).

Although there is a considerable literature on disaster management, there is very little reference within it to the application of project management. Hayes & Hammons (2002) use the term "disaster recovery project management" in reporting on recovery of a refinery stopped by hurricane damage. They provide useful guidance on challenges faced in disaster recovery projects. Farris & Wilkerson (2001), again using case studies, discuss aspects of management from initial scope definition through project closeout and propose a performance based contracting system that allows contractors to recommend alternatives that provide best value to the client. Le Masurier *et al.* (2006) in comparing routine and post-disaster reconstruction across New Zealand case studies, concluded that although routine construction processes had proved adequate for small-scale disasters, larger programs of reconstruction following major disasters required a greater degree of coordination that was not adequately addressed in policy and legislation. However, they did not specifically address project management.

In summary, other than in an indirect manner, the project management literature has little to say about its application to disaster management, and the literature on disaster management has little to say about project management. If we accept that disaster response and recovery is implemented through multiple projects and that as Tun and

Pathranarakul (2006) suggest, disaster management is a form of public project management whereby all phases of disaster management, from prediction and prevention, to response, recovery and reconstruction may benefit from a project management approach, then it is interesting that there is so little interaction between the two bodies of literature.

Having investigated the relationship between project and disaster management in the literature, the next step is to examine the disaster management framework in Queensland followed by treatment of project management in existing regulatory frameworks for disaster management using the 2011 Queensland Floods as a case study.

DISASTER MANAGEMENT FRAMEWORK IN QUEENSLAND

In order to provide the context for analysing institutional discourses on the recent Queensland flooding of 2011, it is important to first understand the disaster management (DM) framework in Queensland. This paper first discusses the key principles for disaster management followed by a review of legislation and planning policies relating to DM and lastly an analysis of governance structure for DM with explanation of the roles of different levels of government.

Key principles for disaster management in Queensland

The Australian disaster management system takes an integrated approach to deal with a range of hazards that are likely to affect a locality (Queensland Government, 2011). The five guiding principles for disaster management in Queensland are:

- comprehensive approach
- all hazards approach
- all agencies approach
- local disaster management capability and
- a prepared resilient community

The comprehensive disaster management principle entails reducing risks and building community resilience while making sure there is capability for effective response and recovery. The "all hazards" principle places emphasis on developing a disaster management plan that can deal with various types of hazard as activities and functions for one hazard may be applicable to other types of hazard as well. Likewise, the "all agencies" approach emphasises the importance of coordinating activities of different organisations including all levels of government, non-government and private sectors. The "local disaster management capability" principle recognises the key role that local government should play in managing disasters at the local level. Lastly, the "prepared resilient community principle" highlights the need for awareness, preparedness and resilience of communities by ensuring that all individuals in the community share the responsibility to deal with disaster event.

Legislation and State planning policies for disaster management

The Queensland Disaster Management Act (2003) forms the legislative basis for disaster management by requiring establishment of disaster management groups for the state, disaster districts and local government areas as well as to prepare disaster management plans and guidelines (Queensland Government, 2011). A relevant policy is the State Planning Policy 1/03: Mitigating the adverse impacts of flood, bushfire and landslide (SPP 1/03) which sets out the State's interest in ensuring that the natural

hazards are adequately considered when making land use decisions about development. The policy requires council planning schemes and development assessment decisions to minimise community vulnerability and financial impacts of hazards.

Governance structure for disaster management

Disaster management in Australia is structured in a 'tiered' framework involving all levels of government (EMA, 2004). Disaster management groups are established at local, district and State levels and supported by disaster coordination centres at all levels. Responsibility for disaster management is progressively taken up through the local, district, state and national tiers depending on the severity and extent of natural disasters. Figure 1 explains the governance arrangement for disaster management in Australia.

Figure 1: Queensland disaster management arrangements (Queensland Government, 2011)
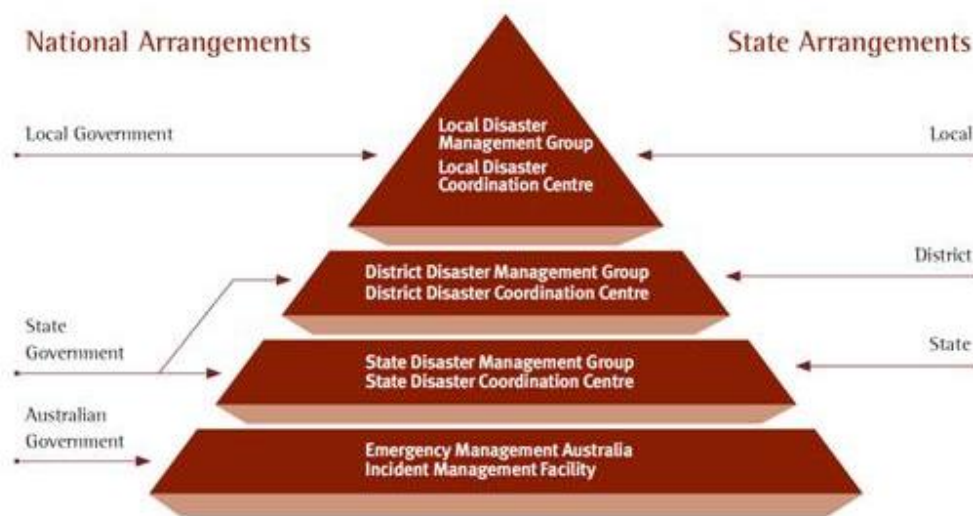
Local government is clearly identified as the key agency to deal with local disaster events and has important responsibilities that include establishing local disaster management groups and developing and maintaining a local disaster management plan.

Besides the local disaster management groups, there is also provision for district disaster management groups to support local governments in disaster operations. This group has representations from all state agencies responsible for disaster management activities and coordinates activities at district level.

The State Disaster Management group is the peak body providing strategic advice to state government. It is responsible for developing a state disaster management plan as well as providing policy guidelines for local governments in Queensland.

At the federal level, Emergency Management Australia is the peak body dealing with national level disasters. The Council of Australian Governments has recently agreed to adopt a whole-of-nation resilience-based approach to disaster management with focus on national coordinated and cooperative efforts to withstand and recover from disasters. This approach was built on National Strategy for Disaster Resilience (National Emergency Management Committee, 2009).

CASE STUDY: THE 2011 QUEENSLAND FLOODS

The Queensland Minister for Police, Corrective Services and Emergency Services, in his foreword to the Queensland State Disaster Management Plan (2011, p.3), said that the past few years had "upheld Queensland's reputation as Australia's most disaster prone state". From September to November 2010, Queensland experienced a wet spring that meant that by early January 2011 the river catchments were already saturated before the onset of extreme rainfall.

Beginning in December 2010 floods affected an area larger than France and Germany including at least 70 towns and over 200,000 people (BBC News, 2010). Three-quarters of the State of Queensland was declared a disaster zone (Hurst, 2011) and by the end of January 2011, 35 people had died in flood related incidents (Queensland Police Service, 2011).

Brisbane, the capital city of Queensland, Australia, is not unfamiliar with flooding but on the 13th of January 2011 the city experienced the highest and most serious flooding since 1974. Flooding was experienced throughout most of the Brisbane River catchment. The floods caused loss of life; an estimated 18,000 properties were inundated in the Brisbane River Valley and according to the Insurance Council of Australia, about 56,200 insurance claims were received with payouts estimated at $2.55 billion. Around 3,570 business premises were flooded, and commercial losses of approximately $4 billion were reported across the agriculture, mining and tourism sectors. Over 19,000 kilometres of roads and around 28 percent of the Queensland rail network were damaged and three major ports were significantly impacted. The Australian Emergency Management Australia Disasters Database estimates that 28,000 homes would need to be rebuilt, while vast numbers of dwellings require extensive repairs (van den Honert & McAneney, 2011).

METHOD

The approach adopted for increasing understanding of the treatment of project management in existing regulatory frameworks and disaster management practice is to use discourse analysis in the context of a specific case study as outlined above.

Discourses are structured collections or bodies of meaningful text which can be studied through systematic analysis of the texts as well as their "production, dissemination, and consumption – in order to explore the relationship between discourse and social reality" (Phillips, Lawrence, & Hardy, 2004, p.636). The approach is concerned not only with what is present in a discourse but with what is excluded and is particularly relevant in dealing with socially constructed phenomena such as disaster management and project management - "analysing text involves much more than attending to what is 'in' those texts [...t]he point [...] is not to get the text to lay bare its meanings (or its prejudices), but to trace some of the threads that connect that text to others" (MacLure, 2003, p.43). There is precedent for use of discourse analysis in studying disaster management (e.g. Wyatt-Nichol & Abel (2007).

This paper reports specifically on results of a summative content analysis that was undertaken as a first step in understanding the treatment of project management concepts and approaches in the discourse represented by regulatory frameworks and practice of disaster management. The summative content analysis was undertaken using qualitative analysis software, ATLAS.ti 6.2 (Friese, 2012) and focused on identifying the frequency of occurrence of terms that would indicate the positioning of project management in the disaster management discourse. Occurrences of the terms

were searched using ATLAS.ti, then coded and counted. The qualitative data analysis software enabled the researchers to review all occurrences of terms to assess the nature of their use in context.

Two sets of texts provided the basis for analysis. The first set of texts form the institutionalised discourse represented by policies, guidelines and procedures for disaster management at local, district and state level within Queensland, and at national level. The second text is the inquiry report into the 2011 Queensland floods. The first set of documents sets the framework for disaster management and the second text represents the reality of its implementation. The full list of documents used in analysis is shown in Table 1.

Table 1: Documents used in analysis

1. Institutionalised discourse: policies, guidelines and procedures for disaster management	
– National – P:1 National Strategy for Disaster Resilience (National Emergency Management Committee, 2009) – P:2 EMA (Emergency Management Australia) 2004, Emergency management in Australia: concepts and principles, Australian Emergency Manual Series – Manual 1. (EMA, 2004) **• State** – P:3 Queensland Disaster Management Act (2003) – P:4 Queensland Disaster Management and Other Legislation Act 2010: Act No. 40 of 2010 – P:5 State Planning Policy 1/03: Mitigating the adverse impacts of flood, bushfire and landslide (SPP 1/03) – P:6 State Planning Policy Guideline – P:7 Queensland State Disaster Management Plan 2011 (Queensland Government, 2011)	**• District** – P:8District Disaster Management Guidelines (Queensland Government, 2010) – P:9 Rockhampton District Disaster Management Plan (Rockhampton District Disaster Management Group, 2012) – P:10 Cairns District Disaster Management Plan (Cairns District Disaster Management Group, 2011) **• Local** – P:11 Cairns Local Disaster Management Plan (Local Disaster Management Group - Cairns Region, 2008) – P:12 Rockhampton Regional Council Local Disaster Management Plan (Rockhampton Regional Council, 2009)
2. P:13 Queensland Floods Commission of Inquiry: Final Report – March 2012	

RESULTS

For purposes of analysis, the documents identified in Table 1 were first searched for concepts that might be considered as central to the discourse of disaster management. They were then searched for references to project, program and risk management in order to identify how they are treated relative to these terms in the disaster management discourse and how far they might be from centrality in that discourse.

To establish a sense of scale and focus, all of the thirteen documents identified in Table 1 were analysed for occurrence of references to key disaster management terms "preparedness", "prevention", "resilience", "response" and "recovery". Of these terms, response and recovery are by far the most popular, each being mentioned at least four to five times more often than resilience and six times as often as preparedness and prevention. This is not unexpected as both response and recovery are essential reactions to disaster events, while resilience is largely a socially constructed and aspirational concept. Prevention and preparedness are clearly less central to the discourse suggesting that disaster management remains largely reactive. If the two sets of documents are treated separately, all of these terms except for response are used more frequently in the institutional framework documents than in the flood inquiry report.

The terms selected to explore the treatment of project management in the disaster management discourse were "project management", "program management", "risk

management", plus the terms "project" and "program". Clearly neither project management nor program management have any visibility or status in the disaster management discourse. Across all the documents, the term program management is not used at all and project management is only used four times and only in the institutional framework documents. Once it is used in an appendix to the State Planning Policy 1/03 in the context of risk management; two occurrences are in the Cairns District Disaster Management Plan in the context of provision of recovery support services specifically relating to repair of uninsured dwellings; and one occurrence is in the Rockhampton Local Disaster Management plan, again in the context of risk management. Project management does not appear at all in the 658 pages of the Queensland Flood Inquiry Report.

Risk management has the same level of importance in the disaster management discourse as prevention and preparedness and often in association with them. There is a clear presence at least in the institutional framework documents of a group of activities that together may be referred to as risk management that have a recognised place in and make a contribution to disaster management.

Taking the terms "project" and "program" separately, the term "program" is used slightly more often than "resilience", but most often not in any sense that is connected to projects and project management. The term "project" is used less than half as often as "program" and more often in the Queensland Flood Inquiry Report than in the institutional framework documents.

Detailed examination of the text in context indicates that while projects and programs are terms used to describe initiatives and actions that are undertaken as part of a disaster management process or in response to a disaster event, the concept of specific management approaches for projects and programs are not recognised within the discourse. By contrast, risk management as a set of processes and procedures is well understood and considered an important part of disaster management.

CONCLUSION

Although disaster management may be described as a form of public project management and therefore all phases of disaster management, from prediction and prevention, to response, recovery and development of resilience may benefit from a project management approach; this paper has revealed that project management has no visibility in the disaster management discourse.

Review of the literature revealed only a tenuous connection between project management and disaster management and analysis of the disaster management discourse via a case study confirmed this disconnect in practice. Risk management, however, appears to be well understood in the world of disaster management and features prominently in disaster management frameworks and practice.

Further research needs to be undertaken to understand why project management plays such a minor role in disaster resilience. One might speculate, however, that the current representation of project management in standards is seen as too bureaucratic and time consuming to be suited to a field in which response is the central concern. It is possible that project managers, in their attempts to define a profession, have erected barriers that isolate them from wider acceptance and engagement. This paper suggests the need for a rethink of project management approaches to meet the specific characteristics and needs of disaster events if project managers and the construction

industry wish to take an earlier and more influential role in building disaster resilience.

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