

**AN EXAMINATION OF IMPROVEMENTS REQUIRED TO  
LEGISLATIVE PROVISIONS FOR POST DISASTER  
RECONSTRUCTION IN NEW ZEALAND**

A thesis submitted in partial fulfilment of the requirements for the  
Degree

Doctor of Philosophy in Civil Engineering

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by

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## **Dedication**

“Now to Him who is able to do immeasurably more than all we ask or imagine, according to His power that is at work within us, to Him be the glory...” Eph. 3: 20-21

**to**

**Lola, Dammy & Segun**

**without whom the struggle will be meaningless**

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## **ABSTRACT**

Previous disaster management studies allude to the problems of coordination and the difficulties that may be associated with the implementation of recovery programmes in New Zealand. These studies have also indicated opportunities for improving the current recovery and reconstruction framework in advance of a major disaster. They have shown that much existing legislation were not drafted to cope with wide-scale devastations and were not developed to operate under the conditions that will inevitably prevail in the aftermath of a severe disaster.

This thesis therefore explores improvements that could be made to legislative provisions so that they facilitate large-scale recovery management in New Zealand. Three legislative documents are in view: Civil Defence Emergency Management (CDEM) Act, Resource Management Act (RMA) and Building Act (BA). The research investigations involved qualitative research methodology using multi-methods to determine the practical implication of implementing current reconstruction arrangement under these legislative documents. The methods employed include: interviews, document analysis, focus group study, surveys, and the use of subject matter experts for research verification.

Results show that the three legislative documents may become sources of vulnerability in post disaster reconstruction because of their influence on the timely achievement of recovery objectives. The impediments posed by these legislative documents are mainly in the form of procedural constraints; ambiguities in rights and responsibilities for recovery management; and deficiencies in the intents and purposes of the legislative documents. More general results show that pre-planning the management of disaster resources; and collaborative arrangements for response and recovery programmes are a pre-cursor to effective and efficient management of reconstruction in New Zealand.

The research concludes by providing useful recommendations that are specific to the three legislative documents and other general recommendations. It is hoped the implementation of these recommendations could improve the robustness of the current reconstruction framework so that it is able to cater for the complex needs of rebuilding for resilience in New Zealand.

## **Glossary**

|          |   |
|----------|---|
| BA       | The Building Act 2004 No 72 (as at 01 August 2009)                            |
| CDEM     | Civil Defence Emergency Management  |
| CDEM Act | The Civil Defence Emergency Management Act 2002 No 33 (as at 01 October 2008) |
| EM-DAT   | The International Disaster Database   |
| EQC      | Earthquake Commission of New Zealand  |
| IPENZ    | Institution of Professional Engineers New Zealand                             |
| MCDEM    | Ministry of Civil Defence and Emergency Management                            |
| MfE      | Ministry for Environment  |
| NZSEE    | New Zealand Society for Earthquake Engineering                                |
| RMA      | The Resource Management Act 1991 No 69 (as at 01 October 2009)                |



## Chapter One

### Introduction

#### 1.1 Background

The rising scale and magnitude of natural disasters in the world is unprecedented. For example in 2007, there were 414 natural disasters that caused an average of US\$74.9 billion damage with an average of 16,800 lives lost during the period (2008). The same study indicates a future upward trend in the number of extreme disaster events due to changes in global climate, urbanisation and increases in population. Vulnerabilities to natural disasters and environmental emergencies are on the increase and it is predicted that disasters will affect more people in coming years.

In New Zealand and countries in the Pacific region the scale of destruction from cyclones, earthquakes and tsunamis are in line with global phenomenon and are a harsh reality. This means that the focus of disaster management activities at every level of intervention should be to reduce the inevitable impacts of natural disasters. For these vulnerable countries like New Zealand, there needs to be preparations across the 4R's of Reduction, Readiness, Response and Recovery. A prepared community mitigates its risk to disasters and is poised to implement recovery, if it has a plan in place. According to Ye, (2004) pre-planning activities will help to alleviate the scale of devastation and destruction that follows large catastrophes and will allow recovery from the event to be accelerated.

For disaster management activities to be successfully implemented, pre-planning in one form or another needs to be carried out (Cousins, 2004). One aspect of pre-planning is the need to constitute viable policies and procedural arrangements that will facilitate recovery after disasters. Thus the formulation of public policies for reduction, readiness, response and recovery should be the rational starting point for disaster management (Comerio, 2004). These public policies have to be coupled with a strong commitment by national governments for their successful implementation.

The current study focuses on the regulatory policies that stipulate the participatory roles of disaster management stakeholders during the recovery phase of a disaster; and other regulatory policies that directly impact on the reconstruction of physical assets. The former category of regulatory policies assign authorities and responsibilities to the disaster management stakeholders; with indications on how disaster activities are to be coordinated to achieve collective and individual recovery objectives. In New Zealand, the Civil Defence Emergency Management (CDEM) Act 2002 is the key document that prescribes the activities of disaster management agencies. While the regulatory policies that directly impact the reconstruction of physical assets in New Zealand, which the current study focuses on include: the Resource Management Act (RMA) 1991, and the Building Act (BA) 2004. The study believes these three legislative documents/Acts must be made robust enough to facilitate the implementation of recovery policies. Studies conducted in Nepal have shown that legislation drives the implementation of recovery policies, especially where special powers, rights or responsibilities need to be defined (ACTIONAID Nepal, 2004). Spence (2004) suggests that legislation and regulatory frameworks have to be appropriate, so that the frameworks provide suitable environment for the interaction and interrelationship of disaster management stakeholders during response and subsequent recovery activities.

The organisation and coordination of recovery is usually complex because a wide range of activities occur simultaneously with an equally wide range of needs that have to be met. Experiences from past disaster management arrangements (even in advanced economies), are indicative of the continuous struggle to meet the recovery needs of all stakeholders. Some advanced countries are being caught off-guard in spite of their previously acclaimed disaster management policies (Chan et al., 2006; Kouzmin, Jarman, & Rosenthal, 1995; Mitchell, 2006; S. K. Schneider, 1995; W. Smith & Dowell, 2000). Several contributory factors may account for the achievement or non-achievement of disaster management goals and objectives. These may include:

- pre-disaster trends and levels of preparedness which is linked to vulnerability (McEntire, 2001). Wisner (2004) describes a pressure and release (PAR)

effect where the level of vulnerability to disasters is the result of underlying causal factors that existed before the disaster event.

- the extent of damage resulting from the disaster in terms of its magnitude and geographical spread (Mitchell, 2006);
- availability and accessibility to the required resources for both response and recovery (capability or coping ability); and
- the prevailing political will and governmental interests in disaster management activities. Rolfe & Britton (1995) are of the opinion that the pace of reconstruction is severely impacted by political and cultural conflicts over recovery plans, thus the successful achievement of disaster management goals will depend on the political environment.

The current study approaches effective and efficient implementation of post-disaster reconstruction from the viewpoint of legislation and regulations; believing that legislation and regulatory provisions significantly influence the organisation for long-term recovery after natural disasters. The study shows that particular attention needs to be paid to changes that should be put in place to facilitate reconstruction programmes at all ownership levels. Without developed frameworks, reconstruction and re-development programmes may be carried out on an ad-hoc basis with little regard for the needs of an affected community.

The study provides a description of the operational procedure for post-disaster recovery as suggested by the Ministry of Civil Defence and Emergency Management (MCDEM) in New Zealand. It evaluates key disaster-related legislation and regulations that provide the framework for the implementation of recovery, specifically the CDEM Act, RMA and BA, to discover if they are in tandem with the demands for the reconstruction of physical facilities in a major natural disaster in New Zealand. A robust regulatory framework would enable the achievement of CDEM's objective of 'community resilience' in New Zealand. In other words, the regulatory framework should be enabling of rebuilding programmes for damaged physical facilities and consequently contribute to the overall well-being of the affected community. Therefore the pertinent question

that is consistently addressed throughout the current study and which underpins the research programme is:

*What improvements can be made to existing disaster-related legislation and regulatory provisions so that they facilitate the implementation of significant reconstruction programmes in New Zealand?*

## **1.2 Statement of the Research Problem**

There is no doubt that New Zealand communities are exposed to risks from natural hazards of one form or another. The question often posed at conferences and symposia is not ‘if a disaster will happen’ but ‘when a major one will happen’ (J. O. B. Rotimi, Le Masurier, & Wilkinson, 2006) ? With a follow-on question of ‘are we ready’? The frequency with which different disaster emergencies have been declared are proof of New Zealand’s disposition to natural disasters. Table 1.1 presents an outline of recent disaster events (2000-2007) that have necessitated the declaration of states of emergencies around the affected areas in New Zealand. The table presents a high disposition to rainfall related hazards (floods and landslips) since the turn of the century; but these events have been largely confined to rural areas and are of low-magnitude. Relative to other world disasters, these local events had low scope of impact in terms of their physical and societal dislocations.

However, these low-magnitude events do not negate the real risks that New Zealand communities are faced with and neither does it reduce the importance of disaster risk management strategies. New Zealand has had its share of significantly large natural disasters in its history. The Ministry for Culture and Heritage gives a dateline of major natural disasters that happened in New Zealand history (Ministry for Culture and Heritage, 2009). Some examples of these are: the Taupo landslide of 7 May 1846 with about 60 deaths including Ngati Tuwharetoa leader Mananui Te Heuheu Tukino II; the 1855 Wairarapa earthquake that altered the landscape of the Wellington region with 5 to 9 recorded deaths in Wellington, Manawatu and Wairarapa; and the deadliest earthquake in the

Hawke's Bay (Napier) region of 1931. The official death toll as a result of the Napier earthquake was put at about 256.

**Table 1.1 - Emergency declarations in New Zealand (2000 – 2007)**

*Source: Adapted from [www.civildefence.govt.nz](http://www.civildefence.govt.nz)*

| <b>Date Declared</b>  | <b>Date Terminated</b> | <b>Geographical area/region affected</b> | <b>Nature of Emergency</b> |
|-----------------------|------------------------|--|----------------------------|
| <b>2007</b>           |                        |  |                            |
| 21 <sup>st</sup> Dec  | 22 <sup>nd</sup> Dec   | Gisborne                                 | Earthquake                 |
| 30 <sup>th</sup> July | 31 <sup>st</sup> July  | Milton                                   | Flooding                   |
| 10 <sup>th</sup> July | 13 <sup>th</sup> July  | Far North DC                             | Flooding                   |
| 05 <sup>th</sup> July | 07 <sup>th</sup> July  | Taranaki District                        | Tornado                    |
| <b>2006</b>           |                        |  |                            |
| 07 <sup>th</sup> July | 08 <sup>th</sup> July  | Rangitikei District                      | Flooding                   |
| <b>2005</b>           |                        |  |                            |
| 17 <sup>th</sup> May  | 30 <sup>th</sup> May   | Whakatane District                       | Flooding, Landslips        |
| 18 <sup>th</sup> May  | 20 <sup>th</sup> May   | Tauranga District                        | Flooding, Landslips        |
| <b>2004</b>           |                        |  |                            |
| 17 <sup>th</sup> July | 30 <sup>th</sup> July  | Whakatane District                       | Flooding, Landslips        |
| 17 <sup>th</sup> July | 23 <sup>rd</sup> July  | Opotiki District                         | Flooding, Landslips        |
| 17 <sup>th</sup> Feb  | 25 <sup>th</sup> Feb   | Manawatu-Wanganui                        | Flooding                   |
| 17 <sup>th</sup> Feb  | 18 <sup>th</sup> Feb   | Marlborough District                     | Flooding                   |
| 17 <sup>th</sup> Feb  | 27 <sup>th</sup> Feb   | South Taranaki District                  | Flooding                   |
| 16 <sup>th</sup> Feb  | 17 <sup>th</sup> Feb   | Manawatu District                        | Flooding                   |
| 16 <sup>th</sup> Feb  | 17 <sup>th</sup> Feb   | Rangitikei District                      | Flooding                   |
| <b>2003</b>           |                        |  |                            |
| 04 <sup>th</sup> Oct  | 09 <sup>th</sup> Oct   | Kapiti Coast District                    | Flooding                   |
| <b>2002</b>           |                        |  |                            |
| 21 <sup>st</sup> June | 23 <sup>rd</sup> June  | South Waikato District                   | Flooding                   |
| 21 <sup>st</sup> June | 24 <sup>th</sup> June  | Thames District                          | Flooding                   |

Large scale natural disasters have been few and far between and it can be concluded that New Zealand is relatively inexperienced in the management of it (catastrophes) and that such events may require extensive preparatory work than the usual. Hopkins, Lanigan and Shephard (1999) hold similar view, they conclude that large-scale disasters would pose considerable economic, physical and social challenges that could make the task of recovery and reconstruction extensive in New Zealand.

In terms of legislation and regulation there is anecdotal evidence to suggest that there is little provision in legislation to facilitate large scale reconstruction programmes in New Zealand. Feast (1995) for example, identified several issues in relation to planning and construction legislation that would impede reconstruction of Wellington, following a major earthquake. Feast's study suggested that much of the legislation (in particular RMA and BA) that existed during the period were neither drafted to cope with an emergency situation nor developed to operate under the conditions that will inevitably prevail in the aftermath of a severe seismic event. Commenting on the RMA, Feast explains that its consultation procedure may be precluded by the problems of meeting the reconstruction requirements of a devastated city within a reasonable period (Feast, 1995).

Since Feast's analysis, the Civil Defence Act 1983 and BA 1991 have been revised, with amendments made to the RMA (review and realignment of the RMA is ongoing, which this study has provided input into). However these legislative documents still portend considerable obstacles to post disaster reconstruction, as will be examined within this thesis. An example of the scale of the problem being experienced under RMA provisions was summed up by the Minister for Environment in his first reading to Parliament about the need to reform the RMA. Extract of his comments made on 19 February 2009 follows:

...since the RMA became law there has been growing criticism about the slow and costly plan preparation and consenting processes. Decision making processes under the RMA must become more efficient. The amendments in this Bill will provide timely and welcome support to other government measures to stimulate the economy (N. Smith, 2009).

Recovery under procedural burdens may become an endless process of partially fulfilled expectations. This will most certainly be exacerbated by poor planning and unsustainable policies. Such poor planning activities result in increases in vulnerability of disaster-affected individuals or groups and could lead to a recurring disaster-poverty cycle, as were experienced in the Latur 1993 earthquake (Jigyasu, 2004) and the Gujarat 2001 earthquake (Shaw, Gupta, & Sarma, 2003) where reconstruction objectives were largely unmet. Failed recovery after the Latur and Gujarat earthquakes could be considered extreme and

unlikely in the New Zealand context, but it is clear that every post-disaster management programme requires deliberate and sustained approaches that are built upon well grounded policies and strategic frameworks (Coghlan, 2004; Comerio, 2004).

Four studies (AELG, 2005; Harper, 2006; MWH, 2004; Page, 2005) that were commissioned locally provide valuable comments on the adequacy of some disaster-related legislation and the regulatory framework in New Zealand. Some of the key conclusions from these reports justify the current research, which seeks improvement to current legislation. Specific references have been made to these commissioned reports within the thesis.

Few changes have been made in the intervening period since the release of these four reports. Although the RMA and BA are experiencing symptomatic review, of which this research has provided input to, more considerations of the impact of legislative provisions on post-disaster reconstruction is needed. Recently, Becker, Saunders, Hopkins, Wright, & Kerr (2008) reported that New Zealand's recovery arrangements have been approached haphazardly with little forethought to long-term consequences. Response arrangements during the snowstorms in the Canterbury region were ineffective and are indicative that more ground needs to be covered in the realm of emergency management. During the Canterbury snowstorms the affected areas experienced electricity outages of upwards of three weeks after the event (Hendrikx, 2006). A catastrophe in the magnitude of the New Orleans disaster that followed hurricane Katrina in 2005 or the Indian Ocean Tsunami in 2006 would pose significant challenges for reconstruction works in New Zealand, and rebuilding programmes would find it hard to cope with its legislative framework.

If reconstruction is to proceed at the speed most often desired for an early recovery from disasters, improvements to implementation guidelines and changes to legislative provisions are needed. These improvements may take the form of reviews, repeals and or waivers to the subsisting legislation and regulatory frameworks. A cursory review of studies on world disaster events show the importance of implementing enabling legislation and regulatory frameworks for

disaster recovery (Burby, Salvesen, & Creed, 2006; Meese III, Butler, & Holmes, 2005; Nigg, Barnshaw, & Torres, 2006). These studies make it clear that physical development and other environmental regulations have become restrictive and burdensome and do not allow for flexibility in decision making.

There is continuous tension between strictly applying reconstruction regulations which aim at preventing a recurrence of the previous community vulnerabilities; and allowing an affected community to move back to its former habitation quickly. Clearly, the quicker communities return to habitability of as many of their homes as possible, the better it will be for restoring a sense of normality (recovery). According to Kennedy, Ashmore, Babister, & Kelman (2008) disaster management activities should aim to 'build back safer'. For example, McDonald (2004) from a planning perspective explains that the redevelopment programme in Napier, New Zealand still portend similar vulnerability levels as was experienced during the 1931 earthquake. The city was largely rebuilt using previous planning parameters (the current study therefore does not recommend speedy reconstruction at the expense of quality of delivery but proposes enabling legislation that will facilitate robust planning processes for early recovery after a major disaster).

Decisions on the implementation of reconstruction regulations have to make trade-offs between idealistic goals and expediency. The current study believes there are opportunities for improving existing legislation and regulatory provisions, specifically the CDEM Act, RMA and BA to guide the performance of reconstruction programmes towards the achievement of resilience in New Zealand. This can be achieved without compromising the benefits inherent in these development and environmental legislation.

The study supports and focuses on a greater imperative to have appropriate systems in place in advance of any significant disaster event. This would provide for a more pro-active approach to disaster management planning and implementation in New Zealand. Past recovery and reconstruction activities have involved the modification of routine construction processes on an ad hoc basis (Reid, Brunson, Fitzharris, & Oughton, 2004). The current study shows that whilst such ad hoc arrangements may work reasonably well for small-scale



disasters, effectiveness would be improved by modifying the legislative and regulatory framework in advance of a disaster. Pre-planning allows for expedient reconstruction programmes. The study highlights the importance of making improvements in the recovery framework in larger scale disasters by ensuring that reconstruction programmes are robust and within an enhanced civil defence emergency management framework.

### **1.3 Statement of Research Objectives**

The principal focus of the study is to improve existing legislation and regulatory frameworks for reconstruction so that they facilitate the effective and efficient implementation of reconstruction programmes after large-scale natural disasters in New Zealand. The following outlines the research objectives pursued throughout the study:

- 1) To review New Zealand's emergency management framework; its guidelines on recovery operations; and related emergency management legislation. This presents an overview of existing reconstruction strategies and procedures and locates its legislative provisions within the overall recovery spectrum. This objective is largely met through an analysis of existing legislation and government policy documents.
- 2) To identify constraints that may be posed by existing legislative and regulatory provisions, in particular those contained in the CDEM Act, RMA and the BA, to the realisation of reconstruction objectives. Reconstruction problem identification is achieved through information gathered from research reports, interviews, focus groups, recovery case studies and the evaluation of legislative documents.
- 3) To investigate whether building and development control officers, and other disaster management practitioners, envisage problems in the post-disaster recovery process that are specifically caused by deficiencies in legislation. This objective is achieved through a survey designed to understand and propose the means by which post-disaster reconstruction problems could be minimised. The

survey results are verified using subject matter experts to comment on the feasibility of improvements to the deficient parts of legislation.

- 4) To suggest improvements to recovery-related legislation and regulatory provisions. The suggested improvements include reference to parts of the CDEM Act, RMA and BA that could be reviewed and realigned to allow for the implementation of significant reconstruction programmes in New Zealand. The research seeks to make specific influence on government's post-disaster reconstruction policy.

## **1.4 Scope and Limitations**

This research study falls under the ambit of research initiatives pursued under Objective 3 of the Resilient Organisations (ResOrgs) project, which is funded by the Foundation for Research Science and Technology (FRST) in New Zealand. The key research question addressed by this study is *'what improvements can be made to existing disaster-related legislation and regulatory provisions so that they facilitate the implementation of significant reconstruction programmes in New Zealand?* This research question was agreeable to high level industry and research participants at a workshop organised by ResOrgs in April 2006. Details of the research priorities identified by the workshop are included at Appendix A3, this serves to show where the current research sits within the Objective 3 (ResOrgs) research programme.

The intent of this research is to improve emergency management practice in New Zealand through research output that is both relevant to industry and practice needs. The Author has worked in collaboration with members of the supervisory committee and other researchers to produce intermediate research outputs. A list of publications resulting from this synergy of knowledge and copies of some of the Author's key articles are included at Appendices C and D1 to D7 respectively.

## **1.5 Synopsis (Organisation of Thesis)**

Chapter one introduces the research project and provides background information on the magnitude of the research problem. It goes on to justify the need for the study with a commentary on previous studies around the problem area. The research question is presented and the steps taken (in the form of research objectives) to address the research question.

Chapter two presents fundamental concepts connected with disaster management and post-disaster reconstruction. It goes on to review the structure of civil defence emergency management in New Zealand. The chapter provides the conceptual foundation to the study's approach to disaster management.

Chapter three reviews the legislative and regulatory framework for post-disaster reconstruction in New Zealand. It collates information on potential problems to implementing subsisting regulatory provisions from a review of three Acts (the CDEM Act, RMA and BA), government documents and recovery reports and case studies.

Chapter four describes the research methodology. It describes the qualitative and quantitative research methods employed for data collection; the development of the theoretical framework and; the methods used in the analysis of survey data. The chapter also outlines the ethical process and ethical issues considered by the study.

Chapter five presents the results and outcome of a workshop (focus group); an opinion survey of building and environmental control officers and disaster practitioners in New Zealand; and the result of a research verification using subject matter experts. The analyses of the data obtained is presented and discussed within the context of the research objectives.

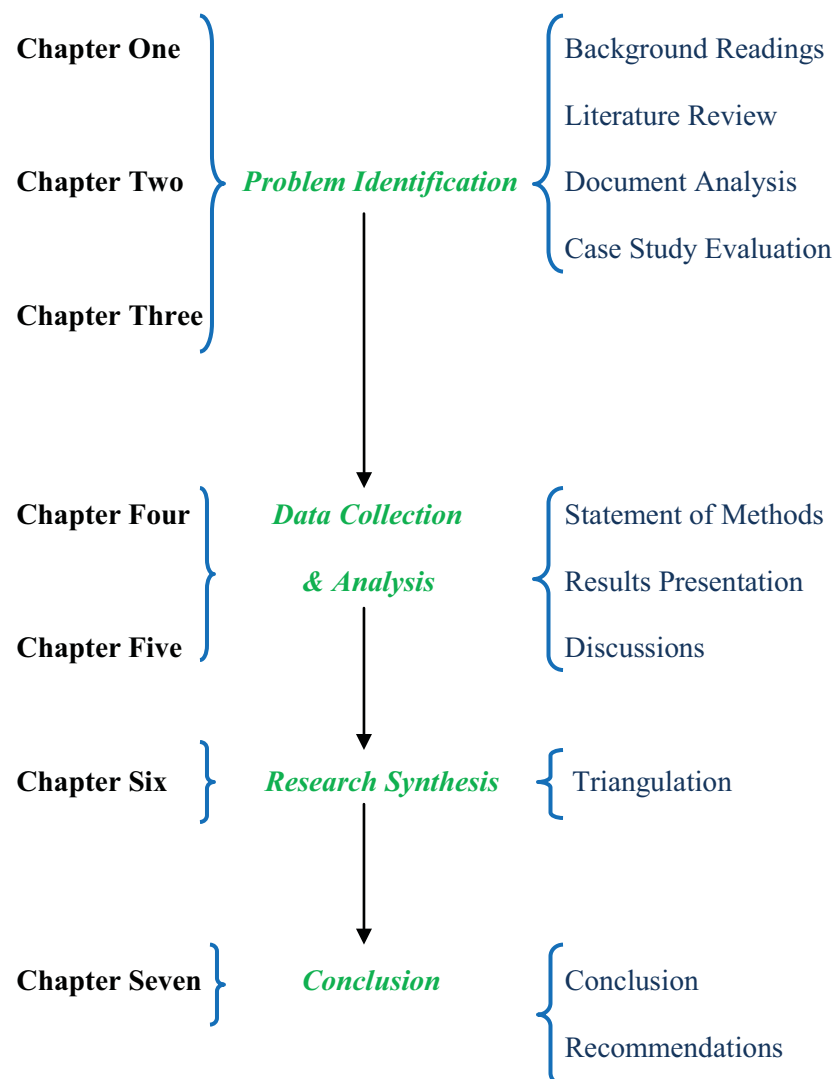
Chapter six presents a synthesis of the research findings by comparing the outputs of prior investigations discussed in the previous chapters with the opinions held by subject matter experts. Thematic analyses of the research findings bring

research closure. The chapter sieves through the key findings of the research and paves way for the recommendations in chapter seven.

Chapter Seven concludes the study by integrating all the parts of the thesis into a meaningful conclusion. The chapter provides a list of recommendations for the improvement of legislative and regulatory provisions that could enable the implementation of large scale reconstruction programmes in New Zealand.

Essentially the study is divided into four conceptual parts: *Problem Identification* covered in chapter one to three; *Data Collection and Analyses*, covering chapter four and five; *Research Synthesis* in chapter six; and finally the *Conclusion* in chapter seven. These four conceptual parts are depicted in Figure 1.1 below.

**Figure 1.1 - Thesis Outline**



## Chapter Two

### **Disasters and Disaster Recovery Fundamentals**

#### **2.0 Introduction**

This chapter describes some of the fundamental concepts connected with disaster management and other aspects which relate with the current study. It provides a review of background readings around the subject area. Some explanatory notes and working definitions that are reinforced throughout the study are presented within the context of the current study. There is a discussion on the social dimensions to recovery, to underscore the importance of recovery as not just a process of reinstating damaged physical facilities but of harnessing individuals and communities to avoid a rolling series of repercussions that could impede overall recovery. The chapter also highlights the importance of coordinating the reconstruction activities of stakeholders in post disaster management.

The chapter concludes with the relationship between disaster management and legislation. It gives an overview of the civil defence emergency management (CDEM) framework in New Zealand, as a pre-cursor to the presentation of building and environmental legislation that is covered in more detail in chapter three.

#### **2.1 Understanding Disasters**

It is important to begin with an understanding of what a disaster is. Without this conceptualization it will be difficult to know what needs to be recovered from and the magnitude of the problems that are associated with the management of disasters. Disasters have undergone several transformation of meanings and a variety of definitions (McEntire, 2001). According to Drabek (1991) the old and primitive view was that disasters were acts of God, and so the casualties associated with catastrophic events were considered some sort of punishment by supernatural beings. However with increased scientific understanding of the earth's physical environment, disasters became synonymous with their causative agents. Such a conceptualisation placed greater emphasis on disasters as naturally

occurring, while downplaying the contributory (and critical) role of humans towards the disasters (McEntire, 2001; Weichselgartner, 2001).

Present day understanding of disasters give disasters as not only naturally occurring; but unnatural and man-made too. The attack on the World Trade Center in New York City in 2001; coordinated bombings of public transport systems (Madrid, 2004; London, 2005; Mumbai 2006) or the changing face of political and territorial disagreements/disturbances are indicators of the magnitude of the new wave of man-made disasters that present day societies have to contend with (BBC News, 2004, 2005, 2006; National Commission on Terrorist Attacks Upon the United States, 2004). Therefore an all-inclusive definition of disaster was offered by the UN-DHA internationally agreed glossary of basic terms as:

A serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of affected society to cope using only its own resources. Disasters are often classified according to their cause (natural or manmade). (UN-DHA, 1992 p.27).

This definition provides a holistic view of disasters because it provides greater understanding of the different causes of disasters, the catalytic processes that are involved, and the interaction of disasters with the physical environment. Some disasters may overwhelm local capacity and necessitate external assistance from national or international levels, while others could be contained and effectively managed locally. Though disasters are often caused by nature, disasters can have human origins. Wars and civil disturbances that destroy communities and displace people are included among the causes of disasters. Other causes could be: building collapse, blizzard, drought, earthquake, explosion, fire, flood, epidemic, hazardous material or transportation incident (such as chemical spills), hurricane, nuclear incident, tornado, or volcanoes. This shows that a number of technology and social systems are connected to every disaster event (McEntire, 2001).

As noted there are limitless number of causes of disasters (triggering agents); many occur infrequently and impact small populations, while others may involve widespread emergencies such as health epidemics and other bio-security problems (MCDEM, 2002). The UNDP (1992) explain that some other hazards may occur

in areas that are prepared to deal with them so that the level of destruction is insignificant. The triggering agents in any disaster therefore emanate from either the natural environment or human activities and in some cases a combination of the two.

Lotke & Borosage (2006) and Comfort (2005) suggest for example that the disaster that followed 'Hurricane Katrina' was both natural and man-made. Nature created the devastation but human conservatism (demonstrated in the failure to prepare, respond and rebuild) created the catastrophe. The US national government and its disaster agencies have been accused of complacency despite the acknowledged risks and vulnerabilities posed by a break in the levee systems in New Orleans. It therefore goes without saying that the activities or inactivity of people are a great influence on the impact that a disaster will have on a community. This view is also shared by Bolin and Stanford (1998) and Mileti (1999).

The current research study focuses on the effect of natural disasters on the physical and built environment. These form of disasters are the consequences of natural events that occur when human activities and natural phenomenon become connected (Leon Abbott, 2005). Thus in areas where there are no human activities (and an absence of built facilities), a natural phenomenon will not constitute any hazard and is unlikely to result in a natural disaster (Eshghi & Larson, 2008). In other words natural disasters are the result of the interaction of triggering agents with the human population and their habitation.

In chapter one, an indication of New Zealand's vulnerability to natural disasters was presented in table 1.1. The table lists recently declared emergencies as a result of some natural events; although very few of these events had resulted in high casualties and widespread calamities. Compared to recent world catastrophes these local events may seem to be small-scale events, however considering the New Zealand setting and the impact that these events had on local response and recovery capacities, they could be considered significant.

The impact of a hazard event on local capacities gives an indication of the scale of the disaster whether significant or not. A useful distinction between different

categories of disasters in relation to their magnitudes is offered by the University of Delaware's Disaster Research Centre (Quarantelli, 2000). An outline of their categories compared to New Zealand's emergency response classifications is given in the next paragraphs.

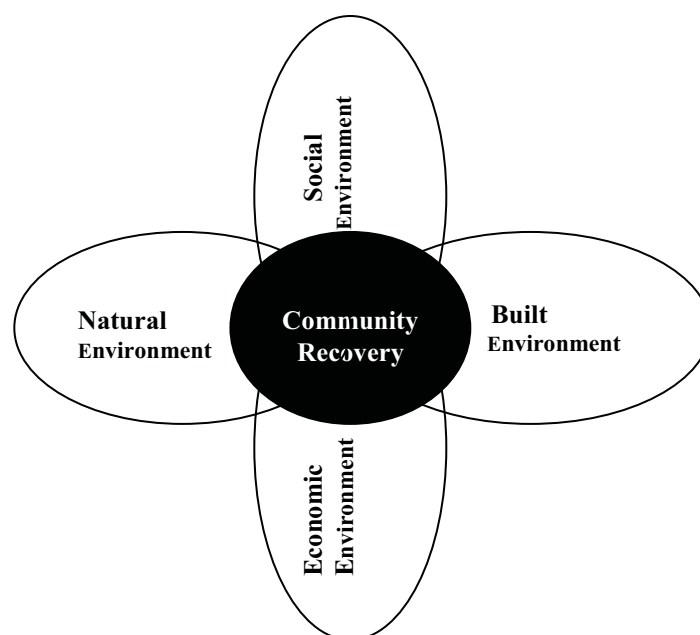
An *emergency* refers to a local event with a small geographical spread that may be managed locally without the need for additional response measures or changes to organised emergency procedures. This may equate to New Zealand CDEM group's classification of a Level 1 and 2 event type as indicated in Appendix A1 (MCDEM, 2005a). Such small and localised events may not warrant a declaration of a state of disaster emergency.

A *disaster* has a wider scale of impact than an emergency. Such an event requires more responding groups who would not normally interact in order to manage an emergency. Such an event will require the affected, to relinquish their usual autonomy and freedom to special response measures and organisation. The scale of this category of hazard event usually changes community dynamics thus requiring closer cooperation between public and private organizations to be able to respond and recover from the event. The magnitude of this hazard type necessitates the declaration of local state of emergencies which will be within the confines of a Territorial Authority's responsibility. The New Zealand CDEM plan classifies this as a level 3 and 4 event type, which requires a higher level of governmental response than in an emergency event.

A *catastrophe* is the largest scale of a hazard event that destroys most of a community. It prevents local officials performing their duties; causes most community functions to cease; and prevents adjacent communities from providing the necessary aid. Catastrophes will require some form of external aid and assistance beyond what a national economy can cater for. A catastrophe is an imminent state of national emergency classified as a level 5 event in Appendix A1 (MCDEM, 2005a). A good example of this disaster type is the destruction that followed hurricane Katrina in New Orleans. The event was described by Mitchell (2006) as an urban catastrophe with a region wide devastation, that challenged the recovery capacity of the entire United States of America.



In the context of the above definitions, recent hazard events in New Zealand fall within the disaster category (levels 3 and 4). Local states of emergencies were declared to allow for response and initial recovery activities to take place. The management aspect of recovery (reconstruction) from disasters and major catastrophes are those for which this research desires to proffer solutions to. Such events impact the four facets of a community's environment (to a greater or lesser extent). These community environments are the interrelated social, economic, natural and built environments expressed by the MCDEM (2005b) and depicted in figure 2.1. Good disaster recovery management strategies would aim at holistically addressing these four community facets (Natural Hazards Centre, 2001). A further breakdown of the four community recovery facets is provided by MCDEM (2005c). For example the MCDEM document suggests breaking down the built environment facet to: residential housing; commercial or industrial property; public buildings and assets; rural farmland and lifeline utilities (see figure 2.2).



**Figure 2.1 – The holistic recovery system**  
*Source: MCDEM (2005b)*

| <b>Social Environment</b> | <b>Economic Environment</b> | <b>Natural Environment</b> | <b>Built Environment</b>       |
|---------------------------|-----------------------------|----------------------------|--------------------------------|
| Safety & Wellbeing        | Individuals                 | Natural Resources          | Residential Housing            |
| Health                    | Businesses                  | Waste Pollution            | Commercial/Industrial Property |
| Welfare                   | Infrastructure              | Amenity Values             | Public Building & Assets       |
|                           | Government                  | Biodiversity & Ecosystems  | Rural Farmland                 |
|                           |                             |                            | Lifelines Utilities            |

**Figure 2.2 – Elements and sub-elements of a recovery system**

*Source: After (MCDEM, 2005c p.8)*

This research considers how reconstruction work (and subsequent recovery) could be facilitated for especially the built environment through improved regulatory frameworks. It believes that considerations for post-disaster reconstruction should begin before a disaster occurs. These pre-planning activities should include making the existing regulatory framework robust enough to be implemented for a major disaster or catastrophe.

## 2.2 Disasters and Vulnerabilities

Vulnerability is the dependent component of disasters and catastrophes. For example it is conceptualised by McEntire (2001) as a function of the degree of risk, susceptibility, resistance and resilience of a community to a disaster. An alternative but not completely different expression of disaster vulnerability are those given by Benson and Clay (2003) and Turner et al. (2003). They see vulnerability as the interactive component of the exposure, sensitivity, reliance, reliability and resilience of any system that is experiencing a hazard event.

Vulnerability has been expressed in many different forms. Cutter (1996) and Weichselgartner (2001) provide useful reviews of these wide range of expressions from different authors. Weichselgartner concludes that the discrepancies observed in the definitions arise from both epistemological orientations and methodological

practices. In simpler terms the differences stem from the perspective from which vulnerability is viewed. Three main themes have developed from vulnerability studies: vulnerability as the degree of exposure to risk or hazards which may be linked to pre-existing conditions; vulnerability as a social response; and vulnerability of places (S. Cutter, 1996).

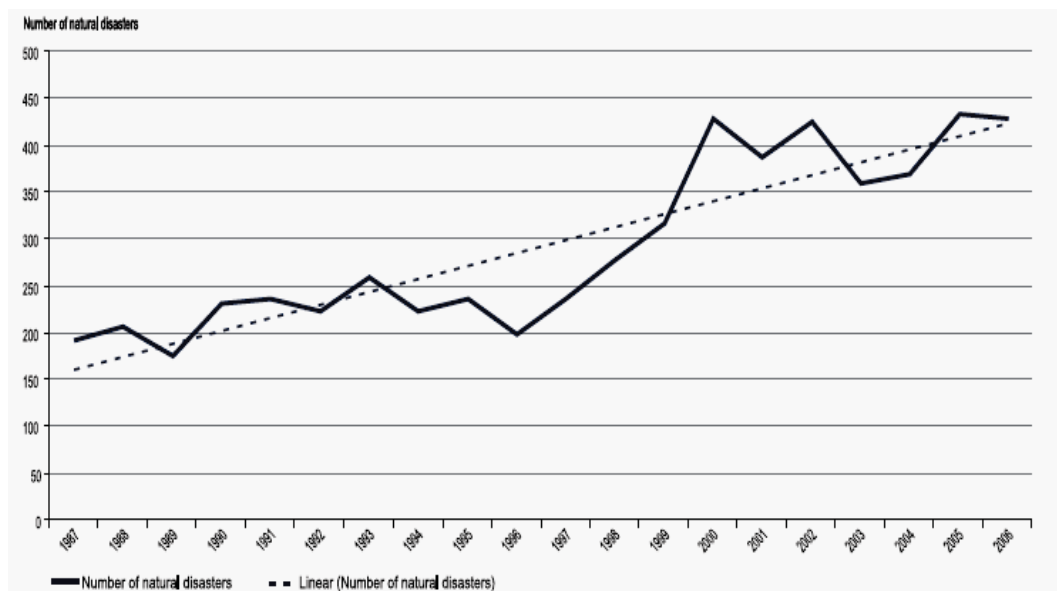
Disaster vulnerability as a result of pre-existing conditions is explained by the degree of exposure to the risk or hazard. Cutter (1996) gives a treatise of several studies that established the factors that determine disaster vulnerability due to pre-existing conditions. These factors include: the source of the hazards; the magnitude, duration, impact frequency and rapidity of onset; the nature of human occupancy of the hazard zone; and disaster mitigating characteristics of the hazard zone (S. Cutter, 1996).

Vulnerability as a social response refers to the coping responses of individuals or groups. Hence the susceptibility of social groups or individuals derive from their potential losses or sensitivity to losses as a result of any hazard event (Weichselgartner, 2001). According to Dalziell & McManus (2004) this may have both spatial and non-spatial domains. Social vulnerability explains why some individuals or groups in a community are more prone to damage, loss and suffering than others. Such groups may be characterised by their socio-economic positions like class, ethnicity, gender, or age (Green, Gill, & Kleiner, 2006; MCDEM, 2005b). Khazai et al. (2006) explain that the Indian Ocean Tsunami had a selective effect on the different sections of the society in Sri Lanka. The poorer were more vulnerable than the affluent. Consequently reconstruction policies are more likely to be skewed in favour of persons with better socio-economic status.

Vulnerability of places on another hand is more geographically centred. Mili's (2003) definition suggests for example that the potential for loss (vulnerability) derives from the interaction of the society with biophysical conditions. Biophysical vulnerability relates more to the concept of hazard risk and is probabilistic (Brook, 2003). In other words, biophysical vulnerability is the probability of the occurrence of a hazard or that of the outcome, which is a function of the event risk and inherent or social vulnerabilities.

Two sets of dominant elements are common in these and other thread of vulnerability expressions. Vulnerability is a factor of either one or a combination of both of them. These are the triggering agent(s) on one hand; and/or the coping responses/abilities (resistance, degree of fragility or resilience) and adaptive capacities of those affected, on the other. It is envisaged in the current study that the resilience of New Zealand communities can be improved through enhanced reconstruction and recovery regulations. Thus bringing about a situation where communities can recover from a disaster event without the constraints imposed by legislation and regulations. This approach pre-supposes the triggering agents as a given, or that its occurrence is inevitable (but without ignoring the potential to reduce the risk).

In recent times, the coping abilities of communities have become more adversely impaired than the prevalence of the triggering agents themselves. There is an alarmingly higher toll of losses, damage, destruction and other casualties from disasters worldwide. The Centre for Research on the Epidemiology of Disasters (CRED) published staggering statistical results of world disaster occurrence and the toll of human casualties (Hoyois, Below, Scheuren, & Guha-Sapir, 2007).



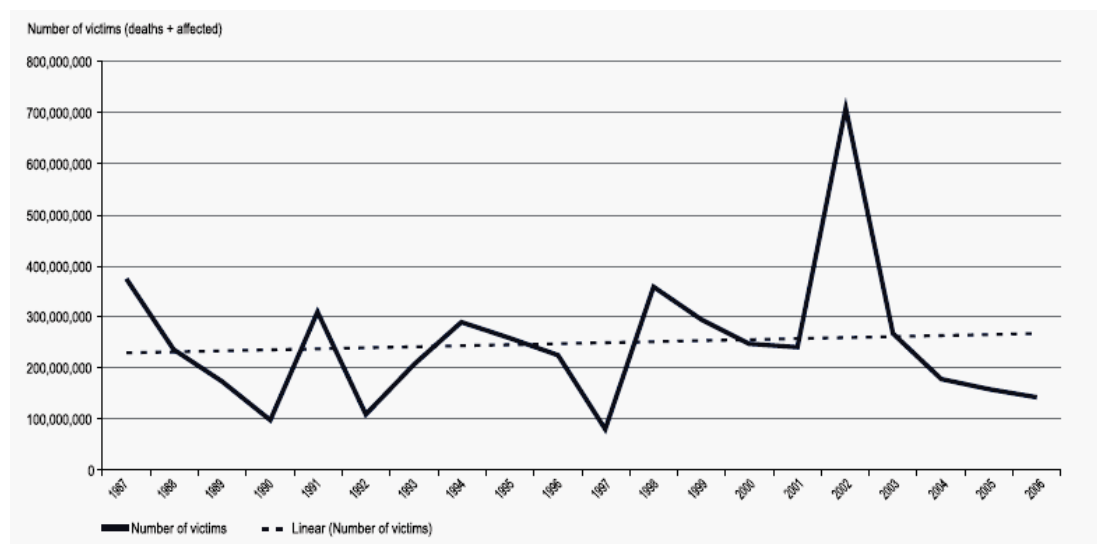
**Figure 2.3 – Natural disaster occurrence (1987–2006)**

*Source: Hoyois et al. (2007)*

The number of natural disasters and catastrophes since the year 2000 to date have increased significantly by a multiple factor of about two (Figure 2.3). The pattern hitherto was fairly regular (the pattern varied between 200 and 250) between 1987 and 1997.

Figure 2.4 on the other hand, presents data on the number of victims (persons killed plus persons affected) of natural disasters. Though the pattern displays highly variable number of disaster victims during the period 1987 to 2006; the corrected linear time-trend (in dotted lines) shows clearly an increased trend during the corresponding period.

From all indications emphasis in disaster management should be placed more on improving the resilience of vulnerable communities. This correlates with the ‘International Strategy for Disaster Reduction’ developed by the United Nations (UN) in 2000 (Britton, 2006). The UN strategy stresses the importance of building disaster resilient communities by national governments through cooperative arrangements between all stakeholder agencies.



**Figure 2.4 – Numbers of victims of natural disasters (1987–2006)**

*Source: Hoyois et al. (2007)*

Therefore greater emphasis should be accorded to local and national capacity for response and recovery as very little can be done to reduce the prevalence of natural hazard events. New Zealand for example is exposed to not less than 17

significant hazards varying from natural, technological to man-made hazards (ODESC, 2007). The list of hazards include: earthquakes, volcanoes, landslides, tsunamis, coastal hazards, floods, severe winds, snow, droughts, wildfires, animal and plant pests and diseases, infectious human disease pandemics, infrastructure failures, hazardous substance incidents, major transport accidents, terrorism and food safety. These hazards pose serious risks to its human population and infrastructures; however its vulnerability has increased not because of these hazards but its ability to recover from them. For example research evidences suggest that resource availability could constrain reconstruction efforts (Bhesram, 2007; Hopkins et al., 1999). The current research study shows that in recent natural disasters in New Zealand, response and recovery capabilities could benefit from improved framework enabled by appropriate legislative provisions. This and other related aspects are covered in more detail in chapter three.

The response and recovery capacity of New Zealand communities are further exacerbated by developmental growth patterns. According to ODESC (2007) a greater percentage of the population (86%) is vulnerable to significant hazards because they are located in its urban centres. This is why recent disasters in New Zealand have been significant. Since 40 years there have been more flooding incidents (table 1.1 depicts a more recent pattern of floods), rain-causing landslips and debris flows that have caused significant damage to properties and have necessitated the evacuation of people from their otherwise permanent abodes (ODESC, 2007).

It is a general and widespread phenomenon for the human population in urban areas to expand into areas that have a high risk of being impacted by hazards. This pattern of development increases disaster risks and vulnerabilities. The situation is even more prevalent in developing countries (AUDMP & ADPC, 2003; Quarantelli, 2003) where new urban settlements and residential developments are located in landfill sites, hilly regions and industrial zones. Further are the so-called 'lifestyle' properties springing up around coastal areas (which in many of the cases encroach subsisting coastal buffer zones) where urban growth and human activities have increased vulnerability to hazards. To reduce disaster vulnerability and also minimise the potential contribution of these development

activities to hazards; Brennan (2003) suggests merging both development planning processes and disaster risk management activities. In other words, development planning which incorporates the prior assessment of hazard risk levels may prove valuable to streamlining developmental growth in a manner that reduces exposure to disaster elements. This point will be made clearer in subsequent parts of this thesis.

There are reported cases where development plans have been streamlined to reduce disaster vulnerabilities in New Zealand. A notable example is the creative urban design implemented in the Totara Park, Upper Hutt to reduce the impact of a Wellington earthquake (Saunders, 2008). The design involved a setback of critical assets away from the Wellington fault line, so that the degree of damage to these assets, in the event of an earthquake, is minimal. Other examples include: Waitakere City Council's 'Project Twin Streams' which reclaimed and converted at-risk land into riparian reserves; the relocation of Kelso Township in Otago; construction of risk mitigation structures in Matata after the 2005 floods (Becker et al., 2008). Becker et. al. (2008) conclude however that these schemes could benefit from more forward planning so that sensible and sustainable decisions could be made on future land uses. Good forward planning begins with an understanding of vulnerabilities (and risks) which feeds into planning and advocacy arrangements by responding agencies. The objectives of emergency management for structured and coordinated reduction (mitigation), readiness, response, and recovery are achievable when disaster vulnerability levels are evaluated (Green et al., 2006). Such an evaluation is an effective hazard risk management strategy (Becker et al., 2008; de Guzman, 2003; Kasperson, Kasperson, & Dow, 2001) and one way of increasing community resiliency to hazards. Thus community resiliency is achieved through the alteration and subsequent reduction of a community's vulnerabilities.

It is useful to note that several factors act as catalysts to disaster vulnerabilities. Six major categories are outlined below in line with those suggested by McEntire (2001).

- a) *Physical factors*: This refers to the proximity or exposure to the triggering agents. As previously explained urban centres have become more vulnerable because of their dense human population and accounts as a pertinent reason for the establishment of development and environmental regulations such as the Building and Resource Management Act.
- b) *Social factors*: vulnerabilities due to social factors are linked to the social structure, networks and systems that exist within a community. For instance the impact of the New Orleans disaster was felt more by groups that had fragmented social networks (J. Barnshaw & Trainor, 2007). Social factors may also be explained by the level of awareness and education about the hazard events. One objective of CDEM in New Zealand is to create awareness about disasters and make individuals and whole-of-community responsible for their activities that will reduce their vulnerabilities.
- c) *Cultural factors*: this is the level of acceptance or apathy of the public towards disasters. Others may include defiance or indifference to safety precautions and regulations; dependencies and absence of personal responsibilities.
- d) *Political factors*: may include lackadaisical support for disaster programmes by responsible governments and disaster agencies; inability to enforce or encourage steps for mitigation; over-centralisation of decision making; and isolated or weak disaster related institutions. Baca and Omer (2006) have expressed that prevailing policy approaches have an influence on both pre and post-disaster impact levels; and are also positively related to vulnerability. In the words of Gavidia and Crivellari (2006 p.84) the relationship between policy and vulnerability is ‘as real as a building with the wrong foundations’. In situations where there is an incoherent normative framework (political and institutional set up) and a corresponding capacity for policy implementation; there is a greater likelihood for coordinating organisations to under-perform. From Gavidia and Crivellari perspective, incoherencies in disaster management policies could create overlaps, gaps, and non-constructive competition amongst responding agencies.



- e) *Economic factors*: example of this includes differential wealth distribution, lack of hazard insurance, sparse resources for the prevention, planning and management of disasters. The state of an affected economy (whether buoyant or poor) is positively related to vulnerability. According to Benson and Clay (2003), poor and socially disadvantaged groups are the most vulnerable to natural hazards.
- f) *Technological factors*: the list of technological factors include (but are not restricted to) lack of structural mitigation devices; environmental pollution; over-reliance on ineffective warning systems; and other poor technological judgements.

Earlier on, it was mentioned that vulnerabilities can be reduced by first gaining an understanding of the hazard events. This is achieved through the assessment of disaster risk levels. Disaster risk assessment methodology and the development of loss estimation models have been reported in several disaster management studies (S. L. Cutter, Boruff, & Shirley, 2003; S. L. Cutter & Emrich, 2006; de Guzman, 2003; Greiving, Fleischhauer, & Lückenkötter, 2006; Pelling, 2007; Turner et al., 2003), but these evaluative approaches are outside the scope of the current study.

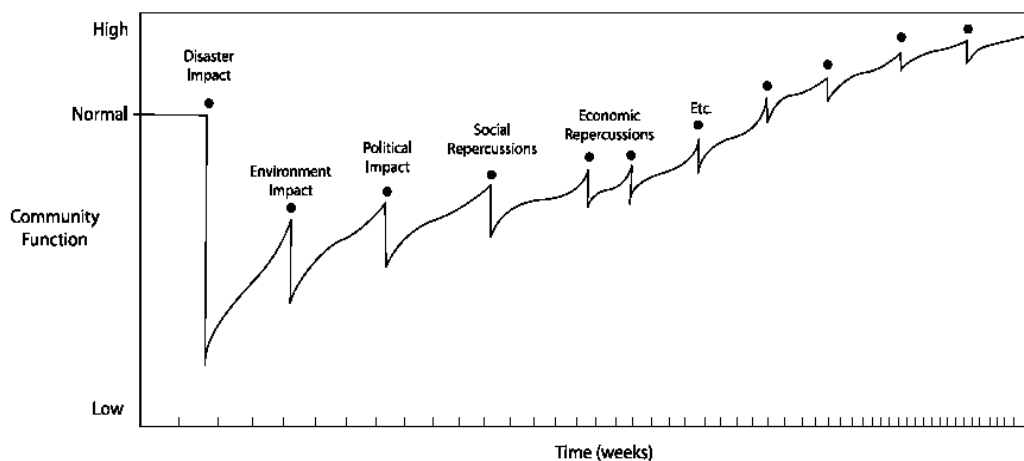
However it is worth noting that New Zealand has embraced risk and vulnerability assessment at all levels of public governance. Evidence of this is found in the National Hazardscope Report (ODESC, 2007) and regional CDEM Group Plans (MCDEM, 2005a). These documents contain risk matrices that were developed through a painstaking process of vulnerability and impact evaluations across the country. These exercises have no doubt contributed towards the objectives of CDEM in New Zealand and earned it a reputation of having a comprehensive framework that is worthy of emulation (Mitchell, 2006). The CDEM's cardinal vision is for New Zealanders to understand and routinely act to reduce, avoid and prepare to manage the adverse effects of identified hazards because the communities are aware of the benefits of doing so. There seems to be a greater understanding of disaster vulnerabilities coupled with awareness through regular campaigns in communication media. The vision for resilience in New Zealand is

encapsulated in the CDEM strategic report titled ‘National Civil Defence Emergency Management Strategy’ (MCDEM, 2004).

There is little doubt from the foregoing that the coping and adaptive capacities (resilience) of a community are improved, if communities are made aware of the hazards that they need to prepare for. The communities need to be equipped as well, with all the resources (material, financial, social and psychological) necessary to prevent or respond effectively to a crisis. The latter is where disaster resilience stems from (Green et al., 2006).

### 2.3 Disasters and their Impacts

Vulnerabilities as described previously, largely determine the magnitude of the effects of disasters on individuals and groups. These effects are varied and typically are in the form of a rolling series of repercussions (secondary and ripple effects) shown in figure 2.5. Some of these impacts may be direct or indirect and positive or negative as suggested by Quarantelli (2006).



**Figure 2.5 – Process of disaster repercussion with multiple impacts**

*Source: Gordon (2004 p.131)*

Direct impacts of disasters include death and injuries (physical, traumas or illness) to the human population; and or the destruction (in part or whole) of the physical environment, infrastructures, lifelines and services; or farmlands etc. In all of the cases the normal functioning of the affected community is impaired at the initial impact. Subsequently other indirect impacts may be experienced such as those on

the environment, political system, social structure, the economy and other developmental programmes. The magnitude of the effects of the triggering agents on a community is largely dependent on activities undertaken before, during and after the hazard event (Becker et al., 2008; McEntire, 2001). These are the realms of opportunities where good national recovery policies underpinned by legislation could play pivotal roles. Prior to any disaster or catastrophe, hazard mitigation practices and emergency preparedness activities could help to reduce the adverse effects of hazards; while after the event the effectiveness and efficiency of response and recovery programmes that are implemented (coupled with community recovery resources and any extra-community assistance); will determine how quickly normalcy is restored into the affected community (Lindell & Prater, 2003; Natural Hazards Centre, 2001).

Several factors contribute to the magnitude of destruction caused by different disasters. Some of these are described in line with Singh's (2007) research study below:

- a) The size and situation of an economy before the event. For example, under-developed economies have more potential to suffer greater damages from disasters. (Benson & Clay, 2003; Pelling, 2003);
- b) The structure of production or the nature and scale of the phenomenon (the triggering agent). Different types of disasters produce different impacts (Hoyois et al., 2007);
- c) The moment (time and duration) at which the disaster takes place. The low level of damages recorded during the 2007 Gisborne earthquake in New Zealand, could be attributed to the fact that the quake took place after normal work hours;
- d) The degree of social organization and participation (Gordon, 2004). The fragmented nature of the social networks that existed in New Orleans accounted for the impact the disaster had on the populace (J. A. Barnshaw, 2006);

- e) Political and institutional capacity; and
- f) The manner in which the affected government, the wider society and the international community respond to the disaster.

Part of the ripple effects generated by a disaster may include the disruption of ongoing developmental initiatives within a community (Lindell & Prater, 2003). There is a cause-effect relationship between disasters and development. Developmental initiatives may be impacted through: the shortening of the life of development investments because of loss of resource inputs and or diversion of available resources into unplanned disaster management programmes; general disincentives to invest further; unemployment and loss of income; and political instability (Asgary, Badri, Rafieian, & Hajinejad, 2006; Lindell & Prater, 2003).

Disasters significantly impact communities' social structures and systems, either in the short-term or over a relatively longer time frame. This often manifests as unique social problems (Drabek & McEntire, 2003). Lindell and Prater (2003) have expressed social impacts in the form of psychosocial, socio-demographic, socio-economic and socio-political impacts. These distort existing social bonds within a system thus individual and group roles may become discarded in favour of improvised responses to the immediate disaster threat (Gordon, 2004). Dalziell & McManus (2004) suggest similar de-bonding of group systems within business organisations.

Two patterns of responses may be exhibited by individuals and groups after a disaster; these are emotion-focused coping or problem-focused coping responses (Lindell & Prater, 2003). The former response pattern causes emotional and behavioural situations like fatigue, depression, anxiety, nightmare etc, which could continue over a longer-term; while the problem-focused coping responses positively gear individuals or groups to address the disaster event. The latter response pattern explains why individuals or groups demonstrate altruism and cooperation in order to organise rescue operations and to seek a restoration to pre-disaster normalcy (Drabek, 1986). According to Mileti (1999) this response pattern sees victims becoming rescuers, bursting into action, usually in a controlled and rational manner, providing or seeking help with some skill,

competence and effectiveness. In the same vein, Auf De Heide (1989) opined that altruism is exhibited when different organisations begin to share tasks and resources across jurisdictional boundaries, oftentimes without any form of standardisation. Altruism is individuals' and groups' innate strategy for surviving a hazard. According to Gordon (2004) every system requires systematically organised bonds and relationships to function effectively, therefore in spite of an initial de-bonding caused by a hazard, a need to re-bond is eventually evoked.

Damages caused by disasters ultimately result in economic losses (whether direct or indirect). Natural disasters in themselves are a reflection of negative economic impacts they have on the society and its other productive assets (Andersen, 2003). The economic losses from a disaster are exacerbated by a combination of the increase in the frequency of natural and man-made hazards and of inherent vulnerabilities that are previously described in this chapter.

In conclusion, disaster impacts are varied but could be summed up to include physical, socio-cultural, economic and psychological aspects. It is important that any recovery management activity that is implemented by coordinating agencies take a holistic approach that will cater for all of the different impacts aforementioned.

## **2.4 Disaster Response, Recovery and Reconstruction**

The occurrence of a disaster elicits response at different levels within a community (or a system). Individuals or groups (whether directly affected or not); organisations and businesses; responding agencies and external aid agencies; and in fact every facet of the community will be expected to play a role in alleviating the impacts of the disaster event. The following sections describe the nature of response, recovery and reconstruction at post-impact, within the context of the current research study.

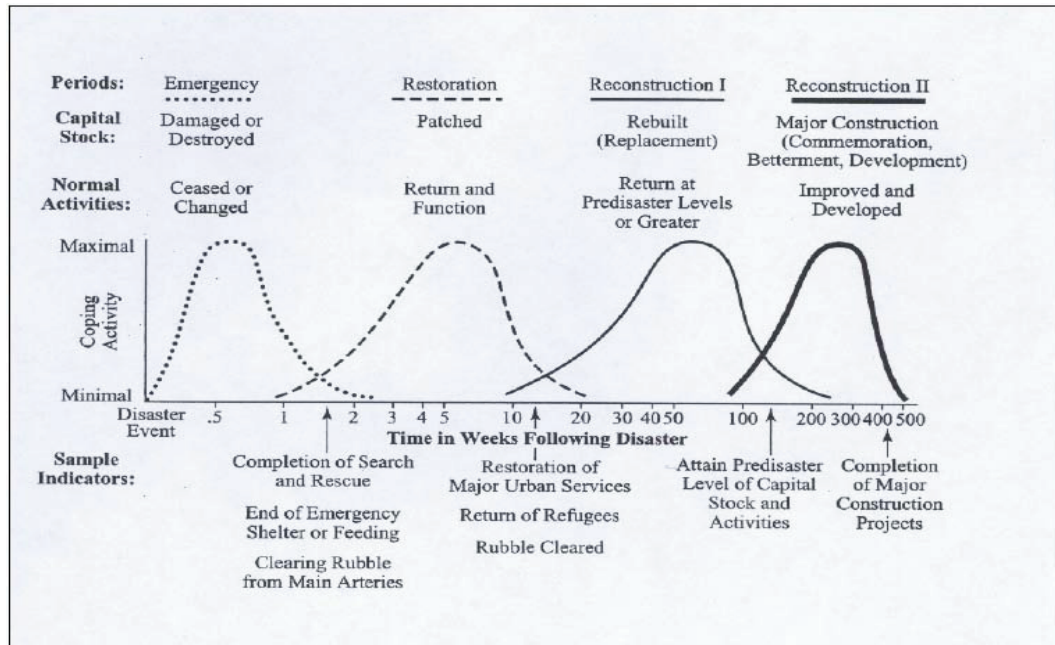
### **2.4.1 Disaster Response**

Response is what takes place at the immediate post-disaster impact and is generally in line with seminal studies reported by Haas, Kates and Bowden (1977)

on the entire recovery timeframe. Response is a transition phase towards more sustained recovery activities that will return the affected community to situations of normalcy. Response is considered the first phase of a series of four overlapping sequence of post-disaster recovery activities (Kates & Pijawka, 1977; Sullivan, 2003; Vale & Campanella, 2005) as indicated in figure 2.6 below. Each succeeding phase takes approximately ten times longer than the preceding phase; but a simultaneous programme of activities could shorten the entire recovery timeframe (Sullivan, 2003). The response phase corresponds to the emergency or crises period when normal, social and economic activities either cease or are drastically affected. It is more often characterised by chaos and disorganised response. The end state of response is when no more search and rescue operation and all safety evacuations are completed (as indicated in figure 2.6).

Usually, the focus of responding agencies at this post-disaster stage will be on mitigating the effects of the disaster on the human population and the provision of suitable shelter after the devastation. Responding agencies go through four sub-phases of response as suggested by Harrald (2006) These are ‘storming/forming’, ‘norming’, ‘performing’ and ‘transition’ phases shown in figure 2.7. This response pattern is similar to individual or group/community reactions described by Drabek (1986); or response of social systems suggested by Gordon (2004). Response is initially altruistic and disorganised but over time becomes more orderly. Response is mostly activity-focused involving all-of-community action towards assisting the affected.

Initial disaster response takes the form of ‘storming’ the place of impact (ground zero) with all the resources available, while other external resources are being mobilised (Harrald, 2006). This initial phase is often characterised by chaos, but the ability to transcend this sub-phase depends to a great extent on pre-planned response arrangements. Harrald suggest three other phases that follow the initial chaotic response phase.

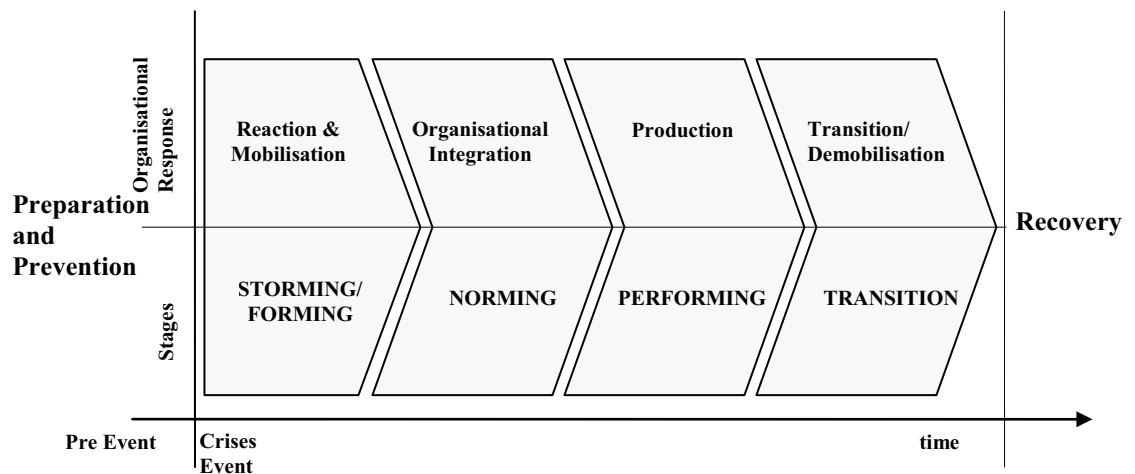


**Figure 2.6 - Sequence of post-disaster activities**

*Source: Vale & Campanella (2005)*

The second phase sees a normalised form of response programme, which may be taken over (especially in significant events) by larger organisational arrangements capable of identifying response needs and providing services that are beyond the capability and capacity of the first responders. If mobilization and integration are successful, a 'performing' or production phase is reached where larger response organisation becomes fully operational and their activities become routinised. At this fourth and final phase of response, the external presence in disasters becomes diminished during a demobilization and transition to recovery stage. Harrald suggests however that significantly large external recovery organisation may remain for an extended period of time in extreme disaster events.

From the foregoing it is clear that pre-planning activities are central to disaster response. This will determine how long the initial response will take before the final transition to the disaster recovery stage. The following factors (Harrald, 2006) are critical to the success of disaster response initiatives at the response phase.



**Figure 2.7 – Stages in organisational disaster response**

*Adapted from Harrald (2006)*

- The availability of resources that will guarantee initial life and safety responses.
- Accurate assessment of needs for people, funds, and equipment so that resource mobilisation is enhanced.
- Effective gathering of situation awareness information and sharing these across disaster organisational networks that may be involved in coordination and response to the hazard event; and
- Prior planning of organisational structures and processes to guarantee resource mobilisation.

The latter factor especially reinforces the case for advance preparation for disaster events and of the cardinal responsibilities of any coordinating unit/organisation. Therefore, setting up of a responding agency for coordinating emergency activities is a first step. Preparing the agency and whole-of-community for adequate disaster response through training, educational and public awareness campaigns; scenario planning and disaster exercises is another veritable pre-planning tool (Comerio, 2004).



Delayed response to disasters need to be avoided as this may result in emotional problems such as anger, resentment and bitterness when it becomes apparent that responding agencies are unable to meet the needs of the affected (Scurfield, 2006). Delayed response can be avoided by creating an enabling environment for all response activities to be effectively performed.

This is the perspective view of the current study, which believes that underpinning response and recovery policies with robust legislative and regulatory frameworks would help address post-disaster needs. There is no gainsaying the benefits of planning ahead for a good disaster response. To fail to plan is to plan to fail at this most critical phase of a disaster event. The response phase is the time in the entire disaster recovery phase that gauges prior planning arrangements in relation to their adequacy. The response phase also presents the most opportunistic time to plan for the implementation of subsequent recovery activities.

#### **2.4.2 Disaster Recovery**

Recovery is a term that has been used interchangeably with reconstruction, restoration, rehabilitation and restitution (Quarantelli, 2006). Its description depends on the context within which it is defined. Rolfe and Britton (1995) describe recovery as a time for repair and reconstruction of the physical infrastructure damaged after a disaster and as a healing process for communities and their residents.

Similarly Mitchell (2006) describes recovery as the process whereby a stricken community binds up its wounds, reasserts order, and acquires or reacquires preoccupations. In these contexts, recovery is synonymous with both reconstruction i.e. the post-impact rebuilding of physical structures; and psychosocial recovery (recuperation from emotional, health problems that deal with the well-being of individuals and the affected community).

Aysan and Davis (1993) see recovery as that period following the emergency phase, when actions are taken to enable victims to resume their normal lives and means of livelihood, and to restore infrastructure, services and the economy in a manner appropriate to long-term needs and defined development objectives.

These definitions denote that recovery is all encompassing of rehabilitation, reconstruction, restoration, restitution and reinstatements with the objective of bringing the affected community back to either pre-disaster or improved levels of functioning. Recovery builds on the initial response after a disaster event.

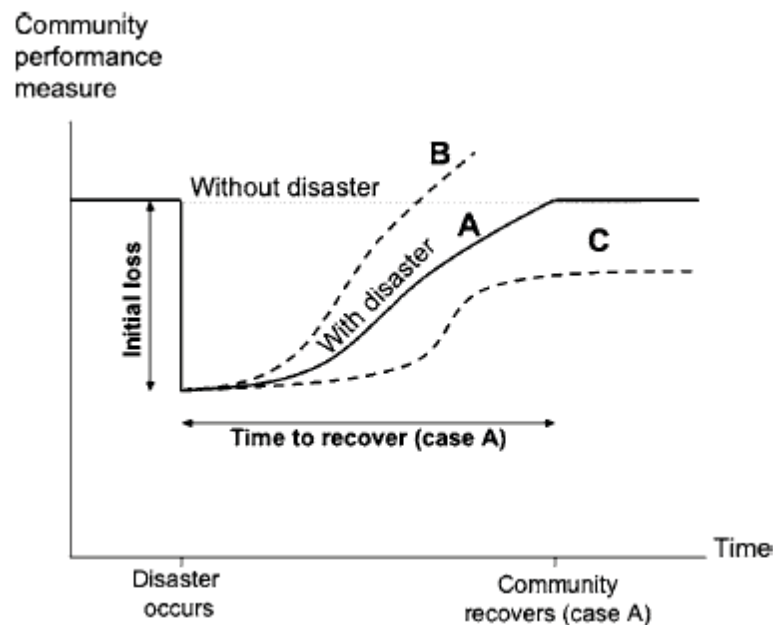
Putting the above into perspective, the working definition adopted throughout the study is that of recovery 'as the totality of activities; carried out at the post-impact stage at some point after the initial crisis time period of disasters; to progressively reinstate damages made to every facet of a community's environment'. It is an incremental process that terminates when the community's capacity for self-help has been restored. Sullivan (2003) explains that recovery activities come to an end when an assisted community reaches levels of functioning where it can sustain itself without further external interventions.

Recovery involves a series of complex social and developmental procedures that are achievable through a high degree of self-determination (Emergency Management Australia, 2004). The set of procedures involved are multi-faceted but require holistic approaches which have to be sustained over a spate of time (B. D. Phillips, 2004). Every post-disaster recovery programme should aim at returning every facet of an affected community and the elements of its environment, as early as possible to original levels (status quo); or to a time accelerated and performance improved situation. These conditions are depicted in figure 2.8 as case A and B with the graphs equating to or above initial performance levels respectively. It is quite possible also (in the worst case scenario) that an affected community, group or individuals may never recover from the event to the extent that final performance levels generally fall below pre-disaster states (as depicted in case C). In any case, communities rarely return to their pre-disaster states (Angus, 2004), but the desire is for such communities to incorporate at least all the essentials of satisfactory living hitherto experienced with at least some level of improvement.

Olshansky (2005) explains that the key success parameters for every recovery effort are speed and quality. The earlier situations can return to normalcy the better for overall recovery. In terms of quality of recovery, Mitchell (2004)

suggest that recovery be increasingly focussed towards a designed future rather than a recovered past. Hence recovery should present opportunities for improving on pre-disaster performance levels of communities.

Hazard mitigation and risk reduction strategies are able to be integrated into recovery decision making process so that the communities' adaptive capacity is improved and they become more resilient to future disasters (Brennan, 2003; Ingram, Franco, Rio, & Khazai, 2006). It may be possible for other developmental and growth goals that may have been missed as a result of the disaster event, to be recaptured as future developmental initiatives during recovery (Bolin & Stanford, 1998).

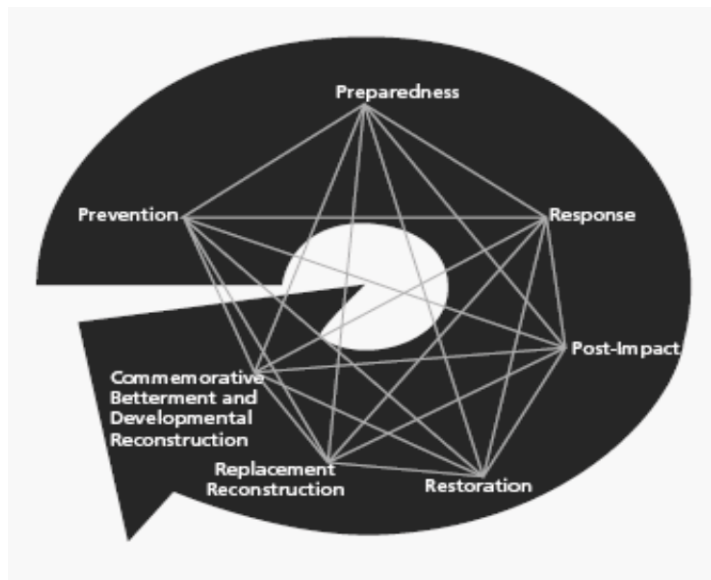


**Figure 2.8 – Schematic of recovery**

*Source: Miles & Chang (2006)*

There is therefore a two way relation between pre and post-disaster activities. For example an effective recovery process affects future planning activities and in turn is affected by prior plans and contingency provisions. This complex interrelationship is depicted as a web of activities on a more integrative variant of the recovery process in figure 2.9 (referred to as the Charlottes' Doughnut). The doughnut shows that recovery activities and considerations do not actually commence after disasters but before. This view is also expressed by Rubin, Saperstein, & Barbee (1985) who take the view that recovery activities are a series

of illogical sequences. In a similar vein, Schwab, Topping, Eadie, Deyle, and Smith (1998) and Sullivan, (2003) submit that the recovery model developed from Haas, Kates, and Bowden seminal study are an approximation of the reality. Sullivan (2003) explains that post-disaster activities do not take place in a sequential order but in concert, in a certain continuum that incorporates the broader emergency management elements of prevention, preparedness and response to emergencies and disaster events. These elements are interwoven as a network of activities as depicted on the Charlottes' diagram. Preventative and preparedness activities play significant roles in the entire recovery process and vice versa. This explains why communities with prior plans in place are able to recover faster than those without any form of plan.



**Figure 2.9 – Charlottes Doughnut**

*Source: Sullivan (2003)*

According to Davies (2006) recovery should portend an experiential learning cycle so that the *experiences* gained during the period are *analysed* and become *action plans* for future recovery programmes. To be successful on post-disaster recovery programmes, certain principles need to be followed. Sullivan (2003) suggests some of the following principles:

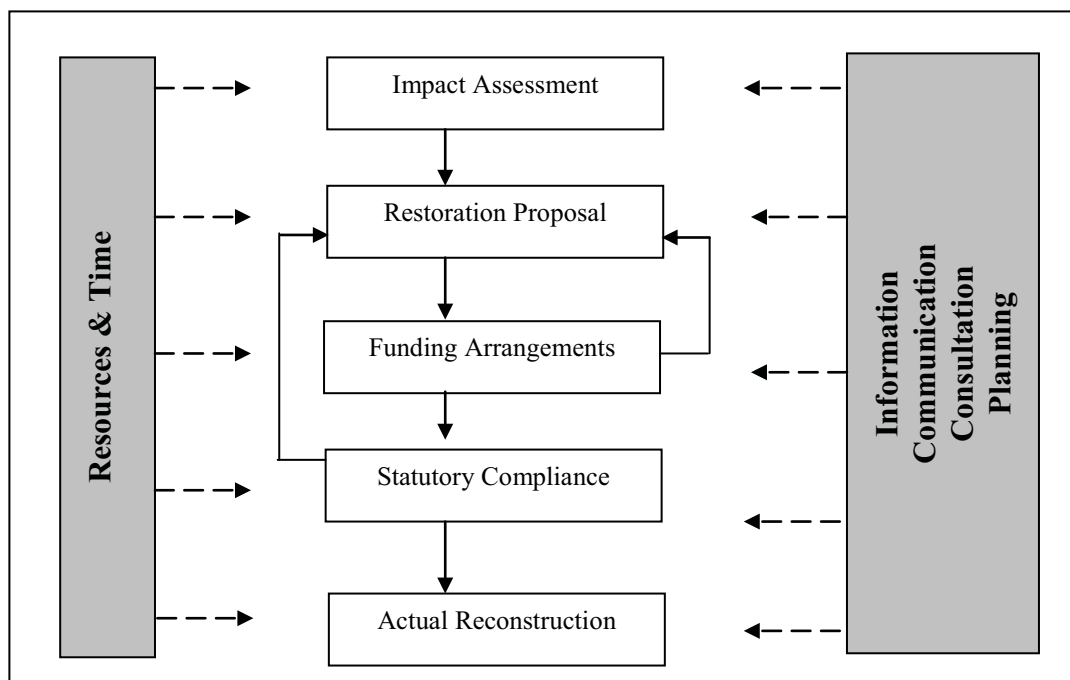
#### *2.4.2.1 The fundamentals of a recovery process*

- a) Consultation and communication are central to the success of recovery activities. Stakeholders need to be included in every decision that is made so that both understanding and commitment is guaranteed. Sullivan refers to a community-centric approach vital to all planning and management arrangements for recovery. Such an approach (community-centric approach) enables collective decision making (Rubin et al., 1985) and mutually supportive partnership among disaster stakeholders (Mitchell, 2006). Consultation and communication are important recovery policy initiatives.
- b) An entire recovery process must be enabling and supportive, designed to assist the affected community to attain an appropriate level of functioning/performance (Lizarralde, 2004; Sullivan, 2003).
- c) The recovery process must be flexible and amenable to changes. This is easily facilitated through integration and information exchange among all stakeholders to the process.
- d) Recovery begins at impact but a comprehensive consideration of recovery management needs to be cultivated well before an event actually occurs.
- e) Recovery needs to be supported by training programmes and scenario exercises to ensure that personnel/agencies are adequately prepared to perform their roles.
- f) Finally the recovery process has to be comprehensive, integrated, timely, equitable, fair and flexible. There has to be a link between a recovery plan and actual delivery.

The complexity of relationships or interdependences between what happens before and after a disaster are recognized by the current study. The study anticipates that the learning oriented evaluations that will be undertaken of past disaster recovery/reconstruction arrangements would yield useful insights for future planning activities in New Zealand. This is one of the objectives of the research study.

### 2.4.3 The Disaster Reconstruction Process

Reconstruction is a subset of recovery and according to Quarantelli (2006) it refers to the post impact rebuilding of the physical structures destroyed or damaged in a disaster. Disaster reconstruction passes through five key stages/processes as is conceptualised by Brunsdon and Smith (2004). The following paragraphs are loosely based on their reconstruction process model which is presented as figure 2.10.



**Figure 2.10 – The Post-Disaster Reconstruction Process**

*Source: Brunsdon & Smith (2004)*

- a) Impact Assessment - The first set of activities usually undertaken towards the reconstruction of damaged facilities is the assessment of damages and impact. This begins after the initial emergency/crisis phase (when search and rescue operations and evacuation operations have been completed). At this stage information is collated on the magnitude of the disaster event on individuals, community(s) and the physical environment. The planning of all recovery operations also commences. The result of the impact assessment exercise becomes the basis for future reconstruction works. This exercise lends itself to reviews and updating to take account of new information at later stages. Every

stakeholder in the reconstruction process is enlisted so that a comprehensive *Needs Assessment* report is prepared through inspection and survey of the damage. The success of this exercise is greatly enhanced by information gathering, collation and dissemination approaches; coupled with the level of interaction and planning arrangements that exist between the different disaster stakeholders.

- b) Restoration proposal - After the initial needs assessment exercise, decisions have to be taken on whether to repair, replace or demolish affected properties. Subsisting development regulations will determine what needs to be done in regard to repairing, replacing or demolishing affected properties. *Restoration Proposals* give an outline of the anticipated reconstruction needs. They are usually submitted to finance institutions as one of the requirements for funding; and to physical development control departments to meet compliance requirements.
- c) Funding – Reconstruction funds may be raised privately; through Insurance companies; and from external donor agencies or charities. In New Zealand for example, residential property owners are insured by the Earthquake Commission (EQC), which is the primary provider of natural disaster insurance. The EQC insurance covers damages caused by earthquake, natural landslips, volcanic eruption, hydrothermal activity, and tsunami. The outcome of funding and other statutory compliance applications may necessitate adjustments to initial restoration plans, hence the feedback arrows shown on the diagram. Some other factors apart from economic considerations may impact on restoration programmes. These may include structural integrity, safety, and functional/historical/cultural significance of the property to the owner.
- d) Statutory Compliance - When funding arrangements are ongoing or concluded, the next stage in the reconstruction process involves the application for resource consents and building approvals. This phase in the reconstruction process is usually painstaking for both the party(s) seeking approvals and the approving authorities. Approving authorities need to ensure that performance

quality and safety provisions are not compromised. It is necessary to ensure that a considerable level of resilience is incorporated in all post-disaster development proposals. New knowledge gained from disaster events should facilitate the adjustment of subsisting design concepts so as to mitigate future disaster risk.

Statutory application and documentation procedures have been known to slow down reconstruction programmes (Burby et al., 2006). The entire process is worsened by the absence of skilled designers and processing officials. According to AELG (2005) resource unavailability is likely to affect New Zealand's reconstruction capacity in the event of a large-scale destruction of physical infrastructure.

Thus the period when statutory compliances/consents are pursued is usually characterised by disillusionment of affected individuals and the community. This is because of delays/failures in planning and other inefficient support systems which may ultimately result in unfulfilled hopes (Lotke & Borosage, 2006; Scurfield, 2006).

- e) Reconstruction - The final phase is the actual implementation of the reconstruction works. This is the reinstatement and regeneration stage in the entire recovery programme where conscious efforts are made to reinstate the built environment and other facets (natural, social and economic environments) to normalcy.

The time period for complete reconstruction is relatively indefinite. It could last months, years, decades after the disaster event. It is quite possible also that the community or individuals may never recover from the event or that performance levels after recovery may exceed pre-disaster levels (as depicted previously in see figure 2.7). What is certain however is that with the right organisational arrangements some semblance of early recovery could be attained. The sooner this is achieved, the better for overall recovery. Suffice to mention that the reconstruction process may not be as straightforward as those presented above, and certainly the logistics of implementation results in many complex dilemmas. In the words of Davies' (2006):



...many [disaster dilemmas] concern the relentless pressure for rapid recovery from all quarters which is set against the normal demands for prudent planning, detailed consultation, reviews of safety requirements etc. There is also the demand for reform to be balanced with another pressure for realism or a return to pre-disaster norms. In facing most dilemmas both issues are needed and need to be balanced and integrated into a unified policy and in many cases the resolution of such dilemmas may be addressed through parallel initiatives using 'action-planning' approaches (p. 18).

These dilemmatic reconstruction decisions are social, physical and political in nature. They result in conflicts between implementing a speedy recovery and the needs for safety or quality (which reduces initial vulnerabilities); or even speed versus wider community participation in decision making. These are the complexities associated with disaster reconstruction and recovery. Ingram et al. (2006) conclude that relief and short-term recovery efforts can be urgent and rapid; but longer term recovery would have to be cautiously implemented. Long term recovery programmes have to be based upon comprehensive assessments of risk and vulnerabilities; and balanced with overall recovery needs. At the center of all recovery decisions are the stakeholders whose recovery needs have to be continuously recognized throughout the process. Wider consultations with disaster management agencies on recovery decisions (directions) cannot be overstated.

Political dilemmas are traceable to faulty decision making and implementation strategies by policy makers. Burby (2006) presents two disaster paradoxes to explain national or local governments' complacencies in throughput reconstruction programmes. The first is the *safe development* paradox where governments choose a cautious approach to nationally-driven (re)development programmes. Such safe policies could fail to reduce the potential for future catastrophic destructions and economic losses from disasters. The second paradox is the *local government* paradox which occurs at the lowest level of government hierarchy. In both cases insufficient attention is given to policies that will limit vulnerabilities. Public policy decisions on disaster management at all levels of governance can be short sighted, by adopting quick-fix solutions that may not stand the test of time. Burby's paradoxes were evident in the New Orleans disaster of 2005. There was both a lack of foresight on the consequences of a break in the levee system and also of policy for response and recovery from the event. Clearly

hasty reconstruction programmes have longer-term impacts that may be difficult to undo and could generate further increase in disaster vulnerabilities (Ingram et al., 2006). Reconstruction decisions should therefore be a trade-off between idealistic goals and expediency. Post-disaster reconstruction decisions should result from well articulated, coordinated and implemented policies which is the subject covered in the next section.

## **2.5 The Primacy of a Coordinated Post-Disaster Reconstruction**

Earlier the study reviewed the dilemmatic problems associated with post disaster management giving reasons for the importance of coordinating reconstruction activities to achieve desired objectives. Post disaster reconstruction decisions can have either good or bad consequences but a lot depends on how activities are planned and implemented (Weichselgartner, 2001). The cause-effect relationship between pre and post-disaster activities (decisions) cannot be overstated. The Charlottes' diagram presented previously (see figure 2.8) demonstrates the complex web of disaster activities that will have to be coordinated to achieve useful objectives. Chief amongst post disaster management objectives is to enable a community to recover from the event whilst also future-proofing the community and its physical facilities against similar disaster events. This increases its resilience, reduces vulnerability and ultimately prevent a secondary post disaster tragedy (Brewster, 2005).

In the pursuit of reconstruction objectives, it is not unusual for conflicts (resulting from conflicting priorities for example) and discord to ensue between affected groups, government, and recovery providers during the recovery spectrum (Drabek, 1986). Such a situation affects morale and people become susceptible to depression, despondency and emotional exhaustion. Gordon (2004) suggests that the situation leads to misunderstanding and alienation at all levels of a community's social fabric. A number of factors may account for discords amongst stakeholders during reconstruction and recovery. Auf De Heide (1989) gives three of these factors to include:

- a) scarcity of information and or breakdown in communication among recovery stakeholders;

- b) challenges posed by the management of limited recovery resources; and
- c) excessive response and recovery provisions by external aid agencies and outsiders. As they say too many cooks spoil the broth.

Schneider (1992) suggest that stakeholder conflicts may also result from the emergence of new social norms after a disaster event which may not mesh well with traditional norms. From an individual or group perspective, stakeholders then struggle to re-establish or maintain their previously recognised roles, responsibilities and boundaries during the recovery phase. So that new groups that emerge after a disaster event may have difficulty working together with already established ones (Quarantelli, 2006).

Whatever are the reasons for discord, the issues have to be properly managed otherwise they could have lasting effects on individuals and the community at large. Typically the effects may be long-term chronic social and psychological effects (manifested through cognitive, behavioural and adaptive responses); or be short-term in the form of restiveness and in-cohesiveness in community partnerships. Picou, Marshall, and Gill (2004) study suggest that the scale of litigations among stakeholders during the implementation of reconstruction programmes could become very extensive because of disaffection with the recovery process (and when recovery needs are unmet).

Reconstruction and recovery as a whole would therefore gain immeasurably from being implemented as a fully integrated process. Vulnerable individuals and groups need to be prepared for imminent post-disaster complexities through both pre and post-event arrangements. The approaches have to be conscious; concerted; strategic (Lizarralde, 2004; S. K. Schneider, 1995) and sustainable (Monday, 2002; Ye, 2004) enough to accelerate the process of reinstating the disaster-affected communities. An all-hands-on deck approach cannot be overstated to stem the disaster from overwhelming recovery capacities.

The position taken by the current study (and which is reinforced throughout) is that the rational starting point should be the implementation of robust recovery and reconstruction framework that is underpinned by enabling legislation. The

formation and implementation of viable regulatory framework will help guide the interaction and interrelationship of all recovery stakeholders and will be a vital tool for coordinating future post-disaster reconstruction activities (Parker, 1992; Spence, 2004). Consideration would need to be given to special powers, rights or responsibilities of all disaster stakeholders. These rights and responsibilities have to be well defined, during the implementation of disaster management policies and programmes.

Legislation provides the legal sanction on disaster policies and action plans (ACTIONAID Nepal, 2004) especially as they will need to be integrated with other national or local development planning policies by respective government hierarchies. New Zealand could benefit from a thorough review of its legislation and regulatory arrangements in advance of a significant disaster event. Pre-planning the implementation of enabling recovery-related legislation and regulatory provisions should therefore facilitate the achievement of its disaster management goals and objectives. In conclusion, Schwab et al. (1998) provides useful arguments to support the need for pre-planning for recovery. These include:

- Prior plans reduce the chances for making short term decisions that could limit future options. ‘A plan can identify options and define priorities ahead of time, ensuring that the first decisions following the disaster represent the community’s long-term wishes’ (Olshansky, 2005 p. 8).
- Plans prevent public officials from making ‘pressure of the moment’ decisions that could result in failed opportunities to achieve improved community recovery.
- The pre-planning process itself is a valuable tool for building consensus around a vision before a disaster. In this way all stakeholders have common objectives and shared commitments towards previously determined rebuilding decisions.
- Plans position a community to access post-disaster funding because the planning process provides officials opportunities to examine a wide range of

funding options and to decide on the best way to source and apply for funding before a disaster event.

## **2.6 Civil Defence and Emergency Coordination in New Zealand**

In this section the emergency management framework of New Zealand is discussed. The section traces its evolution from a response-oriented system to its current pro-active system of emergency management. All emergency management activities are largely coordinated by the Ministry of Civil Defence and Emergency Management (MCDEM) in New Zealand. The Ministry's activities are guided by the provisions of the CDEM Act which will be discussed in more detail in chapter three. However the development of CDEM activities could be traced back to the first introduction of an Emergency Precautions Scheme (EPS) in 1939 (Lee, 1990). The focus at inception was to protect the public in the event of war and hostilities but this has been progressively developed to an all-hazards coordinating role. Table 2.1 summarises the developmental milestones of New Zealand's CDEM up to its current form.

Current CDEM arrangements evolved from the lessons gained from significant world disaster phenomena. First were the disaster management experiences of the Northridge (California) earthquake in 1994, where the need to develop more effective coordination between lifeline utilities and emergency services were identified (Britton, 2006). Angus (2005) explains that around this period in New Zealand, hazard and resource management work was variable and isolated, and carried out at the local community levels by the various local authorities. The New Zealand Fire Service provided much of the manpower with the Police as the law and order authority. This earlier approach had significant gaps and deficiencies with respect to dealing with major 'nationally significant' disasters in the category of the Northridge earthquake, and needed reviewing. Secondly, other world disaster phenomena like the Kobe (Japan) earthquake which occurred in 1995 triggered world-wide reaction and brought about alternative approaches to disaster reduction activities in vulnerable communities. Notably the 'Yokohama Strategy and Plan of Action for a Safer World' was developed in response to disasters in the magnitude of the Kobe earthquake (Angus, 2005).

**Table 2.1 – The Development of the CDEM Act (Major Milestones).**  
*Source: Culled from Britton (2006) and Lee (1990)*

| S/No | Civil Defence Act/Legislation   | Year |
|------|---|------|
| 1    | <b><i>Emergency Precautions Act</i></b><br>The Emergency Precautions Scheme (EPS) with focus on protecting the public in the event of war   | 1939 |
| 2    | <b><i>Local Authorities Emergency Powers Act</i></b><br>The introduction of powers and functions to local governments to respond to both natural disasters and war-like threats.  | 1953 |
| 3    | <b><i>Local Authorities Emergency Powers Act</i></b><br>Previous Act reviewed to reflect the possibility of direct attacks with nuclear and non-nuclear weapons. This led to the formation of a Ministry of Civil Defence in 1959   | 1958 |
| 4    | <b><i>Civil Defence Act</i></b><br>Public protection against major disaster, nuclear or other armed attack.   | 1962 |
| 5    | <b><i>Civil Defence Act</i></b><br>An update of the previous  | 1983 |
| 6    | <b><i>Civil Defence Emergency Management Act</i></b><br>Reviewed based on recommendations of the following reports: Law Commissions 1991; CAE 1991; and Civil Defence review panel 1992. The Act takes cognisance of New Zealand's increased vulnerabilities to natural disasters, public sector reforms and modern realities. More impetus for the review came after the <i>Wellington after the Quake Conference, 1995.</i> | 2002 |

The 'International Strategy for Disaster Reduction' (ISDR) was a policy initiative developed afterwards to change world emphasis from reactive disaster management approaches to disaster reduction as an integral part of sustainable development (EM-DAT, 2006). Britton, (2006) explains that the launch of the ISDR by the United Nations (UN) in 2000 coincides with changing emphasis towards holistic approaches to disaster research and practice. The UN document suggested strategies for the implementation of cooperative arrangements between individual national governments and their sub-governments; and with other

stakeholder agencies. Significant contributions made by these declarations and which has impacted CDEM activities in New Zealand is that of a paradigm shift to the management of risks as opposed to earlier focus on the management of hazards alone (Coles & Buckle, 2004). Building and environmental development legislation in New Zealand have embedded appreciable degree of risk considerations along those of the management of disaster risks.

Systematically and progressively, New Zealand's disaster management system moved from conventional response-oriented system for small local emergencies to more pro-active multi-agency approaches across the 4Rs of reduction/mitigation, readiness/preparedness, response and recovery (Angus, 2005; Britton, 2006). Britton (2006) sums up the different approaches that several national government have taken since the holistic disaster concepts were developed, to include:

- the development of public policies for the protection of lives, the economy and natural resources from the hazard events,
- enhanced community and stakeholder involvements,
- establishment of nodal agencies that are responsible for inter-institutional coordination and arrangements,
- legal and regulatory provisions, and
- overarching strategic frameworks that outline how disaster management links with other essential governance requirements.

Britton (2006) goes further to outline some of the differences in attributes between New Zealand's emergency management system and other countries (Japan and the Philippines). These differences are presented in tabular format in Table 2.2. It would seem from his analysis that New Zealand's disaster management system has a more holistic approach and more in tune with the concepts proposed or recommended in world disaster strategic documents. New Zealand's current disaster policy agenda therefore is to build resilience in its communities through their understanding of their vulnerabilities (MCDEM, 2005b). This philosophy is explained further in the following section.

**TABLE 2.2 – Disaster Management in Three National Systems**  
 Source: Adapted from Britton (Britton, 2006)

| COUNTRY<br>ATTRIBUTES        | JAPAN  | NEW ZEALAND  | THE PHILIPPINES   |
|------------------------------|--|--|---|
| Overall Approach             | <ul style="list-style-type: none"> <li>• Centralised/Directive</li> <li>• Fragmented</li> <li>• Reactive</li> </ul>  | <ul style="list-style-type: none"> <li>• Decentralised/Cooperative</li> <li>• Inclusive/Nationwide approach</li> <li>• Proactive</li> </ul>  | <ul style="list-style-type: none"> <li>• Centralised/Hierarchical</li> <li>• Fragmented</li> <li>• Reactive</li> </ul>  |
| Supporting Platform          | Incremental  | “Greenfield’s Approach” to develop best fit  | Ad hoc  |
| Legislation Characteristics  | <p><i>Disaster Countermeasures Basic Act (1961)</i></p> <ul style="list-style-type: none"> <li>• 15 Generic Acts</li> <li>• 28 Hazard-specific Acts</li> <li>• Reactive</li> </ul> | <p><i>Civil Defence and Emergency Management Act (2002)</i></p> <ul style="list-style-type: none"> <li>• Risk-based</li> <li>• Proactive</li> <li>• Empowering</li> </ul>  | <p><i>Presidential Decree 1566 (1978)</i></p> <ul style="list-style-type: none"> <li>• Reactive</li> </ul>  |
| Disaster Management Approach | <ul style="list-style-type: none"> <li>• Product-focus</li> <li>• Impact-based</li> <li>• Technical research/ response</li> </ul>  | <ul style="list-style-type: none"> <li>• Process-focus</li> <li>• Consequence-based</li> <li>• Mitigation/response</li> </ul>  | <ul style="list-style-type: none"> <li>• Task-focus</li> <li>• Impact-based</li> <li>• Response-focus</li> </ul>  |
| Decision-making Style        | <ul style="list-style-type: none"> <li>• Reactive</li> </ul>   | <ul style="list-style-type: none"> <li>• Proactive</li> </ul>  | <ul style="list-style-type: none"> <li>• Static-reactive</li> </ul>   |
| Level of Specificity         | <ul style="list-style-type: none"> <li>• Hazard-specific</li> <li>• Structural mitigation dominates</li> </ul>   | <ul style="list-style-type: none"> <li>• All-hazard</li> <li>• Integrated mitigation</li> <li>• Promote risk reduction</li> </ul>  | <ul style="list-style-type: none"> <li>• Non-specific</li> </ul>  |
| Focal Agency Attributes      | <ul style="list-style-type: none"> <li>• Cabinet Office</li> <li>• Non-military Head</li> <li>• Policy-advice</li> <li>• Operational advice</li> </ul>                             | <ul style="list-style-type: none"> <li>• Ministry within the Department of Internal Affairs</li> <li>• Non-military Head</li> <li>• Policy advice</li> <li>• Operational control</li> <li>• Warning advice responsibility</li> </ul> | <ul style="list-style-type: none"> <li>• Department of Defence</li> <li>• Military Head</li> <li>• Operational control (OCD)</li> <li>• Policy coordination (NDCC)</li> </ul> |



### 2.6.1 New Zealand CDEM Philosophy

As stated previously, the philosophy behind the current New Zealand CDEM approach is that of community engagement and increasing awareness to the different risks and hazards that communities may be exposed to. This community-centric approach was depicted in figure 2.1. New Zealand expects its citizens to understand the hazards that they face and routinely act to reduce and avoid their adverse effects because they value the enduring social, economic, cultural and environmental benefits of doing so (Angus, 2005). This is encapsulated in the CDEM vision statement as '*resilient New Zealand – communities understanding and managing their hazards*'. There are four related goals that make up the national CDEM strategy as follows (MCDEM, 2005b):

**Goal 1:** To increase community awareness, understanding and their participation in CDEM activities

**Goal 2:** To reduce the risks from hazards to New Zealand

**Goal 3:** To enhance New Zealand's capability to manage emergencies, and

**Goal 4:** To enhance New Zealand's capability to recover from disasters.

The key drivers in New Zealand's disaster management are for an all-hazards and multi-agency approach which will guarantee reduction (mitigation), readiness (preparedness), response and recovery from any hazard event. The four key elements: reduction, readiness, response and recovery which are referred to as the 4Rs are described in line with Angus (2005) below:

- a) Reduction: The identification and analyses of the long-term risks to human life and property by both natural and man-made hazards. Hazard reduction activities would include taking steps to eliminate the risks posed by the hazard, where practicable and where not, reduce the probability of its occurrence and the magnitude of its impact.
- b) Readiness: involves developing operational systems and capabilities before an emergency happens. Angus (2005) lists readiness activities to include self-

help and response programmes for the general public, as well as specific programmes for emergency services, utilities and other agencies.

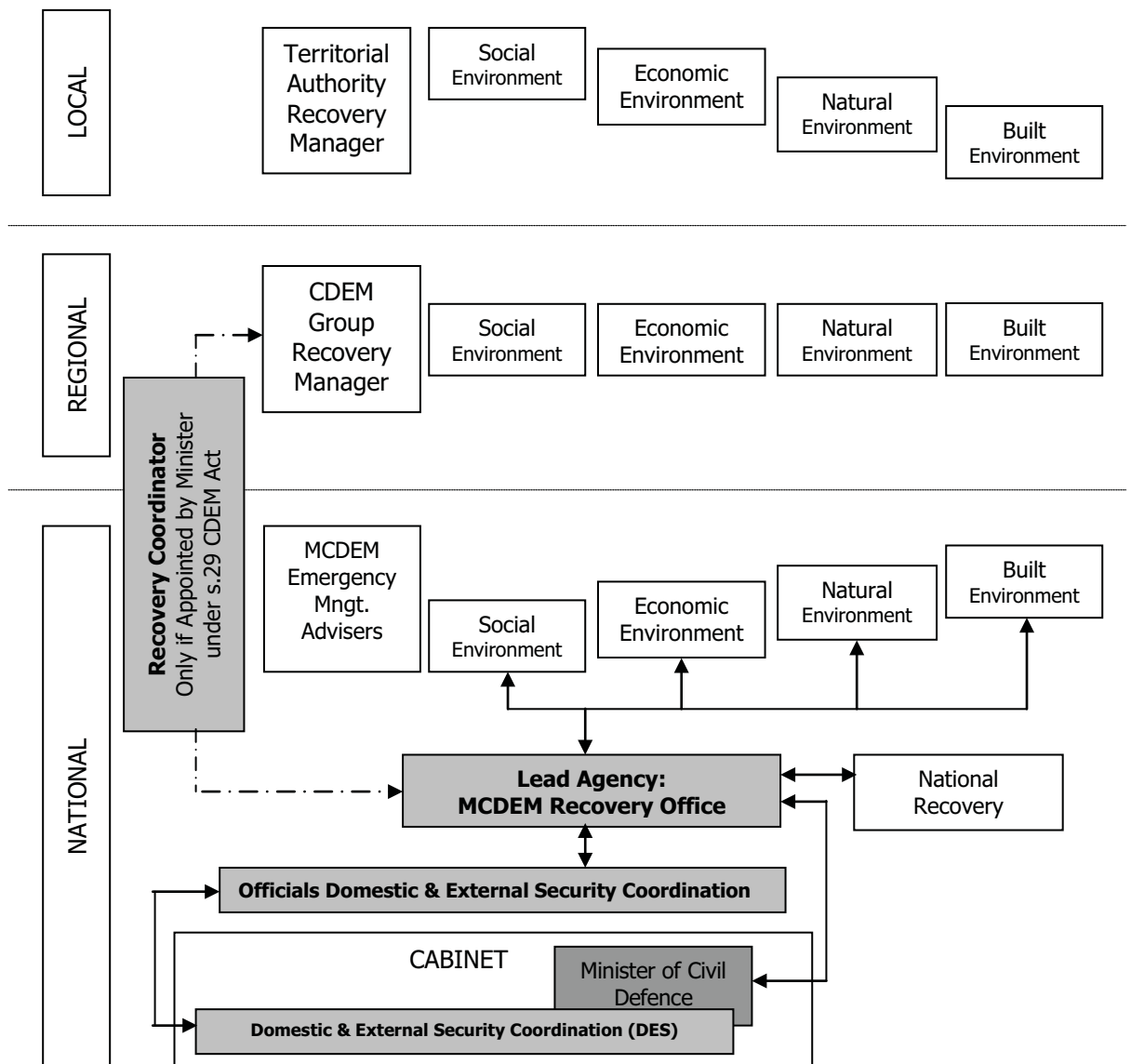
- c) Response: As previously explained response activities are actions taken at the immediate post-impact to save lives and property and to help communities to recover from a hazard event. Where there is a prior knowledge of the hazard occurring, response may include activities taken to prepare for response immediately before or during the event.
- d) Recovery: Activities beginning after initial disaster impact has been stabilised and extending until the community's capacity for self-help has been restored. A further definition provided by the MCDEM (2005b) is that recovery involves the coordination of efforts and processes necessary to effect the immediate, medium and long-term holistic regeneration of communities after a disaster.

### **2.6.2 New Zealand CDEM Recovery Structure**

A feature of the national recovery structure (pictorially represented in figure 2.11) is that all recovery activities are delivered through a continuum of central, regional, community and personal structures (Angus, 2004). Planning and coordination is achieved at all levels by the MCDEM and cluster groups of agencies. The lead agency at all government tiers, for operational planning is the MCDEM together with these cluster groups of agencies. The cluster groups suggested by the MCDEM include lifelines, health, research, welfare/recovery, agriculture and rural, emergency services etc. The goals of the clusters and related disaster management agencies are to (MCDEM, No date-b):

- clarify goals, responsibilities and roles for disaster management
- identify gaps in capabilities and capacities; and
- address the gaps through action plans.

Depending on the national significance of an emergency a Domestic and External Security Committee (DES) and or an Officials Domestic and External Security Coordination (ODESC) group (see figure 2.11) may be set up for a whole of government response and to provide strategic oversight. The structure provides for the formation of parallel task groups at each level of government (local, regional and national) in line with the four environments that recovery activities have to cater for i.e. the social, built, economic and natural environments. The generic structure may be expanded through the creation of subtask groups corresponding to the magnitude or geographical spread of a disaster event.



**Figure 2.11 – Generic national recovery management structure**  
 Source: MCDEM (2005c)

The structure allows for the appointment of a Recovery Coordinator to act as a liaison between all the hierarchical levels involved in the recovery efforts, in case CDEM groups are unable to perform recovery functions because of the scale of a disaster.

The disaster management system in New Zealand is devolved and decentralised so that initial response and subsequent recovery initiatives are based at the local levels. This system of disaster management responsibilities takes the view that communities are the ones affected and should act reasonably because they value the enduring social, economic, cultural and environmental benefits of tackling any hazard event (Angus, 2005). Higher level of involvement is activated when a disaster event is beyond local response capacities. An indication of the levels of response to different scale of events is presented in Appendix A1 (This in line with those suggested by the CDEM group plans). Essentially the chart explains how higher levels of response are being activated from single level local response (Level 1) to a multi-agency state or national response (Level 5) corresponding to the magnitude of a disaster event.

A unique aspect of the New Zealand CDEM structure is that it does not provide for a specific stand-alone organisation to manage its disasters. It behoves disaster stakeholders to plan together on how they will coordinate a multi-agency approach that will be successful, in addition to their traditional activities. Typical reconstruction stakeholders include:

- Asset owners (may be private or public and the business community);
- Lifeline agencies (i.e. transportation, utilities, telecommunication etc.);
- Civil defence and emergency management groups (national, territorial, and local government departments, police. Fire brigade, relief and welfare agencies, health and safety personnel etc.);
- Insurance companies;
- Non-governmental agencies (charities, funding organisations etc.);

- Construction and reinstatement organisations.

There has to be a robust regulatory framework that will promote interactions and foster mutual relationships amongst these stakeholders. Without such a framework, the disaster stakeholders may have difficulty in working together (Quarantelli, 2006). Rolfe and Britton (1995) have suggested that the management of recovery may become competitive between central, regional and local levels of government for control of the process. Among other considerations for a viable framework, is an understanding that stakeholders' priorities are bound to differ while they struggle to re-establish or maintain their recognised roles, responsibilities and boundaries after a disaster event.

The regulatory provisions that will be suggested by the current study would take cognisance of these issues and seek means of promoting stakeholder interactions in the best possible manner. It is hoped that the framework will provide an enabling structure for reconstruction to progress irrespective of the magnitude of the event. An important perspective from which the current study looks at legislation and regulatory provisions is that of the individual house owners. Individual house owners would have to rebuild their damaged properties on their own. It is unlikely that government will be directly involved in the rebuilding process beyond providing insurance funds through the Earthquake Commission (EQC) in the event of a naturally occurring disaster. The study believes that building and statutory requirements must facilitate the reconstruction process for this category of owners too. There has to be a trade off between a strict regime of compliances and the consequences in terms of delayed recovery. Regulations are desirable (necessary evils) during normal times but may become unbearable burdens during rebuilding programmes for this category of owners. Whilst not recommending outright deregulation of the reconstruction process, the study believes some degree of flexibility or perhaps pragmatism will benefit recovery (particularly for individual house owner reconstruction efforts).

## 2.7 Concluding Statements

The chapter has presented some key concepts surrounding disaster management literature especially as they relate to the current study. It presents the relationships between disasters and vulnerabilities; response and subsequent recovery. It has shown how vital a coordinated response and reconstruction arrangements will be to whole-of-community recovery. Underpinning the conceptual approaches to disaster management is the setting up and implementation of policies that will promote the interaction of the different facets of an affected community.

The legislative and regulatory environment has a great influence on post disaster activities. The study's position is that the legislative environment must be enabling, otherwise disaster management will pose an onerous challenge to all stakeholders. The CDEM framework in New Zealand has seemingly evolved to meet some of the complex demands associated with more significant disaster events. Its all-hazards approach has been commended in literature, however studies have shown that there is room for its improvement around the area of disaster recovery. Its disaster recovery framework needs to be underpinned by enabling legislation that will facilitate an early recovery from a significant natural disaster. Reconstruction work should not be hindered in any foreseeable way.

The next chapter therefore will review existing recovery-related legislation with a view to identifying potential impediments to the realisation of New Zealand's reconstruction objectives. It builds on the conceptual foundation that is laid by this chapter.

## Chapter Three

### Legislation and Post-Disaster Reconstruction

#### 3.0 Introduction

Having presented some fundamental concepts surrounding disaster management and given a description of the structure of civil defence and emergency management arrangements in New Zealand. The current chapter reviews some of the legal and regulatory guidelines that surround the disaster management process and its implementation. These are the Civil Defence Emergency Management (CDEM) Act 2002, Resource Management Act (RMA) 1991 and the Building Act (BA) 2004 Particular emphasis is given to post-disaster reconstruction in New Zealand and a presentation of the constraints that may be posed by existing legislative and regulatory arrangements to the realisation of recovery and reconstruction objectives. Information used for this chapter was pooled from government documents, official reports of past recovery and reconstruction programmes, and other useful academic articles. Essentially the chapter focuses on the first and second research objectives that were outlined in section 1.3 of chapter one.

There are other pieces of legislation that could influence recovery and the re-development of the built environment, apart from the three mentioned above, but only casual references are made to them within these chapter. Some of the relevant New Zealand legislation includes: District and Local Council Plans; Local Government Act (2002); Earthquake Commission Act (1993); Housing Improvement Regulations (1947); Historic Places Act (1993); Soil Conservation and Rivers Control Act (1941).

#### 3.1 Legislative and Regulatory Considerations Post Disaster

As highlighted in chapter two, legislation and regulatory requirements can have significant influence on the rate of recovery after a disaster event. It was made clear that the legislative and regulatory environment would have to be managed,

paying particular attention to changes that would need to be put in place beforehand to assist post-disaster reconstruction efforts. The overall desire is for legislation to enhance the recovery and reconstruction process so that it (presents opportunities) improves the functioning of an affected community and risks from future events can be reduced while the community becomes more resilient. Resilience in the context of the current study allows the community to be able to mitigate future disasters and recover rapidly.

Opportunities for increased resiliency do not remain for long after disasters (Cousins, 2004). The desire to return to normalcy builds quickly after disasters, and with a good flow of external resources, the opportunities to introduce mitigating measures become limited over time (Berke & Campanella, 2006). Menoni (2001 p.105) notes that, “market forces put pressures to reconstruct as quickly as possible transportation networks to long distances and commercial and office buildings, hampering efforts to implement lessons learnt from the disaster in the attempt to reduce pre-earthquake vulnerability”. Speed of reconstruction is important, otherwise victims might begin to rebuild on their own ways and at locations that controlling agencies are unable to prevent (Olshansky, 2005).

Pressures to rebuild key lifelines quickly are borne by national and local administration with the implication of reduced quality of delivery. This approach has led to even more disasters and the increased vulnerability of a poorly planned and designed built environment to future disasters (Jigyasu, 2004; Shaw et al., 2003). For example buildings reconstructed in the same vulnerable locations create increased and additional risks (Wamsler, 2004). The clamour to rebuild quickly also amplifies the social, economic and environmental weaknesses that result in large-scale disasters (Ingram et al., 2006). Extra quality and embedded forethought can help reconstructed built assets and community to be more resilient, but there is inevitably a trade-off between time, cost and quality, which recovering communities have to make (Olshansky, 2005).

In New Zealand there is an apparent emphasis on readiness and response activities, with little consideration given to planning for sustained recovery activities (Angus, 2005). Where recovery is considered, it seems to be for the



short term, as may be evident in emergency awareness campaigns that encourage communities to prepare for up to three days or more after an event (MCDEM). This demonstrates short-termism in planning for sustained disaster response and recovery. Recent emergency events clearly show that longer-term recovery plans would be required beyond seven days for the complexities associated with the rebuilding of damaged built assets. Routine construction processes have been observed to be modified on an ad hoc basis during the recovery phases in previous hazard events in New Zealand (Becker & Saunders, 2007; Le Masurier, Rotimi, & Wilkinson, 2006). Whilst such an approach can work reasonably well for small-scale emergencies, the effectiveness of reconstruction could be improved by modifying the recovery framework in advance of a disaster. Feast (1995) noted during the 'Wellington after the Quake' conference, that some form of review of New Zealand legislation was needed so that it could cope with the challenges that may be posed by significant disaster events.

Though significant progress has been made in reviewing disaster-related legislation (notably the development of the CDEM Act 2002 and amendments to building and development control legislation), there remain opportunities for improvement (J. O. B. Rotimi et al., 2006). Within the context of past experiences in New Zealand, there is an imperative to have revised systems in place before a larger scale disaster occurs. Larger scale disasters present different set of challenges beyond which New Zealand response organizations are familiar with. Pre-planning for reconstruction should therefore avoid any disaster event becoming protracted. In the words of the Chairman of the Earthquake Commission, Neville Young, 'natural disasters are by definition unpredictable and it is much more difficult to plan response under the stress of post-disaster trauma than in the calm before the storm' (Earthquake Commission, 2005).

The discussion in this chapter intends to flag some of the problems connected with the implementation of current legislation. In other words it will present the aspects of legislation that could pose impediments to the realisation of reconstruction objectives, especially when a large-scale reconstruction programme is being pursued.

### 3.2 Improving Recovery through Legislation

The current study takes the position that a well articulated and implemented legislation, should not only provide an effective means of reducing and containing vulnerabilities (disaster mitigation), but also become a means of facilitating better thought out and designed reconstruction programmes (recovery). Legislation should give legal backing to disaster management policies (ACTIONAID Nepal, 2004; Interworks, 1998).

It is evident that coordinating authorities in New Zealand would be unable to cope with a high volume of demand for their services in the event of a significant hazard event (Hopkins, 1995). Resource availability is an issue because there is a high potential for shortfalls in resources (AELG, 2005; Hopkins, 1995; Lanigan, 1995; Page, 2004; Singh, 2007). Overall community recovery would therefore be exacerbated by inadequate resources with the implication of a sustained recovery period beyond that anticipated. Evidences from literature on the recovery from the Bay of Plenty storm in New Zealand in 2005 provides valuable lessons on the complexity of issues that could impact disaster recovery efforts. Middleton's (2008) situation report of the housing situation after the flood is presented in Table 3.1. At 300 days after the event, 35 households still required permanent re-housing out of a total of 300 compulsory evacuations. At the same time nine households were still occupying temporary accommodation. Middleton (2008) suggests that the situation was traceable to the inadequacy of personnel to carry out building safety evaluations and the mandatory requirements for processing building and environmental consents. Processing of consents appeared to have been undertaken under a business-as-usual policy prescribed by existing legislation (J. O. Rotimi, Wilkinson, Myburgh, & Zuo, 2008).

It is apparent that there was a gap between the process of identifying homes that are suitable or unsuitable to continue to be lived in by residents on one hand; and of helping them to recover from a disaster so that they get back to their normal life, on the other hand.

**Table 3.1 - Temporary accommodation requirements after the Bay of Plenty storm.** *Source: Middleton (2008)*

| Period in temporary accommodation | Number of households permanently re-housed | Number of households in temporary accommodation |
|-----------------------------------|--|---|
| Up to 60 days                     | 0  | 293   |
| 60 - 150 days                     | 71   | 222   |
| 150 - 200 days                    | 140  | 82  |
| 200 - 300 days                    | 38   | 44  |
| Over 300 days                     | 35   | 9   |

Details not available after 16<sup>th</sup> March 2006 (303 days after the event)

To address the resource problems in a disaster situation, there have to be guidelines on how to access available resources either internally or externally to assist recovery. The questions that readily come to mind are:

- a) whose responsibility is it to commandeer the needed resources for reconstruction works?
- b) Would such a person/entity have the legal backing to control resources?
- c) How would externally-sourced resources be integrated with local supply? For example, how would external damage assessors be trained on local building and environment regulation; and
- d) where will the needed reconstruction funds be sourced from?

These are pertinent issues that should be included in a recovery plan and for which there should be enabling legislation to ensure their implementation.

Recently the New Zealand Society of Earthquake Engineers (NZSEE) drafted new guidelines on building safety evaluations during a declared state of emergency (New Zealand Society of Earthquake Engineers, 2009). The NZSEE's belief is that rapid evaluations undertaken during the emergency declaration period could help to start the process of recovery. Such guidelines show the need to harness human resources towards a successful recovery from disasters. With such revisions, it is hoped that the problem of damage evaluations and assessments

have been adequately addressed by the document. However the document fails to suggest how externally sourced personnel could be integrated into the re-building process (New Zealand Society of Earthquake Engineers, 2009).

After damage assessments and evaluations, building and environmental legislation should not present impediments to actualising reconstruction and rebuilding programmes. Yet several post-disaster recovery literatures have indicated that the implementation of certain aspects of development legislation could hinder the realisation of reconstruction objectives (Marano & Fraser, 2006; Meese III et al., 2005) and drag residential rehabilitation (Burby et al., 2006) after disasters. Locally, strict implementation of some provisions of the Earthquake Commissions (EQC) Act, 1993 could prevent some property owners from getting damage compensation (Page, 2005). Consequently the desire to reconstruct as quickly as possible would be affected by the absence of funds. A key provision of the EQC Act prevents property owners from transferring a large identified risk onto the EQC for settlement (Schedule 3 s3(d) of the EQC Act). It appears that this clause has not been strictly applied in past disaster events, otherwise buildings with s73 (Building Act) notices would not have qualified for compensation. The EQC is increasingly seen by the public as a disaster recovery mechanism rather than the regular insurer of properties, hence its flexible and social responsibility approach to compensations (Earthquake Commission, 2005).

There have been instances where the EQC have had to assess and administer claims which were outside its normal covered perils (Earthquake Commission, 2005). Clearly private residential property owners with limited insurance options would be more vulnerable if stricter application of the EQC provisions were applied.

Reference was made in a report commissioned by the Building Research, New Zealand to the conflicts that may exist in the interpretation and implementation of the RMA and BA (MWH, 2004). Such conflicts may cause impediments to post-disaster reconstruction processes. For example the report identified two potential sources of conflict from these legislative documents that may impact on reconstruction projects. The first type of conflict relates to the processing of

consents under the BA and the RMA. It is noted that both Acts are coordinated by different agencies, the BA by the Department of Building and Housing (DBH) and the RMA by the Ministry for Environment (MfE). The MWH report suggests that coordinating the implementation of the two documents in a disaster situation may result in legal complications. Both documents may need to be streamlined with one another to avoid legal complications. The MWH report also identified a potential source of conflict in the interpretation of the substantive contents of both Acts. Some of these conflicting issues will be discussed under each legislative document in the later part of this chapter.

The current study believes that efficiency in recovery and reconstruction programmes can be ensured through the pursuit of viable policies and guidelines. These policies would need to be underpinned by supportive and enabling legislation to ensure their smooth implementation. As was explained in previous chapters, legislation drives the implementation of recovery policies. Legislation defines powers, rights or responsibilities and promotes the interaction and interrelationship of disaster management stakeholders during initial response and subsequent recovery activities. Every stakeholder for example, would need to understand their individual and collective responsibilities which have been prescribed in recovery plans. The apparent division between those who, in practice, take responsibility for reconstruction and those who set policy and legislation create barriers that need to be overcome.

Such divisions were evident in two recent disaster exercises where Resilient Organisations team members participated as Observers. These were the Capital Quake Exercise carried out in November 2006 and Exercise Ruamouko in March 2008 (Resilient Organisations, 2008).

The debriefing reports by team members after the exercises revealed that coordination was lacking from responsible agencies and it was apparent that there was a disconnect between emergency agencies and utility providers. Coordination was identified at both exercises, as keystone vulnerability. Lack of coordination prevents responding agencies from meeting recovery objectives, which is a consequence of a poor recovery framework. An excerpt of the debriefing report

for Exercise Ruamouko is given in the text box below. The report shows the opinions of three observers on the interaction of the major responders during the disaster role play. Generally both exercises reveal that response priorities between different response organisations were unrelated, with performance carried out within organisational silos. The two reports suggested more assertive coordination responsibilities by emergency management departments during future response and recovery activities.

**How well did players understand and proactively manage keystone vulnerabilities?**

*Observer 1:*

- Badly - they did not take an active role during the exercise, were reluctant to get involved and were very passive. The team had a relaxed approach waiting for requests from Transit NZ Auckland rather than being proactive and seeking information.
- Not very well because most involved personnel did not really understand the dimensions and criticality of the event (or potential event).
- I had the perception that many were only trying to be seen to act in case there was a review, rather than actually take part and benefit from the exercise.

*Observer 2:*

- Communication was one of the keystone vulnerabilities. The size of email files with attachments caused problems due to SPAM restrictions - information sharing was limited.
- Issues with Auckland City not answering the phones.
- Organisations were waiting for information rather than proactively seeking it.

*Observer 3:*

- As for the evacuation process, only BOP [Bay of Plenty] regional council was proactively seeking information on estimated arrival numbers and responding by directing the appropriate amount of evacuees to their respective welfare centres and feeding back this information to the Excon team in a timely manner for evaluation and coordination. All of the other regions were just reacting to the injects provided, some with no direct feedbacks at any level

**Figure 3.1 Excerpt of Debrief Report on Exercise Ruamouko '08**

The problems in ineffective coordination may be traced to the bureaucratic tendencies of public officials (S. K. Schneider, 1995). An evaluative report (S. K. Schneider, 2005) on governmental response to Hurricane Katrina suggests that the

problems encountered during response activities in the event were the result of administrative elements in the emergency management system. The thesis of this current study is that improved legislation and regulatory framework could help to break down organisational silos and promote proactive approach of response agencies to disaster recovery.

The pertinent question that this study desires to address in relation to legislation and regulation is: *what aspects of legislation require review or realignment so that they facilitate reconstruction programmes?* This question recognises the importance of installing and implementing flexible but robust legislative requirements that will not hinder the achievement of recovery objectives.

The next section discusses existing recovery-related legislation in New Zealand. It is an attempt to identify the issues that may have to be taken into consideration to facilitate post-disaster reconstruction in New Zealand.

### **3.3 A Review of Recovery-Related Legislation**

The section reviews the three legislative documents that are the focus of the current study. Reference is made to key clauses and sections of the documents to put them in the context of the current study. The objectives of this legislative review are to reveal their practical implications to post-disaster reconstruction activities and to note particular aspects of these legislative documents that may constitute constraints to reconstruction after a significant disaster event in New Zealand. A brief introduction of the Acts is presented followed by a discussion of their practical implications to reconstruction. The review aims to further address objective two of the research.

#### **3.3.1 The Civil Defence Emergency Management (CDEM) Act 2002**

This is the Act that provides the foundation for civil defence and emergency management activities in New Zealand. The main purposes for promulgating the CDEM Act are contained in **Part 1 s3(a)-(f)** and include creating awareness of hazards; giving directions as to the management of those hazards; and the coordination of emergency activities across the areas of reduction, readiness,

response and recovery. To guide the implementation of the Act, a number of supportive documents were prepared by the coordinating ministry, MCDEM. Some of these documents give context to disaster recovery planning and management such as The Guide to the National CDEM Plan 2006; Focus on Recovery: A holistic framework for recovery; Recovery Planning; and Recovery Management. A complete list of MCDEM publications is available on the ministry's website. This study presented the key aspects of New Zealand's CDEM framework in chapter two.

A significant development since the promulgation of the CDEM Act has been the production of a National CDEM Strategic Plan and other accompanying guides (s39-45). It would appear from these documents that New Zealand has a coordinated structure for local, regional and national support for both response and recovery. The CDEM Plan suggested a generic national recovery structure which is depicted in figure 2.11 of chapter two. The CDEM Act has also committed local councils to produce local and regional emergency plans in consonance with the national plan and with the work of other cluster agencies (s12-22). Some of the practical implications that the current study envisages in the implementing of certain provisions of the CDEM Act are presented below. These practical problems/issues are discussed in the light of the effect they could have on a large scale reconstruction programme in New Zealand.

### ***3.3.1.1 The CDEM Act and Reconstruction***

The establishment of the CDEM Act as an overarching policy guideline for CDEM in New Zealand is widely acclaimed. The document provides for the delivery of recovery and reconstruction through a continuum of central, regional, community and personal structures in New Zealand (Angus, 2004). Such hierarchical and horizontal arrangements are necessary in post disaster management, but would need to be coordinated to avoid failure. There is often a large number of participants in every rebuilding programme resulting in conflicting implementation priorities. Thus a high level of integration of all disaster stakeholders becomes an imperative for success (Rolfe & Britton, 1995).



All stakeholders will need to understand their individual and collective responsibilities at the post-disaster reconstruction phase. Such responsibilities have to be clearly delineated within the hierarchical arrangements suggested by the MCDEM.

From a review of related literature and commentaries on the administration of the CDEM Act the following salient issues/questions are worthy of consideration.

Who should take charge of what during reconstruction?

The Act provides for the control of emergency management operations by the Director of CDEM (s9). These powers are delegated through the various CDEM hierarchies from a National Controller to a Recovery Coordinator (Dantas, Seville, & Nicholson, 2006). However s9 and other associated sections only grant the exercise of such powers during a declared state of emergency. At the expiration of an emergency period, these provisions cease to apply and routine procedural arrangements are reverted back to. Clearly a high level of integration and coordination will still be required after this period, between the different agencies and stakeholders to the recovery process. This should be extended for a longer period till some semblance of pre-disaster normality is apparent. The need for enabling powers by CDEM officials is demonstrated during the presentation of recovery experiences at previous local incidents (case studies) in later part of this chapter.

There are shortcomings in the definition of emergency powers contained in s86 to s91 of the Act. There appears not to be specific provisions on how the powers delegated to a National Controller could be exercised for lifeline utilities for example (AELG, 2005). In any case, the appointment of Recovery Coordinator is discretionary and limited to a maximum of 28 days unless they are reappointed (s29 and s30). The power to coordinate is thus limited to a declared emergency period or 28 days, whichever is longer.

Harper's (2006) review of disaster legislation provide similar conclusions on the limited powers of both Local and Regional councils. The report indicates that the

duties and obligations of these governmental bodies are not clearly expressed in legislative documents. Thus there is no control over the relationships between governmental bodies and other disaster stakeholders. The implication of these ambiguities, on who should take charge of what during recovery activities would be made clearer when the local case studies are presented later in the chapter. However it is clear that such ambiguities can lead to lack of responsibility and poor commitment (everyone's responsibility is no one's responsibility).

#### Who coordinates reconstruction?

As expressed earlier, CDEM agencies are able to direct reconstruction activities, assets and services to other organisations under the CDEM Act. However from experience there is a preference by MCDEM to coordinate and work with lifelines to set priorities instead (AELG, 2005). This is because the agencies do not generally have the resources and skills for these tasks. For example one of the duties of the Residential Housing Subtask Group that could be set up for the purposes of recovery is to “repair, reconstruct or relocate buildings – obtain fast-track building and other consents; ensure sufficient builders and materials for construction works; coordinate skilled trades and their work standards” (MCDEM, 2005c p.20). This description of duties does not match what the Residential Housing task force can take on and do not appear to concur with what has happened in practice (J. O. B. Rotimi et al., 2006). Local authorities have been responsible for the coordination of activities through their appointed Recovery Managers (Tonkin and Taylor, 2005). If a CDEM agency were to direct activities under the provisions of the CDEM Act they would become responsible for the oversight and management of all resources and services. It would seem that such overarching control is necessary.

At the micro-levels of reconstruction following previous disaster incidents in New Zealand individual property owners together with insurance companies largely undertook the management of reconstruction works on their damaged properties, while the EQC provided the statutory counterpart funds. The involvement of private insurance companies in reconstruction activities was largely undertaken as a social responsibility to customers. The efficiency of this arrangement in a large-

scale disaster cannot be guaranteed. Page (2005) suggested that bulk reconstruction contracts could be awarded by the EQC to relieve residential property owners from sourcing and managing the reconstruction process directly. Thus a coordinated response may be worthy of consideration. The EQC employed this procurement approach after the Te Anau earthquake of 2003, using a large single contractor to coordinate and manage the recovery works (Earthquake Commission, 2005). The contractor also dealt with the local authority consent processes on the behalf of property owners. Definitive conclusions have not been made on the benefits of such an approach, but it was apparent that property owners who took up this procurement option were satisfied with the outcome (Earthquake Commission, 2005). One could assume that this procurement arrangement would be an improvement in time, cost and quality over arrangements where individual property owners competed for the services of a limited number of reconstruction resources.

#### What are reconstruction needs and how are these prioritised?

Contiguous to responsibilities and powers to coordinate activities under the Act are issues linked to the identification of recovery needs and their priorities. If CDEM agencies were to coordinate activities then reconstruction priorities would have to be set by them. However this has never been the case. The current recovery framework behoves organisations and individuals to determine their reconstruction needs and to set their own priorities assuming to a great extent that this will align with overall recovery objectives. Different stakeholders in a reconstruction process have their different priorities (with limitless ramifications). Coordination remains a significant barrier to achieving effective emergency management activities (McEntire, 2002). McEntire suggests that challenges in information collation and dissemination; poor communication between field and operations centre; equipment failures; language barriers and command and control mentality are some of the factors inhibiting the coordination of emergency functions by responsible agencies.

Coordination becomes more complex when different stakeholders (organisations) are expected to determine their own recovery priorities. There are three particular

difficulties associated with the coordination of emergency organisations Quarantelli (1982) cited in Granot (1997).

- a) Diversity of the perspectives of public and private sector agencies in disasters
- b) Qualitative difference between routine coordination and disaster coordination, and
- c) Different connotations of coordination for different organisations and departments within the same organisation.

Granot (1997) explains further that organisations have distinct cultures, values, beliefs, behavioural norms and expectations that make true inter-organisation cooperation difficult to achieve. Lack of cooperation between organisations and individuals is a form of ‘silo’ (Fenwick, Seville, & Brunsdon, 2009). Fenwick et al. (2009) describe ‘silo mentality’ as divisive individual and group mindsets which manifests as communication barriers that create disjointed, disconnected and detrimental ways of working.

In emergency and disaster management, organisational silos have to be broken down to allow for cross exchange of information, shared commitment and proactive responses. Quarantelli (1988) describes how organisational silos could result in lack of consensus amongst disaster stakeholders. Silos cause breakdown in communication, co-operation and co-ordination between disaster stakeholders and consequently a reduction in organisational resilience to hazards (Fenwick et al., 2009). Wolensky & Wolensky (2005) observed similar silos in the performance of different government hierarchies in disaster management.

Rolfe & Britton (1995) suggest that the identification of needs and priorities under existing recovery frameworks may be exacerbated by the scale of reconstruction programmes, especially where the event cuts across regional and geographical boundaries. There is the potential for political and cultural conflict, since reconstruction plans and organisational capabilities at local levels differ. AELG (2005) and WRLAWG (2004) have therefore suggested the need to facilitate

stakeholder relationships in New Zealand by establishing common reconstruction needs and priorities during reconstruction.

### 3.3.2 The Resource Management Act (RMA) 1991

The RMA was promulgated in 1991 but has undergone several amendments over time to improve its implementation across a range of environment planning and development issues. The RMA promotes the sustainable management of land, sea, air and water, so that New Zealand resources are protected for future generations (Skelton & Memon, 2002). The Act provides for the avoidance, remedy or mitigation of the adverse effects of proposed activities on the environment; and also ensures that environmental principles are provided for in every resource management planning and decision-making. The RMA adopts an effect-based approach to development planning with an emphasis on the biophysical environment (J. Dixon, 2005). An outline of the specific purposes for the development of the RMA is given in s5 of the RMA.

**Table 3.2 - Types of resource consents**

*Source: Ministry for Environment (2006)*

| Consent Types        | Situational Examples  |
|----------------------|---|
| Land-use consents    | To erect a building.<br>To convert a garage in a residential neighbourhood into a shop.<br>To establish papakainga housing.                             |
| Subdivision consents | To divide a property into two or more new titles, using fee simple or unit title mechanisms.  |
| Coastal permits      | To build a wharf on the coast below the mean high-water springs mark.<br>To discharge stormwater into coastal waters.                                   |
| Water permits        | To take water from a stream for an irrigation scheme.<br>To build a dam in the bed of a river.  |
| Discharge permits    | To discharge stormwater from a service station through a pipe directly into a lake.<br>To discharge exhaust fumes from a wood-curing kiln into the air. |

The RMA is administered by respective local councils (s30-s36) but their activities are coordinated by the Ministry for Environment (MfE). The RMA is interpreted in line with respective regional policy statements (s63-s70) and district

plans (s72-s77) to ensure that the entire New Zealand environment is managed sustainably. Each local policy document identifies the environmental issues specific to its region or district; and set out the plans, objectives and methods for achieving the desired sustainable environmental results (J. Dixon, 2005). Table 3.2 gives an indication of the different types of resource consents that can be applied for under the RMA, with examples of where the consents may be required.

In the next section the practical implications of the RMA on post-disaster reconstruction activities are discussed. Information for this section was pooled from the analysis of the RMA and commentaries from other relevant literature.

### ***3.3.2.1 The RMA and Post-Disaster Reconstruction***

The reconstruction and rebuilding of damaged physical properties after a disaster may require the application of the RMA, as in normal developmental projects. However the need for urgency common to post disaster reconstruction projects may cause cumbersome delays in the implementation of certain aspects of the Act. It is not unusual for environmental legislation to become an impediment to the realisation of reconstruction objectives. Evidence suggests that the impediments may occur as a result of procedural constraints inherent in development legislation (Meese, Butler, & Holmes, 2005); and consequently they become sources of vulnerability (Gavidia & Crivellari, 2006).

Some of the impediments envisaged during the implementation of the RMA in a significant reconstruction programme in New Zealand are discussed under the following paragraphs.

#### Issues associated with bureaucracy and procedural requirements

The RMA requires people to submit applications for a permit (resource planning consent) before their proposed physical (re)developments projects could proceed (s9-s23). Approval for such permits is granted by the councils (referred to as the Consent Authority in s30, s31) with consultation and agreement with the affected local community. This consent application process provides for an assessment of

any likely environmental impacts of the proposals and how these would be mitigated. The potential effects of any development proposal on the environment (whether minor or major) will determine whether the resource consent application should be publicly notified, require limited notification or non-notified (**s93-s95**). This requirement for public notification influences the processing time for resource consents. For example, the maximum time allowed for a non-notified consent decision to be reached is 20 working days from the date of lodgement of an application, while a notified consent decision will take a maximum of 50 working days or 70 working days if a public hearing is necessary. A typical flowchart of the consent process is included as Appendix A2. Times for processing resource consents are indicative only; as the times may be extended in situations when higher than normal volumes of consent processing are encountered (Ministry for Environment, 2006).

The implications of the consent process can be understood from the two-yearly survey conducted by the Ministry for Environment on local authorities. The 2007-08 survey found that only 69% of consents were processed within the statutory time limits (Ministry for Environment, 2009). This figure is lower than 73% realised in 2005-06 survey period (Ministry for Environment, 2008). Some underlying issues pertaining these results were unmasked in an IPENZ position paper on the RMA (IPENZ, 2008). For example, IPENZ believes there is the need to address the non-compliant cases (31% that could not be processed within the statutory time) within reasonable timeframes to avoid a spike of workload on the consenting authorities. There is little doubt that consent applications would overwhelm local councils' capacities during post-disaster recovery. There would be a spike of applications (above normal applications) which already has about 31% backlog of unattended applications. Delayed processing causes unnecessary cost burdens to applicants, since their development projects will have to be put on hold till approval is granted. In New Zealand the issues associated with RMA consenting delays have always been protracted and never empty of resentments (McShane, 2003; Page, 2005).

### Emergency Work Prioritisation Issues

The RMA caters for redevelopment works that may be required under situations of urgency. **Section 330** of the Act deals with works considered emergency which may have resulted from a disaster event. This is the key section that gives powers to a person or entity to undertake emergency works or to take preventative or remedial action without necessarily obtaining resource consents when one would normally have been required (Harper, 2006). Similarly the section gives backing to activities considered immediate, necessary and sufficient to remove the cause of, or mitigate any actual or likely adverse effect of, any emergency (**s330(2)**). *Immediacy, necessity and sufficiency* are the key qualifying conditions governing the application of **s330** of the Act. However the person or entity that is granted the emergency powers must have the capacity to do so. **Section 330 (a)–(c)** gives three sets of qualifications for persons or entities to be able to carry out emergency activities under the Act. The practical application of **s330** is that the proposed work must meet the emergency criteria before a bypass of the stipulated consent process can be activated, as long as the Consent Authority is advised within seven days that the emergency work was undertaken. In the event that the adverse effect and the emergency works continue, an application for resource consent must be made within 20 working days of any initial notification (**s330B**).

In spite of **s330** provisions, the RMA was considered burdensome and a source of frustration during reconstruction works in the Manawatu flood of 2004 (Tonkin and Taylor, 2005). Much valuable time was lost trying to develop an understanding with the Regional Council about emergency actions that would cover all situations under the RMA, rather than requiring a formal process for each activity. The possibility for time wasting by the RMA on significant national projects was attested to by the current Minister for Environment, Nick Smith (2009) while presenting a case for the review and realignment of the RMA after 18 years of its existence.

Public notification is unique to the RMA and allows community members in the immediate environment to work through all environmental impact issues before the local councils commit to a development project. However the stipulated



notification and consultation procedures have further implication on post disaster recovery. At one extreme, strict implementation of the notification process may slow down recovery. Time is wasted going through submissions for and against a proposed development. In the event that a decision is not reached at the council level, the consent applications are transferred for hearing at the environment court. At the other extreme, there is the risk of non-participation by concerned parties which could negate its usefulness (Clark & Newlove, 2001). Thus redevelopment projects that could potentially harm the surrounding environment may be wrongfully permitted.

### Dealing with Nationally Significant Projects

Another dimension to the implementation of the RMA is the potential effect it could have on the rebuilding of critical infrastructure post disaster. Of the 0.69% of the total consents declined in the 2005-2006 period, some were for major infrastructure projects that were in the national interest (IPENZ, 2008). Though the RMA provides for a fast track process for projects of national significance (**s6, s141**), there is no indication that critical reconstruction projects are adequately covered by this provision (McShane, 2008). Criteria such as the cost of projects, scale of projects, sphere of influence on the public are well established in the RMA; however there appears to be no specific criterion that could enable the classification of some reconstruction projects as being in the national interest. The absence of specific criteria to fast-track critical reconstruction projects has the implication of delaying the projects beyond acceptable timeframes.

McShane (2008) suggests a cost-benefit assessment whereby the potential benefits of a proposed development would become an additional criteria for classifying projects of national significance. Such assessments could be applied to reconstruction projects too so that public infrastructure projects and critical lifeline utility projects with demonstrated public/social benefits may be sped up through a bypass of normal consent processes. With increased clarity on the projects that are nationally significant, Ministerial call-in provisions in the RMA (**s141(B)**) could be applied to shorten the consenting process for such projects considerably.

### The RMA and Litigations

The RMA has been the subject of litigation (Ministry for Environment, 2003) as a result of protracted procedures and development control decisions. The Ministry for Environment 2007-08 report show that there were 722 appeals transferred to the Environment Court. These large number of appeals places considerable load on the court system. In a disaster situation such prolonged litigation periods may impact whole-of-community recovery after a disaster (this is discussed in more detail later in this chapter).

### The RMA and Civil Defence Legislation

The RMA expressly recognises the activities of a CDEM group in the event of a civil defence emergency (**s330B**) whereas local authorities and network utility operators will exercise powers under **s330** (Harper, 2006). Harper posits that the responsibility for actions undertaken during a civil defence emergency will rest on the delegating body whether, the CDEM group, local authority or Minister. In the event of a significant disaster event, it is expected that the Minister of civil defence and emergency management will take control and can exercise its powers within emergency provisions contained in both the CDEM Act and RMA. During a declared emergency, **sections 9, 12, 13, 14 and 15** (relating to the obtaining of resource consents) of the RMA cease to apply, therefore civil defence legislation (CDEM Act) supersedes (Harper, 2006). While the foregoing may not be considered an impediment to emergency activities, the issue of concern lies with the re-emergence of resource consent processing after the expiration of a declared emergency. The pertinent question to ask is: what steps could be taken to prevent the problems of delays associated with consent processing occurring after a declared civil emergency has been lifted?

### **3.3.3 The Building Act (BA) 2004**

The Building Act provides for the regulation of building works, the establishment of a licensing regime for building practitioners, and the setting of performance standards for buildings for purposes outlined in **s3** of the Act. The Act prescribes

the requirements of the national building code which requires buildings and other associated features to meet certain performance standards such as durability, fire safety, sanitation services and facilities, moisture control, energy efficiency and access (**s16, s17...**). The Act is administered at the national level by the Department of Building and Housing (DBH) and at the local level by Building Consent Authorities (BCA) and Territorial Authorities through a building consent process (**s12**). The responsibilities of BCAs under the Act are complemented by Licensed Building Practitioners who are expected to have undergone an accreditation and certification process to enable them act in the capacity of consent and code compliance officers.

The practical implications of implementing the provisions of the BA are discussed under the following heading. Particular emphasis is given to the problems that could be experienced during reconstruction after a significant hazard event in New Zealand.

### ***3.3.3.1 The BA and Post-Disaster Reconstruction***

Building consent processing involves individual property owners, their designers/builders and the Building Consent Authorities. An application for consent is required for all building work in connection with the construction, alteration, demolition or removal of a building (**s40**) with some minor exceptions. Consent is granted when the BCA is satisfied that the proposed works are in accordance with the building codes and associated regulations. Under normal circumstances, the building consent process is expected to take 20 days (**s48**), though the reality is far from this. The Act requires a strict inspection of work progress during construction at 'hold points' corresponding to progress milestones. Each defined stage must be inspected and certified before subsequent stages can be started. Inspection provides some certainty about code compliance and construction quality, and ensures that constructed works are in accordance with the original work specified in the approved consents. At completion of all works a Code of Compliance Certificate (CCC) is issued (**s91-s95A**).

The BA is laudable as a risk-mitigating document for proposed development and redevelopment projects. It would allow for improved construction technology and facilities that could reduce vulnerabilities after a hazard event for example. But strict implementation of some of the BA provisions could create problems during reconstruction projects. Some of the issues which are culled from related literature are discussed under the following headings.

#### Issues contiguous to consent processing

Relevant sections of the BA appear to give some clarity on the building and alteration works that will or not require an application for consents. However in the event that building or alteration work is carried out in situations of urgency (as may be the case after a disaster); there are no special provisions in the BA for territorial authorities to issue retrospective consents for work that has been undertaken without the necessary building consent. It behoves the property owner therefore to apply for consent before any remedial work is carried out on a damaged property; and consequently a code of compliance certificate issued at completion. A property owner (vendor) may have limited opportunities to sell without a code of compliance certificate. Property law requires that the owner of a property for sale must guarantee full disclosure of the availability or non-availability of the necessary permits and where appropriate a code compliance certificate (The Real Estate Institute of New Zealand, cl. 6[8]). It is not clear what implications such disclosure will have on sale value in terms how a buyer will view a certificate of acceptance in relation to a code compliance certificate during sale transactions.

The BA's provision for works that do not have to comply with building codes is likely to generate implementation problems during reconstruction programmes. There is a special waiver under the BA to allow building consents to be granted subject to a waiver or modification of the building code (s67-s70). The determination of the appropriate circumstances when this section can be applied has been left to the discretion of BCAs. BCAs are required to prepare policies and guidelines on how this discretion can be exercised, but this is not being done across all councils (DBH, 2005). In somewhat similar requirements, BCAs are to

prepare guidelines for collaborating with other councils and disaster agencies for resource sharing and deployments in a disaster situation. This is required to provide donee councils relief during the likely demands for external services when consent applications increase.

Processing of building consents at the early stages of reconstruction and recovery are a potential bottleneck (AELG, 2005). Access to normal resource levels is unlikely and so there will be shortages of qualified persons and material resources to handle impact assessments and consent processing. More flexible approaches to the standard consent process might be necessary to expedite the consenting process and help cope with high volumes of consent applications after a major disaster. As a fall out, the potential complexities during response and recovery after disasters, procedural delays and other bureaucratic processes may impact a property owner's ability to proceed with reconstruction before a building consent lapses.

Pertinent to reconstruction also is the implication of **s52** of the BA. This section prescribes a 12 months period for the validity of an issued building consent, except a special extension is granted by the BCA. This provision may compound post-disaster recovery, where reconstruction is not started before an issued consent lapses. A repeat application will have to be made by the property owner. An appropriate extension of this period to reflect the realities of post-disaster reconstruction and with due consideration to the magnitude of devastation experienced after an event, may have to be made by respective councils. A valuable lesson for New Zealand was the reported amendment to planning regulations after Hurricane Ivan in the Cayman Islands. The amendment included the extension of the period of validity to development approvals from 12 to 18 months from their dates of issue. It was also reported that the fees charged for consent applications were reduced by 50% to alleviate the effect of the disaster on the community (The Legislative Assembly, 2004). These kinds of amendments could ensure that the recovery process is not made more onerous by planning requirements.

### The effects of BA Notices

Another key aspect of the BA that may impact on reconstruction activities post disaster is the limitations and restrictions applicable to buildings on land subject to natural hazards (s71-s74). The Act requires that Territorial Authorities must refuse to grant building consents on land subjected to natural hazards unless the land can be protected from the hazard, and where waivers are granted, it requires that notices be placed on the land to indicate the risk of natural hazards it is exposed to. If this provision is strictly implemented, then some categories of house owners may not qualify for insurance claims where there is an identified risk to their land and facilities. There is a limit to what property owners can claim from insurance companies; and the BA notices may complicate the issue more. For example, risk from ground subsidence is not covered by the EQC, although the rule was bent in Waihi 2001 due to public outcry (Earthquake Commission, 2005). There are ongoing adjustments to New Zealand hazard landscape, which means that previously risk-free buildings may be re-defined as risk-prone after hazard review exercises. Hence new notices could prevent owners of such properties from being compensated in future disasters.

### **3.4 A Review of Recovery Case Studies in New Zealand**

Having discussed the practical implications of recovery-related legislation, this section reviews two locally significant flooding incidents in New Zealand. The review demonstrates the challenges that such disaster events could pose to the regulatory environment and other salient issues that will need to be addressed to improve resilience in future recovery programmes. Both incidents reviewed had significant impacts on the economy, physical and built assets and on response and recovery capabilities in New Zealand. The extent of damages and the risks to life and property warranted the declaration of civil emergencies in both situations.

The events and the scale of impacts are individually described followed by a review of the reconstruction and recovery activities that took place after each event. Finally a summary of the lessons learnt from the two flooding events is made within the context of the current study.

### **3.4.1 Manawatu-Wanganui Flood, 2004**

The flooding incident occurred in the Manawatu-Wanganui region in year 2004. The affected region is located in the lower half of the North Island of New Zealand. The flooded area covered 10 districts and includes Palmerston North and Wanganui Township as prominent cities. The flooding of the Manawatu-Wanganui region was caused by heavy rain and gale force winds which occurred from 15 to 23 February 2004. The event necessitated a region-wide civil defence emergency declaration on 17 February that lasted till midnight of 25 February. At the height of the event over 2300 people were reported to have been evacuated from their homes.

#### ***3.4.1.1 Damage Assessment***

The flood incident triggered the largest emergency management activity in New Zealand for 20 years (Reid et al., 2004). Many rivers breached their banks and considerable areas of farmland were inundated by silt and floodwaters. Damage to infrastructure was significant with damage to roads, bridges, and railways recorded. In addition there were telecommunications, power, gas and water supply outages to thousands of homes. The magnitude of the event stretched the response and recovery capabilities of the local authority and emergency management agencies involved (Reid et al., 2004).

Damage assessments carried out immediately after the flooding event gave recovery estimates as \$160-180 million for the rural sector; and \$120 million for roads and council infrastructure (Van der Zon, 2005). In addition \$29.5 million and \$3.5 million were estimated to stop future flooding of the lower Manawatu and Rangitikei rivers that run through the region respectively. Approximately 500 houses were damaged, 4 bridges destroyed and 21 bridges seriously damaged. Roads and rail closure including power and phone outages were widespread. Stock losses were estimated at 1300 (MCDEM, No date-a). A report by Reid et al. (2004) provided more details on the impact of the flood.

### ***3.4.1.2 Reconstruction and Recovery Work***

Reconstruction work on damaged utilities commenced immediately after the flooding incident. Various utility providers, consultants and contractors worked 24-hour days to repair damaged roads and bridges, and to restore disrupted services (Le Masurier et al., 2006; Reid et al., 2004). The focus was on rebuilding quickly; hence existing contractual relationships were exploited. Reconstruction was carried out through collaboration between CDEM agencies, local authorities, utility companies and insurance companies. Recovery was coordinated through the regional council's CDEM group arrangements as provided for in the CDEM Act. For the other territorial authorities the event was managed using the previous Civil Defence Act 1983 arrangements (Wilkinson, Zuo, Le Masurier, & Van Der Zon, 2007).

The CDEM Act 2002 provided a structure appropriate for dealing with events such as the floods and did not hinder authorities from dealing with the event (Reid et al., 2004). Hence the evolved structure involving: Interdepartmental Officials Domestic and External Security Coordination (ODESC); Domestic and External Security Coordination (DESC); National Crises Management Centre (NCCMC) and local Emergency Operations Centres (EOC) was considered suitable flexible and robust in the event (Reid et al., 2004). Roading authorities did not diverge from normal legislation and regulations and building consents were sought and granted as usual.

However the implementation of environmental control requirements became a source of frustration. According to AELG (2005) much time was lost by utility companies trying to develop an understanding with the regional council about emergency actions that could cover all situations under the RMA, rather than require a formal process for each activity. The Infrastructure Recovery Task Group leader and the Regional Council had to outline the procedures to be followed in the form of a guidance note (AELG, 2005). Van der Zon (2005) highlighted the problem that arose with the deposition of slip materials for example. The regional council required all slip materials to be deposited at designated landfill sites. These landfill sites were located far away from the



disaster zone which would have taken too long to cart away. Subsequently the Regional Council had to allow a more pragmatic approach which meant that slip materials could be moved and deposited locally.

There were reported delays caused by the sourcing of reconstruction funds especially for roading infrastructure. Transfund, the road funding authority that had direct access to government funds did not become involved as early as required, thus the prioritisation process for infrastructure works was hampered (Van der Zon, 2005). Much more was expected to have been done by Transfund to secure certainty over funding of emergency road contracts in the early stages of recovery.

The 2004 flooding incident exposed disaster management problems that could arise from the management of emergencies across jurisdictional boundaries. There were issues connected with the management of recovery around the Whangaehu valley that is shared between the Wanganui and Rangitikei Districts. Reid et al. (2004) believes recovery management could pose jurisdictional conflicts as to who should take responsibility for what in such situations. Reid et al. report identified the need for advance negotiation and a memorandum of understanding amongst Districts Councils to determine which district has primacy in the event of a civil emergency. Without some form of clarity about responsibilities, borderline lands or properties could become mismanaged, overlooked or at worst, emergency activities could be duplicated.

Reid et al. (2004) faulted communication and information flow between agencies during response at the event. It was reported that the Local Councils were slow in some cases to realise the importance of being proactive in seeking information on the range of activities that took place during the event. The local authorities did not have the opportunity to prepare detailed plans and standard operating procedures (SOPs) for information gathering and dissemination before the incident. For example requests for information from the National Crises Management Centre (NCMC) did not match the Local Council's requirements (Reid et al., 2004). The expectation was for Local Councils to be the receptacle of

information by identifying the exact nature of the flooding incident and then to identify who can assist and how these people could be contacted and directed.

Similar inadequacies were observed in the performance of CDEM groups. There was little evidence of active direction by CDEM groups (AELG, 2005). The CDEM Act provided for the CDEM to direct activities, assets and services on behalf of key lifelines, but restoration priorities were determined by lifeline utilities and then communicated to the CDEM group. The CDEM role during the recovery phase was limited to communicating problem areas and issuing progress updates to the lifeline utilities. Individual utilities became aware of problems through the CDEM reports but took their own action to address recovery issues.

### **3.4.2 Matata (Bay of Plenty) Flood, 2005**

This section reports on flooding of Matata Township in the Bay of Plenty in 2005. Matata is a small farm community under the jurisdiction of the Whakatane District located in the North Island of New Zealand. The town is 24 km to the north-west of Whakatane. On 18 May 2005, a band of intense rain (308 mm of rainfall within 20 hours) fell in the catchments behind the Matata Township. The rain triggered floods and several large debris avalanches and landslips. Debris flow reached State Highway 2 and railways around Pikowai to Awakaponga with boulders the size of cars strewn all around. Some details and photographs describing the extent of the flooding incident are available on Environment Bay of Plenty website (<http://www.envbop.govt.nz/CD/MatataTauranga-May-2005.asp>).

The Matata/Tauranga area had experienced significant flooding in the previous year, but this particular incident was more localised, concentrated and unparalleled in its magnitude. The engineering solutions consultants contracted for rehabilitation works at Matata confirm that the flooding incident had a chance of between 0.5% and 0.2% of happening in any year (Tonkin and Taylor Ltd, 2005). The flooding incident necessitated a civil defence emergency declaration on 18 May 2005 and this remained in place until the end of May.

### 3.4.2.1 Damage Assessment

Total government valuation including land value and capital value of properties affected along the flood path of the hazard was initially estimated to be about \$10 million for unsafe buildings and \$3 million for buildings subject to restricted use. The MCDEM situation report (Recovery Report Nr. 06) on the initial damage evaluation at Matata and environs gives a breakdown of physical damages in Table 3.3(a) and (b).

**Table 3.3 (a) Affected houses in 2005 Matata flood path**

*Source: WDC Recovery Report*

| No | Description                 | Nr. of Properties affected<br>(Matata/Awakaponga) |
|----|-----------------------------|---|
| 1  | Unsafe houses               | 28  |
| 2  | Unsafe - houses washed away | 3   |
| 3  | Unsafe land                 | 14  |
| 4  | Restricted use - houses     | 16  |
| 5  | Restricted use - land       | 1   |

**Table 3.3 (b) Other housing situation reports**

| Nature of Work Required  | Matata/Awakaponga | Edgecumbe/Otakir |
|--|-------------------|------------------|
| Houses requiring removal of wall linings<br>- unable to be occupied (Total less<br>unsafe/restricted houses) | 24                | 9                |
| Houses requiring removal of wall linings<br>- preline approved   | 6                 | 0                |
| Houses requiring removal of wall linings<br>- postline approved  | 0                 | 0                |
| Houses requiring removal of wall linings<br>- CCC approved   | 0                 | 0                |
| Septic Tanks and drains to be cleaned  | 85                | 1                |
| Septic tanks and drains cleaned  | 84                | 0                |

Response and subsequent reconstruction activities commenced immediately after the flooding incident. It was reported in the 'WDC Recovery News' a Newsletter published by the Whakatane District, that a week after the incident there were already collaborative activities between the Department of Building and Housing

(DBH), the Whakatane and Tauranga District Councils. The collaboration involved the assessment of flood-damaged properties, processing of urgent building consents, and the provision of guidance on rebuilding procedures. A Recovery Coordinator, Steve McDowell, was appointed by the MCDEM to act as interface between the central government and Whakatane District Council (WDC). Steve was required to produce a recovery plan and to determine the quantum of government's assistance package required by the community, in conjunction with the WDC Recovery Manager, Diane Turner.

#### ***3.4.2.2 Reconstruction and Recovery Work***

Several task forces were set up in line with CDEM guidelines. A Hazard Task Force was appointed whose original scope of work included identifying what action plans and processes need to be put in place to address the short term and long term risks still facing Matata as a result of the event. The Hazard task force worked with the Infrastructure Task Force responsible for clearing flood debris, to sort out roads and to restore portable water to the affected (Wilkinson et al., 2007). Both ONTRACK and Transit NZ owned a significant part of the infrastructure in the affected area and were required to work collaboratively with the Hazards and Infrastructure Task Groups to identify long-term solutions. Other task forces that were set up included the Rural Task Team; and Task Force Green (Le Masurier et al., 2006).

Reconstruction works commenced with road clearance for rocks, stones and debris resulting from the flood. Wilkinson et al. (2007) explain that there was no tendering for the works undertaken during this initial response period; and a fast tracked tendering arrangement was implemented on subsequent reconstruction projects (4-6 weeks after the incident). Fortunately there were existing relationships with contractors executing civil work projects in the vicinity, thus mobilisation of the required resources did not pose a great challenge. However because of the priority attached to the reconstruction projects, progress on existing developmental projects was disrupted.

The rate of progress achieved at the initial response was commendable, however reconstruction activities slowed down considerably afterwards. Private property owners were seriously affected and some were unable to rebuild because they were plainly at risk from similar events in the future. Several flood mitigation project options were proposed coupled with planning controls to reduce risks and to protect lives and property. The WDC Recovery News (Issue 7), 2005 reported that the following redevelopment controls were recommended on sites where damage had occurred until the extent of future hazard zones was confirmed:

- Limit redevelopment works through s72 of the Building Act.
- Keep a record of hazard information on land information memoranda (LIM) and project information memoranda (PIM).
- Undertake all redevelopment works in accordance with the Public Works Act, which requires a limitation of works, so far as practicable, to hazards that have already developed.
- Variation of District Plans to reflect the improved level of hazard information in Matata Township.

A revealing insight into reconstruction and recovery after the flooding incident is found in Spee's (2008) study of the psychological and social impacts of the event on the Matata community. Spee (2008 p.18) generated a list of stressors that relate to the reconstruction problems experienced by individuals and the community following the event. These stressors include:

- The inability to return to homes until months later, fifteen months in one case;
- Two years after the event people were still waiting to receive resource consent to rebuild on their sections;
- Moving four times in one year;
- Constantly making plans which needed to be adjusted due to resource consent timeframes being moved;

- A state of limbo as people waited to learn of their property's fate (i.e. whether the land was considered safe to rebuild);
- Having to live in another community permanently while still considering Matata home;
- Physical health issues (hip operations, heart attacks) for the elderly;
- The fact that no mitigation works had started.

Spee concludes that the longer term recovery events had caused more stress and frustration than the initial periods after the disaster. It would seem that the greatest impact on holistic recovery was the inadequacies experienced during the rebuilding efforts. Individuals and property owners were in a state of limbo for too long after the event. 50 families were still in temporary accommodation five months after the incident (Rowan, 2005). A formal disaster recovery plan only came to effect 18 months after the event.

Construction of flood mitigation structures that were approved by council could not commence because environmental resource consents for such works were still being processed as at June 2008 (Becker et al., 2008). Without the mitigation measures in place, property owners were unable to get insurance cover and without insurance payments no rebuilding could take place. There was widespread misunderstanding on compensation claims and settlement with the EQC making compromises to enable residents to receive compensation for their flooded properties (L. Dixon, 2005). In any case building consent processing in the at-risk areas of Matata was suspended till March 2007. Middleton's (2008) analyses of the housing situation after the event re-affirms the impact that (re)development and legislative requirements had on the whole-of-Matata recovery.

### **3.4.3 Summary of Lessons from the Local Disasters**

This section summarises the key lessons learnt during the two flooding incidents reviewed in 3.4.1 and 3.4.2 above. More detailed lessons across all aspects of recovery are provided by Reid et al. (2004) and AELG (2005), however the

current study discusses the lessons learnt within the context of improvements needed in legislative and regulatory provisions.

#### ***3.4.3.1 Powers to coordinate reconstruction activities***

It was observed in both flooding incidents that response and reconstruction works were managed through the collaborative effort of CDEM groups, local authorities, utility companies and insurance companies during recovery in both cases. The CDEM did not play a lead role in directing activities in spite of the legal provisions under the CDEM Act that enabled it to do so. Emergency powers were never exercised during the declared state of emergencies (AELG, 2005). Utilities (with their respective contractors) were allowed to determine their own reconstruction priorities without specific directives from the CDEM agencies. The following modes of interaction between CDEM and lifeline utilities are possible (AELG, 2005). The different modes are dependent on the scale and type of hazard events that is being managed.

1. Utilities determine their own restoration priorities with CDEM gathering information and monitoring performance.
2. CDEM and lifelines work together to identify priorities and to implement performance through agreements.
3. CDEM determine priorities and then request utilities to perform in line with the set priorities.
4. CDEM direct specific actions calling on the powers in the CDEM Act.

Modes 1 and 2 were the operating situation in both flooding incidents and could pose barriers to effective reconstruction activities. None of the entities involved in the management and coordination of reconstruction in previous disaster events had any specific remit to work outside their own interests (Resilient Organisations, 2006). Therefore for larger scale disasters it might not be out of place for more proactive action from CDEM in the form of modes 3 and 4 coordination.

### ***3.4.3.2 Processing of building and environmental consents***

In both flooding incidents, there was a fast track approach adopted at the initial response stages. Rapid procurement routes were employed to engage contractors for emergency road network clearance and debris removal by key utilities. This approach was possible because there were already established relationships with these contracting organisations. However reconstruction activities were slowed down at the reconstruction stage when building and environmental compliance requirements took effect. There appears not to have been a waiver to normal processes except in the situation reported in the Manawatu-Wanganui flood where the Recovery Task Group leader and the Regional Councils prepared guidance notes outlining more expedient procedures to be followed for debris clearance and disposal. Delays caused by statutory compliance procedures were in addition to delays already caused by the property assessment and evaluations after the event. Such delays necessitated a review of building safety evaluation procedures to speed up recovery in future disasters (New Zealand Society of Earthquake Engineers, 2009).

There was anecdotal evidence to suggest widespread duplication of resources on both flooding incidents. Damage assessments were required by different agencies like the EQC, private insurers and the local councils and it was not uncommon for assessment exercises to be repeated on the same properties by these agencies (Reid et al., 2004). This situation had a ‘knock-on’ effect, thus delaying the actual implementation of the various reconstruction projects.

In summary, both flooding incidents emphasise the importance of pre-planning for large scale response and recovery programmes in New Zealand. By undertaking some prior planning, responding agencies are better equipped to implement recovery plans within reasonable time frames forestalling the sort of frustrations experienced in these events. A good supportive framework should guide effective co-ordination of resources after an event, allowing for more effective and efficient recovery activities.



### **3.5 What lessons can be learnt from recovery programmes overseas?**

As the title suggests, this section gives a brief review of recovery activities in other countries that could provide useful lessons on post-disaster recovery. The reviews are made with a focus on changes that were made to existing legislation and regulatory provisions to allow for recovery activities to proceed unhindered. The reviews provide evidences on the need for appropriate legislation and other regulatory provisions for reconstructing the built environment after disasters.

It is useful to note that research on the impact of regulations on building rehabilitation or on how procedural barriers discourage physical development and rehabilitation, is sparse but developing (Burby et al., 2006; May, 2004). Much of what exist in housing and disaster management literature are anecdotal evidences that suggest that there is a relationship between building/environmental regulations and rehabilitation works (Martín, 2005). Some of these anecdotes do not provide enough empirical data for further research and Schill (2005) suggests that the lack of empirical data makes it difficult to influence public policy. However poor the empirical data on these relationships are, it has not diminished the fact that regulations could become burdensome in rehabilitation and reconstruction projects and are worthy of considerations (Gavidia & Crivellari, 2006; Marano & Fraser, 2006). The current study presents information that will support the thesis that some aspects of legislation may have to be reviewed to meet emergency management objectives.

Martin (2005) describes burdensome regulations as those which incorporate excessive rules and regulations and red tape (statutory procedures) that add unnecessarily to the cost of housing. Though Martin's study refers to the effects of building codes on housing, the current study believes the same parallel can be drawn for reconstruction projects also. Therefore burdensome regulations impact negatively on recovery such that physical facilities are unable to be rebuilt at the speed desired by the community and property owners.

Listokin & Hattis (2004) provides useful analysis on two kinds of barriers that building codes could pose to rehabilitation works. They are 'hard' and 'soft' barriers to rehabilitation. The hard barriers are impediments to rehabilitation as a result of over-regulation, which would not add appreciably to building value or public safety (Burby et al., 2006) and could discourage housing development or rehabilitation because they are added burdens (May, 2004). For instance building and environmental regulations that do not reduce the vulnerability of built assets to a hazard event are unnecessary. Also to insist on expensive structural solutions in a highly hazardous zone, where a simple alternative will be to restrict development in that zone is another example of regulation that could fall under Listokin & Hattis hard category.

Soft impediments, on the other hand, are administrative requirements that require extra time, money and effort to accomplish rehabilitation and reconstruction projects (Listokin & Hattis, 2004). These are red tapes (bureaucratic procedures) that could delay new construction and the rehabilitation/reconstruction of physical facilities (Marano & Fraser, 2006; May, 2004). Such soft impediments are the focus of the current research study.

Bureaucratic procedures must be supportive of emergency management under different emergency scenarios whether routine or chaotic. However research suggest that bureaucracies have been less supportive of the expediency that is desired in disaster response and recovery (Olshansky, 2005; Rosenthal & Kouzmin, 1997). Bureaucracies derive their strength and weaknesses from a modus-operandi that is time consuming, the typologies are 'procedure-bound' and are unable to foster creativity, improvisation, and the adaptability needed in disaster situations (Harrald, 2006). May (2004) suggests three sources of regulatory process barriers which are in line with the current focus on legislation in New Zealand. These process barriers are outlined below:

- Regulatory approvals. These are delays associated with consent processes and approvals that arise from cumbersome decision making processes and the duplication of regulations. These types of delays are inherent in the building and environmental legislation which were discussed in section 3.3. Some other

examples of post-disaster reconstruction programmes where regulatory approvals became impediments are presented later in this section.

- Regulatory enforcement strategies and practices. These are overly rigid practices that foster an unsupportive regulatory environment for the development and rehabilitation of the housing stock. In post disaster situations rigid enforcement strategies discourage genuine recovery efforts as would be shown later.
- Patchwork of administrative arrangements. This could result from duplication of administrative structures (as in layers or hierarchies of control) and gaps in regulatory decision processes. May (2004) explains that patchwork frustrates regulatory implementation and adds to complexities in regulatory processes.

Process barriers could also result from *administrative conflicts* in and among disaster agencies (Listokin & Hattis, 2004). For example rivalry between responding agencies are not foreign to emergency services and are an obstacle to effective emergency management (Granot, 1997; McEntire, 2002; Quarantelli, 1988). Rivalry may result from existing silos or from the absence of a coordinating agency as were previously experienced in the local events reviewed earlier. Hence a broad range of cooperative effort is needed for the success of post disaster reconstruction activities. Organisations must coalesce to plan for resource utilisation in the restoration of physical assets. Coordination is therefore central to multi-organisational response and recovery programmes (L. Comfort et al., 1999; McEntire, 2002). The question is how is coordination achieved? The current study believes that a good start point will be to embed the requirements for the coordination and interaction of all stakeholders in legislation and regulatory provisions. This will then feed into respective community recovery plans with policies and specific criteria for post-disaster situations.

Another useful dimension to the problems with burdensome regulations is provided by Listokin & Hattis (2004). It is that regulatory procedures could become too rigid forcing implementers to ‘go by the book’ even though variations may be warranted. This places implementers in a state of continuous fear of liability should things go wrong. Some latitude of control and discretion is often required to aid decision making as long as such decisions are pragmatic. Commenting on the rebuilding

programme after the flooding incident in New Orleans, Stackhouse (2006 p. 36) says ‘removing democratic processes from the rebuilding process has the advantage of expediting decision making by allowing politically dangerous but practical outcomes’. This statement suggests that greater freedom in decision making by officials of coordinating agencies could increase the speed of rebuilding programmes after significant disaster events.

From the foregoing treatise, it is evident that legislation and regulations pertaining to post-disaster reconstruction could hinder the achievement of reconstruction objectives. Speed is of essence in disaster reconstruction while pre-planning activities help to improve the speed and quality of reconstruction delivery (Harrald, 2006).

In the following sections, two examples of overseas disasters are presented to show where changes were proposed or made to legislation to enable speedy implementation of reconstruction objectives.

### **3.5.1 The Northridge Earthquake 1994**

The Northridge Earthquake is chosen in this study because it provides an historical example of a disaster situation where legislative changes helped to facilitate reconstruction projects. The nature of the disaster is first described then a presentation on the legislative changes that were made after the event is discussed within the context of the current study.

The earthquake was a moderate but damaging disaster that struck Southern California in the early hours of 17 January, 1994 (Barton-Aschman Associates, 1995; Bolin & Stanford, 1998). It had a magnitude of 6.8 on the Richter scale, small compared to other earthquakes but devastating because of the quantum of damage the earthquake caused.

(Comerio, Landis, Firpo, & Monzon, 1996) give an insight into the extent of damage. There were damage to 27 bridges and a collapse of sections of six freeways. 450 public buildings suffered significant damage; 6000 commercial buildings, 49,000 housing units in 10,200 buildings had serious structural damages; while 388,000 housing units in 85,000 buildings experienced minor

damages. The total value of damage to houses in Los Angeles was estimated to be about \$1.5 billion (Comerio et al., 1996).

The Northridge earthquake caused a shift in emphasis from disaster preparation and relief to recovery in the United States (Comerio et al., 1996); and this shift largely resulted in the success of emergency management programmes for the restoration of the affected areas. (Kamel & Loukaitou-Sideris, 2004) suggests that reconstruction activities contributed to the economic revitalisation of the affected area. Kamel et.al. explain that the efficiency and effectiveness of response became a primary objective which was tackled by every government agency. Several bureaucratic requirements were suspended to pave way for rapid rebuilding of damaged infrastructure (Marano & Fraser, 2006; P. Phillips, 2005). (Marano & Fraser, 2006, p. 2) conclude that ‘identifying and easing regulations and statutes that inhibit reconstruction can mean a dramatically faster and less costly recovery’.

Wu and Lindell (2004) provide an insightful summary into some of the actions that were taken to increase the speed of housing reconstruction in Los Angeles after the earthquake. The summary in Table 3.4 provides proof that expediting procedural requirements by establishing fast-tracked processes that would operate after a disaster would benefit recovery. It would be observed across the different government departments in Table 3.4 that there was a streamlining of bureaucratic procedures of one form or another.

Whilst the rapid recovery experienced after the Northridge earthquake can be attributed to other factors, such as political will (Wu & Lindell, 2004) and large supplementary appropriations to tackle the incident (Barton-Aschman Associates, 1995; Kamel & Loukaitou-Sideris, 2004); public policy changes and enabling emergency management legislation played a substantial role in the rebuilding programmes after the earthquake.

**Table 3.4 - Actions taken to increase the speed of housing reconstruction in Los Angeles. Source: Wu & Lindell (2004)**

| Department                 | Actions increasing the speed of housing reconstruction  |
|----------------------------|---|
| Building and safety        | <ul style="list-style-type: none"> <li>Establish criteria for emergency demolition contracts</li> <li>Establish due process and procedures for demolition</li> <li>Prepare pre-incident agreements</li> <li>Set up a damage assessment system</li> <li>Expedite building permits</li> <li>Establish one-stop processing</li> <li>Create parcel database</li> </ul>  |
| Community Redevelopment    | <ul style="list-style-type: none"> <li>Review and revise qualifying criteria for the city's neighbourhood revitalisation tools</li> <li>Streamline procedures for redevelopment area expansion or Additions</li> </ul>  |
| Housing                    | <ul style="list-style-type: none"> <li>Prepare emergency regulations</li> <li>Identify staff in other departments who understand loan processing</li> <li>Have procedures to adopt emergency regulations</li> <li>Develop loan guidelines and procedures</li> <li>Obtain pre-approval on loan procedure from federal agencies</li> <li>Develop and implement city loan programme</li> <li>Identify available housing</li> </ul> |
| Planning                   | <ul style="list-style-type: none"> <li>Update procedures to expedite permits</li> <li>Insure consistency of R&amp;R Plan with safety element</li> <li>Prepare procedures, forms, list of R&amp;R division members</li> <li>Determine criteria for balancing post-event work priorities</li> </ul>   |
| Emergency Operations Board | <ul style="list-style-type: none"> <li>Request formation of ad-hoc committee on R&amp;R, assist utilities in restoration, initiate demolition and debris removal programme</li> </ul>   |
| Chief Legislative Analyst  | <ul style="list-style-type: none"> <li>Lobby for and support the National Earthquake Insurance Program</li> </ul>   |

### 3.5.2 Hurricane Katrina, New Orleans US (2005)

The disaster that followed Hurricane Katrina provides lessons on legislative changes either proposed or already implemented to enable its recovery from the event. The Hurricane was a category 3 storm that struck New Orleans and the Gulf Coast in the morning of 29 August, 2005. The storm surge caused severe destruction along the Gulf coast from central Florida to Texas in the US (Knabb, Rhome, & Brown, 2006). Knabb et al. (2006) reported that the most severe damage occurred in New Orleans, Louisiana, because of the failure of the levee system that was designed to contain the resulting storm surges. The worst damage was caused by floods resulting in probably the largest evacuation of citizens

within the US in recent times, with an estimated 1.2 million people evacuated before the incident and another 100-120 thousand afterwards (Nigg et al., 2006). About 350,000 houses were destroyed and over 200,000 persons required temporary shelters scattered around 16 states in the US (Rodriguez & Marks, 2006).

By all accounts Hurricane Katrina was a catastrophic event with economic loss estimates of about \$200 billion (Burby, 2006). Comfort (2005) concludes that the catastrophe was both natural and man-made, suggesting that the event was both uncontrollable and controllable. Uncontrollable because the hurricane was a natural meteorological phenomenon, while it was controllable because the break in the levee system and resulting floods could have been avoided through better foresight and planning (Burby, 2006; Piotrowski, 2006). The incident exposed the inadequacies of US response capacity to disasters of that magnitude and brought other emergency management issues to the fore (Harrald, 2006; Rodriguez & Marks, 2006; S. K. Schneider, 2005; Waugh Jr, 2006).

Within the context of the current study, Hurricane Katrina provides valuable lessons for disaster management. One of which is the need to prepare for the unexpected as every hazard brings surprises and every disaster even more surprises (Colten, Kates, & Laska, 2008). The disaster situation was completely overwhelming leaving the New Orleans community dysfunctional. Its response system was a failure and complete recovery is not expected any time soon. Recent reports conclude that reconstruction after Katrina will most likely take longer than a decade to accomplish (Colten et al., 2008; Kates, Colten, Laska, & Leatherman, 2006).

Along similar lines, the Katrina disaster shows what could happen when there is a breakdown in the administrative elements of an emergency management system (S. K. Schneider, 2005). Schneider suggests that there were three bureaucratic characteristics that failed, and which impeded the response process at the critical early phases of the disaster. These failed bureaucratic characteristics include:

- a) Established emergency procedures – Schneider concludes that the response process was impeded by a failure to implement pre-established administrative procedures. Rodriguez & Marks (2006) attributed the failure to a breakdown in communication between the hierarchies of government. Thus its top-down (command-and-control) approach was not effective. The American Bar Association (2006) in its review of the emergency system that operated during the disaster, suggested more proactive response arrangements that will originate from the bottom-up with the local authority as the first responders. The American Bar Association (2006) believes that the emergency procedures that operated during Katrina caused conflicts in jurisdictional responsibilities between emergency agencies. In their words, ‘there remain no standards or consensus as to when an incident warrants direct Federal as opposed to EMAC assistance, or indeed, in what order, or in what quantity, resources should be requested via one route or the other’ (American Bar Association, 2006 p. 17).
- b) Leadership. There was also a lack of decisive leadership in the Katrina response activities (American Bar Association, 2006; S. K. Schneider, 2005). The leadership problem is cross-linked with the emergency management system which manifested as lack of situational awareness amongst all the disaster stakeholders (Rodriguez & Marks, 2006). Waugh Jr (2006) concludes that the slow and inadequate disaster response that characterised Hurricane Katrina was the result of lack of understanding (of functions and roles) that was exhibited by emergency management officials.
- c) Unclear emergency management objectives. The US emergency management agency has had a confused set of objectives largely because of its shift in focus from natural disasters to antiterrorism activities since 11 September, 2001 (American Bar Association, 2006; S. K. Schneider, 2005).

Perhaps the most valuable lessons for the current study are the steps being taken to rebuild damaged infrastructure in the disaster zone. A pertinent question this study asks is, what policies are in place (or have been put in place) to encourage a holistic recovery after the event? Some of the policy changes and legislative reviews are briefly outlined below.



1. Changes in building codes and standards - There are reported changes made to the building codes in New Orleans with a view to improving the resilience of built spaces in New Orleans. For example there were revisions made to the base flood elevation levels for new construction to three-feet or higher (Colten et al., 2008). This is a risk mitigation strategy which has been tied to flood insurance cover so that only buildings that meet the new guidelines can qualify for flood insurance and subsequent compensations. Overall, funding sources and budget priorities have been developed for reconstructing flood protection in New Orleans (Colten et al., 2008; Edwards, 2007).
2. Changes in emergency management regulations and guidelines - Colten et al. (2008) explains that the Katrina event necessitated the review and updating of Louisiana and New Orleans response strategies and their emergency operations plans. The legislative reviews included the adoption of an all-hazards approach thus expanding the scope and magnitude of anticipated hazards; and allowing greater involvement of non-agency actors who proved crucial to response and recovery after the event. Colten et al. noted that partnering with non-governmental stakeholders was a paradigm shift that emerged out of the Katrina experience.

Other useful changes have been advocated to improve emergency management activities. For example, Chhean & Kakkar (Chhean & Kakkar, 2006) suggest the development of comprehensive disaster management plan at local response levels, which will be consistent with a national level disaster management framework in the U.S. Chhean & Kakkar are of the opinion that such a development will assist local responders to effectively manage complex disasters. Crockett (2007) on the other hand suggests giving more powers to the military to intervene in a natural disaster. This is probably consistent with Chhean & Kakkar notion of merging natural emergency preparedness and response functions in the Federal Emergency Management Agency within the Department of Homeland Security, so that the nation's security apparatus are accessible to natural disaster management in times of need.

3. Changes in land development regulations – Changes to land and development regulations are largely seen as a veritable tool for mitigating disaster risk in disaster management (Burby et al., 1999; Ingram et al., 2006; Schwab et al., 1998; Wamsler, 2006). After Hurricane Katrina several changes in land use planning and zoning systems have been proposed to reduce the vulnerability of the New Orleans region from future flooding disasters (Burby, 2006; Edwards, 2007; Olshansky, 2006).

The legislative changes described above do not provide an exhaustive list of the changes needed to facilitate the recovery at New Orleans; but they serve as exemplars to the importance placed on built asset reinstatements as a major input to holistic recovery. Edwards, (Edwards, 2007) suggest that the building reconstruction efforts in New Orleans (with a focus on restoration of landmarks and facility improvement) act as stimulants to development and growth opportunities which in turn benefits recovery. The rate at which recovery is achieved is therefore tied to the speed of reconstruction guaranteed by legislative and regulatory changes.

### **3.6. General Implication of Legislation on Recovery**

Having highlighted some of the issues that are connected to the appropriateness of legislation and regulatory provisions in the previous sections; this section presents a summary of their implication on recovery. In other words the following summarises the effect that poor legislative provisions could have on post-disaster reconstruction activities.

1. Loss of vital momentum of action – The efficiency of post disaster reconstruction activities is impaired as a result of delays caused by poor planning and implementation; restrictive legislation and regulatory provisions; lack of government commitment in reconstruction programmes (Aysan & Davis, 1993; S. K. Schneider, 1995).
2. Loss of commitment to the reconstruction process – There is a tendency for poor commitment to recovery programmes by responsible authority because

disaster practitioners are unable to apply pragmatic solutions to real-time reconstruction problems for fear of being held liable for their decisions. (J. O. Rotimi et al., 2008).

3. Difficulties in achieving reconstruction deliverables and inability to accelerate the process of reinstatement (Ye, 2004); introduce measures for risk and vulnerability reduction; and aid planning for sustainable developments. Jigyasu, (2004); Shaw, Shiwaka, Kobayashi & Kobayashi, (2004).
4. Impairment of overall community recovery and quality of life. Of essence, reconstruction should become a tool for empowerment till a level of functioning is reached where communities are self sustaining and require no external interventions (Ofori, 2004); (Sullivan, 2003); and also a therapeutic process for overall community recovery (Aysan & Davis, 1993).

### **3.7 Overall Summary of Knowledge Gaps in Literature**

This section concludes the problem identification phase of the study (see figure 1.1, chapter one). The section summarises the key issues that have been raised in chapter one through chapter three from background readings, review of literature, document analyses and case study evaluation. The summary of the three chapters is in meeting with objectives one and two outlined in section 1.3, chapter one. The objectives began with a review of the existing situation and conclude with the identification of the research problem and knowledge gaps.

As outlined in chapter one, the research question being addressed by the current study is:

*What improvements can be made to existing disaster-related legislation and regulatory provisions so that they facilitate the implementation of significant reconstruction programmes in New Zealand?*

This research question presupposes that there are problems in existing disaster-related legislation and regulatory provisions which need improvement. The research study thus far has identified some of these problems and provides some

articulation of the problems specific to the three legislative documents that are the focus of the current study. Some of the key issues pertaining to the implementation of the three legislative documents being studied are presented in the left-hand column on Table 3.5. The knowledge gaps which the current study desires to address are presented in the right-hand column.

The next stage of the research study which is covered in chapter five validates the existence of these identified research problems and seeks means by which the problems can be solved through suggested improvement schemes.

**Table 3.5 – Summary of Knowledge and Knowledge Gaps**

| Knowledge Contribution   | Knowledge Gap   |
|--|---|
| <p><b>Legislation could become a source of vulnerability in post disaster reconstruction</b></p>   | <p><b>Limited articulation of the nature of legislative problems</b></p> <p><b>Limited suggestion of solutions especially from practitioner perspectives.</b></p>   |
| <p><b>KEY ISSUES WITH LEGISLATION</b></p>  |   |
| <p><u>Civil Defence &amp; Emergency Management Act (2002)</u></p> <p>Adequacy of statutory powers for recovery.</p> <p>Extension of Recovery Coordinators powers beyond declared emergency period.</p> <p>Recovery modalities, adequate?</p> <p>Implementation of CDEM Act vis-à-vis BA and RMA, Any conflict?</p> | <p>Clarity in responsibilities and arrangements to deal with the transition from disaster response to recovery.</p> <p>Operation and coordination of disaster recovery after emergency declarations.</p> <p>Cross linkages of disaster management (in CDEM Act) with building (BA) and environment (RMA) legislation.</p> |
| <p><u>Resource Management Act (1991)</u></p> <p>Resource consent process and statutory requirements.</p> <p>Consultation in the RMA.</p> <p>RMA and pragmatism of post disaster decisions.</p>   | <p>Limited knowledge of reconstruction requirements vis-à-vis resource consents processing.</p> <p>Implications of processing delays on reconstruction projects.</p>  |

|   |  |
|---|--|
| <p>Conflicts during RMA/BA implementation</p>   | <p>Identifying of reconstruction projects of national significance for ministerial call-ins (bypassing normal consent procedure for significant reconstruction projects)</p> <p>Mitigating the effect of public notification in post-disaster reconstruction works.</p> <p>Minimising litigation in reconstruction projects with potential environmental impacts.</p>  |
| <p><u>Building Act (2004)</u></p> <p>Building Consent process and compliance requirements.</p> <p>Procedural arrangements for building/damage evaluations (on-the spot assessment).</p> <p>Approval and certification of BCAs.</p> <p>Training requirements for new and external evaluators/assessors.</p> <p>Insurance cover for buildings with section 71-74 notices etc.</p> <p>Decision making liabilities etc.</p> | <p>Limited knowledge on means by which stipulated processes can be simplified for significant events.</p> <p>Lack of guidelines for special waiver / modification of BA provisions for reconstruction projects.</p> <p>How to address parity issues for CCC and COA for property owners.</p> <p>Empowerment of BCAs for discretionary application of BA provisions in circumstances where expediency is necessary.</p> <p>Harmonisation of regulatory provisions between BA and environmental (RMA) / emergency management (CDEM Act) legislation.</p> |
| <p><u>Other Issues</u></p> <p>NZ recovery capacity.</p> <p>Effect of resource availability.</p> <p>Collaboration amongst TAs and Councils.</p> <p>Public acceptance of legislative reviews.</p>   | <p>Limited knowledge on public acceptability of legislative changes.</p> <p>Practicability of suggested improvements to recovery capacity.</p> <p>Limited knowledge on consequences of reconstruction resource shortages.</p> <p>Poor collaborative arrangements between responding agencies / councils.</p>   |

## Chapter Four

### Methodology and Research Development

#### 4.0 Introduction

This chapter begins by explaining the development process of the research from inception to completion. It then presents the research design and the philosophical assumptions that underlie the use of the methods that have been employed in the study. The methods are described and the rationale for using these methods in the study is explained. This is followed by the ethical issues considered in the study and a description of the theoretical framework that led to the development of the research questions. Finally the approach to data analyses is explained.

The research essentially involved a systematic process of problem identification; data collection and analyses; synthesis of the knowledge gained; and finally the drawing up of objective conclusions in relation to the research objectives. The thesis outline in figure 1.1 chapter one, lists the activities and sub-activities undertaken throughout the four phases of the research process. Further details on the research process are presented in the following section to show how the study developed from the initial research directions to its current form.

#### 4.1 The Research Process

Figure 4.1 provides a diagrammatic overview of the research process and the progression from the initial to the final phase of the research. In the first phase of the research there was a need to identify the research problem(s). The phase involved preliminary readings around the subject area and review of contemporary thoughts on disaster management in New Zealand. The researcher also met and interviewed five disaster management practitioners in Wellington and Christchurch in July 2006 (a summary of these interviews is included at Appendix B2). The outcome of the interviews coupled with the reviews of relevant recovery reports gave the initial directions to the research study and

provided a focus on delivering results that will be of relevance to disaster management in New Zealand.

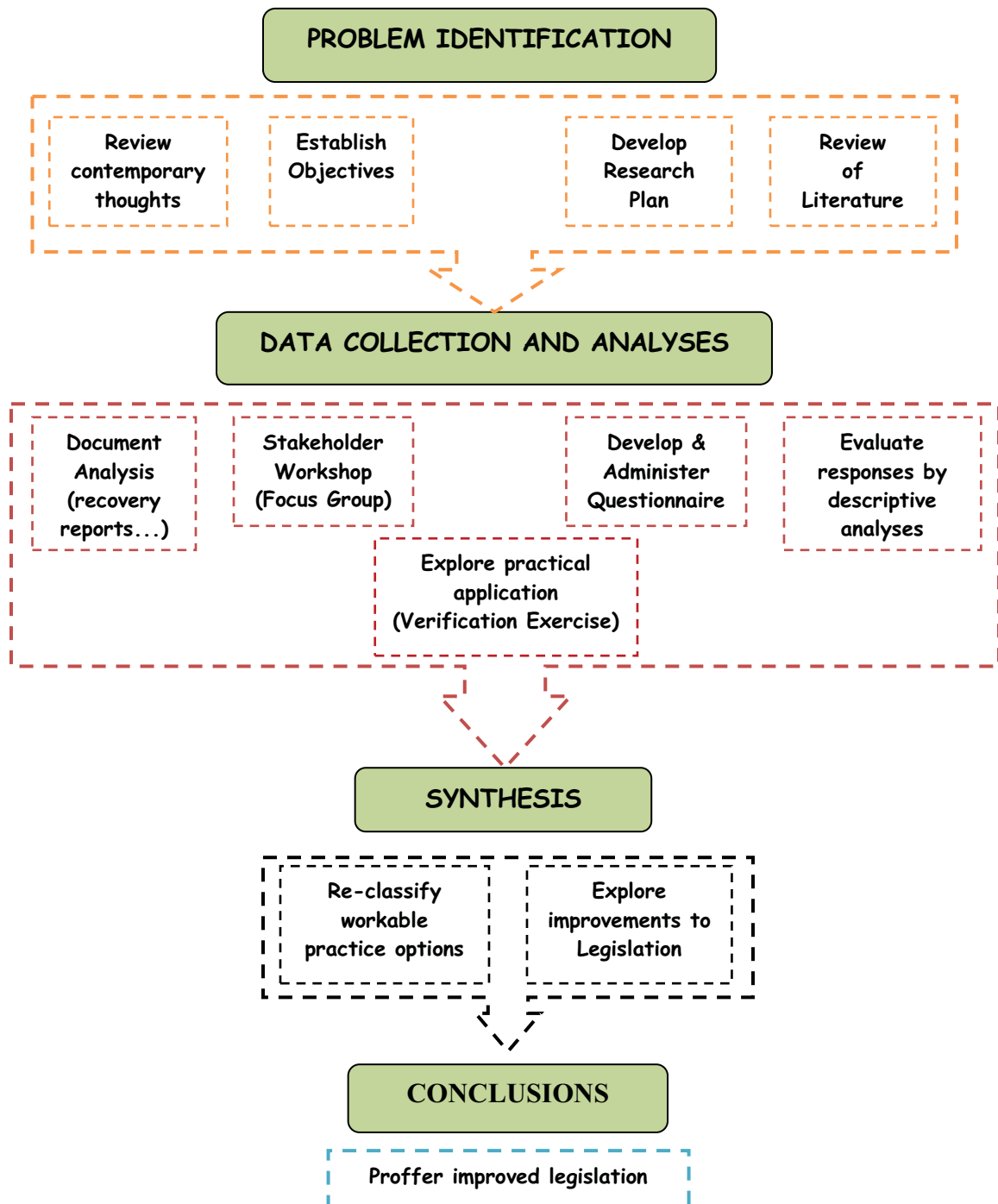


Figure 4.1 – Research Development Phases

Key research questions that the research was initially based upon include:

*How effective will the existing New Zealand reconstruction framework be in the event of a major disaster?*

*Will the provisions in the existing regulations help or hinder reconstruction programmes?*

*What framework and practice changes could be made to improve the reconstruction framework with due cognisance of stakeholder objectives?*

Four research objectives and plans were developed in line with these initial objectives and they included:

- To review existing CDEM operational framework vis-à-vis statutory guidelines and regulations.
- To identify the factors that determine the effectiveness of CDEM reconstruction programmes and their relationships and levels of influence.
- To ascertain the effects of regulations on post disaster reconstruction framework, and
- To develop process models of the existing and proposed reconstruction framework.

Subsequently the researcher commenced detailed review of relevant literature, which culminated in the presentation of five conference papers in 2006 and 2007, of which three were peer-reviewed. Endnote record of these papers is given in Appendix C, while copies of some of the publications are included at Appendices D1 to D7. Feedback on these presentations led to a honing of the research question and objectives to those presented in sections 1.1 and 1.3 of chapter one.

The second phase was the data collection and analyses phase. Primary data was obtained through the analyses of local and overseas recovery reports, government and other local documents. Secondary data was collected using two methods: (a) workshop involving a focus group of industry practitioners and (b) online survey of a wider community of building and development control officers and other



disaster practitioners. Information obtained from the secondary data was analysed descriptively in line with the evolving research question and objectives. Two peer-reviewed papers, one journal and the other a conference paper, published parts of the preliminary findings in 2008 and 2009 (see Endnote record in Appendix C). The findings from the research aspect of the study were then presented to subject matter experts for their verification. The verification and validation exercise was designed to gauge the practicability of some of the suggested improvements to the legislative documents that were the focus of this study.

The third phase of the study involved a synthesis of all the information generated to arrive at objective conclusions that meet the stated objectives of the research study. The suggested improvements to legislation are therefore the result of a re-classification of practice options beyond those generated from the secondary data collection and analyses.

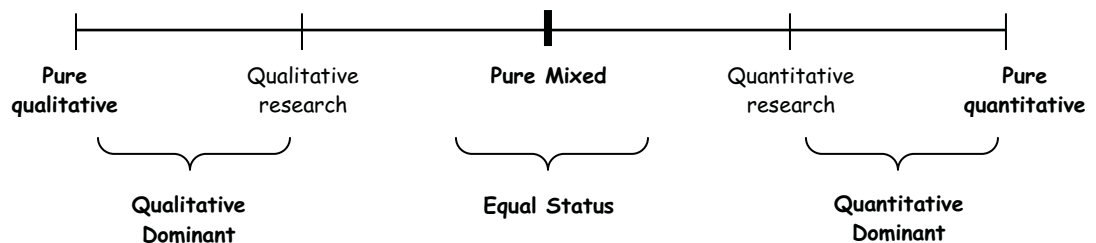
The study consistently explored opportunities to disseminate the research output so that the final research outcomes could be relevant to practice needs and realities. Examples of where the research outputs were presented include:

- a) Presentation and discussion of the draft recommendation via telephone conference to industry focussed representatives based in Wellington on 2 April 2009. A copy of the paper submitted for discussion is included at Appendix A4
- b) Written submission to the the Select Committee on Local Government and Environment, New Zealand Parliament. This was a submission on simplifying and streamlining the Resource Management Act, was submitted to New Zealand parliament on 4 April 2009. A copy of the submission is included at Appendix D1

The next section describes the research design and gives reasons for selecting the methods that are applied in this research study.

## 4.2 The Research Design

A multi method approach (triangulation) has been employed in the research study with a view to providing more credibility and validity to the research process. This triangulated approach is commonly used in social science research (Bryman, 2001). Bryman (2001) and Flick (2006) both explain that triangulation in a research study is a combination of several qualitative methods or may involve the combination of both quantitative and qualitative research methods. This combination of both quantitative and qualitative research methods can occur at three matrix levels (Johnson, Onwuegbuzie, & Turner, 2007). It could be a ‘pure mix’ of both quantitative and qualitative methods, in which case, each method has equal status with none of the methods dominating; or at two extremes of ‘quantitative dominant’ or ‘qualitative dominant’ mixed research methods in line with Johnson et al. (2007). Figure 4.2 gives a linear representation of these three major research paradigms and other subtypes.



**Figure 4.2 – Three major mixed methods research paradigms including subtypes** *Source: Adapted from Johnson et al. (2007, p. 124)*

Both quantitative and qualitative research approaches have been individually applied in disaster research according to Stallings (2006), while triangulation is increasingly being applied to more recent disaster research (Brunsma, Overfelt, & Picou, 2007). For example in the current study, five qualitative research methods were employed. Four of the methods assisted in the collection of research information from both primary and secondary sources; while the fifth research method helped to validate the qualitative information collected. All five research methods are described within this chapter.

The combined use of the five research methods have made for more incisive and robust findings on the impediments which legislative provisions could pose to post-disaster reconstruction activities, and what improvements can be made to the current recovery management framework. This research approach provides further evidence that multi-method research strategies result in convergent validity because of the range of perspectives that the research has been viewed from (Lewis-Beck, Bryman, & Liao, 2003).

#### **4.2.1 Multiple Methods and Disaster Research**

Multiple method research study refers to the application of or combination of several approaches to the study of the same phenomenon. Multiple or multi method research is alternatively referred to as mixed research (Johnson et al., 2007); complementary research (Flick, 2006); and triangulation. The term ‘triangulation’ has been credited to Webb, Campbell, Schwartz, and Sechrest (1966) (Bryman, 2001; Johnson et al., 2007) when they suggested that:

“Once a proposition has been confirmed by two or more independent measurement processes, the uncertainty of its interpretation is greatly reduced. The most persuasive evidence comes through a triangulation of measurement processes. If a proposition can survive the onslaught of a series of imperfect measures, with all their irrelevant error, confidence should be placed in it”. (p. 3)

Multi methods research approach is ‘becoming increasingly articulated, attached to research practice, and recognized as the third major research approach or research paradigm, along with qualitative research and quantitative research’ (Johnson et al., 2007, p.112). The primary philosophy behind multi methods research is that of introducing pragmatism to the research process. Thus knowledge is approached from a variety of perspectives. This benefits the research by improving confidence in the research materials that have been gathered from the variety of sources (Mays & Pope, 1995). Hewson (2006) explains that confidence is achieved through convergence and cross-validation of the findings; and wherever there are differences in the findings, these can be easily identified for further research.

Greene, Caracelli, & Graham (1989) provide useful reasons for employing a mixed methodological approach in research studies, which are applicable to multi methods. These reasons are outlined below with indication in each case, as to how these have been applied in the current study.

1. Triangulation i.e. seeking convergence and substantiation of results from different methods when studying the same phenomenon. Triangulation in the current research study involved a synergy of information gathered from both primary and secondary sources; and the inputs of subject matter experts.
2. Complementarity, which means seeking to elaborate, enhance, illustrate, or clarify the results from one research method(s) with results from another research method(s). For example two complementary methods were used in the current study to collect secondary data: the focus group study and the online survey.
3. Development – involves using the results from one method to help inform the other method. Research development was achieved in this study through a three-step process starting from the focus group, through the administration of a questionnaire and finally the verification of the research results.
4. Initiation - discovering paradoxes and contradictions that may lead to the review of a research question. Initiation was applicable in the first and second phase of the research using a combination of methods such as interviews, focus groups to narrow the original research question into those that will deliver useful knowledge to disaster management in New Zealand; and
5. Expansion – involves seeking to expand the breadth and range of an inquiry through the use of different methods for different inquiry components. Concepts referred to in disaster management literature, especially those with relevance to legislative provisions, have been expanded upon through the focus group study and the online survey method.

These five identified reasons have informed and provided the rationale for the methods used in the current research study. The study envisages that the final

output gives more credence to the multiple methods that have been applied. The validity of the current research findings is thus enhanced (Jupp, 2006).

A form of triangulation that has been used in disaster research is multiple data triangulation where data is gathered using several sampling strategies. Tierney, Harrald and Nebb (2000) used the multiple data triangulation approach to obtain data from multiple sources such as document analysis, interviews and physical observations. Another form of triangulation used in disaster research involved the use of multi methods to explore local risks and threats in Australia by Buckle, Marsh, & Smale, (2003). The Buckle et al. study commenced with an exhaustive review of literature; then an analysis of expert opinions using grounded theory methodology; structured and semi-structured interviews were then conducted with individuals and focus groups; and finally a number of municipalities that had experienced disasters were studied using a case study approach. Buckle et al. explain that their choice of method was partly because of the absence of a robust and rigorous body of knowledge and theory about key disaster concepts; and in part by the exploratory and speculative nature of the study. Multiple methods therefore offered the best approach to their research. A similar approach to Buckle et al study was used by Barnshaw and Trainor (2007) and Barnshaw (2006) with the use of multi methods to provide better understanding of the complex social processes that resulted from Hurricane Katrina. Both studies employed interviews, which were based on grounded theory strategies and structured surveys of randomly selected disaster victims.

In general, four distinguishable forms of triangulation are in use (Denzin & Lincoln, 2000). They are Data, Investigator, Theoretical and Methodological triangulation. Of the four forms of triangulation, methodical triangulation is predominantly used where the intention is to maximise the validity of a research (Denscombe, 2008; Johnson et al., 2007; Jupp, 2006).

Methodological triangulation is used in the current study considering the exploratory and speculative nature of the current research. It was apparent from the literature reviewed that no other study has considered how the current legislative framework pertaining to reconstruction activities can be made robust to

cater for large scale disasters. The current study conscientiously exploited methods such as document analysis, focus group studies, a survey instrument to seek improvements to the current post-disaster regulatory environment and finally using subject matter experts to verify the research outputs. In summary, qualitative methods were used to gain basic knowledge in the subject area, which are then validated using both qualitative and quasi-quantitative methods.

From the primary information sources reviewed, there appears to be a strong relationship between prior regulatory policies and the success of post disaster management programmes. Qualitative information obtained through document analyses and focus group discussions identified that reconstruction could be hindered by the current legislative framework in New Zealand. However this information is largely unarticulated in the current research environment. Potential solution(s) to the perceived problem(s) have also remained unexplored. Hence this current study's research objective is to provide knowledge on how the existing legislative and regulatory framework for reconstruction could be improved, so that the legislative framework facilitates effective and efficient implementation of reconstruction programmes after large-scale natural disasters in New Zealand.

The use of a multiple methods approach benefits the current study. Multiple methods provide more substantive results than in situations where many small qualitative investigations are undertaken or where there are few poorly executed quantitative investigations (J. Barnshaw & Trainor, 2007). Generally the prospects for the use of triangulation in disaster research are increasing and have helped to introduce robustness in disaster research processes.

### **4.3 Outline of Research Methods Used**

This section describes the individual research methods that have been used in accomplishing the objectives of this study. The section gives the rationale for their selection as appropriate tools for the study. Essentially the five methods discussed fall under the qualitative research category.

Qualitative research methods are usually employed in the investigation of aspects of social circumstances that are not amenable to quantitative measurement as Sumner (2006) has stated. Denzin and Lincoln (2000) and others suggest the common use of the method to study things in their natural settings. Attempt is made in qualitative research to interpret natural phenomena from the meanings people bring to them. Qualitative research methods provide ways of knowing based on a constructivism of understanding, meanings and theory.

The qualitative research approach has the researcher as the primary instrument of data collection and analysis (Merriam, 1998), thus the findings and results are fundamentally interpretive. According to Leedy and Ormrod (2001) the methods require a great deal of analyses and syntheses so that all information generated from the study are fitted together to form a meaningful matrix. The qualitative research methods that are used to accomplish the objectives of this study are described in the following sections.

#### **4.3.1 Personal Interviews**

At the early stages of the research programme it was necessary to complement the researcher's knowledge base with information from other people. Personal interviews were therefore arranged with industry and government experts working in the general area of civil defence and emergency management in New Zealand.

The interviews were an aspect of the problem identification phase of the research and had the following key objectives:

- To clarify the focus of the research, specifically to determine from these experts if the right research questions were being asked. A list of the initial research question is included in section 4.1.
- To develop further research direction beyond those decided after the initial literature review.
- To determine potential information sources and the strategies for sourcing the information required.

- To determine the best way to continue with subsequent parts of the research.

As such, the conversations and interviews were not without purpose (Merriam, 1998); and the study concludes that the interview objectives were largely met. The people initially interviewed were:

1. Mr. Rian Van Schalkwyk (Coordinator, Recovery Management Forum, Wellington)
2. Dr. Hugh Cowan (Research Manager, Earthquake Commission, Wellington)
3. Mr. Roger Crimp (Telecom, Wellington)
4. Mr. Peter Kingsbury (MCDEM, Canterbury Regional Office), and
5. Mr. David Brunson (Project Manager – Wellington Lifelines Group)

These industry experts were contacted prior to the interview to solicit their participation. A research outline (including brief literature and research objectives) was sent to the research participants in advance by email, for their consideration. The interviews took place in the interviewee's respective offices in Wellington and Christchurch. The interviews were conducted on 18 and 19 of April 2006 and generally lasted between 30 and 45 minutes. These preliminary interviews were semi-structured and took place within the first seven months of the research programme. Questions were generally open-ended so that the interviewees could comment freely on the proposed research and other relevant issues.

The interviewees made useful comments on the research questions and objectives that helped shape the research focus. A summary of the interviews is included at Appendix B2, however the key themes that emanated from the interviews include:

- This research should place emphasis on the identification of issues around the implementation of building and environment legislation such as the Building and Resource Management Acts. These legislative documents were considered pertinent to the achievement of reconstruction programmes in a major disaster.



- The study is to evaluate research information from both local and overseas disasters on how reconstruction works were progressed under the existing legislative frameworks. The criteria for selecting overseas disasters should be their similarities (in social, cultural and economic terms) with the New Zealand environment.
- The research study should plan effectively for the data collection phase with a good communication plan that would ensure a good uptake of the perspective views of a wide range of disaster management stakeholders.
- The study is to develop best practice guidelines that could ensure smooth implementation of building and environmental legislation.

The interviewees were also forthcoming on the study resources at their disposal and they suggested other sources of information that were useful for the research. The interviews generated the initial research directions and gave useful insights into the nature of the research problem.

Generally the personal interviews and other discussion forums clarified some of the initial research ideas, while the interviews necessitated reviews to some of the research objectives outlined in section 1.3 of chapter one.

#### **4.3.2 Workshop (Focus Group Study)**

Following on from the preliminary interviews, the Resilient Organisations research group held a workshop on 11 April 2006 at Te Papa, Wellington. The theme of the workshop was '*Barriers to Post-Disaster Reconstruction*'.

The workshop was designed to facilitate group discussion on ideas, experiences and memories of participants around reconstruction after natural disasters in New Zealand. The group discussion produced information and insights only accessible through the interaction found in a group setting. This interaction is referred to as the group effect, such that issues emerge in a kind of chaining or cascading manner from topics and expressions preceding the discussion (Lindlof & Taylor, 2002 ).

The workshop had industry practitioners in attendance with a wide a range of experience in civil defence and emergency management including other specialist knowledge areas in legislation, contract and recovery management. A profile of the workshop participants is given in Table 5.1 of chapter five. The specific objectives of the workshop included the following:

1. To explore the challenges and opportunities for reconstruction in a post-disaster situation.
2. To prioritise research efforts on those reconstruction issues that are most critical, and for which the research team might be able to realistically influence.
3. To identify potential barriers and opportunities for engaging the reconstruction stakeholders in addressing these issues.
4. To define research outputs.

There were three keynote papers presented in a general session, before participants were divided into four groups to brainstorm and discuss the main issues of reconstruction under four headings: legislation and regulations; contracts and procurement; resources; and coordination of reconstruction. At the end of the breakout sessions, participants reconvened to report back on the issues discussed. The results of the workshop (focus group) that relate to the current study are presented in chapter five, while the complete report on the workshop deliberations is included at Appendix A3. Some of the research priorities identified by the focus group have been progressed to a logical conclusion in the current study. The focus group study facilitated the triangulation process of the current research study.

### **4.3.3 Document Analysis**

One of the objectives of the current study is to evaluate research information from past disasters and to seek means of translating the lessons learnt to improve New Zealand situations. It was therefore considered appropriate to undertake in-depth contextual analyses of past reconstruction programmes. Information on both local

and international reconstruction phenomena was collected through the analysis of relevant documents, research reports and commentaries. A large amount of information on the disaster events was obtained through electronic searches of reports and official documents. This qualitative research method was significant as it provided insight into current reconstruction arrangements such as the structure of recovery management in New Zealand; reviews of historical information on reconstruction activities, such as Matata and Manawatu flooding incidents; and commentaries on the legislative framework, such as the Civil Defence Emergency Management Act.

Documents relating to reconstruction and recovery activities in two local natural disasters (the Matata and Manawatu flooding incidents) which had significant impact on New Zealand communities; and two other international events (Hurricane Katrina and Northridge Earthquakes) were reviewed. The external events were chosen for their magnitude and impact on the built environment (catastrophes); and the local events were selected because they are recent natural disasters of considerable national significance in New Zealand. The reviews and analysis show the constraints placed on recovery by restrictive legislative provisions. There was an exploration of the relevant legislative reviews (coupled with the modalities of such reviews) that were made in each of the incidents to allow for the implementation of post-disaster reconstruction programmes.

Key legislative documents that provided guidelines on post-disaster reconstruction and recovery in New Zealand were analysed. The legislative documents which were the focus of the current research study include: the Civil Defence Emergency Management CDEM Act (2002); the Resource Management Act RMA (1991); and the Building Act BA (2004). Other related documents, agency reports and commissioned reports referred to included research reports of studies conducted by Resilient Organisations research group members; and reports prepared by The Institution of Professional Engineers New Zealand (IPENZ) and the Auckland Engineering Lifelines Group (AELG). Key lessons from the document analyses and disaster cases are presented in chapter three.

#### 4.3.4 Survey/Questionnaire

The survey used in this research study was designed as an instrument for validating previously generated information from the personal interviews and focus group discussions. The questions covered themes and sub-themes which are in line with the main objectives pursued throughout the interviews, focus study, and analyses of relevant documents. The questionnaire was an opinion survey with the majority of the questions in the form of Ordinal and Likert scales. The different sections of the questionnaire contained statements which participants were required to rate according to their opinions on the subject matter. The statements are both positively and negatively worded to minimise the tendency of participants responding towards one end of the scale (Sekaran, 2003).

There were open ended questions which permitted the participants to give reasons for their opinions and to provide additional comments. The open ended questions were probing questions (Oppenheim, 1992) which illuminated their responses and helped to put the results in proper perspective. Analyses of responses to these parts of the questionnaire are presented in chapter 5.

The questionnaire was designed as a generic instrument so that the same questionnaire was administered to all irrespective of who was participating. It was therefore necessary to collect demographic and other useful information to assist with categorising the responses. These demographic questions helped to ascertain the respondent's profile. Where needed, the pattern of the responses could be cross validated with their capability profile during data analysis.

The main body of the questionnaire required the respondents to rate some statements about the CDEM Act, BA and RMA in accordance with their opinions on how these Acts will affect the implementation of reconstruction works after disasters.

The questionnaire was structured to be administered as an on-line survey (through an independent web portal called 'Survey Monkey') to respondents. This decision was reached after having explored several data collection methods. For example

some government agencies that were initially consulted, gave indications that they could not permit the use of their websites to promote the survey or to use their mailing lists to distribute hard copies of the questionnaire. The preferred option was therefore the on-line survey with participants sent web links to the survey within the letter requesting their participation. The request for participation included attachments containing the ‘participant information sheet’ and ‘participant consent forms’.

The survey was initially open for a period of six weeks commencing late February to the end of March, 2008. The survey portal enabled tracking of the survey to determine the number of completed and uncompleted responses. A reminder was sent out mid-March to request participants to respond to the survey before the end date. A further two weeks was allowed for the completion of the online survey.

The questionnaire asked questions which aligned with the main research objectives outlined in section 1.3 of chapter one. In order to identify the constraints that may be posed by existing legislative and regulatory provisions (objective 2), the questionnaire asked questions to determine the effect that existing provisions within the CDEM Act, BA and RMA could have on the reconstruction of the built environment after major natural disaster events in New Zealand.

To meet objective 3 of the research, the questionnaire asked specific questions to confirm or refute recovery problems that are envisaged in the deficient aspects of recovery-related legislation. For example there were questions to determine the following:

- a) how the span of control and liabilities of appointed Recovery Coordinators could be enhanced through legislation, so that they retain control of reconstruction after the initial response to a disaster.
- b) how existing arrangements for emergency readiness and response can be extended to cater for the longer-term recovery period especially after the expiration of declared state of emergencies.

- c) how the building consent process can be simplified and made more responsive to potential higher demands during the reconstruction period, reducing the frustrations experienced under the current process.

These questions emanate from previously gathered research information during the first phase of problem identification. Generally the questionnaire was designed as a validation tool and to propose means by which the identified deficiencies in legislation could be minimised. The quantitative data generated from the survey was analysed with the aid of the Statistical Package for Social Sciences (SPSS) and Microsoft Excel software.

#### ***4.3.4.1 The Pilot Survey***

An initial pilot of 10 surveys was conducted using members of the research supervision committee, members of the Resilient Organisations research group and two officials of the Ministry of Civil Defence and Emergency Management.

- \* On the front page you say they should withdraw by 31st Jan 08 - will need to change this date.
- \* 1. In the course of your work performance (decision making etc), how often do you make reference to the following Acts - suggest taking out the word "performance"
- \* Pg 3: There can be no conflicts while applying the BA and other Acts relating to the reconstruction of the built environment. - is "can" the right word here?
- \* Pg 3: The BA consent application process is not the major source of concern in post-disaster reconstruction. - should "the" be replaced by "a" - what impact would this change have on the answers you get?
- \* Pg 3, question 2. Suggest spelling out "Building Act"

The initial questionnaire was subsequently modified in line with the feedback received from this pilot group of respondents. A large proportion of the changes made to the original questionnaire dealt with rewording/rephrasing of the questions.

An example of some of the suggestions to reword the questions is given in the text box on the previous page. Items in the text box were extracted from the email correspondences between the researcher and one of the pilot participants.

Some other suggestions by pilot participants relate to the structure of the questionnaire. For example the parts of the questionnaire with Likert scales had to be written to include both positively and negatively-worded questions to prevent participants from answering questions at one end of the scale. An extract from the email correspondence with one of the participants relating to the wording of the Likert-scaled questions is given in the text box below.

The questions on BA/RMA are all negative, you should change some of them to be positive, as otherwise people will not read all and answer 'Strongly Disagree' for them all, or 'Strongly Agree'. Likewise with the civil defence ones being all positive.

There were useful suggestions by the pilot participants to facilitate smoother administration and answering of the online questionnaire. There were some technical tools in the Survey Monkey portal, which needed adjusting to enable survey participants to start and complete the questionnaire without broken or missing links within the period for which the survey was open. The text box below gives an observation that was made by one of the pilot participants on the technicalities of the online questionnaire.

About your trial survey, there are several technical problems as some of the question lists have vertical dead locks, which shouldn't be the case (couldn't select same answer for different questions). You may want to fix them. The other thing you might want to consider is that some questions are required to be answered before the interviewee could proceed further. Respondents may drop the survey halfway very easily. But generally it's a very organised and good one.

Other changes that were made to the initial questionnaire included providing enough space for participants to address some of the open-ended questions; and making some of the questions in the demography section optional, so that the

respondents can complete the questionnaire. These and other changes previously described are proof of the usefulness of conducting pilot surveys.

#### ***4.3.4.2 The Communication Plan***

At the conclusion of the pilot survey, a communication plan was put in place for the distribution of the questionnaire. The communication plan was necessary in order to reduce the following perceived risks:

- risk of non-participation or poor response to the survey.
- poor communication plan resulting in inability to reach the target respondents.
- difficulties in achieving follow-up and feedback on responses after the survey, and
- discarding of responses from either uncompleted or outlier-type answers.

The following paragraphs describe the steps taken to minimise the risks identified above.

To address the risk of non-participation or poor responses, the researcher decided to seek means by which wider participation could be gained. One step taken to achieve good response was to solicit participation through local councils in New Zealand. All 86 councils in New Zealand were telephoned to request their permission to pass the questionnaires through their offices. After speaking with either the Chief Executive Officers or their Personal Assistants, 85 councils gave their approval to become the channels of distribution of the questionnaire. The councils were required to identify officials who were in a position to address the issues raised in the survey. These included officers concerned with the implementation of the Building Act, Resource Management Act and Civil Defence Emergency Management Act. Some of the councils had officers responsible for each Act while others had officers with dual/multiple roles that could respond to the survey. Another step taken to encourage participation was to administer the questionnaires to the 12 Regional Emergency Management Officers (EMOs) in New Zealand, through their Coordinator based in Wellington.



He was contacted by phone, and he agreed to assist in the distribution of the questionnaire to his colleagues. There was also specific invitation to selected people and a general invitation to participate placed on the Resilient Organisation website to improve the responses rate to the questionnaire. A breakdown of the final survey participation through the different medium used to encourage participation is given in Table 5.2 of chapter five.

The risk of inability to reach target responses was mitigated by using a variety of means to advertise the online survey. There were phone calls and emails made to key people; advertisements were placed on the Resilient Organisations website; and personal contacts with industry participants. These means of communication were exploited to their fullest use to increase the probability of reaching the target participants.

To minimise the risk of not achieving follow-up and feedback to the survey, a part of the questionnaire requires participants to indicate their interest in participating in any feedback or future surveys. Those who indicate interest are further required to fill-out their email contacts to demonstrate consent to future contacts. The survey result database includes contact information of participants who can be contacted for their feedback.

Finally to avoid discarding the responses, the study needed to ensure that only people who had genuine interest in the survey and the overall research outcome participate in the survey. It was also necessary to ensure that the respondents had good knowledge of the subject matter in the questionnaire. Therefore the questionnaire was structured to pick up the knowledge base of participants and other background information which could demonstrate the reliability of their responses. The information sheet accompanying the questionnaire contained information on who the questionnaires were addressed to, and other information that could encourage the right participation. A copy of the participant information sheet is included at Appendix B3.

#### 4.3.5 Subject Matter Experts (SMEs)

Subject matter experts (SMEs) are individuals who are experts in their field of activities (Sugar & Schwen, 1995). They have been engaged in the current study to complete triangulation in the research process. The research is conscious of the need to provide feasible solutions to deficient parts of the three legislative documents, hence the engagement of SMEs to verify the research outputs and to confirm whether suggested solutions could be applied in practice. Three SMEs were selected; one for each legislative document (CDEM Act, RMA and BA) to extend and verify the results obtained from the focus group and online surveys. The SMEs were expected to provide their opinions on issues relating to their field of expertise and other general issues around the implementation of post-disaster reconstruction programmes in New Zealand.

A structured questionnaire was administered to each of the SMEs for their comments. The respective questionnaires to the SMEs are included at Appendix B6 to B8. The questionnaires contain the outlines of key issues that emanated from the focus group study and online survey; and other general issues on disaster management in New Zealand. The specific objective for approaching the SMEs with these issues is to enable verification of the research outputs, in terms of the deficiencies in these legislative documents and the feasibility in practice of this study's suggested improvements.

The three SMEs selected for the study are:

1. Mr. Paul Houlston - Manager, Civil Defence Emergency Management Policy in the Department of Internal Affairs, Te Tari Taiwhenua, Wellington. Mr. Houlston holds a postgraduate qualification with over 20 years of New Zealand experience. Paul considers that he has very good knowledge of the three legislative documents being studied. However he is selected as the SME to give his valued opinion on policy-type issues around the CDEM Act.
2. Mr. Owen McShane - Director, Centre for Resource Management Studies, Kaiwaka, Northland. Owen is a commentator on a wide a range of issues that

border the RMA. Owen has written widely on resource management and draws references from overseas experiences to proffer suggestions to implementation problems around the RMA. Owen has over 20 years of New Zealand and overseas experience. Owen has been selected as the SME to address issues pertaining the RMA and reconstruction in New Zealand.

3. Mr. Mike Stannard - Chief Engineer, Department of Building and Housing, Wellington. Mike was requested to give his valued opinion on the implementation issues around the BA in New Zealand. Mr. Mike Stannard has a postgraduate qualification with over 20 years of work experience in both New Zealand and overseas. Mike has a very good understanding of BA issues and engages with the document on a regular basis.

The information obtained from this verification exercise enable a re-classification of practicable solutions beyond those generated from the secondary data collection and analyses. The actual results of the verification are presented in discussion format in chapter five in line with the key themes emanating from the research. The verification exercise enhanced the research triangulation that pulls together all the information into a meaningful conclusion in chapter six and seven.

#### **4.4 Developing the Theoretical Framework**

This section gives an outline of the conceptual foundation that has been developed from the qualitative approaches used in this study. This is the theoretical framework upon which other aspects of the research are based. Sekaran (2003) describes the theoretical framework for a research as that which presents the interrelationships among variables that are integral to the dynamics of the research study. The relationships between the variables helps develop theories and hypotheses which can be examined for their validity by the research process.

The preliminary readings around the subject area and the outcome of the workshop held in April 2006 provided useful insight into the issues of concern in the management of post-disaster reconstruction activities in New Zealand. There were a range of problems and issues that were identified, which could cause

impediments to the realisation of reconstruction objectives in New Zealand. A pertinent issue, which is being pursued by the current study, is the legislative and regulatory framework for post-disaster reconstruction. Thus the main research question pursued by the study is:

*What improvement can be made to existing disaster-related legislation and regulatory provisions so that they facilitate the implementation of significant reconstruction programmes in New Zealand?*

Other related questions developed out of this main research question include:

*What specific provisions/clauses within the Civil Defence Emergency Management Act, Resource Management Act and Building Act, could impact post-disaster reconstruction?*

*How could a balance be achieved between the needs for expeditious reconstruction programmes and legislative compliance requirements contained in the three Acts?*

*How adequate is New Zealand's recovery framework to cater for a large-scale recovery effort beyond what it is used to?*

The CDEM Act, RMA and BA are the three legislative documents of primary interest in post-disaster reconstruction in New Zealand. These documents give legal backing to recovery related issues including emergency and recovery powers, coordination responsibilities, standard operating procedures, and interrelationships between stakeholders. The research investigations conducted by the current study show clearly that regulatory provisions in these three Acts need to be made more robust to enable post-disaster recovery and reconstruction programmes. The research hypothesis therefore is *that some of the content of the three Acts would need to be reviewed so that they facilitate the implementation of significant reconstruction programmes.*

The survey instrument is designed to prove or disprove that the three legislative documents were deficient and could impede post-disaster reconstruction. Thus if it could be deduced from the survey results that the three Acts pose significant barriers to post disaster reconstruction then the hypothesis is accepted otherwise rejected.

Research triangulation is achieved in the current study through a synergy of information gathered using the focus group, the online survey and the research verification questionnaire. These approaches generate information on improvements that can be made to the legislative documents to facilitate post-disaster reconstruction. Some other general opinions about the nature of disaster management in New Zealand would also provide conceptual basis to the survey responses.

#### **4.5 Research Data Analyses**

The study adopts a qualitative approach to the analyses of the research data. Several analyses and presentation formats are used. For example frequencies and percentages were used to classify the opinions obtained from the online survey (see Appendix B5); tables and figures summarise some of the data (see section 5.2 to 5.8); and descriptive narratives of essay type questions are provided (section 5.10). The objective for selecting the approach to research data analyses in the current study follows Chenail (1995) suggestions for openness, juxtaposition and simple presentation strategies.

Openness is achieved in the data analyses by presenting as much of the information collected during the research study as possible, in a clear manner. Juxtaposition in the study involved relating the information and data collected from both primary and secondary sources to the analyses, description and commentaries. Juxtaposition allowed emerging themes and gaps to be accurately discussed within the context of the current study. Finally the presentation format has been kept as simple as possible because complexity is in the data collected in any qualitative research (Chenail, 1995).

Some of the information collected required further analysis beyond those described above, such as the ranking of responses using weighted average measure, and thematic analysis of essay type responses. These analytical methods are briefly described under the following headings.

#### **4.5.1 Weighted Average Method**

The weighted average was used to rank some of the responses obtained from the Likert scaled questions. Values (0, 1, 2 and 3) were assigned to the opinions given by participants. For instance, 3 was assigned to 'High priority'; 2 to 'Low priority' etc. The formula used simply sums up the respective multiples of the number of response by the assigned values. The total weight is used as the criteria for ranking the statements. A statement with the highest total weight is ranked 1, meaning that it is considered by the respondents to be of higher priority than the next succeeding total weight.

#### **4.5.2 Thematic Analyses**

Thematic analysis has been used in the context of this research to summarise and encapsulate information that was provided in the open ended questions in the online survey and the questionnaire to the SMEs. Thematic analysis allowed ideas to emerge from identifiable themes and patterns from the transcripts of the responses. The steps involved reading backwards and forwards between the transcripts to collate the themes. In some sections where thematic analysis was conducted, the result includes extracts of relevant transcripts to provide back-up evidence. Complete transcripts of the original data from the online survey are presented in the Questionnaire Analyses sheet in Appendix B5.

### **4.6 Ethical Considerations in the Research**

The study considered ethical issues at all stages of the research design and execution process. An application was made to the University's Human Ethics Committee on the 5 October 2007. Ethics approval was granted by the Human Ethics Committee on 30 November 2007 (Ref. HEC 2007/148 in Appendix B1). Ethics application was made on the University's approved format and other supporting documents such as the list of questions with an appropriate rubric; participant information sheet (included at Appendix B3); and participant consent form (included at Appendix B4) were attached.

All University ethics guidelines and principles were adhered to in the formulation and administration of the questionnaire. All solicitations for participation and subsequent correspondences contained information guided by the following principles:

1. Informed Consent – All participants were made aware of the nature of the research through the initial request for participation (emails and web information) and the participant information sheets. They were told their rights to accept or decline their participation at any time during the study (including withdrawal of information they have provided). All participants were requested to fill out a consent form to confirm their decision to participate in the research.
2. Privacy and Confidentiality – All participants were assured of their rights to privacy, confidentiality and anonymity through the use of pseudonyms. No participant is directly identified within this thesis, without their prior consent to do so.
3. Limitation of Deception – Every step has been taken to provide participants with the true nature of the research and of the use of any information they have provided.
4. Minimisation of Risk – There is no foreseeable risk on the part of the participants and the researcher in this study considering that other ethics principles are upheld.
5. Obligations under the Treaty of Waitangi – There were no matters of cultural concern raised; nonetheless cognisance was given to this principle throughout the study.

#### **4.7 Conclusion**

The focus of this chapter was to provide an overview of the research process, research methodology and the parameters within which the study was conducted. The development process of the research questions and objectives from the early

part of the study up to its current form were presented together with contextual information that explains the reasons for choices that were made during the research development phases. The research programme involved qualitative research approaches to generate data on the needed improvements to three legislative Acts in New Zealand. The qualitative research methods used were presented and the process by which research triangulation was achieved in the study is explained.

The following chapter presents detailed results from the focus group study, the online survey and the verification questionnaire. This is undertaken in pursuant of objective three of the research study which is outlined in section 1.3 of chapter one.



## Chapter Five

### Analyses and Presentation of Results

#### 5.0 Introduction

This chapter reports on the results of the research methods employed in the study i.e. the focus group, online survey and verification exercise. The three approaches are described and the research outcomes presented under main themes and sub-themes pursued by the research. These themes are in consonance with the general focus of the research study which has been highlighted throughout the literature review and other parts of this report.

The chapter concludes by comparing the results of the two research approaches as a way of validating the research outcomes. The main objective of the chapter is to present the problems (and possible solutions) associated with the implementation of current recovery-related legislation in practical terms. Other general aspects of disaster management in New Zealand are covered by the research also.

Preliminary investigations that were carried out through interviews, literature review and document analyses brought to light recovery problems in New Zealand. Particularly some issues surround the implementation of the CDEM Act, RMA and BA. Some of the issues were highlighted in section 3.3 and 3.4 of chapter three, while the result of preliminary interviews conducted at the early stage of the research are presented in section 4.3.1.1 of chapter four.

Essentially this chapter is in pursuant of objective three of the research study, which is:

*to investigate whether building and development control officers, and other disaster management practitioners, envisage problems in the post-disaster recovery process that are specifically caused by deficiencies in legislation.*

The chapter presents the result of three research instruments to prove or disprove recovery problems that are envisaged during the implementation of the current

legislative framework for post disaster; and to seek means by which future reconstruction programmes can be executed with minimum hindrance.

## 5.1 The Research Workshop (Focus Group Study)

This section reports on the outcome of the workshop described in section 4.3.1.2 of chapter four. The outcomes are reported using the personal notes and observations of the author during the course of the discussion sessions.

The workshop was structured in a focus group format, with participants encouraged to express their ideas in a free-flowing and relatively unrestrictive atmosphere. ResOrgs' lead researchers were the facilitators and moderators to the group discussions while student researchers (including the author) were the rapporteurs at the discussion sessions that took place simultaneously.

The focus group was comprised of representatives experienced and knowledgeable in CDEM and other specialist knowledge areas such as insurance, disaster legislation, construction and contract management. A breakdown of the type of organisations represented at the workshop is given in Table 5.1. In all, there were 24 focus group participants and 9 ResOrgs members in attendance. The invited participants had been sent a proposed agenda, and a list of questions that the group would discuss prior to the workshop.

**Table 5.1 – Profile of workshop participants**

| No           | Type of Organisation                      | Number in attendance |
|--------------|---|----------------------|
| 1            | Insurance including EQC                   | 6                    |
| 2            | Territorial/local councils                | 5                    |
| 3            | Lifelines (Telecom, Transit NZ etc)       | 3                    |
| 4            | Research and Education                    | 4                    |
| 5            | Private consultancy (legal & engineering) | 4                    |
| 6            | MCDEM                                     | 2                    |
| 7            | Resilient Organisations                   | 9                    |
| <b>TOTAL</b> |   | <b>33</b>            |

There were three keynote papers presented in a general session before participants were divided into four sub-groups to discuss key post-disaster reconstruction issues under four headings: legislation and regulations; contracts and procurement; resources; and coordination of reconstruction. At the end of the breakout session, participants reconvened to report back on the issues discussed and to summarise the key outcomes. The key outcomes that relate to the current research study are presented under the section 5.1.2. The following sub-heading presents a summary of the keynote presentations.

### **5.1.1 Summary of Keynote Presentations**

This section summarises the three keynote presentations delivered at the general session before participants were broken into smaller groups. More emphasis is given to the second keynote presentation because it aligns more closely to the current research focus. Generally, all three presentations helped to set the stage for the focus group discussions that followed the keynote presentations.

#### First Keynote Presentation: David Hopkins (David Hopkins Consulting)

David's presentation was on the effects of disasters and the challenges it poses to recovery. David summarised the effects of disasters into what he acronym the '4Ds' of Damage, Death, Destruction and the Determination to recover. In terms of the challenges to recovery, he drew an interesting analogy of the disaster recovery process and recovery from the casualty of a broken limb. In summary he considers that the main challenge to recovery is to 'get back to normal' by taking every possible step to achieve this.

#### Second Keynote Presentation: David Middleton (EQC)

David Middleton's presentation focused on the issues and problems that surround post disaster reconstruction in New Zealand. His presentation reinforced the issues identified by the workshop conveners i.e. resources, legislation, coordination and contractual issues. David believes that recovery in New Zealand would present a set of challenges that could not be easily solved under normal/routine operating conditions. He pointed out that day-to-day legislation

such as the Resource Management and Building Acts will constitute the biggest impediments to reconstruction as emergency management officials may be constrained and fearful of overstepping certain legislative parameters. David suggests that the following specific issues need to be addressed as a way of enhancing post-disaster recovery in New Zealand:

- a) The challenges that will be faced by appointed Recovery Controllers who may not have the power to coordinate recovery activities under the current legislative framework.
- b) The transfer of recovery coordination between different persons during a long-term recovery period i.e. transfers of control from Group Controllers to Group and local Recovery Managers etc.
- c) The nature of contractual arrangements in New Zealand may pose impediments to the efficiency of reconstruction projects. Contract and procurements arrangements may have to be reviewed to suit the demands for speed and efficiency during recovery periods.

David concludes that it is imperative that systems be put in place that will streamline processes before any significant disaster event in New Zealand. He believes that emergency management officials can achieve success in disaster management, if the officials are given reasonable leeway to act under conditions of trust and positive relationships.

Third Keynote Presentation: Regan Potangoroa (UNITEC, New Zealand)

Regan presented three novel questioning systems being trialled on actual disaster events around the world by some of the non-governmental agencies he is involved with. These questionnaires were developed to ensure that the intervention of the non-governmental agencies in disaster reconstruction activities achieves the desired objectives for community recovery. Such questionnaires may be useful as a check on the effectiveness of recovery policies after disasters.

### 5.1.2 The Focus Group (Key Outcomes)

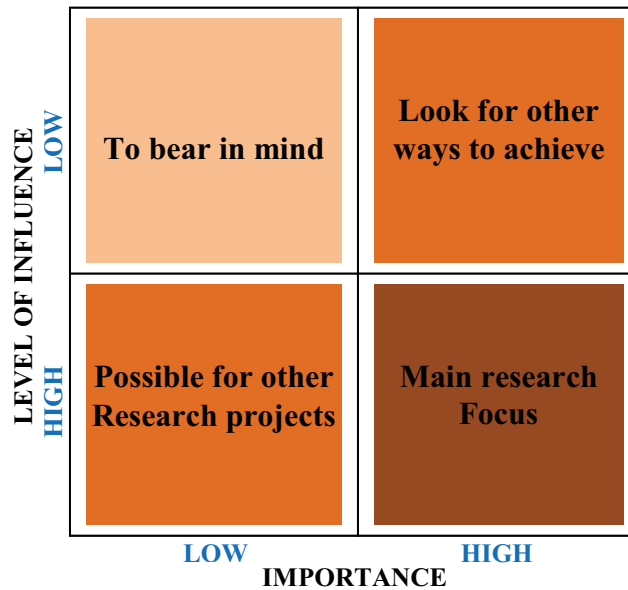
This section presents the outcome of the discussions by focus group participants. The discussions were held after keynote presentations in four different groups corresponding to the four identified issues that could pose barriers to post disaster reconstruction activities in New Zealand. These are (a) contractual issues; (b) resource availability and accessibility; (c) legislation; and (d) recovery coordination. However, this chapter presents only the outcome of the discussions under (c) and (d) because they closely align with the research focus.

The pre-cursory information given to the ‘legislation’ focus group and subsequent discussion honed the hypothesis that the provisions of some legislative documents would impede reconstruction after a large-scale disaster in New Zealand. These impediments could be lengthy bureaucratic procedures; conflicts of responsibilities or misplacement of recovery policy priorities. The questions addressed by the participants were:

- (a) How to provide the best balance between legislative requirements and rapid recovery (reconstructing the built environment) after disasters.
- (b) What could be done to achieve effective reconstruction?
- (c) Would a review or realignment of existing legislation be adequate?
- (d) Is a national recovery framework required to facilitate reconstruction objectives?

At the end of the focus groups deliberations, the information was collated and discussed further in a general session. The sets of information generated by the focus group were plotted on a decision matrix table (see Figure 5.2) to determine their relative importance and subsequently the priority areas were ranked.

After plotting the general issues on the decision matrix, the statements in the following text box summarise the research priorities pertaining to the current research study on disaster legislation and regulations.



**Figure 5.1 - Decision matrix for ranking research priorities**

***Items in the main research focus:***

1. To determine the extent of liabilities for reconstruction works and where this lies
2. To determine how the consenting process for reconstruction programmes can be simplified
3. To study the gaps in existing legislation and other wider government initiatives and consequently the constraints this will impose on post-disaster recovery
4. To determine public acceptance issues for changes in legislation needed, and
5. To define what legislation should address.

***Items to be achieved by other ways (High Importance):***

1. How to facilitate engagement by the Disaster Planning and Management Committee (DPMC).

The items identified in the main research focus, were used to formulate the key objectives pursued by the current research study. Particularly items 2, 3 and 5 listed in the text box above are in consonance with the issues discovered at the early stages of the research programme; they were also raised at a number of

forums where the current research was discussed. Other items in the main research focus identified by the group have been identified as potential future research topics for the Resilient Organisations research programme.

The deliberations of the focus group that considered the legislative and regulatory barriers to post disaster reconstruction in New Zealand are summarised below.

***Current legislative and regulatory provisions may pose barriers to the implementation of major reconstruction programmes.***

Focus group members were in general agreement that the provisions in some legislative documents around disaster management are ambiguous. Particular concern was in the implementation of those provisions during extensive reconstruction programmes when the demands for speed are of essence to community recovery. The focus group noted that more should be able to be achieved following the expiration of the period of a declared emergency. The following are examples of the areas of concern noted in some legislative documents:

- Civil Defence Emergency Management (CDEM) Act – There were concerns around planning and strategising for reconstruction activities as provided for by the Act. For example, group members were of the opinion that appointed Recovery Controllers may not have the powers to actually coordinate reconstruction. Coordination and control responsibilities are more likely to be taken over from the Controller at the expiration of a declared state of emergency. This may mean changes in policy approaches and discontinuity during the transition period from emergency response to actual recovery. This change may impact on the implementation of reconstruction programmes.
- Resource Management Act (RMA) – The focus group were concerned that the statutory requirements for processing of resource of consents may not augur well for an early recovery from a disaster event. There are delays envisaged in compliance and processing arrangements considering that there would be a spike of consent applications to be processed within a limited timeframe.

- Local Government Act – The processes and powers stipulated in the Act are of concern and the focus group asked how much discretionary control is able to be exercised under current extensive consultation requirements? Another related question asked was: what liability cover exists for Recovery Managers?
- Building Act (BA) – Compliance and processing delays are envisaged as in the RMA. Focus group members asked what effect the new building inspection regime would have on minor reconstruction works. The new Act requires several hold points during construction work where inspections have to be carried out before work could be progressed. For minor reconstruction works, how much of inspection is needed and in which circumstances will inspection be required. There are also wider implications of the new guidelines for certification of Building Consent Authorities on reconstruction work. The question asked by members is: how prepared are the councils for certification?
- EQC Act – The areas of concern on the EQC Act include its prescription and limitation to the administration of compensation claims. The focus group noted that there is no certainty on what perils are covered by EQC considering that the EQC had been flexible in previous hazard events.

Of the five legislative documents identified by the focus group, only three of these have been investigated by the current study that focuses on the CDEM Act, RMA and BA.

***Current legislation may prevent pragmatic solutions from being implemented during response and recovery.***

The focus group discussed the implications of the current framework on decision making responsibilities. There were fears that disaster management leadership could become more risk-averse as the scale of devastation in a disaster event increases. There is the tendency on the part of decision-makers not to want to apply a pragmatic solution that is outside of statutory guidelines. They note that



the current legislation is disempowering. For instance, who can make decisions on debris disposal, dead animals, or waste? How much liability cover is available to decision makers in the event of failed policies or actions?

***Organised arrangements for readiness and response may not be adequate in a large-scale recovery programme.***

The focus group discussed the recovery situation in previous disaster events. They concluded that there are organised arrangements for readiness and response in New Zealand; however these arrangements would not suffice, particularly during the recovery phase of a major natural disaster. The following questions were posed: Who is in charge of recovery? Is it the MCDEM, Recovery Controller, Recovery Manager, or affected lifelines? Some local government officials in the group suggested the establishment of cluster groups as a special arrangement to oversee reconstruction activities within geographical areas. No conclusion was reached on the feasibility of this cluster approach. However, it was agreed that the statutory basis for coordination of recovery activities in New Zealand is not adequate.

***Several different pieces of legislation guide recovery agencies thus operational performance may not permit flexibility in decision making.***

The group noted that there were different pieces of legislation that contain operational guidelines for performance during an emergency. Some of the guidelines are specific to some agencies while others are generic. Some agencies may find it difficult to operate outside the remit of their guiding documents (emergency plans, standard operating procedures etc) which may not be in tandem with those of other agencies. Inter-agency coordination of efforts seems unlikely in such a circumstance. Some group members have questioned the extent to which agencies would consider the impact of their actions (or inaction) on other agencies.

*Legislation may be difficult to change because law revision takes a long time to process before implementation.*

The group noted that legislation changes take long to effect. Potential reviews and law changes may have to be made before a disaster event. The group noted that contentious areas observed during recent recovery programmes have to be addressed before another hazard event. The group submit that this is one way that current bureaucratic tendencies could be avoided in times of chaos. In the event that needed legislative changes have not taken effect before another disaster, the group suggested that a controlled relaxation of the contentious areas may be expedient to allow for efficiency and effectiveness of emergency activities.

### **5.1.3 Conclusion**

The information received from this focus group reinforces previously held opinions about the problems of implementing legislative provisions after a disaster in New Zealand. There is some consistency in the opinions expressed by this focus group and those of the industry experts interviewed at the early stages of the research. Throughout the research development stages it became apparent that the CDEM Act, RMA and BA are the main pieces of legislation of concern in post-disaster reconstruction in New Zealand. Therefore, imperatives for this research programme include more incisive studies to address the potential problems that these three Acts may cause to post-disaster reconstruction; and how these problems can be mitigated.

The research question is honed on the improvements that can be made to the three identified legislation and other regulatory provisions so that they facilitate the implementation of significant reconstruction programmes in New Zealand. Thus, in pursuant of the third research objectives which is to investigate whether problems are envisaged in the recovery process that are specifically caused by deficiencies in legislation (outlined in section 1.3), the study expanded the scope of its investigation by administering an online questionnaire to a larger group of disaster management practitioners, building and environmental development officials.

The online survey is described in the next section and is followed by a discussion of the results of a verification exercise. The chapter concludes with a general summary of findings from the three research approaches (focus group, online survey and verification exercise) employed in this study.

## **5.2 The Online Survey**

This section reports on the outcome of the online survey administered using an internet web service called Survey Monkey (<http://www.surveymonkey.com/>). The section begins with a description of the questionnaire, the profile of the respondents and then the salient issues covered by the different parts of the questionnaire. The results are presented under main themes and sub-themes, corresponding to prior qualitative information that is being validated by the questionnaire.

### **5.2.1 Brief Description**

The website used for the administration of the questionnaire has basic research features which allow for the design of the survey instrument; its testing, the collection and simple analyses of the responses. Some information on the survey instrument was provided in chapter four (section 4.3.2.1). A detailed analysis of the questionnaire is included at Appendix B5. This contains data on frequency and percentages of the responses.

The objective of the questionnaire was to investigate whether officials with experience in building and environmental development and emergency management envisage problems in the post-disaster recovery process in New Zealand. Thus the questionnaire covered the following themes:

- Investigation of the impediments imposed by the CDEM Act on post disaster reconstruction
- Investigation of the impediments imposed by the RMA on post disaster reconstruction

- Investigation of the impediments imposed by the BA on post disaster reconstruction, and
- Other general investigations on the effectiveness of post-disaster management activities in New Zealand.

Two other parts of the questionnaire covered the following themes:

- The demography of participants (Profiling); and
- Questions to determine participants' knowledge of disaster-related legislation

Altogether the questionnaire covered the six main themes that were outlined above. The results of the analyses of the responses are presented under six sections (5.3 to 5.8) that correspond with the themes covered.

### **5.2.2 Response Rate**

There were four methods by which the on-line survey was administered to the participants in New Zealand (stated in chapter four, section 4.3.2.1). These were by direct administration of the survey to the 86 territorial local authorities; through the Coordinator of Regional Emergency Management Officers; selective distribution to interested persons; and a general request for participation posted on the Resilient Organisations' website.

It was estimated that a total of 200 responses could be received through these sources. The research assumes that at least one-third of the 86 councils will produce three participants each (N=86) while the remaining two-thirds will produce two participants each respectively (N=114). The first set of surveys were despatched to participants on 22 February 2008. A follow-up in the form of a reminder was sent out on 18 March 2008 to those who had either not responded or completed the questionnaire. The survey portal had a tracking system that displayed the number of persons who had started, but not completed their questionnaire. The last of the questionnaire was received by surface mail on 15 May 2008.

The total number of usable questionnaires after a data cleanup exercise was 80. This corresponds to an overall response rate of 40% when compared with the total anticipated response of 200. The table 5.2 below gives a breakdown of the number of questionnaires received through each medium of distribution.

**Table 5.2 – The distribution of survey responses**

| No.          | Medium of Distribution                              | No. of usable Questionnaires | Response rate cf expected 200 (%) |
|--------------|---|------------------------------|-----------------------------------|
| 1.           | Local Councils                                      | 57                           | 28.5                              |
| 2.           | Coordinator, Regional Emergency Management Officers | 19                           | 9.5                               |
| 3.           | Selected participants                               | 4                            | 2                                 |
| 4.           | General notification (ResOrgs website)              | 0                            | 0                                 |
| <b>TOTAL</b> |   | <b>80</b>                    | <b>40</b>                         |

The highest number of questionnaires was received through the territorial local authorities, while no questionnaires were received through the Resilient Organisations' website. The same set of questionnaires was administered to all the participants irrespective of their background or inclinations. Participants completed parts of the questionnaire according to their understanding of the issues raised within each part. Therefore there were variable levels of completeness of the different parts within the questionnaire. This variability is accounted for and appropriately indicated in the general analyses of the questionnaire in Appendix B5 and in discussions in the later part of this chapter.

### **5.3 Profile of the Survey Participants**

This section presents salient characteristics of the participants to the survey, which had a section on the demography of participants. Data on demography have been used in these analyses to establish the competencies of the participants, and to

provide assurance that the results could be relied upon as a representative sample of opinions across New Zealand.

Participants' response to this section was optional and data obtained was limited by this. A preliminary analysis of the completed responses shows that there is no significant relationship between the pattern of the responses and the participants. Identifiable groups held opinions at both ends of the scale. Table 5.3 summarises the demographic information collected from respondents to the online survey.

**Table 5.3 – The demography of survey participants**

| Profile of Respondents         |                      | Frequency | Percentages |
|--------------------------------|----------------------|-----------|-------------|
| Country of Practice            | New Zealand          | 80        | 100         |
|                                | Overseas             | -         | -           |
| Region/Island                  | North Island         | 40        | 50.0        |
|                                | South Island         | 17        | 21.3        |
|                                | Not Stated           | 23        | 28.7        |
| Gender                         | Male                 | 48        | 60.0        |
|                                | Female               | 9         | 11.2        |
|                                | Not Stated           | 23        | 28.8        |
| Place of Work Experience       | New Zealand only     | 47        | 58.8        |
|                                | Overseas only        | 2         | 2.50        |
|                                | Both                 | 3         | 3.75        |
|                                | Not Stated           | 31        | 38.7        |
| Work Experience                | Above 20yrs          | 30        | 37.5        |
|                                | 16-20 years          | 8         | 10.0        |
|                                | 11- 15 yrs           | 6         | 7.50        |
|                                | 6 - 10 yrs           | 6         | 7.50        |
|                                | 0 - 5 yrs            | 7         | 8.80        |
|                                | Not Stated           | 23        | 28.8        |
| Highest qualification obtained | Postgraduate         | 15        | 18.8        |
|                                | Degree or Equivalent | 19        | 23.8        |
|                                | Diploma              | 10        | 12.5        |
|                                | Others               | -         | -           |
|                                | Not Stated           | 36        | 45.0        |

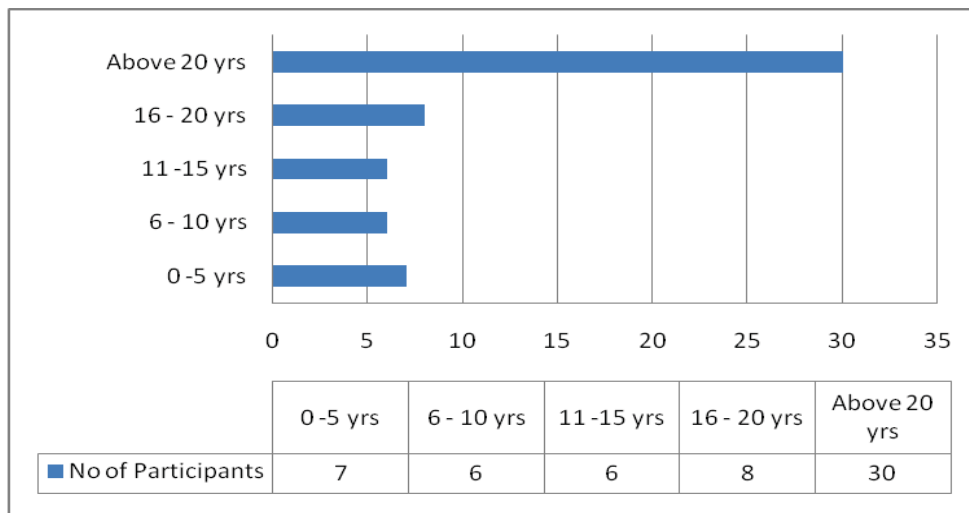
### 5.3.1 Regional Groupings

57 participants indicated their regional groupings. Of this number the majority came from the North Island (73%) while the remaining 27% were based in the South Island. The percentage of uncompleted responses (30%) makes statistics on regional grouping inconclusive. However, there is no indication within parts of

the survey data that participants’ regional grouping had any impact on the pattern of their responses.

**5.3.2 Work Experience, Qualifications and Professional Affiliations**

Table 5.3 also gives a summary of the professional work experience of the participants. Of note is that more than 37.5% of these participants have above 20 years experience, with at least 62.5% having more than 5 years of disaster-related work experience. A detailed analysis of the data is expressed as a horizontal bar chart in Figure 5.2.



**Figure 5.2 – Survey participants' work experience**

Of the total number of completed responses 58.8% (n=47) indicated that their disaster-related work experience was gained while working in New Zealand; 2.5% (n=2) while overseas; and 3.75% (n=5) have both New Zealand and overseas experience.

In terms of their educational qualifications, 18.8% have post graduate degrees; 23.8% undergraduate degrees or equivalent; and 12.5% (n=10) diploma qualifications. Participants have also indicated a wide range of professional affiliations to disaster management and other professional associations.

Generally the data displays a good level of relevant academic and professional experience of the survey participants. This is indicative of a good capability profile which positively influences the integrity of the responses. One may conclude that the information collected can be relied upon; and that it reflects the perspective and opinions of the respondents.

## **5.4 Survey Participants' Knowledge Base**

As stated earlier, the questionnaire was a generic instrument; this means that an identical set of questions was administered to the participants, irrespective of their job responsibilities in their respective organisations. Therefore, to create a distinction between the responses, participants were asked to rate their levels of understanding of the three Acts under consideration, i.e. the Civil Defence Emergency Management (CDEM) Act; Resource Management Act (RMA); and the Building Act (BA). They were also to indicate how often they make reference to these regulatory documents; their understanding of each document; and to provide information on other regulatory documents which relate to the roles that they are employed in.

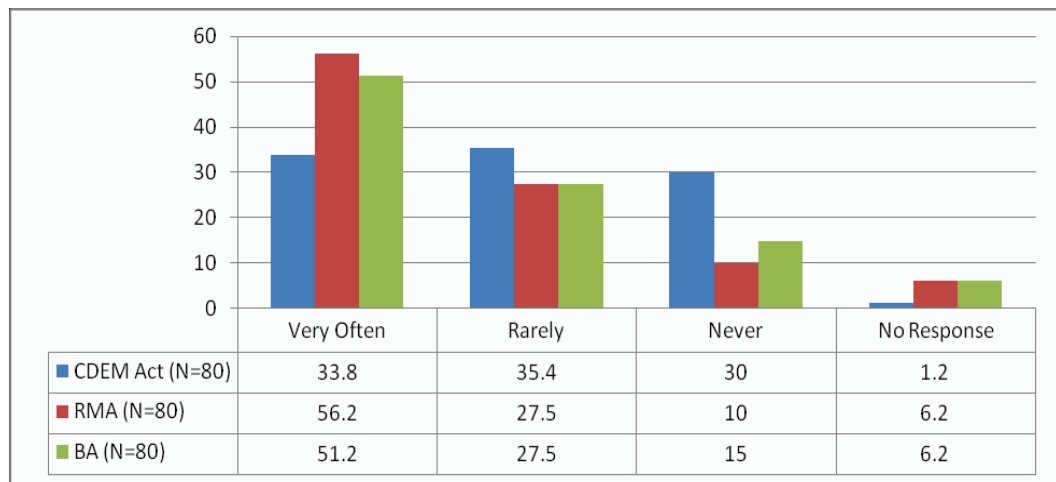
This section of the questionnaire helped to segregate the responses in line with the participants' different levels of understanding of the Acts, so that it would be possible to explain incomplete and unusable responses within the questionnaire. The dataset analysed in 5.5 to 5.7 have been adjusted, using two criteria: (1) the total usable responses; and (2) analyses of responses from those who claim to have a good knowledge of the contents of each regulatory document only. The analyses of this section of the questionnaire are presented in Section 1 of Appendix B5.

### **5.4.1 Participants' Levels of Reference to the Acts**

Figure 5.3 presents a summary of the responses (in percentages) to the question requiring them to indicate how often they make reference to the three Acts under consideration.



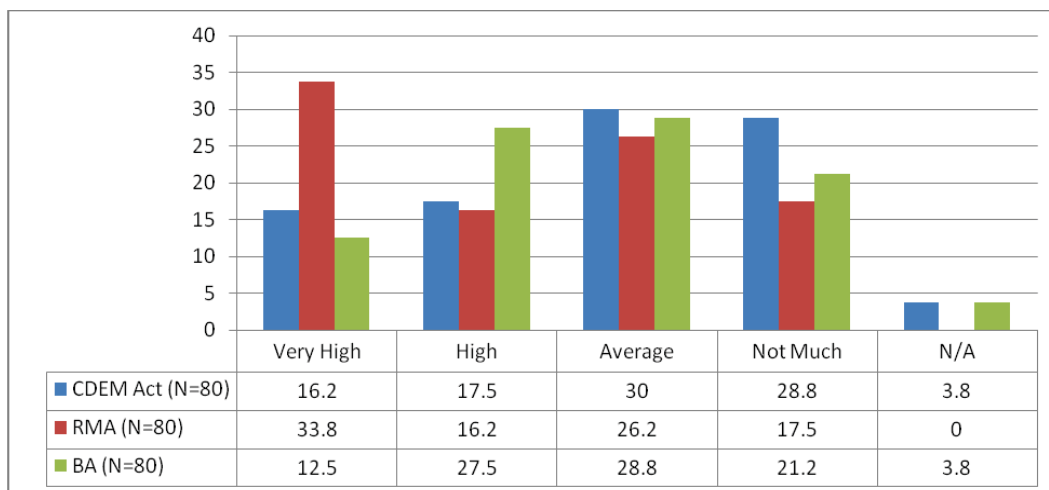
The chart shows that a good number of the participants, 33.8% for the CDEM Act, 56.2% for the RMA and 51.2% for the BA, have expressed that they very often refer to these Acts in the course of performing their roles. Fewer than 15% of the total participants (N=80) indicated that they have never had cause to refer to the respective Acts, especially with regards to the RMA and BA.



**Figure 5.3 - Level of reference to the three Acts**

#### 5.4.2 Participants’ Understanding of the Provisions of the Acts

As a follow-on to the question requiring references to the three Acts in 5.4.1, participants were asked to rate their understanding of the provisions of the three Acts. The objective was to determine how knowledgeable the participants were with the Acts even though they may not reference the Acts in the course of their work. Their response to this question is presented in a bar chart form in Figure 5.4. There is evidence of a good level of understanding of the provisions of the three Acts. 63.7% (n=51) of the participants have an above average understanding of the CDEM Act, while the remaining 36.3% (n=29) have either little understanding of the Act or failed to respond to the question.



**Figure 5.4 – Levels of understanding of the Acts**

The reasons given by some of the participants who assessed themselves as having little understanding of the CDEM Act are provided in the text box below.

Any potential Civil Defence issues [I] discuss directly with Council's Civil Defence Officer. (P002)

Civil Defence and Emergency Management Act not well publicised or used in my everyday role. (P005)

Not required to use in my role, I will reference the appropriate staff when required. (P012)

I am a team leader for building controls; although I participate in Civil Defence I am not involved in the management. (P023)

I have some knowledge of the CDEM Act in my capacity as a headquarters Manager for civil defence matters. I however rarely refer to this legislation in my capacity as Principal Planner. (P022)

There has been little need for me to have knowledge of the CDEM Act... (P034)

Not a core responsibility in my role. (P035)

Role is policy and reactive to emergencies, but in context of the Building Act only. (P041)

A thematic analysis of their responses show that the reasons they have outlined for their little knowledge of the CDEM Act centre around their respective roles and responsibilities that do not involve a direct involvement in CDEM.

For example those participants who held building and development control or environmental/health control roles have indicated that they are not involved in disaster management decisions thus have little use of the CDEM Act. One participant believes that the CDEM Act is not well publicised suggesting that only persons with direct emergency/disaster-related responsibilities could understand its content.

A comparatively higher level of understanding of the RMA was indicated by the participants. 82.5% (n=66) have an above average understanding of the RMA. This high percentage may be explained by the large percentage of the survey response that came from local government officials who have to deal with environmental and resource issues of one form or another on a fairly regular basis. It could be deduced from the transcripts (see text box below), that persons with little understanding of the RMA are those with job roles distinct from environmental compliance such as emergency management and health. One participant expressed that the RMA is only relevant to reduction and readiness work. This suggests that the RMA provides for disaster mitigation activities only.

I am an Emergency Manager involved in CDEM and Rural Fire. I rely on others for information regarding the RMA and Building Act. (P008)

Involved in Emergency Management (P026)

...RMA [only] relevant to reduction and readiness work. (P042)

Not really relevant to the day to day activity in Health. (P063)

Similar high levels of understanding (75%; n=60) were obtained for the BA. It is interesting to note that some of the participants have indicated that they have dual responsibilities within their Council that require an understanding of both the provisions of the BA and CDEM Acts. Reasons given for lack of understanding of the Building Act are similar to those of the CDEM Act and RMA.

Have no responsibilities with Building Act. (P004)

Involvement is with the Soil Conservation and Rivers Control Act, not the Building Act. (P010)

I don't use them much and I don't need much knowledge of them to do my job. (P040)

BA not so relevant to CDEM work which has its own Act... (P042)

I leave this to the relevant experts; not my field. (P064)

Have a working knowledge only. Reliant on the planning section and building compliance section to provide resources and response post disaster. (P069)

The Building Act has no relevance to my work. (P070)

Don't work with them often. (P079)

These reasons are largely to do with their respective roles. Excerpts from transcripts of the reasons given by participants are presented in the box above.

### 5.4.3 Other Useful Acts/Regulations

Participants were asked to indicate which other Acts/Regulations related to disaster management were useful in the discharge of their job responsibilities. They were provided with a shortlist which they could add to. The list includes the Local Government Act 2002 which 76.2% (n=61) of the participants believe was relevant in disaster management. The District Plan was selected by 27.5% (n=22); the Earthquake Commissions Act 1993 selected by 18.8% (n=15); the Housing Improvement Regulations 1947 selected by 10% (n=8); Historic Places Act 1993 (30%); and Soil Conservation and Rivers Control Act 1941 (15%). Other Acts and regulations that participants considered useful in disaster management considerations are outlined in the text box below.

One participant explained that while some of these documents may not be as relevant in routine construction works, they may be relevant during reconstruction works after a disaster. Some of the provisions of these documents may influence

the implementation of the three key Acts and vice versa. For instance the District and Regional plans provide overarching policy guidelines on the administration of local and territorial areas in New Zealand, and could determine how other guidelines contained in the three Acts could be interpreted and applied within a jurisdictional area.

- The Civil Defence Plan and associated Guidelines. Expressly mentioned are the Southland CDEM Group plan, Welfare plan and Recovery plan.
- Health related Acts such as: The Public Health Act, Health and Disability Act 2002; Health Act 1956; Health and Safety in Employment Act 2002; Hazardous Substances and New Organisms Act; Air Quality NES.
- Public Works Act.
- Local Government Official Information & Meetings Act.
- Fire Service Act 1975; Forest and Rural Fires Act 1977.
- BRANZ Bulletin on Flooding Assessment.
- Property Law Act 2007.
- Biosecurity Act 1993.
- District and Regional Plans (Regional Policy Statements).
- Reserves Act (1977).

## 5.5 The CDEM Act and Post-Disaster Reconstruction

This section of the questionnaire contains statements relating to the CDEM Act. Participants were required to rate some statements according to how well each represents their opinions on a five-point Likert scale. There are four interrelated issues covered by the section and the questions that relate to these issues are highlighted. Sixty-One (76.25%) completed the questionnaire and usable responses have been considered in these analyses. It could be inferred that complete responses came from participants who have indicated a good knowledge base on the CDEM Act and its provisions, coupled with others who may make reference to the Act in the course of their work activities. The full analysis of the questions in this section of the questionnaire is presented in Section 2 of Appendix B5. Further discussions are presented under the following headings.

### 5.5.1 The Impact of the CDEM Act on Reconstruction Programmes

Participants' opinions were sought on three related statements intended to capture what impact the CDEM Act will have on reconstruction programmes in New Zealand. The statements (St.1 – 3) are listed while a summary of the responses is presented below in Table 5.4.

It would seem from the data presented in the table that the majority of the participants are unsure of the effect that the CDEM Act will have on reconstruction programmes. The opinions expressed by few of the participants (at both ends of the Likert scale) show a prevalence of disagreement with the three statements posed.

**Table 5.4 – Impact of the CDEM Act on reconstruction**

|   | Statements  | SA | A     | N     | D     | SD   |
|---|---|----|-------|-------|-------|------|
| 1 | The CDEMA provides for a speedy implementation of reconstruction projects. (N=61)                                       | 0  | 16.4% | 59.0% | 23.0% | 1.6% |
| 2 | Large scale implementation of reconstruction projects have been catered for under the current regulatory regime. (N=61) | 0  | 9.8%  | 62.3% | 4.6%  | 3.3% |
| 3 | There is <b>NO</b> foreseeable hindrance to reconstruction posed by the CDEMA. (N=61)                                   | 0  | 21.3% | 65.6% | 8.2%  | 4.9% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

### 5.5.2 The Powers for Coordinating Recovery Programmes

Two statements which were presented to participants in this section generated inconclusive responses. The statements and the percentage responses are presented in table 5.5. Few participants responded at both ends of the scale (disagreed or agreed with the statements) compared with a larger percentage that were neutral about both statements.

A slightly higher percentage of participants (in response to the first statement) are of the opinion that the powers of Recovery Coordinators are not adequate when it comes to dealing with large scale disaster events. Conversely the majority of the

participants have expressed that appointed Recovery Coordinators have enough power to decide on reconstruction activities under the CDEM Act.

**Table 5.5 – Powers for coordinating reconstruction**

|   | Statements  | SA   | A     | N     | D     | SD   |
|---|---|------|-------|-------|-------|------|
| 1 | The statutory powers of appointed Recovery Coordinators as contained in the CDEMA are <b>NOT</b> adequate for large-scale disasters. (N=61) | 4.9% | 18.0% | 55.7% | 19.7% | 1.6% |
| 2 | Recovery Coordinators have enough powers to decide on reconstruction priorities under the present regulatory framework. (N=61)              | 4.9% | 24.6% | 52.5% | 18.0% | 0    |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

Opinions on these two statements appear to be conflicting considering that 22.9% agreed that the powers of appointed Recovery Coordinator are not adequate for large disasters while 29.5% indicate that the Coordinators have enough powers to decide on reconstruction priorities.

### 5.5.3 The Period of Declared Emergencies

Participants were required to express their opinions on two statements relating to the powers of Recovery Coordinators during and after declared emergency periods. The first statement wanted to know if the maximum specified days for an appointed Recovery Coordinator were adequate, while the second statement aims to determine whether an extended period could facilitate reconstruction works.

The response in percentages to the two statements is presented in Table 5.6. It seems that the prevalent opinion (n=30) among participants is for the extension of emergency powers of Recovery Coordinators beyond the declared emergency period. This response compares with the opinions on statement no.1 in 5.5.1 where they expressed that the provisions of the CDEM do not provide for a speedy implementation of reconstruction projects. However, some participants (n=20) are of the opinion that extending emergency powers beyond the declared emergency period may not facilitate reconstruction works.

**Table 5.6 – Period of declared emergencies**

|   | Statements   | SA   | A     | N     | D     | SD   |
|---|--|------|-------|-------|-------|------|
| 1 | The maximum specified days (28) for which Recovery Coordinators are appointed need to be extended beyond the declared emergency period. (N=61) | 6.6% | 42.6% | 49.2% | 1.6%  | 0    |
| 2 | Extending emergency powers beyond the emergency period may NOT facilitate reconstruction works. (N=61)   | 3.3% | 29.5% | 47.5% | 18.0% | 1.6% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

#### 5.5.4 Implementing the CDEM Act

The opinions of participants about the statement in this section would help determine if, in their view, the provisions of the current CDEM need to be re-aligned with other legislation. This assertion will hold true only if participants confirm that there is conflict in the implementation of parts of the CDEM Act. Participants were required to respond to the statement as set out in Table 5.7 below:

**Table 5.7 – Potentials for conflict under the Act**

|   | Statements  | SA   | A     | N     | D    | SD |
|---|---|------|-------|-------|------|----|
| 1 | There are potential areas of conflict in the implementation of the CDEMA with other legislation during the recovery phase. (N=60) | 6.7% | 33.3% | 55.0% | 5.0% | 0  |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

The result gives a majority opinion that there are potential areas of conflict in the implementation of the CDEM Act. Participants (40%) who agreed with this statement make a prevailing case for a review of the CDEM Act and for its re-alignment with other regulatory documents. Further evidence to support this claim is discussed in the following section.



### 5.5.5 General Comments on the CDEM Act and Post-Disaster Reconstruction

The next section summarises the issues connected with the CDEM Act and the implementation of post-disaster reconstruction in New Zealand. It is condensed from the survey results presented in sections 5.5.1 to 5.5.4; and the participants' responses to some open-ended questions.

It was made apparent by participants that some aspects of the CDEM Act require reviewing in order to facilitate the speedy implementation of reconstruction projects. They have indicated that large scale reconstruction projects are particularly vulnerable to slow execution because they are not specifically catered for in the CDEM Act.

Greater responsibilities for the coordination of disaster activities are expected from MCDEM and its officials than in the present circumstance. Under current legislation, the responsibility for reconstruction project implementation largely rests with the lifeline utilities and individual project owners. This was put succinctly by one of the participants. In his words:

*...the CDEM Group, I believe should make more submissions to the reconstruction process, particularly where development is proposed in places that are in close proximity to hazard-prone areas. That is not the case at present. I believe the CDEM Group should be more proactive, and stand as the mediator and/or integrator between emergency procedures/provisions across different sectors in NZ... (P055)*

The survey result is also indicative of the need to empower appointed Recovery Coordinators by extending their tenure beyond the statutory 28 days provided for in the CDEM Act. In somewhat similar note, participants have also expressed that the statutory powers conferred on Recovery Coordinators be extended beyond the period of a declared state of emergency in large scale disasters. It would seem that such an extension could enable more pragmatic response and recovery decisions by any appointed Recovery Coordinator.

Finally, the survey results are indicative of the need for clearer linkages between the CDEM Act and other legislation to forestall conflicting implementation of

some provisions contained in these legislative documents. In the words of one of the participants (see text box below), the CDEM Act and the two other legislative documents have parallel processes which have to be streamlined to achieve both effective and efficient disaster management.

Integration between the CDEMA, RMA and the BA is crucial. These three legislative instruments have parallel processes in my view which seldom interact. For example, the CDEMA is somehow silent on 'Reduction', says a lot about Readiness, Response and Recovery. I believe the reduction phase is crucial to ensure less occurrences of disasters in New Zealand. Also, the CDEM Group, I believe should make more submissions to the RC process, particularly where development is proposed in places that are in close proximity to hazard-prone areas. That is not the case at present. (P055)

The participant gave the example of harmonising processes around risk/hazard mitigation for proposed developments. Other examples may include harmonising operational guidelines contained in the CDEM Act with those of District and Regional plans to help address potential recovery implementation problems. Integrating and aligning the provisions for post-disaster reconstruction within all disaster-related legislation would be more enabling of large scale recovery programmes.

## **5.6 The RMA and Post-Disaster Reconstruction**

This section of the survey had an average of 61 (75%) complete responses out of the total 80 collected. The individual number of responses used for the analyses are indicated on the Questionnaire Analysis sheet in Section 4 of Appendix C1. An indication of the respondents' profiles is given in 5.3. It shows a comparatively higher level of understanding of the provisions of the RMA than the other two legislative documents.

The questions in this section were structured similarly to previous sections. There are Likert scales as well as open-ended questions to seek clarification on participants' opinions. Four main themes related to the implementation of the

RMA during reconstruction activities are covered in the section. The results are presented under the following sub-headings.

### 5.6.1 The Impact of the RMA on Reconstruction

Participants were presented with four statements with a view to determining the impact that the RMA will have on reconstruction projects. Responses were made on a five point Likert scale and are summarised in Table 5.8 below.

The opinion of participants on the first statement is split as to whether the RMA will impede reconstruction works or not. About equal numbers agreed and disagreed with the statement. However, a slightly more prevalent opinion (above 45%) was that the RMA would impact reconstruction activities negatively. A larger percentage (over 47%) also disagreed with statement 3 (that the RMA will **NOT** become a regulatory burden on disaster-affected property owners). Conclusively, therefore, most participants felt the RMA could pose a burden on property owners during reconstruction work.

The response to the fourth statement was inconclusive with 69.4% unsure about whether the RMA was a source of frustration in previous disasters in New Zealand.

**Table 5.8 – The RMA and reconstruction**

|   | Statements   | SA   | A     | N     | D     | SD   |
|---|--|------|-------|-------|-------|------|
| 1 | The RMA will <b>not</b> impede the effective achievement of reconstruction of built infrastructure. (N=62) | 3.2% | 32.3% | 24.2% | 35.5% | 4.8% |
| 2 | The RMA will have a negative effect on efficiency during reconstruction works. (N=62)                      | 4.8% | 41.9% | 22.6% | 24.2% | 6.5% |
| 3 | The RMA will <b>NOT</b> become a regulatory burden on disaster-affected property owners. (N=62)            | 1.6% | 33.9% | 16.1% | 46.8% | 1.6% |
| 4 | The RMA was a source of frustration in previous disaster situations. (N=62)                                | 1.6% | 9.7%  | 69.4% | 11.3% | 8.1% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

### 5.6.2 The RMA Consent Process

The objective of this section is to determine if participants were supportive of the consent procedure outlined in the RMA and whether they consider public notification under the RMA is appropriate.

**Table 5.9 – The RMA and consent processing**

|   | Statements   | SA   | A     | N     | D     | SD   |
|---|--|------|-------|-------|-------|------|
| 1 | The application process for resource consent will <b>NOT</b> slow down reconstruction programmes. (N=62)   | 6.5% | 16.1% | 19.4% | 53.2% | 4.8% |
| 2 | The RMA places too much emphasis on consultation. (N=62)   | 4.8% | 19.4% | 35.5% | 33.9% | 6.5% |
| 3 | The consultation process needs <b>NOT</b> to be limited in scope because of reconstruction demands. (N=62) | 3.2% | 35.5% | 38.7% | 21.0% | 1.6% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

Participants were confronted with three statements (St. 1 - 3). Their responses are expressed in percentages in Table 5.9 above. There is a prevailing pattern of response to the first statement on the effect of the application process on reconstruction work. It is, therefore, conclusive from the views of participants that the resource application process may slow down reconstruction activities. This confirms earlier responses to statements made in 5.6.1. In a similar manner, more participants (38.7%) are of the opinion that the requirements for consultation and public notification may have to be limited in scope to allow reconstruction works to be carried out unencumbered.

However, this opinion was at variance with the participants' response to the second statement (that the RMA places too much emphasis on consultation). It could be concluded from their responses to the second statement that they felt the RMA does not place too much emphasis on consultation.

### 5.6.3 The RMA and its Implementation

In this section there are two statements requiring participants' opinion. The objective is to determine the problems experienced by territorial local authorities with implementing the RMA. The direction of participants' opinions is presented in Table 5.10.

**Table 5.10 – Implementation of the RMA**

|   | Statements  | SA   | A     | N     | D     | SD   |
|---|---|------|-------|-------|-------|------|
| 1 | There is the possibility of conflict between the different tiers of government concerning the implementation of the RMA. (N=61) | 8.2% | 54.1% | 23.0% | 11.5% | 3.3% |
| 2 | There could be jurisdictional conflicts between councils and regions etc during reconstruction works under the RMA. (N=62)      | 4.8% | 50.0% | 19.4% | 21.0% | 4.8% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

The table presents a prevailing agreement with the two statements, with over 62% and 54% agreeing with statements 1 and 2 respectively. Participants expressed the view that there could be conflicts between different tiers of government on the implementation of some provisions of the RMA. It is also possible that the implementation of the RMA across territorial local authorities may result in jurisdictional conflicts.

### 5.6.4 The powers of Recovery Managers under the RMA

In this section, the study's objective was to determine if Recovery Managers are able to exercise their powers and responsibilities towards the coordination and implementation of reconstruction projects. The study sought participants' opinions on whether they felt Recovery Managers should be allowed to veto any aspect of the RMA that could restrict the execution of reconstruction projects.

The prevailing opinion (42%) was for Recovery Managers to be allowed to veto the RMA, where there was a clear need to do so. Lower percentages of

participants were either neutral or disagreed (38.1%) with this view. Details of the responses are presented in Section 4 of Appendix B5.

**Table 5.11 – Powers of Recovery Managers**

|   | Statements  | SA   | A     | N     | D    | SD   |
|---|---|------|-------|-------|------|------|
| 1 | Recovery Managers should be allowed to veto some aspects of the RMA, where there is a clear need to do so. (N=62) | 4.8% | 37.1% | 27.4% | 4.2% | 6.5% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

### 5.6.5 General Comments on the RMA and Post Disaster Reconstruction

The following paragraphs summarise the responses from the questionnaire section that cover the RMA and post disaster reconstruction. Other responses from open-ended questions have been included in this discussion to put the issues raised by the questionnaire into clearer perspective.

Participants have indicated that the RMA will impact reconstruction activities and programmes. For instance, the emphasis on public notification and wider consultation on the environmental impacts of proposed developments is likely to slow down the reconstruction of damaged physical assets. This signifies that more flexibility in the current resource consent process is desirable.

Participants indicated that, while the RMA could be considered burdensome, it was also necessary to regulate reconstruction to avoid a recurrence of existing vulnerabilities. The RMA was commended by one participant (P055) as being crucial to risk and hazard reduction. However, there seems to be a need to improve processes around emergency work provisions to reduce the potential for the RMA to become an impediment to reconstruction activities. One participant suggests that there is a lot of inconsistency between different territorial local authorities on how emergency work provisions are implemented. These conclusions originate from comments made by some participants on how large scale reconstruction programmes could be facilitated. These comments are presented in the next page.

RMA's not an impediment if have right relationships in place and know how to use the tools it provides like emergency works provisions in a disaster. (P017)

There is a clear need to identify what can, and cannot, be done under 'emergency works'. This will negate the potential backlog of regulatory 'red tape' whilst still providing surety of maintaining acceptable standards. Bypassing the regulatory [provision] is a 'licence' to build substandard buildings. (P051)

Improvements to RMA and BA to better provide for emergency works, AND better training and information to support Councils using these provisions (there is currently a lot of inconsistency in how emergency works provisions under the RMA are implemented, for example). (P052)

The survey results give an indication that the powers to progress recovery activities by Recovery Managers would need to be enhanced. The prevailing opinion is that Recovery Managers or appointed Recovery Coordinators should have the capacity to veto certain requirements/provisions under the RMA to allow for reconstruction work to progress with little hindrance. Some caution is noted here since sub-standard works may create difficulties when the situation normalises.

Finally, it was observed that jurisdictional conflicts may arise in RMA implementation between territorial local authorities in New Zealand. For instance, subtle differences exist between individual District Plans that could influence how the RMA is interpreted and implemented across different territorial local authorities. This inconsistency was alluded to by one participant in the text box above. Such potential problem areas may have to be overcome so that they do not hinder the progress of reconstruction activities. Differential progress (and interpretation of standards) during recovery between territorial local authorities may not augur well for overall recovery efforts, particularly individual house owners who may be frustrated by consenting processes in the post-disaster phase.

## **5.7 The Building Act and Post-Disaster Reconstruction**

This section of the questionnaire contained questions relating to the Building Act and the effects that some of its provisions will have on post-disaster

reconstruction activities. Participants were presented with statements as in 5.6 above, which they were required to rate according to how best they represent their opinions on a five-point Likert scale. An average of 65 (81.25% of the total 80 responses completed) was usable for this section of the questionnaire. Participants who provided their opinions in this section included those with a good knowledge base on the Building Act and those who refer to this document in the course of their work activities. The profile of participants in this category shows that more than 65% of them have had over 15 years of working experience. The detail of the profiling was provided in 5.4.2. Further details on the data set and its analyses are provided in Section 3 in Appendix B5.

### 5.7.1 The Building Act and its Implementation

There are three statements in this section that required the opinions of the participants. The objective was to determine whether there are problems in the implementation of the Building Act during reconstruction works. The statements are outlined below, while a summary of the responses (in percentages) is presented in figure 5.12. There seems to be a general perception that the BA will impact on post-disaster reconstruction activities to a greater or lesser extent.

**Figure 5.12 – Implementing the Building Act**

|   | Statements  | SA    | A     | N     | D     | SD   |
|---|---|-------|-------|-------|-------|------|
| 1 | Strict application of the BA provisions will affect efficiency of construction operations (N=66)                            | 21.2% | 34.8% | 28.8% | 13.6% | 1.5% |
| 2 | The consents/approval procedure outlined in the BA may become cumbersome during large scale disaster reconstruction. (N=66) | 28.8% | 48.5% | 10.6% | 7.6%  | 4.5% |
| 3 | Councils will <b>NOT</b> struggle to meet the requirements for consent processing after a major disaster event (N=66)       | 4.5%  | 10.6% | 10.6% | 47.0% | 7.3% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

There is prevailing agreement among participants (over 55%) that the strict application of some of the provisions of the BA may affect the efficiency of



reconstruction operations. Also in response to the second statement, participants (over 76%) are of the opinion that the building consent process may become cumbersome during large scale reconstruction programmes in New Zealand. Their opinion on the third statement confirms their previous responses to both statements 1 and 2. Most of the participants disagreed with the notion that Councils will not struggle to meet the requirements of building consent processing after a major disaster event.

### 5.7.2 Simplifying the Consent Process

The statements under this sub-heading sought participants' opinions on the processing of building consents under the BA. The objective was to confirm whether consent processing was a problem and whether this would need to be simplified.

**Table 5.13 – Simplifying the consent process**

|   | Statements   | SA   | A     | N     | D     | SD    |
|---|--|------|-------|-------|-------|-------|
| 1 | The BA consent application process is <b>NOT</b> a major source of concern in post-disaster reconstruction. (N=64)     | 4.7% | 20.3% | 31.2% | 31.2% | 12.5% |
| 2 | There are enough provisions for bypassing consent processing in the BA for post-disaster reconstruction (N=65)         | 6.2% | 18.5% | 50.8% | 18.5% | 6.2%  |
| 3 | The building consent and compliance process must be followed through irrespective of the scale of the disaster. (N=65) | 9.2% | 50.8% | 15.4% | 21.5% | 3.1%  |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

It can be observed from figure 5.13 above that over 43% (n= 28) of participants disagreed with the first statement; thus the consent application process was considered a major source of concern during post-disaster reconstruction. However in response to the third statement, participants are of the opinion that the building consent and compliance process must be followed through irrespective of the scale of the disaster. This was agreed to by 60% (n=39) of the participants.

The second statement generated inconclusive opinions on the provisions for bypassing the current consent procedure. The opinions were split between the sufficiency and insufficiency of the BA provision for bypassing routine processing of building consents.

### 5.7.3 The Clarity of Building Act Provisions

The set of statements in this section sought to determine from the participants their opinions about certain provisions of the BA that may directly impact on reconstruction activities. The statements and the responses are detailed in Table 5.14 below:

**Table 5.14 – The clarity of BA provisions**

|   | Statements  | SA   | A     | N     | D     | SD   |
|---|---|------|-------|-------|-------|------|
| 1 | The BA is clear as to the damage inspection procedure on built facilities (N=66)  | 1.5% | 16.7% | 62.1% | 18.2% | 1.5% |
| 2 | The current insurance cover (liabilities) for Building Consent Authorities (BCA) and their Independent Qualified Persons (IQP) is adequate for decision making (N=63) | 3.2% | 14.3% | 68.3% | 12.7% | 1.6% |
| 3 | Section 71-74 Notices in the BA will prevent some disaster-affected property owners from receiving compensation (N=63)  | 6.3% | 20.6% | 69.8% | 1.6%  | 1.6% |
| 4 | The arrangements made by councils for the on-the-spot assessment of damaged properties are adequate. (N=65)   | 0    | 21.5% | 38.5% | 30.8% | 9.2% |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

It can be observed that a greater percentage of participants took a neutral position on the issues raised. For example participants neither agreed nor disagreed with the notion that the BA provided a clear procedure for post-disaster damage inspection. However, they were more forthcoming on the arrangements made by territorial local authorities for on-the-spot assessment of damaged properties in statement no. 4. A large percentage of respondents 40% (n=26) believe that the arrangements made by territorial local authorities in this regard were inadequate.

The second statement generated an inconclusive response. The majority of participants were not sure of the relationship between liability cover and reconstruction decisions. Of those who understood the problem, there was a split in opinion of the adequacy (17.5%) and inadequacy (14.3%) of liability cover in decision making.

There appears to be little agreement on whether section 71-74 notices in the Building Act will prevent disaster-affected built facilities from receiving compensation for damages. Only 27 % (n=18) are of the opinion that these provisions will prevent compensation of property owners; while about 70% (n=56) have taken a neutral position on the issue.

#### 5.7.4 The Building Act and other Regulatory Documents

The two statements in this section look at the relationship between the BA and other regulatory documents in terms of how they facilitate the implementation of reconstruction programmes. The statements and the responses are presented in Table 5.15.

**Table 5.15 – The BA and other regulatory documents**

|   | Statements   | SA   | A     | N     | D     | SD    |
|---|--|------|-------|-------|-------|-------|
| 1 | There is <b>NO</b> potential for conflicts while applying the BA and other Acts relating to the reconstruction of the built environment. (N=66)          | 0    | 6.1%  | 34.8% | 47.0% | 12.1% |
| 2 | There could be jurisdictional conflicts (i.e. between local and regional councils) in the implementation of BA provisions after a major disaster. (N=65) | 7.7% | 36.9% | 24.6% | 26.2% | 4.6%  |

SA - Strongly Agree; A - Agree; N - Neutral/Unsure; D - Disagree; and SD - Strongly Disagree

59% of participants disagreed with the first statement. Therefore, they hold the view that there is potential for conflict to arise between the BA and other regulatory documents. This view contrasts with that of the 6% who agreed with the statement. This suggests that BA may require re-alignment with some other regulatory documents to ease the implementation of reconstruction projects.

Majority of the participants (47.6%) also agreed that there could be jurisdictional conflicts in the implementation of BA provisions after a major disaster. Such conflicts can be envisaged in reconstruction projects that spread across jurisdictional boundaries.

#### **5.7.5 General Comments on the BA and Post Disaster Reconstruction**

The following general comments emanate from the responses in 5.7.1 to 5.7.4 and other general opinions expressed by the participants to some open-ended questions.

Participants are of a general view that the strict implementation of the BA may become cumbersome during a major disaster recovery programme. Their responses have indicated that reconstruction works may be slowed down by procedural requirements that cannot be supported by the quantum of existing resources in the country. They assert, in particular, that the capability of the building consent authorities (BCAs) coupled with Designers and Engineers (independent qualified persons IQPs) to respond to demands for on-the-spot assessments of damaged built facilities would probably be an issue. This group of professionals identify that they struggle with the consent process during ‘normal times’, and would most probably be challenged further by a larger volume of requests if the current resource levels are maintained during ‘abnormal times’.

Participants were not satisfied with the arrangements made by territorial local authorities for on-the-spot assessment of damaged buildings. These inadequacies in rapid building evaluations may exacerbate the reconstruction problem already posed by resource availability problems.

The survey responses give little clarity on the possibilities for simplifying the consent process. The view held by some of the participants is that the benefits of strict implementation of the BA outweigh the disadvantages. Thus, in their view New Zealand communities are more likely to be adversely affected by a relaxation of the provisions for thoroughness in the processing of (re)building consents. Some participants have expressed the view that territorial local authorities are

under an obligation to apply the BA regardless of the circumstance. A cross section of these views is presented in the transcripts below:

...the BA and its purpose and principles have a large and important effect on society, to throw those principles out in the reconstruction phases may make society the loser. (P028)

Council's are obliged to adhere to the Accreditation requirements. (P029)

...Application of the Building Code will ensure that "practical/pragmatic" building solutions post-disaster do not become additional problems in the recovery period e.g. during aftershocks. (P035)

Bypassing the regulatory is a 'licence' to build substandard buildings. (P051)

It may be inferred from these statements that current consenting procedures are satisfactory and the situations under which the process can be bypassed are tenable. However, the question is raised of how the 'build back better' philosophy may find expression through application of the BA in its current or amended form. One of the participants indicated that urgent works can be carried out if such is certified with a Producer's Statement certificate (PS4) or for reasons of safety. However, another participant explains that a Certificate of Acceptance (COA) is less robust than a Code of Compliance Certificate (CCC) as shown in the text box below.

Certificate of Acceptance (COA) work is currently viewed with extreme caution. Many COA applications are not accepted and of those that are accepted very few will receive a COA, the liability risk is too high as there has been no council inspections of the work. In a major damage event most homeowners will want to proceed on the basis of a COA and can legally do so, I would be very surprised if any council granted the COA on completion. (P066)

On the issue of compensation for properties that have been notified under section 71-74 of the BA, not many participants considered that the BA will prevent compensation by Insurers. In the words of one participant:

It is up to the earthquake commission to decide if they will pay out on section 71 - 74, political influences may affect this area... (P028)

This statement suggests that compensation issues are largely political and presupposes that the scale of destruction may warrant a change in insurance legislation to accommodate a larger number of affected properties. This position assumes that the Earthquake Commission (EQC) could be influenced by a change in compensation policy. This may not hold true for private insurers whose decisions are largely made on a commercial basis. The problem envisaged with compensation claims for notified buildings is clearly expressed in the comment below:

If a building affected by disaster is rebuilt again, the Consent Authority under the BA is mandated to require the property owner to register a Section 72 notice on the affected title, which may affect the right to the property being insured. etc. (P055)

Participants are of the opinion that there has to be a review and realignment of the BA with other legislative documents. This view was previously explained in section 5.5.5. Such a review and realignments should prevent conflicts during the execution of reconstruction projects.

Apart from reviews and realignment to the BA, it appears that further steps need to be taken to ensure consistency in its implementation across the country. This was put succinctly by one participant as a suggested solution to operational and logistic problems associated with large-scale reconstruction programmes:

(there is a need for) ...co-ordinated, uniform and consistent application of provisions of the BA by Councils within a region. Regional co-operation and production of common protocols and procedures. (P032)

## **5.8 Facilitating Post-Disaster Reconstruction in New Zealand**

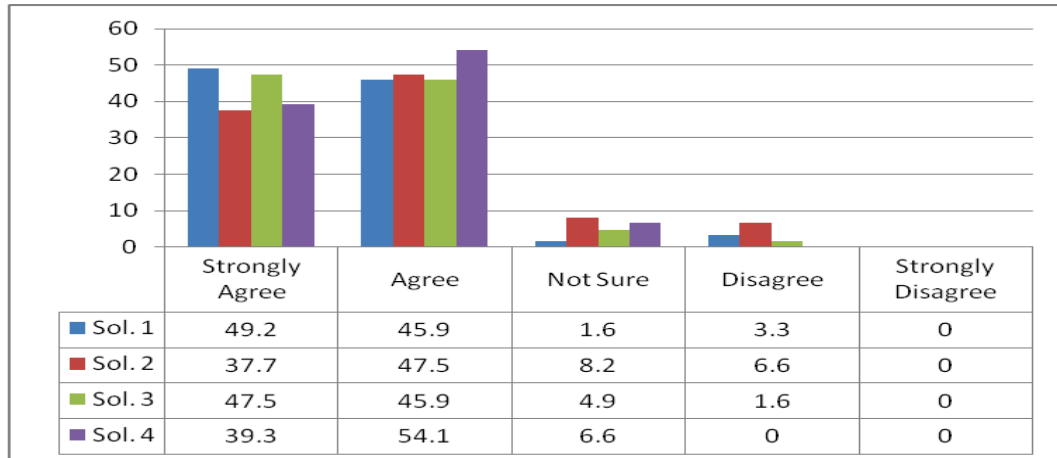
This section of the questionnaire was designed to collate the perspective and views of participants on issues that are pertinent to post disaster management in New Zealand. There are four aspects covered by the questionnaire that are analysed under the following subheadings.

### 5.8.1 Solving Operational/Logistic Problems in Reconstruction

Participants were presented with some suggested solutions to operational and logistic problems that are associated with large-scale reconstruction programmes. The solutions include: (1) Continuous training of emergency personnel, (2) Disaster exercises and personnel role plays, (3) Public disaster awareness campaigns, and (4) Pre-planned programmes and courses of action.

Using the five point Likert scale, participants were to indicate how strongly they agreed or disagreed with these suggested solutions. A summary of the responses is presented in Section 5(A) of Appendix B5.

Figure 5.5 displays the pattern of the responses in bar chart format. The percentage responses leave no doubt as to the opinion of participants about the suggested solutions (Sol.1 - 4). The prevailing opinion is that all four solutions will help to reduce the operational and logistic problems associated with large scale reconstruction programmes.



**Figure 5.5 – Response to suggested solutions to logistic problems**

Participants have also indicated other possible solutions in response to the open ended question requiring them to suggest other solutions. A selection of their suggestions is presented in the text box on the next page.

Better co-ordination between Emergency Services, particularly on training matters. (P001)

Political buy-in from Local Authorities and Central Govt agencies... More Central Govt funding/support in areas where national planning makes more sense than piecemeal efforts in regions. (P011)

Training, or at least awareness programmes, should be included for council staff throughout the organisation e.g. Resource Consent Officers, Asset Management Officers, RMA Monitoring Officers etc. (P032)

The role of Reduction is imperative. It is through understanding of likely effects under any given scenario, that programming can be forecast. You can then be proactive rather than reactive and have an accurate plan of action ready to go. This is what would be 'honed' in the exercises. (P051)

Memoranda of Understanding with neighbouring countries. (P078)

A thematic analysis of the transcript above (in the text box) reveals four possible solutions to operational and logistic problems that may be experienced at the post-disaster reconstruction phase in New Zealand. These are outlined below:

- improved coordination of disaster management services;
- generalised disaster training and exercises;
- memoranda of understanding with neighbouring jurisdictions, and
- political buy-in into disaster management activities by all levels of governance.

### **5.8.2 Facilitating Large-Scale Reconstruction Programmes**

In a similar vein to 5.8.1 above, participants were asked to indicate the priorities they attach to some suggested ways by which large-scale reconstruction programmes could be facilitated in New Zealand. Their responses are summarised in Section 5(C) of Appendix B5. To rationalise the data, further analysis has been performed to generate a ranking of the responses on the means by which large-scale reconstruction programmes could be facilitated.



Table 5.16 below displays the weighted score of the responses on a scale of zero to three (3 – High priority; 2 – Low priority; 1 – Not necessary; and 0 – Not sure). The total weight for each problem was obtained as the sum of the products of each weighted score and the number of respondents in each case. The resulting total weight was used as the basis for ranking the means by which large scale reconstruction programmes could be facilitated. The factor with the highest total weight is ranked 1, meaning that it was considered by the participants to be of the highest priority.

**Table 5.16 - Means of facilitating large reconstruction programmes**

|   |   | No. of Responses (Weight) |            |            |          | Total Weight | Rank |
|---|---|---------------------------|------------|------------|----------|--------------|------|
|   |   | 3                         | 2          | 1          | 0        |              |      |
| 1 | Prior MoUs between Responders (councils, lifelines etc.)        | 42<br>(126)               | 11<br>(22) | 3<br>(3)   | 5<br>(0) | 151          | 1    |
| 2 | Accelerated registration of BCAs and IQPs.                      | 23<br>(69)                | 16<br>(32) | 14<br>(14) | 8<br>(0) | 115          | 4    |
| 3 | Selective Implementation of parts of legislation for expediency | 27<br>(81)                | 23<br>(46) | 4<br>(4)   | 7<br>(0) | 131          | 2    |
| 4 | The development of a national reconstruction policy statement   | 31<br>(93)                | 14<br>(28) | 8<br>(8)   | 8<br>(0) | 129          | 3    |

Table 5.16 shows that the highest priority was given to memoranda of understanding between first responders as the means by which large scale reconstruction projects could be facilitated. This is followed by selective implementation of parts of legislation; the development of a national policy statement on reconstruction; and accelerated registration of building consent authorities in that order.

In addition to the responses above, participants have also indicated other actions that could be taken to facilitate large reconstruction programmes. They also provided some useful comments on the three legislative documents being evaluated. Transcripts of some of the responses are presented in the following text box.

The example of debris disposal can be avoided by identifying the potential need and pre-planning, rather than "selective" implementation (observance?) of the RMA. (P010)

Co-ordinated, uniform and consistent application of the provisions of the BA by Councils within a region. Regional co-operation and production of common protocols and procedures. (P032)

We already have too much policy - what we need is sound contingency planning with an element of compulsion to it. (P033)

There is a clear need to identify what can, and cannot, be done under 'emergency works'. This will negate the potential backlog of regulatory 'red tape' whilst still providing surety of maintaining acceptable standards... P051)

Improvements to RMA and BA to better provide for emergency works, AND better training and information to support Councils using these provisions (there is currently a lot of inconsistency in how emergency works provisions under the RMA are implemented, for example) (P052)

...some form of national response to building and land damage is required so that homeowners and councils have a guideline to follow. Liability issues abound in building now, after an event even greater. (P066)

The common theme emanating from the statements in the text box above is the need for pre-planning the execution of large-scale reconstruction programmes. The participants have indicated that this requires the joint effort of all disaster stakeholders to prepare contingency plans, protocols and procedures that could be implemented in the event of reconstruction and redevelopment of the physical environment. Reference is made to the linkages between the various regulatory documents. This gives credence to their previous suggestions for the harmonisation of specific provisions within regulatory documents that relate to emergency works and the reconstruction of physical and built facilities.

### **5.8.3 Memoranda of Understanding between Regions and Councils**

Considering that it is important to attain synergy between response and recovery activities in New Zealand, the first question in this section required participants to indicate if there were memoranda of understanding (MoUs) between their respective territorial local authorities and other agencies. This was to determine if

their regions and CDEM Groups have made arrangements and/or given consideration to the modalities for sharing resources in the event of a significant disaster event. Details of the responses are presented in Section 5(C) and 5(D) of Appendix B5.

Majority of participants (41%) confirm the existence of MoUs between regions and CDEM Groups in New Zealand. Such memoranda, where they existed, were considered generic documents and in loosely-written forms that could not commit neighbouring regions to their implementation (i.e. the agreements are not legally binding). A number of participants 15% (n=10) are not aware whether such arrangements have been made within their territorial local authorities, while 44% (n=28) are unsure.

The second question in the section wanted to know whether the MoUs extended to territorial local authorities within regions. This was to determine the level of importance that territorial local authorities attach to cooperative arrangements amongst councils within a regional area. Only 27% (n=18) believe that such memoranda exist, with a larger percentage (52%) indicating that they are unsure of these arrangements within regions.

To further validate the responses to the first and second questions, participants were asked to indicate how well some sets of issues are covered in MoUs. The raw data is presented in Section 5(E) of Appendix B5. Fewer participants responded to this part of the questionnaire (an average of 55%; n=44), perhaps indicating that Memoranda of Understanding are not common documents and, therefore, participants have little knowledge of their contents. Across all the issues suggested that may be covered by typical MoUs, less than 40% have indicated that these issues are mentioned in typical documents.

Selected comments provided by the participants give insight into the MoU issue in New Zealand. Some participants feel that existing civil defence emergency management arrangements have provided for cooperative response and recovery amongst territorial local authorities:

Through civil defence activation (declared emergency) resources can be shared across Regions/Districts. (P016)

We form part of the Nelson-Tasman Civil Defence Group. Not sure if we have a MoU but we are equal participants in a regional Civil Defence Plan (P035)

These MoU are expressed through Group Civil Defence plans - high level, but do incorporate a commitment to resource sharing. (P052)

There is a loose cluster group in this area, building staff do discuss issues but as far as I am aware there are no inter council support agreed. (P066)

These views have not indicated how formal such quasi-arrangements are, and in particular how enforceable they could be in the event of a large-scale disaster. In the opinion of some participants, existing arrangements for resource sharing and assistance are for the purpose of consent processing while those for disaster situations are at developmental stages. Their comments are presented below:

The MoU is set up for sharing resources (ability to process consents and Inspections) but not specifically for disaster situations. (P027)

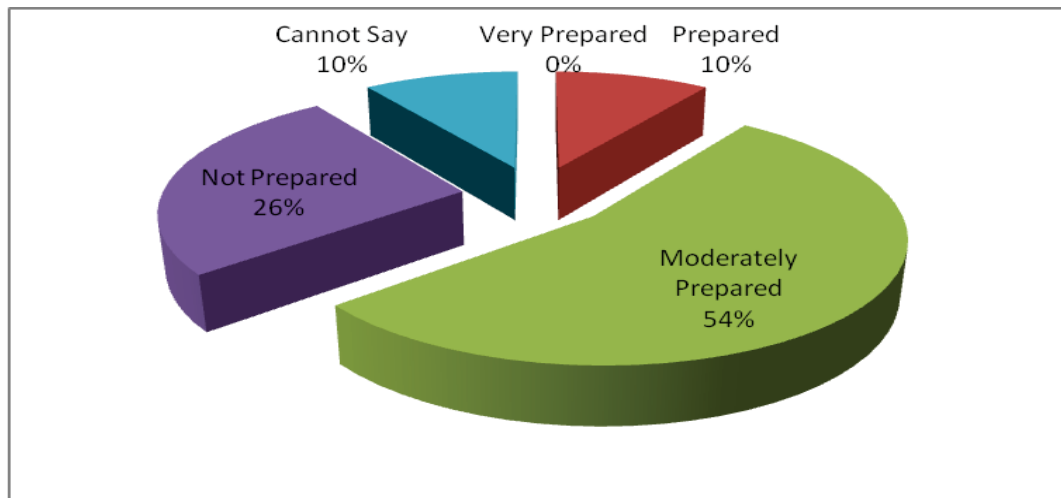
MoUs are very generic and the intent is to implement a resource (including personnel) sharing arrangement... (P062)

The Group Civil Defence Plan and the associated Local Authorities are starting to embrace and see the value of joint approach to resource sharing. (P069)

#### **5.8.4 General State of New Zealand Preparedness**

This section of the questionnaire required participants to express their opinions on the general state of preparedness of agencies in New Zealand for a large scale reconstruction programme. The first question required participants to rate New Zealand's preparedness for a large-scale reconstruction programme. This was followed by a question requiring them to explain the reasons for their response to the first question. The second question was open-ended to allow participants to comment freely on the state of New Zealand's preparedness.

Analysis of the data obtained from the first question is presented in Section 5(F) of Appendix B5. The results are presented in pie chart form in figure 5.6.



**Figure 5.6 - New Zealand's level of disaster preparedness**

The results are indicative of the pessimism of the majority of participants as to the capacity of New Zealand to tackle the problems associated with a large-scale disaster response and recovery. Only 10% of the respondents are of the opinion that New Zealand can cope in the event of a large-scale reconstruction programme, while the majority (54%) were of the opinion that New Zealand is moderately prepared for that scale of event. Further insight into their opinions is determined through a thematic analysis of their response to the open-ended question. The two main themes emanating from their responses are grouped into two categories. One category gives the reasons for their opinion that New Zealand is prepared for a major disaster while the other category give contrary reasons for New Zealand not being prepared for a major disaster. The emerging themes and sub-themes from the responses are outlined in Table 5.17.

## **5.9 A Summary of the Research Findings**

The following paragraphs summarise the research findings presented in 5.1 to 5.8 by comparing the outcomes of the focus group study and the online survey. The purpose of the summary is to present the areas where there is consensus and any variation in the outputs of the two research approaches.

The information obtained in the research investigations confirm the multi-dimensional problems that the implementations of legislative provisions portend to reconstruction work post-disaster. It is apparent that the perceived problems will be compounded in a nationally significant disaster event when the number of stakeholders increase and jurisdictional rights and priorities become diverse. The research therefore confirms the thesis that current legislative and regulatory provisions may pose barriers to the implementation of major reconstruction programmes in New Zealand.

**Table 5.17 – Emerging themes on NZ state of preparedness**

| <b>Main Themes:</b>   |  |
|---|--|
| New Zealand is NOT prepared for a major disaster  | New Zealand is prepared for a major disaster   |
| <b>Sub themes (reasons):</b>  |  |
| NZ is a small country with few resources to tackle a major disaster event.  | NZ communities are resilient and are aware of their vulnerabilities.   |
| NZ is geographically disadvantaged thus access to external aid and resources not easy.                                  | Campaigns and awareness programmes have been effective to prepare NZ communities for a major disaster.                 |
| NZ's capacity to respond and recover is dependent on the capacity of responding agencies and their coordinating skills. | Local response and recovery experiences have helped to prepare responders and communities for more significant events. |
| NZ has a slow uptake of lessons learnt from both local and international disasters.                                     | Emergency management services are up to the task.  |
| Disaster role plays and exercises have not been developed into capacity building schemes.                               |  |

The suite of issues concerning the implementation of certain provisions of the CDEM Act, RMA and BA (observed in previous recovery programmes as impediments to the realisation of reconstruction objectives) has been validated by the research. Some of the issues such as procedural constraints, loss of

pragmatism on the part of disaster practitioners, improper coordination arrangements, coupled with unclear inter-agency responsibilities, are recurring issues highlighted by the focus group and confirmed by the analysis of responses from participants to the online survey. It is apparent that these broad issues deserve attention, through an improvement on the current legislative framework.

The research study also makes it apparent that certain provisions in one legislative document may be at variance to those contained in other documents. Thus it is probable that strict implementation of the provisions of one document may impact on another. Such situations do not permit flexibility in decision making and agencies are likely to find it difficult to operate outside the remit of whichever legislative document guides their performance. Reconstruction would therefore benefit from a harmonisation of these different provisions. The three Acts under focus need to be further aligned and should make specific provision for post-disaster reconstruction to guide the operational performance of recovery agencies.

The research shows that coordination of recovery efforts between and within agencies is achievable through more pro-active leadership from the Ministry of Civil Defence and Emergency Management. Legislation that provides for this leadership and control functions have to be upheld. With particular reference to the CDEM Act, the concerns expressed by the focus group were validated by the survey results. Thus, planning and strategy issues around the implementation of emergency powers and the coordination of response and recovery activities need to be strengthened. For example, appointed Recovery Controllers have not been empowered to actually coordinate reconstruction because control is taken over by different persons during the recovery phase, especially at the expiration of a declared emergency period. The transfer of control (leadership) from one coordinator to another, midway into recovery, may result in changes in policy approaches that could impact negatively on reconstruction programmes. There was suggestion of using cluster groups to facilitate reconstruction work but the modality for using such an approach was not investigated in the current study. However to ensure coordinated reconstruction efforts amongst disaster stakeholders, there is a consensus of opinion that memoranda of understanding

between agencies would benefit reconstruction. This way, every agency becomes aware of its roles, responsibilities and their expected performance. Memoranda of understanding will allow for the exchange of information and resources across all reconstruction needs and priorities. There is every likelihood that a major disaster would overwhelm local response and recovery capacities, thus having in place an agreement on how resources could be deployed from neighbouring (or external) organisations cannot be overstated. The task of preparing for the implementation of memoranda of understanding between organisations allows for the meeting of minds, breaking down of organisational silos and generally more purposeful decisions on emergency and recovery plans.

In summary, conclusions reached by the focus group and the analyses of the online survey responses have presented consistent information on the issues of concern in the implementation of the three legislative documents in New Zealand. Research participants have suggested improvement schemes that could make the legislative documents appropriate for use in significant disaster event in New Zealand. Some of these improvements are explored in the next chapter and form part of the recommendations in chapter seven.

Improving these legislative documents becomes imperative if one considers that a significant proportion of the online survey participants see New Zealand as only moderately prepared for a large-scale disaster event.

## **5.10 The Research Verification Exercise**

A further step in the research process is the verification of the research results with subject matter experts (SMEs). At the conclusion of the analyses presented in sections 5.2 to 5.8, the researcher compiled a summary of the key issues emanating from the research investigations. These summaries were then presented to the identified subject matter experts in the form of a research verification questionnaire. A description of the subject matter experts was given in section 4.3.5. The SMEs commented on the research results and made further contributions that could improve the quality of the research findings. All three SMEs are practitioners that have made valuable inputs into policy formulation



around disaster management in New Zealand. The verification questionnaires prepared for each of the three Acts are included at Appendix B6 to B8.

The following sub-sections give an account of the opinions of the SMEs on the issues that arose from the research investigations that were presented previously. The key points in each of the legislative documents are presented, followed by the opinions of the SMEs on the respective issues.

#### **5.10.1 Research Verification of the CDEM Act (2002)**

The following key issues within the CDEM Act have been consistently highlighted throughout the research study towards improving recovery and reconstruction of physical facilities in the event of a significant disaster. A more detailed discussion of these issues is presented in chapter six.

- a) The concerns around clarity in responsibilities and arrangements within the provisions of the CDEM Act to deal with the transition from disaster response to recovery in New Zealand. The research and investigations presented previously shows in particular that the statutory powers for directing all emergency services beyond a declared emergency period could be limiting and may need to be reviewed.
- b) The issue around leadership of the recovery process by officials of the Ministry of Civil Defence and Emergency Management (MCDEM) at the different levels of response to a disaster. Statutorily the MCDEM mainly engages with emergency services which may be inadequate in the event of significant disasters where recovery may be more complex than the usual.
- c) Similar to (b) above is the need to improve the existing disaster recovery framework, so that it allows individual recovery objectives of responding agencies to be achieved whilst also contributing to overall community recovery.
- d) Finally are the concerns around the linkages between the CDEM Act and other legislative documents in all aspects of disaster management. The research

study shows that streamlining of parallel provisions and operating procedures within all disaster-related legislation would be beneficial to disaster management.

***What is the SME's opinion on these CDEM issues?***

The key issues highlighted above were re-phrased (see Appendix B6) into a questionnaire format and presented to Mr. Paul Houliston, who is identified as a subject matter expert in the current study. Thematic analyses of Mr Paul Houliston's comments on these key issues are presented in the following paragraphs.

On whether the statutory powers for directing all emergency services should be extended beyond a declared emergency period, so that consistency in policy is ensured across the transition phases of emergency response and recovery; Paul explains that:

"the CDEM Act provides sufficient powers for the Director of CDEM to carry out his responsibilities during response and recovery. It is more important to recognise the overall central-decision making body of executive government that addresses emergency management is the Cabinet Committee for Domestic and External Security Coordination (DES) and to support that process the Officials' Committee for Domestic and External Security Coordination (ODESC) provides advice to Ministers on possible response or recovery options. This allows RMA and Building Act issues to be considered".

Paul's response verifies the research position that the Act and other legislation need to be empowering of disaster management. Though, Paul believes that more of the responsibility lie at top management level i.e. DES and ODESC levels explained in chapter two. Statutorily the DES and ODESC become more active in response and recovery coordination in a national scale emergency and are expected to provide leadership in a way that allows for pragmatism at the lower levels of decision making by MCDEM agencies.

On the need to streamline emergency response and recovery activities by different stakeholder agencies for the achievement of common goals and objectives; Paul believes it is "important to see the role of lifelines (which are mainly private companies and not agencies) as complementary to the government's recovery objectives". Paul believes that lifelines will "recover in a way that best suits their business and the needs of their customers". He goes further to explain that coordination of recovery effort could be achieved through the establishment of a "National Recovery Coordinator" role which the CDEM Act allows for. This research study concurs with this suggestion. A permanent Recovery Coordinator role should permit the implementation of a consistent national recovery policy. Existing planning documents prepared by MCDEM pertaining to recovery (i.e. 'Recovery Management' and 'Focus on Recovery') would therefore need to be enhanced, so that they provide a more robust framework and operational guidelines for collaboration with the National Recovery Coordinator during recovery programmes.

On the statement concerning clearer linkage between the CDEM Act and other legislative documents, Paul has a diverse opinion on the issue, according to him:

"The CDEM Act is an 'enabling legislative act' that provides a degree of scope for those responsible to best set the way to achieve its purposes. We recognise that the CDEM framework is supported by the RMA and BA but I don't think closer alignment would achieve a better outcome. The outcomes we seek are better outlined in the National CDEM Strategy (as this document reflects the goals we seek to achieve in our sector)"

Paul seems to suggest that any irregularity concerning linkages between legislative documents is with the implementers of legislation rather than the provisions within the legislative documents.

On the weight of the evidence presented in the research study, clearer linkage between the CDEM Act and other legislative documents would benefit recovery management in some way. This is different from Paul's suggestion which reduces the importance of integrating individual efforts into a coherent whole. The current

research emphasises that operational guidelines for recovery management be provided for in legislation and believes that cross-linking provisions within the CDEM Act and the RMA and BA will positively impact reconstruction performance.

### **5.10.2 Research Verification of the RMA (1991)**

An outline of the key issues linked with the implementation of the RMA during reconstruction is listed below. After which the SME's comments and contributions on the issues are presented.

- a) A major concern is the impact that the consent process and other statutory requirements under the RMA could have on recovery. The study has shown that reconstruction activities could be adversely affected by consent processing requirements; therefore the logistics of consent processing during chaotic response and recovery deserve consideration particularly in a large-scale disaster event.
- b) Similarly there is concern around the RMA requirements for consultation and notification, as they may frustrate genuine reconstruction programmes. This is particularly true for projects of national significance or critical infrastructure projects that could act as catalyst to community recovery after major disasters.
- c) There is the issue of pragmatism in decision making under the RMA. For example: would granting Recovery Managers veto powers permit reconstruction works to progress with the least hindrance?
- d) Finally, the research shows that there are subtle differences that exist in the interpretation and implementation of the Act between different territorial and regional authorities. This issue may result in jurisdictional conflicts between coordinating authorities when dealing with those recovery issues that arise from hazard events that cut across geographical boundaries.

*What is the SME's opinion on these RMA issues?*

Mr Owen McShane was contacted to provide his opinions and comments about the issues presented above. The issues had been re-phrased into a verification questionnaire to solicit his opinion on them. Excerpts of his responses are provided in quotes within the following paragraphs. His opinions are discussed within the context of the respective issues that are raised by the study. The verification questionnaire on RMA issues is included at Appendix B7.

Owen agrees that the requirements for consent processing and other statutory requirements under the RMA are burdensome but necessary. He agrees that the logistics of consent processing during chaotic response and recovery deserves consideration particularly in a large-scale disaster event. According to Owen the "...RMA presently provides for flexibility in emergencies but only if the environment is at risk. There is no provision for [RMA] effects on people". Owen believes that consideration should be given to disaster peculiarities so that the burden of strict consent processing can be lifted. Owen notes that "if we [New Zealand] had an outbreak of Foot and Mouth or Mad Cow Disease would we [New Zealanders] be able to burn animal carcasses without having to apply for resource consent re discharges to air?" This opinion is consistent with the research finding that some flexibility is desired in procedural requirements especially for individual property owners who may be frustrated by the consent process, particularly when effecting minor damage to their properties. Previous natural events in New Zealand have brought the issue of debris management to the fore (see Matata flooding incident presented in chapter three).

On whether the RMA should classify critical infrastructure that could enhance community recovery, as projects of national significance; Owen agrees with this statement. He states that "under the proposed [RMA] reforms the criteria used to classify projects of national significance and reference to the EPA should include appropriate clauses referring to community recovery". The implication of such additional clause(s) is that projects that fall into this category (i.e. reconstruction work on projects that are significant enough to enable whole-of community

recovery) could be fast-tracked with minimal notification procedures. Owen's conclusion verifies the research findings on some of the improvements that need to be addressed in ongoing reform of the RMA. For example the submission by the author to the Select Committee on the reform of the RMA in April 2009 (see Appendix D1) suggested reviews to the RMA for dealing with projects of national significance.

In somewhat similar lines to the above, Owen is in agreement with the statement made within the verification questionnaire that the RMA should be flexible enough to allow for pragmatism in decision making after a disaster. The current research position is that pragmatism should be within some boundaries of reason whilst ensuring that reconstruction works can progress with the least hindrance possible. Owen gave an example of pragmatism that allowed the city of Houston in the U.S.A to be "able to absorb 130,000 households without rises in house prices". Owen opines that this was possible through a major decision to relax zoning requirements in Houston. 130,000 displaced households migrated to Houston after Hurricane Katrina because according to Owen "urban planners actually prevented people rebuilding their homes because they saw the devastation as an opportunity to write new 'Sustainable' plans".

On the differences between interpretation and implementation of the provisions of the RMA between different councils; Owen suggests that the differences are more than subtle, which verifies the arguments posed by the current study. He believes there are conflicting priorities between regional and district councils. In his words, "smart growth advocates in some regional councils would push for post Katrina response while District Councils will tend to want to address the immediate and more local distresses." Owen explains further that "...the ARC [Auckland Regional Council] for example would try to use such a catastrophe as an opportunity to have all the people re-housed behind the Metropolitan Urban Limits." This position suggests that different councils could have different planning priorities that could conflict with neighbouring council's priorities. Owens position seems consistent with the current study that shows that conflicting priorities and regulatory provisions within councils could become more pronounced in disasters and that harmonising

recovery decisions across regional boundaries would benefit reconstruction in New Zealand.

It is pertinent to conclude with Owens's opinion on the specific issues that were raised in the author's submission to the Select Committee on Local Government and Environment in April 2009. The submission had outlined recommendations for the simplification and amendment of the RMA. The recommendations are given below with the respective opinions (transcript) given by Owen, immediately following:

- Streamlining processes for determining projects of national significance. The submission suggests a criterion that would allow reconstruction programmes to fall under those classified as nationally significant.
- To include in membership a Recovery Manager or National Recovery Coordinator (if appointed) into the Environmental Protection Authority (EPA) or any Board of Inquiry.
- To enhance the quality of regional and district plan production in the area of Disaster Recovery. The memo suggests more recognition of post-disaster issues in these plans.
- Improvement to the resource consent processes to tackle the expected spike in consent application for minor works in the aftermath of a disaster, and
- The development of a National Policy Statement on Recovery that will provide an overarching framework/guideline for post-disaster reconstruction work.

Owen's general comments on these issues are as follows:

*"...your emphasis on resilience and flexibility is singularly important as is the observation that there is too much emphasis on preparation and risk avoidance and not enough on dealing with the harsh reality when disasters happen.*

The RMA has a high focus on the natural and physical environment and not enough overt emphasis on the wellbeing of people. This flows into this topic of emergency resilience as you correctly point out.

Part 2 sections 5 and 6 need to be changed. Unfortunately the Minister has promised the Environmental Defence Society that he will make no changes to Part 2 of the Act so you need to seek a "whole of Government" solution.

Policy statements can have no weight unless they reflect Part 2."

Owen's comments support the research results and he is largely in agreement with the intent and purpose of the author's submission on RMA reforms. Part 2 of the RMA referred to by Owen, gives the purpose and objectives for establishing the RMA. As noted by him, the Act has not considered the well being of people as much as it does of the protection of the environment. This aspect becomes more important when environmental considerations take precedence over individual and community recovery after a disaster. Whilst not recommending one above the other, the study believes that due consideration should be given to the implications that the implementation of the Act would have on personal recovery.

### **5.10.3 Research Verification of the Building Act (2004)**

The following lists the key issues that were presented to the SME in the form of a verification questionnaire. Mike Stannard's comments and opinions are presented in the section immediately following this list.

- a) Building consent process and compliance requirements within the BA could slow down reconstruction work. Could there be a short-cut to stipulated processes? Could consent processing problems be associated to resource logistics rather than procedural constraints?
- b) The requirements for notification contained in section 70-74 of the Act could affect rebuilding efforts of individual house owners. Similarly there are issues around the effect of issued CCC and COA during sale agreements.



- c) There are issues around procedural arrangements for building damage evaluations (on-the spot assessment of physical facilities). Could damage evaluations be a pre cursor to the achievement of recovery objectives?
- d) There are subtle differences in the interpretation and implementation of the BA across councils. Could this impact reconstruction programmes in any way?
- e) There are issues of re-alignment of the BA with other legislative documents e.g. the CDEM Act and RMA.

***What is the SME's opinion on these BA issues?***

Mike Stannard provided his comments and opinions about these and other issues. Similar to the other verification questionnaires, the issues were re-phrased in the form of a questionnaire, which is included at Appendix B8. Mike's opinions are presented in the following paragraphs.

On whether consent processing and compliance arrangements under the BA could slow down reconstruction activities. Mike believes this to be the case; however he explains that the recently released guidelines on building safety evaluations are a first step to enhancing (speeding up) reconstruction projects. According to him "the guidelines were produced based on international best practice and tested in Gisborne and more recently in Padang, Indonesia". Mike explains further that central and local government agencies in collaboration with the New Zealand Society for Earthquake Engineering (NZSEE) and the Institution of Professional Engineers New Zealand (IPENZ) are considering resourcing issues in the same light. In his words, "it is envisaged that there will be sharing of personnel among the 73 territorial authorities to assist in emergency reconstruction". This view seems consistent with those held by the current study, which seeks enhanced arrangements for the development of memorandum of understanding amongst response and recovery agencies after a disaster. It would seem also from his comments that he supports rapid property evaluation for damages during the early

phases of response, which this study considers a pre-cursor to/and determinant of the success of subsequent recovery and reconstruction activities.

On the effect of section 70-74 (notices for building on land that are subject to natural hazards), Mike believes this might be an issue for widespread flooding incidents. He cites clause 3 of Schedule 3 of the Earthquake Commission Act as a provision that may be invoked, which may prevent property owners from any compensation and ultimately affect their overall recovery. Though the research investigations did not yield conclusive results on the effect of section 70-74 notices (see 5.6.4); the SME's view point is consistent with the preliminary reviews made in chapter three of the study.

Mike agrees that there are differences between councils on the way the BA is interpreted and implemented. However he believes that the current accreditation process for Building Consent Authorities would reduce these differences. He is "not sure whether these differences impacting on the reconstruction processes have been tested" and "if this is a real problem"? The current study's position has been that the differences in interpretation and implementation may become an issue around geographical borders. This was a concern expressed in chapter three from the document analysis and reviews of past natural incidents in New Zealand.

Finally, Mike does not consider that parity between code compliance certificate (CCC) and certificate of acceptance (COA); could impact on reconstruction activities. According to him "certificates of acceptance were introduced as a mechanism to address building work that was in place and a building consent had not been applied for". It would seem that the marketable value of properties is determined by factors greater than the type of certificate issued and are therefore insignificant in this research context.

#### **5.10.4 Verification of other General Issues**

The three SMEs were required to comment further on the following general issues around the implementation of legislation in New Zealand.

- a) How legislation could encourage government agencies to collaborate for information exchange to ensure their shared commitment to recovery planning and its implementation.
- b) Breaking down existing silos to ensure the achievement of common recovery priorities
- c) Resourcing issues during major recovery programmes in New Zealand.

***What are the SMEs' opinions on these general issues?***

The study has revealed a general concern on the capacity of New Zealand to recover from a major disaster event. It therefore behoves responding agencies to collaborate in all manners to assist one another in times of need. This study's position is that the respective legislative documents could be made to support a framework that will enable collaborative planning and implementation of recovery in large scale reconstruction programmes. Paul Houliston agrees with this opinion, but believes "the councils should be undertaking this function as part of developing their [respective] Recovery Plans". Paul goes further to explain that "government has outlined how it will provide support in the National CDEM Plan (and the Guide)". Owen McShane takes a more cautious approach to the issue, he believes "such cooperation can be highly productive and useful but equally can be a dreadful waste of time and money if not properly supervised and focused". In Owen's word "...we need to be careful to ensure it (collaboration) does not become a wish list for creating new visions of the perfect city or village". Mike Stannard on the other hand is "not sure there needs to be legislation for collaboration to occur". In Mike's view collaboration "is being addressed at the central/local level" anyway.

On the need to break down silos among responding agencies to ensure the achievement of common recovery priorities; all three SMEs verify the research position. Paul Houliston agrees "all parties must work better in this area". Owen McShane sees the problem "as not just silo mentality". According to Owen "silos contain highly conflicting ideologies. They are more like Berlin Walls designed to

prevent the mix of ideas". Similar position was alluded to by Mike Stannard, though he is not convinced that the breaking down of silos is achievable through legislative provisions.

Finally, on resourcing issues that may arise during the implementation of major recovery or reconstruction programmes; the following opinions were given by the three SMEs. Owen McShane agrees that resourcing is an issue that needs to be addressed. He has made several submissions on the issue (his submissions are outside the scope of the current study). Paul Houliston holds a similar view; he states that "...the main impediment will be the capacity and capability of the organisations and individuals involved in recovery... In somewhat similar terms, Mike Stannard explains that resourcing issues have been given serious consideration. According to him:

"The Department of Building and Housing is working with Department of the Prime Minister and Cabinet (DPMC), MCDEM, NZSEE, Local Government and IPENZ to better define responsibilities in the event of a major disaster for building safety evaluation".

In conclusion, this section on research verification has presented the comments made by the three SMEs to the respective questionnaires given to them. The comments and opinions have significantly verified the preliminary research investigations. In a couple of situations, their comments have extended knowledge beyond those held by the current study. The key results from the verification exercise are discussed further in chapter six.

## **5.11 Conclusion**

This chapter concludes the research investigations which had involved three research methods; focus group study; opinion survey and research verification using subject matter experts. These methods provided rigorous analyses of the research question through an iterative process of adjusting and re-adjusting the research themes to align with the key issues in legislation and post disaster

reconstruction. The results and outcomes of the investigations are presented and discussed within the context of the research objectives.

Attempt was made to highlight the significant areas of concern in the legislative documents under focus; and to provide insight into aspects that would need to be improved in the documents. The next chapter will put the result in better perspective through a general discussion that compares the results in this chapter with preliminary findings from chapter two and three.

## Chapter Six

### General Discussions

#### 6.0 Introduction

This chapter presents salient points of synthesis of the entire research findings. It is the concluding aspect of the third conceptual part of the study (The Research Synthesis) that was described in the first and fourth chapter (and depicted in Figure 1.1 and 4.1). The chapter contains information that has been condensed from points that have been made in the preliminary parts of the thesis e.g. literature review, document analysis and case study information; and issues that emerged from the research aspects of the study (in chapter five). A synergy of all the information collated from the literature review through to the research investigations is therefore presented under the following sub-headings. Essentially this chapter completes the triangulation of the research study.

#### 6.1 Synthesis of Findings

The research has so far confirmed the multidimensional problems associated with the management of recovery after a major disaster, especially with regards to some of the regulatory guidelines in the three legislative documents studied. It is apparent from the investigations that, legislation may contribute to vulnerability in disaster recovery, as it could influence the timely achievement of recovery objectives. In the local and overseas natural disaster case studies presented in chapter three, there was evidence of changes that had to be made to building and development control legislation to allow for reconstruction to take place in a more co-ordinated and unhindered manner.

In the current study, the research reaches a conclusion that certain provisions of the three legislative documents that are the focus of the study have the potential of becoming impediments (areas of concern) to the realisation of reconstruction objectives in New Zealand. These impediments are both specific and general to

the three Acts. Some of these impediments are explained further within this chapter.

Generally the information obtained from the research aspects of the study show that the three legislative documents are useful as ‘building back better’ instruments, controlling re-development projects in a manner that is consistent with New Zealand’s resilience objectives. However there are subtleties surrounding their implementation that were (and still are) inhibitive. It could be surmised that a review and realignment of these documents are necessary to present a robust framework under which New Zealand communities can recover after a major hazard event.

An outline of the key research investigations are made in the following sub-headings. The research results are also discussed within the context of the research investigations and the opinions expressed by the subject matter experts to the study. The objective of the chapter is to bring together all the information into a coherent form that will put any suggested improvement to the legislative documents in perspective.

### **6.1.1 The Civil Defence Emergency Management Act 2002**

The CDEM Act reviewed in chapter two and three, is the overarching document that creates awareness of New Zealand hazards; it gives directions on the management of those hazards; and coordinates emergency activities across the 4Rs (Reduction, Readiness, Response and Recovery). The interpretation and implementation of the Act have been produced as guideline (planning) documents, a number of which have been referred to in the preliminary parts of this study. The preliminary investigations and reviews were indicative of deficiencies that needed to be addressed in the Act for a smoother achievement of reconstruction programmes after a disaster. A listing of these deficiencies was given in Table 3.5 and they include:

- The inadequacy of statutory powers to coordinate recovery;
- The need to extend the powers of appointed Recovery Coordinators beyond a declared emergency period;
- The adequacy of recovery arrangements in large-scale disaster events; and
- The implementation of the CDEM Act alongside other building (BA) and environmental (RMA) development control legislation.

The above set of issues was resolved into knowledge gaps which were investigated further in the research phase of the study. The knowledge gaps were outlined in the right-hand column of Table 3.5, and they include:

- Clarity in responsibilities and arrangements to deal with the transition from disaster response to recovery and the actual implementation of recovery programmes.
- The operation and coordination of disaster recovery after the expiration of declared state of emergencies, and
- Cross linking of the provisions of the CDEM Act with the BA and RMA.

These knowledge gaps were used in the drafting of the questions on the CDEM Act which were administered to building and environmental development practitioners in the form of an opinion survey (Appendix B5). The results of the online survey were verified further using a subject matter expert to comment on them. The main themes underpinning the research investigations on the CDEM Act are the themes presented in the following paragraphs. These research themes are presented to give an insight into the research findings and other conclusions arising from this study.

### ***The powers for coordinating recovery programmes***

From the preliminary reviews of the CDEM Act, the study had expressed concerns on the clarity of responsibilities and arrangements to deal with the



transition from disaster response to recovery in New Zealand. This issue was identified during the review of literature and document analysis in chapter three. Subsequent research investigations involving a focus group study and an online survey show, in particular, that the statutory powers for directing all emergency services beyond a declared emergency period could be limiting and may need to be reviewed. For example the appointment of a National Recovery Coordinator, allowed for in the CDEM Act, is currently at the discretion of the Minister during a declared emergency period. The appointment is temporary and it is expected that recovery coordination reverts back to local Recovery Managers after the emergency period. Participants to the research survey have expressed that there could be benefits in the review of **Section 29** of the Act to allow a longer term for an appointed Recovery Coordinator, beyond the expiration of a declared emergency. The study further asserts that such an extension will allow for consistency in policy decisions across the transition phase of emergency response to actual recovery. The subject matter expert (consulted on this Act) was in agreement with these statements but goes further to suggest that the establishment of the position of a National Recovery Coordinator, be a permanent office that will address all recovery issues from small to large scale emergencies in New Zealand.

### *Improving the CDEM framework*

The research result shows that there is the need to improve the existing disaster recovery framework so that individual recovery objectives of response agencies can be achieved within an overall community recovery objective. Emergency response and recovery activities by different stakeholder agencies have not been streamlined towards common goals and objectives in previous disasters in New Zealand (WRLAWG, 2004). Coordination remains a significant barrier to achieving effective emergency/disaster management objectives (McEntire, 2002). The current study views recovery management as a function to be taken on by MCDEM by being proactively involved in recovery programmes. A report by the AELG (2005) had suggested that MCDEM preferred a working model that sets priorities for lifelines during recovery, rather than to direct reconstruction

activities. Tonkin and Taylor (2005) confirmed that local authorities had coordinated their own recovery. The results of these two documents are consistent with the current research findings. Therefore this research concludes that the CDEM Act could permit greater devolvement, delegation and coordination responsibilities to a permanent National Recovery Coordinator. Recovery management could therefore take place within an enhanced synergy of activities by agencies, during a large-scale disaster in New Zealand.

### *Implementing the CDEM Act*

The research concludes that more leadership of the recovery process is required by MCDEM officials at the different levels of response to a disaster. The research submits that leadership should derive from legislative provisions within the CDEM Act and other guideline documents. This will enable pragmatism in decision making by MCDEM officials. Statutorily MCDEM mainly engages with emergency services hence it focuses on the initial emergency response phase of any disaster. This may be inadequate in the event of significant disasters when recovery complexities extend beyond the response phase.

The research result makes it apparent that large-scale reconstruction programmes are vulnerable to slow execution because they are not exactly catered for in the CDEM Act. One suggested solution is the empowerment for the coordination of recovery (National Recovery Coordinator) that was discussed above; another is to recognise the sort of issues that could be encountered in large scale reconstruction programmes, by the Act. In the latter case, the start point could be the incorporation of recovery as an important focus in **Section 3** of the CDEM Act. **Section 3** of the CDEM Act currently emphasises emergency response, and needs to be expanded to include recovery management.

### *The Act and other disaster-related legislation*

In the light of suggested improvements to the legislative documents reviewed by the current study, it is pertinent that the CDEM Act reflects these new improvements in a manner that integrates it with the other legislative documents.

Cross referencing and linking of the new provisions/operating procedures will therefore benefit disaster management. For example it will be useful to include in CDEM planning documents which aspects of the RMA or BA will apply during different phases of disaster response and recovery. Reference could also be made of the new guidelines on building safety evaluations, prepared by the NZSEE as an instrument to speed up recovery after disaster.

The foregoing conclusions suggest that improvements are needed to the CDEM Act so that it can support recovery management in New Zealand. The Act's emphasis on emergency response needs to be expanded to cater for recovery. The establishment of a permanent National Recovery Coordinator which is suggested by this study should put recovery management for large-scale disasters in proper perspective. The revised emphasis on recovery should be reflected in related planning and implementation documents that are produced by MCDEM too.

### **6.1.2 The Resource Management Act 1991**

The RMA is the legislative document that covers all environment planning and development issues in New Zealand. It is administered by respective regional councils but coordinated by the Ministry for Environment. The document has undergone several amendments since its promulgation and within the course of the current study; submissions were requested for a streamline and amendment to some of its provisions. The author made a submission to the Select Committee on Local Government and Environment, New Zealand Parliament in April 2009. This is included at Appendix D1 (Submission on the Resource Management: Simplifying and Streamlining Amendment Bill). The suggested improvements in the document came from the preliminary reviews (in chapter three) and some of the outcome of the research investigations (in chapter five). The preliminary reviews had identified the following key issues which were outlined in Table 3.5 in chapter three:

- Resource consent processing and statutory requirements that could impact on reconstruction schedules and costing.

- The consultation process stipulated in the RMA and its implications for reconstruction.
- The issues that may arise from strictly implementing RMA provisions; and
- Conflicting provisions within the RMA and BA which may hinder the execution of reconstruction programmes.

These key issues were resolved into knowledge gaps as follows:

- Limited knowledge of reconstruction requirements vis-à-vis resource consents processing.
- Implications of processing delays on reconstruction projects.
- Identifying reconstruction projects of national significance that will allow for ‘ministerial call-in’ (bypassing normal consent procedure for significant reconstruction projects by an action of the Minister for Environment).
- Mitigating the effect of public notification in post-disaster reconstruction works.
- Minimising litigation in reconstruction projects with potential environmental impacts.

The knowledge gaps outlined above were then re-structured so that the issues could be investigated further, at the next phase of the study (i.e. the research depicted in Figure 1.1). There were four main themes (see 5.6.1 to 5.6.4 in chapter five) covered by the research investigations. These four themes that relate to the RMA are described in the following paragraphs coupled with the outcome of the research verification by a subject matter expert.

### ***Consent processing under the RMA***

A key issue investigated in the current study of the RMA is the impact that the consent process and other statutory requirements could have on recovery. The preliminary reviews show that the RMA was burdensome and became a source of

frustration in past reconstruction programmes in New Zealand (McShane, 2003; Tonkin and Taylor, 2005). For example 31% of resource consent applications could not be processed in the 2005-2006 period (IPENZ, 2008); while consent processing prevented re-habitation of individual house owners during the Bay of Plenty floods in 2005 (Middleton, 2008). Interestingly research participants have expressed that the statutory requirements in the RMA are a necessity although most agree that it could be burdensome in some situations. This suggests that though there is merit in the stipulated procedures, a simplification of the process would augur well in disaster management situations. The research concludes that the logistics of consent processing during chaotic response and recovery deserve consideration so that the spike of consent applications could be tackled effectively. Some of the suggested solutions are discussed within the following paragraphs; while chapter seven presents more specific recommendations for improving consent processing under the RMA.

### *The effect of public notification*

This research study finds that the requirements for consultation and notification within the RMA could frustrate genuine reconstruction programmes. Frustration will be due to the consultation procedure rather than the purpose or intent of the Act; hence some flexibility in RMA procedural requirements is desirable. This is true for projects of national significance or critical infrastructure projects that could be catalyst to community recovery after major disasters. Surveys on resource consent processing conducted by the Ministry for Environment have consistently given lower than expected results (Ministry for Environment, 2009). These were largely resource applications made during 'peace time' situations. One can imagine what the situation will be when there is a spike in consent applications after a major disaster. It is most certain that critical infrastructure reconstruction projects may be held up, in the 2005-2006 period some of the total resource consents declined were for major infrastructure projects of national significance (Middleton, 2008). Critical infrastructure projects are not adequately catered for in the RMA (McShane, 2008).

The current study has reached a conclusion that reconstruction projects that could be classified as nationally significant are vulnerable and need to be catered for within the RMA so that their execution are able to be fast-tracked accordingly. Provisions for projects of national importance are given in **Section 6** of the Act; while **Section 140-141(C)** outlines ministerial call-in provisions. Both of these provisions outline bypass in normal consent procedures in certain situations. The current criteria do not make provisions for critical reconstruction projects and would need to be addressed as an improvement to current provisions

### ***Implementing the RMA at post disaster reconstruction***

The preliminary reviews show that lack of pragmatism in decision making on the part of disaster management may become an issue by the implementers of the RMA. Stipulated processes seem inflexible which may lead implementers to ‘go by the book’ in most cases. The research has taken the position that within boundaries of reason, Recovery Managers should be able to veto certain RMA requirements to allow for reconstruction work to progress with little hindrance. In Manawatu-Wanganui flood for example, guidelines for debris management became necessary, to set aside rigid RMA requirements for the management of the environment. The position of the current study is that such veto powers could derive from prior agreements and in association with officials in respective agencies that are tasked with approving and issuing resource consents as was the case in the Manawatu-Wanganui flooding incident. The development of ‘what if’ scenarios and associated guidelines on how implementers will interpret parts of the RMA legislation may be a solution that is pre-agreed before disasters occur.

### ***Implementing the RMA across regional boundaries***

The research shows that there are subtle differences that exist in the interpretation and implementation of the Act between different territorial and regional authorities. This position was consistently confirmed from the preliminary to the final research analyses. The research has shown that due cognisance to these differences would minimise jurisdictional conflicts between coordinating authorities when dealing with those recovery issues that arise from hazard events

that cut across geographical boundaries. Prior consideration of conflicting requirements could therefore result in harmonisation and subsequently, working agreements before any disaster.

In summary, improvements are needed to make the RMA cater for the issues that could arise during large-scale recovery programmes. Procedural arrangements need to be eased off for critical reconstruction projects by allowing a bypass of stipulated procedures. The study also show that implementation of the RMA would benefit from uniformity in implementation across councils and regions to forestall jurisdictional conflicts. Specific recommendations to improve the RMA are described further in chapter seven.

### **6.1.3 The Building Act 2004**

The Building Act (BA) is the legislative document that regulates building work and its performance in New Zealand. The Act essentially prescribes the requirements of the national building code in a manner that ensures that buildings and associated features meet certain performance standards like durability, fire safety, sanitation, moisture control, energy efficiency and access. Detailed review of the BA and what its implementation could mean to disaster reconstruction have been given in section 3.3.3 of chapter three. A summary of the key issues in this legislative document was presented in Table 3.5 to include:

- The implication of the building consent process and compliance requirements on reconstruction work.
- The effect of procedural arrangements for damage evaluations (on-the spot assessment) on reconstruction progress.
- Approval and certification of Building Consent Authorities (BCAs) under the Act.
- Training requirements for new and external evaluators/assessors involved in recovery service after a disaster.

- Insurance cover for buildings with section 71-74 notices etc.
- Liabilities for decision making under the Act.

It became evident from the issues outlined above that there were gaps in knowledge which had to be addressed by the current study so that the BA does not pose an impediment to the realisation of major reconstruction programmes in New Zealand. The gaps identified in chapter three included the following (as summarised in Table 3.5):

- Limited knowledge on the means by which stipulated procedures in the Act can be simplified so that the Act caters well for reconstruction after significant disaster events.
- Lack of guidelines for special waiver or modification of the provisions of the Act for reconstruction projects. For example the extension of the validity period of an issued building consents beyond one year.
- The empowerment of BCAs for discretionary application of BA provisions in circumstances where expediency may be necessary.
- The harmonisation of certain regulatory provisions between the BA, RMA (environmental legislation) and CDEM Act (emergency management legislation).

The knowledge gaps outlined above became the cornerstone of the third aspect of the current study (the research depicted in Figure 1.1). The knowledge gaps were resolved into four main themes (see 5.7.1 to 5.7.4 in chapter five) under which a set of statements/questions were administered to building and environmental development practitioners in the form of an opinion survey. There was further investigation to verify the survey results by engaging subject matter expert (the opinions of the subject matter expert were presented in 5.10.3 of chapter five) to comment on the research outputs. The four themes that came out from the research under the BA are described in the following paragraphs.



### ***The BA and its implementation***

In the review of past recovery reports, especially for the two case studies considered in chapter three; there was indication that reconstruction activities could have been achieved at a shorter time span. There was evidence to suggest that the procedural requirements for consent processing for both building and environmental developments impacted on recovery. For example the processing of building consents at the early stages of reconstruction created a bottleneck (AELG, 2005), hence recovery took longer than anticipated (Becker et al., 2008; Rowan, 2005). Spee (2008) conclude also that delayed recovery during the Matata flooding incident was the result of development control requirements (for both building and environment), which caused longer term health related problems than the actual disaster.

The current study has realised results that are consistent with previous research investigations that conclude that building and environmental legislation may become burdensome during disaster recovery (Marano & Fraser, 2006; Meese et al., 2005). A significant percentage of participants to the opinion survey confirm that strict application of the provisions of the BA may impact on the efficiency of reconstruction works. There is also significant agreement that the implementation of BA provisions for large scale reconstruction programmes could become cumbersome and that local councils could struggle to meet stipulated requirements. Therefore, the study concludes that the BA could pose impediments to the timely realisation of reconstruction and recovery objectives in New Zealand.

### ***Simplifying the Consent Process***

Following on from the problem of implementing the BA during disasters in New Zealand, the research study identified the simplification of the consent process as a key issue worthy of further investigation. This stems from the knowledge gaps on how stipulated procedures could be simplified and whether there could be waivers or modifications made to enable reconstruction works under the Act.

The current research finds issues around the building consent process and compliance requirements under the BA. Some of these issues were highlighted above. Though the research investigations have not yielded significant clarity on how the stipulated consent process could be simplified. The general view held by survey participants is that there are benefits in implementing the BA which cannot be substituted by a deregulated framework. The research finds that New Zealand communities are more likely to be adversely affected by a relaxation of the provisions for thoroughness in the processing of (re)building consents. The implementation of the Act seems obligatory and territorial local authorities cannot act otherwise. The research therefore concludes that the benefits for controlled development after a disaster outweigh any desire for speed of disaster recovery.

The research finds that consent processing problems were perceived by significant number of research participants to be more of a logistic issue that could be resolved through adequate resourcing of building development control departments. This will enable the departments to meet processing demands during a large scale reconstruction programme. This view is shared by the subject matter expert that verified the research investigations.

### ***The Clarity of BA Provisions***

A third theme which was investigated by the research was the clarity of certain provisions in the BA. Specific mention was made of damage inspection procedures; insurance cover to consenting authorities; and the implications of section 71-74 notices. These issues had been identified in the literature review and further reinforced at the early stages of the research by the focus group members.

The research finds that damage inspection procedures in past disaster incidents are inadequate and needed reviewing to reflect the demands for rapid assessment following a disaster. However in the course of the current research programme, significant development had been made towards improving damage inspection procedures. The NZSEE produced a guideline for Territorial Authorities on building safety evaluations (New Zealand Society of Earthquake Engineers, 2009). The guideline is based on international best practice for safety evaluations by engineers and damage assessors. According to Mike Stannard, this document

was trialled in the Gisborne earthquake (2008) and more recently in the Padang earthquake, Indonesia (2009) with good results. However the current study highlights the need to provide appropriate training to external personnel whose services are likely to be engaged or donated following a significant hazard event. This issue seems not to have been covered in the current safety evaluation document (New Zealand Society of Earthquake Engineers, 2009).

The research finds that both the provisions of the BA concerning insurance cover for consent authorities and section 71-74 notices are insignificant. There is a widely held view that these set of issues can be settled politically with the right government will and support. For example compensation policies may be reviewed to accommodate community needs in larger scale disasters, even though this may not be expressly provided for in legislative documents. This was the case with Earthquake Commission (EQC) compensation payments made after the Waihi ground subsidence in 2001.

### ***The BA and other regulatory documents***

The reviews in chapter three reveal that certain BA provisions may need to be harmonised with environmental (RMA) and emergency management (CDEM Act) legislation so that there is consistency of interpretation on issues that border around reconstruction and recovery. The Act is administered by the Department of Building and Housing (DBH) and at the operational levels by Building Consent Authorities (BCAs). The regulation of other legislative document is different, for example, regulation of the RMA is achieved through district and regional plans; while the BA is nationally derived and administered. This may cause tension between these ‘bottom up’ and ‘top down’ systems of control (MWH, 2004). Similar conflicts were suggested in the processing of consents when both building and resource consents are necessary to authorise proposed developments (MWH, 2004). Simply assuring a cross reference of related parts of these legislative documents could minimise misinterpretations and any associated implementation problems.

Finally, in the light of current developments (i.e. the production of building evaluation guidelines) it might be necessary to incorporate building evaluation in the BA as a step towards achieving early recovery in the event of a disaster.

## **6.2 Other General issues of concern**

The research has shown that there is concern for the capacity of New Zealand to recover from a major disaster event. Particular consideration needs to be given to the availability, accessibility and means by which disaster resources are applied, by responding agencies. Of note is the integration of external resources (in the form of aid and assistance) into any major recovery programme in New Zealand. For example, building safety evaluation guidelines have not catered for the engagement of external evaluators. The need to introduce package inductions that will enable external resources to come to quick grips with disaster management initiatives cannot be overstated.

The research also gives credence to collaborative arrangements aimed at achieving recovery objectives. There is no doubt that large scale disaster will overwhelm local response and assistance of one form or another will help recovery efforts. The manner in which this collaboration is achieved deserves attention. The study concludes that collaborative arrangements are needed between territorial and regional authorities for information exchange and shared commitments through pre-agreed arrangements. This could be in the form of memoranda of understanding, which could outline arrangements on how recovery can be achieved through the collaborative efforts of disaster-affected councils or regions.

Finally an issue the research emphasises is the need to break down organisational and agency silos that may exist within response and recovery agencies. Current silo mentality amongst agencies results in barriers to efficient and effective recovery. The development of shared recovery priorities are therefore encouraged to break down existing silos and contribute to all-of-community recovery perceptions.

## Chapter Seven

### General Conclusion and Recommendations

#### 7.0 Introduction

The chapter outlines the original contributions made by the research to post-disaster reconstruction knowledge and provides a review of the research objectives and how these objectives were achieved during the research programme. A list of recommendations for changes to parts of the three legislative documents (CDEM Act, RMA and BA) under review is presented, together with other changes that could facilitate improved implementation of significant reconstruction programmes in New Zealand. The chapter concludes with an identification of areas of further research that could extend this current study.

#### 7.1 Original Contributions

The following paragraphs outline the contributions that the research study has made to the body of knowledge recognised as Legislation in Post-disaster Reconstruction.

The research reinforces generally held views that certain provisions in building and development control legislation may hinder the achievement of post disaster reconstruction objectives. Previous research reports on New Zealand disasters indicate that legislation may hinder reconstruction, but the current research has gone further to articulate the deficient aspects of these legislative documents which would have to be addressed. The study places emphasis on three legislative documents (CDEM Act, RMA and BA) which it has shown may impact the implementation of reconstruction programmes in a major natural disaster in New Zealand.

Apart from articulating the deficiencies in the three legislative documents, the research study outlines improvements that could be made to these legislative documents. Attempt is made to refer to parts or clauses, specific to the three documents (CDEM Act, RMA and BA), that could make them robust enough to

be implemented during the reconstruction of the built environment in a major disaster.

The research study shows that there has to be synergy of objectives amongst emergency management legislation with building and development control legislation. For example the planning documents on recovery management, prepared by the MCDEM, could be enhanced by integrating relevant aspects of the RMA and BA that are applicable during reconstruction activities. Such harmonious provisions in all disaster-related legislation would make for robust implementation of recovery policies.

## **7.2 Review of Objectives**

The principal focus of the current study was the improvement of existing legislation and regulatory frameworks for reconstruction so that they could facilitate the effective and efficient implementation of reconstruction programmes after large-scale natural disasters in New Zealand. Conclusions to the four objectives stated in section 1.3 of chapter one are outlined in the following sections.

**Objective 1: To review New Zealand's emergency management framework; its guidelines on recovery operations; and related emergency management legislation.**

New Zealand's emergency management was reviewed by studying government policy documents and guidelines. The research traced the development of the emergency management framework from inception to its current form. Emergency management in New Zealand began as a conventional response system to more advanced disaster management across 4Rs of reduction, readiness, response and recovery. This is a holistic approach to disaster management which has been acclaimed in several literatures. Section 2.6 shows clearly the structure and operational framework for recovery and in particular, reconstruction of the built environment after a disaster in New Zealand. Further analysis of the recovery framework was presented in chapter three, with section 3.3 making reference to the

CDEM Act and its implication to reconstruction. Other recovery related legislation such as the RMA and BA were discussed in chapter three. Generally, chapter three shows how parts of the three legislative documents under review could impact the implementation of reconstruction programmes in New Zealand.

The study gave contextual background to these discussions by reviewing fundamental disaster management concepts in chapter two. For example chapter two gives the definition of disasters, the nature of disaster impacts, post disaster coordination and reviews response, recovery and reconstruction within the context of the research focus. Chapter two and three therefore underpin the research study as it pursues the remaining research objectives.

**Objective 2: To identify constraints that may be posed by existing legislative and regulatory provisions, in particular those contained in the Civil Defence Emergency Management (CDEM) Act, Resource Management Act (RMA) and the Building Act (BA), to the realisation of reconstruction objectives.**

The constraints that the three legislative documents (CDEM Act, RMA and BA) pose to the achievement of reconstruction objectives were identified through several means. These means are discussed in the following paragraphs.

Firstly the study reviewed recovery reports and commentaries on the three legislative documents to reveal their practical implications to post-disaster reconstruction activities. The reviews are contained in chapter three which culminated in a summarisation of the findings in a tabular format (see Table 3.5). The study shows clearly the issues of concern in implementing the three legislative documents at post disaster reconstruction by referencing relevant parts of the legislative documents in bold characters.

Secondly the study evaluated recovery after previous disaster events in New Zealand and overseas. The evaluations were covered in sections 3.4 and 3.5. Information on the disasters were obtained from government reports on the incident, post-event studies and other commentaries. The local case studies focussed on the reconstruction and recovery activities that took place, to

demonstrate the challenges that the implementation of the CDEM Act, RMA and BA posed to the reconstruction process. While the overseas disasters provided lessons on legislative changes that had to be made to allow for reconstruction activities to progress after the events. The evaluation of the local and overseas disasters shows that emergency, building and environmental legislation can become sources of vulnerability in disaster recovery. If legislation is inappropriate then reconstruction objectives may become inefficient and ineffective.

Finally a workshop was organised to identify the barriers to reconstruction in New Zealand. Legislation was one of the four aspects deliberated upon by industry practitioners. The workshop was organised as a focus group study with the key issues identified in the preliminary investigations posed to the participants. The focus group came up with research priorities in post disaster reconstruction, most of which the current study addressed. Section 5.1 covers the results of the focus group study. The results show that there are deficient parts of recovery-related legislation which needed to be improved so that they facilitate significant reconstruction programmes in New Zealand.

The research investigations to meet this second objective provided information which was investigated further using a larger group of research participants. This further investigation is discussed under objective three below.

**Objective 3: To investigate whether building and development control officers, and other disaster management practitioners, envisage problems in the post-disaster recovery process that are specifically caused by deficiencies in legislation.**

Objective three is an extension of the research investigations carried out under objective two. The objective was to solicit wider research participation (by practitioners). The research investigation commenced by administering an online questionnaire to building/development control officers, and disaster management practitioners in New Zealand. The results of the questionnaire were presented in section 5.2 to 5.9 using simple descriptive analyses; charts and tables; ranking etc. for ease of understanding. The survey results largely confirm the deficiencies



envisaged in the implementation of the three legislative documents, which were initially identified under objectives one and two.

Further to the questionnaire survey, the study sought validation of the research results using subject matter experts (SMEs). Three SMEs were identified in the research to verify and extend the research results. A discussion of the research verification exercise including some transcripts of the SMEs opinions are presented in section 5.10. Generally the verification exercise yielded information which is in consonance with the previous research results on the deficient parts of the three legislative documents. The SMEs provided valuable suggestions for improving legislation. These suggestions were shown clearly in the discussions in section 5.10.

This third objective concluded the research aspects of the study and permitted a synthesis of all the information gathered to be presented in chapter six.

**Objective 4: To suggest improvements to recovery-related legislation and regulatory provisions.**

The aim of objective 4 is to answer the research question posed in section 1.1 as follows: *What improvements can be made to existing disaster-related legislation and regulatory provisions so that they facilitate the implementation of significant reconstruction programmes in New Zealand?*

The study had employed a multi method approach involving interviews, document analyses, focus group study, online survey and research verification using subject matter experts. This approach yielded information which supported the research hypothesis in section 4.4: *that some of the contents of the three Acts would need to be reviewed so that they facilitate the implementation of significant reconstruction programmes.*

The research results relating to the three Acts were published as intermediate research outputs, which included peer-reviewed conference and journal papers; and book chapter. A list of all the research publications generated from the current study is included at Appendix C. Copies of some selected publications are included at Appendix D2 to D7. The research also made a submission to the Local Government

and Environment Committee, New Zealand Parliament in April 2009; where portions of the RMA that could be simplified and streamlined were suggested (see Appendix D1).

This research report suggests specific improvements that could be made to the three legislative documents to make them robust to facilitate the implementation of reconstruction programmes in New Zealand. It refers to parts and clauses within the CDEM Act, RMA and BA that need reviewing; and provides action points for policy changes by government and responsible agencies. The research also recommends general areas of improvement to disaster management practice in New Zealand. The complete recommendations from this study are given in section 7.3 below.

### **7.3 Recommendations**

The recommendations arising from the current research study are presented in three sub-sections namely: specific, general and recommendation for future work.

#### **7.3.1 Specific Recommendations**

The following specific recommendations are made for improving the three legislative documents that have been the focus of this study programme. The recommendations are designed to facilitate both the efficient and effective reconstruction of the built environment after a significant disaster in New Zealand. Reference is made where possible to portions of the legislative documents that may be affected by these recommendations. These are to serve as action points for appropriate policy considerations.

#### **Recommendations relative to the CDEM Act**

- The study recommends an enhanced approach to civil defence and emergency management by the coordinating ministry (MCDEM). The current study believes that MCDEM could be made more pro-active by extending provisions within the CDEM Act beyond emergency services to cover recovery management. This would facilitate the holistic performance around the 4Rs

(reduction/mitigation, readiness/preparedness, response and recovery). The study shows that recovery planning and arrangements within the CDEM Act needs to be improved.

***Action:** Review the CDEM Act and other planning documents with a view to strengthening recovery planning and management across all sectors involved in disaster management in New Zealand.*

- The study recommends the re-evaluation of the currently temporary position of National Recovery Coordinator to facilitate all recovery planning and management initiatives. It is suggested that the position be made permanent to reflect the importance attached by MCDEM to recovery management in any scale of disaster.

***Action:** Review **Section 29 and 30** on appointment and function of a Recovery Coordinator.*

- The study recommends clearer distinction between the terms ‘emergency’ and ‘disaster’ within the CDEM Act. The term ‘disaster’ could convey more clearly the severity of a hazard event and the importance of individual and community recovery after the event.

***Action:** Review **Section 3 and 4** on Purpose and Interpretation of the Act.*

- The study recommends greater alignment of the CDEM Act with both the Resource Management Act and Building Act so that all recovery-related provisions within these documents are streamlined to avoid misinterpretations and conflicting implementations.

***Action:** Review appropriate planning and guideline documents on recovery planning management that are produced by the Ministry of Civil Defence and Emergency Management.*

### **Recommendation relative to the Resource Management Act**

- The RMA should streamline the process for determining projects of national significance. There needs to be great clarity on projects that could be considered nationally significant. Criteria such as the cost of a project, scale of the project, sphere of influence on the public etc. may be established; but most importantly there should be a specific criterion that identifies critical reconstruction projects following large-scale disasters as nationally significant. This criterion should refer to Level 4 and 5 event types (regionally and nationally significant emergencies defined in CDEM Group Plans). This will be consistent with the provisions for *immediacy, necessity and sufficiency* contained in Section 330 of the Act.

*Action: Appropriate review of **Part 6AA** on Proposals of National Significance so that it recognises critical infrastructure projects as being nationally significant.*

- The study recommends the inclusion in membership a Recovery Manager or National Recovery Coordinator (if appointed) into the Environmental Protection Authority (EPA) or any Board of Inquiry. This is to facilitate the consenting of nationally significant re-instatement projects especially after disasters.

*Action: Review of **Part 4A** on Environmental Protection Authority to include membership of Recovery Managers or National Recovery Coordinators on the EPA board.*

- The RMA has been a source of frustration in previous recovery programmes largely because of procedural requirements and other provisions for wide consultation. It is recommended that the scale of consultation/public notification be limited in a manner that permits a speedy approval process. Improvement to consent processes would help to tackle the expected spike in consent application for minor works in the aftermath of a disaster.

*Action: Review Section 93-95 to limit the scope of public notifications in catastrophes, possibly limiting decisions to the new Environment Protection Authority (EPA).*

- The RMA should demand greater consideration of recovery issues by Territorial Authorities and Councils. Recovery planning and management should be incorporated into regional and district plans, to enhance their quality in Post-Disaster Management. Current emphasis seems to be more on prevention/avoidance and mitigation of hazards.

*Action: Review Section 62, 67 and 75 to contain 'recovery from catastrophes'.*

### **Recommendations relative to the Building Act**

- The study recommends improvements to the logistics and operational arrangements for tackling consent processing during disasters. This is necessary to tackle the anticipated spike in consent applications that could arise after large-scale destruction to the built environment in New Zealand. Consideration of resourcing issues is paramount and most importantly is the deployment of specialist personnel. Personnel may be sourced locally or externally (overseas), hence training and packaged-induction schemes may need to be prepared for seconded or contracted external resource persons so that they come to grips with local procedures within a short duration. In probably the same context, Territorial Authorities and Councils would need to prepare modalities for collaborative working in advance of a disaster event.

*Action: Review relevant sections of legislative documents that will allow for collaboration in disaster management. (Reference to typical sections given later)*

- Similar to the above, the study recommends the incorporation of the new building safety evaluation guidelines into the BA. The study believes that there should be a specific mandate for rapid building evaluation to enable individual and community recovery after disasters

***Action:** Introduce a new section to deal with Building Safety Evaluations within the BA*

- The study recommends the preparation of policies and guidelines for the exercise of discretionary powers during disasters by Building Consent Authorities (BCAs).

***Action:** Review **Section 124-130** on the Powers of Territorial Authorities in the event of a catastrophe; **Sections 41, 48 and 93** related to the bypass of normal consent processing arrangements.*

- The study recommends that consideration be given to the issue of parity between Certificates of Acceptance (COA) granted in retrospect, and Code of Compliance Certificates (CCC). This should allay any fear that the difference between these certificates relates to process rather than conformance to building standards.

***Action:** Review **Sections 91-99A** to address parity of the CCC and COA.*

### **7.3.2 General Recommendations**

The following general recommendations are made to facilitate post disaster reconstruction processes in New Zealand.

- The study recommends the development of a National Policy Statement that provides an overarching framework/guideline for post-disaster reconstruction. This would bring all post-disaster considerations into a single document but with references to related legislation. The study suggests that the following issues are covered by the Policy Statement:
  - Definition of hazard types referred to in the National Policy Statement.
  - Guidelines on the collaboration of stakeholders during recovery. The policy should encourage stakeholders to consider recovery beyond their existing commercial decisions and silos.

- Framework and guidelines for external aid and assistance e.g. training requirements for external resource persons during a catastrophic response and recovery programme.
- Process-based information on recovery and the reconstruction of the physical environment under different disaster scenarios.
- Description of the relationships between all disaster-related legislation (and development and re-development control guidelines). This will provide a framework for the alignment of all related legislation so that the subtle differences that exist under current systems are eliminated.
- The study recommends the establishment of memoranda of understanding (MoU) between neighbouring Councils and Territorial Authorities. Such memoranda may address the following issues:
  - Procedural arrangements and protocols that will ensure coordinated, uniform and consistent implementation of recovery objectives across respective disaster management agencies.
  - Prescription of responsibilities and liabilities for harmonious relationships amongst parties.
  - Modalities for information dissemination and sharing.
  - Modalities for resource sharing and deployments, especially for external aid and assistance; and their participation in recovery programmes.
  - Training and induction issues for personnel.

Parts of legislative documents that may influence the establishment of memoranda of understanding between councils and territorial authorities includes, but not limited to:

- a) **Section 137** of the Local Government Act on ‘Joint Local Government Arrangements and Joint Arrangements with Other Entities’.

- b) **Sections 12-24** of the Civil Defence Emergency Management Act on ‘Civil Defence Emergency Management Groups’.
- c) **Part 4** of the Resource Management Act on ‘Functions, Powers, and Duties of Central and Local Governments’, and
- d) **Sections 212–247** of the Building Act on ‘Responsibilities of Territorial and Regional Authorities’.

### 7.3.3 Recommendations for future work

This research study recognises its limitations and improvements. It therefore suggests the following areas for future research work to improve knowledge in legislation and regulation for post disaster reconstruction in New Zealand.

- The research has concentrated on specific research priorities identified at a workshop organised in April 2006. These priorities were outlined in section 5.1.2 and included in the complete workshop report at Appendix A3. The remaining research priorities not covered by the current research are hereby suggested for future studies and they include:
  - determining the extent of liabilities for reconstruction works by approving authorities and where such liabilities lie. The current research gave a cursory description of the cautious approach to disaster management decisions by responsible persons/authorities, explaining how this practice could lead to loss in pragmatic decisions. It would be useful to know how liable disaster management decision-makers are, especially when incorrect decisions are made; what the extent of these liabilities are; and what effect these liabilities could have on overall recovery.
  - determining public acceptance issues for needed changes in legislation. The current research has identified aspects of three legislative documents that need reviews and realignment, but stops at this. It is hereby suggested that a study into public perception of these reviews and their acceptability would extend the research and provide interesting knowledge on the



workability of the reviews. Suffice it to say that there are ongoing amendments to these three legislative documents (some of which the current study has made inputs to), therefore further studies to investigate the impact of the new changes and those that have been recommended in this study, would be appropriate.

- The research was limited to a study of the implementation of the CDEM Act, RMA and BA as they relate to post disaster reconstruction in New Zealand. It recognises that other legislative documents that may impact on reconstruction works have not been included in the current study. It is, therefore, recommended that future studies be commissioned to investigate the impact of other pieces of legislation on reconstruction activities.
- During the course of this research, several developments had taken place. Some government ministries and departments had embarked upon reviews and amendments to their operating procedures, emergency management plans, and guideline documents. Significantly the Resource Management Act (RMA) and Building Act (BA) are in a constant state of flux. Recent amendments to these documents came to effect in September 2009 and March 2008 respectively. The study therefore recommends future research investigations into the effect that these recent changes may have on reconstruction objectives.

## **7.4 Conclusion**

This research has addressed a critical gap in post disaster reconstruction literature in New Zealand by systematically addressing the issues that surround the implementation of three legislative documents (the CDEM Act, RMA and BA) that are pertinent to post disaster reconstruction achievement. The evaluation of these legislative documents confirm that some of their regulatory provisions may constrain reconstruction efforts; cause multi-agency responsibility and coordination issues; and result in a general loss of pragmatic decision making by disaster practitioners.

The research has shown that although there are benefits in controlling the reconstruction of the built environment with these building and environmental legislation; recovery agencies however would need to be proactive in designing ways of managing their implementation to meet reconstruction objectives. The regulatory framework for post disaster reconstruction needs to be well articulated and integrated in its implementation so that it provides effective means of reducing and containing disaster vulnerabilities. Such integrated approaches would facilitate both post-disaster reconstruction and other sustainable development programmes.

There is a greater imperative to have appropriate frameworks and systems in place before a larger scale disasters event in New Zealand, because it has been spared the destructions and wide scale devastations that occur frequently around its neighbouring countries. Therefore any action it takes towards an accelerated recovery must be both conscious and concerted.

It is hoped that the current study has provided an insight into the needed pre-planning considerations and of the set of actions/policy initiatives that could be taken to forestall secondary disasters as a result of inappropriate legislation.

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## **APPENDIX A**

**A1** – CDEM Event Types

**A2** – Flow chart of the Resource Consent Process

**A3** – Workshop Report on Barriers to Post-Disaster Reconstruction

**A4** – Research Briefing Paper to Industry

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Table 5.1 Event types and status

| Event Type  | Event Status / Procedures  | CDEM EOC/ECC Role   | CDEM Controllers' Roles  |
|---|--|---|--|
| <p><b>Level 1</b></p> <p>Local incident for which a declaration is not required or appropriate</p> <ul style="list-style-type: none"> <li>• Can be dealt with by Emergency Services and/or Local Authority resources alone.</li> <li>• Specialists may be required for specific circumstances</li> </ul>  | <p><i>Not Designated</i></p> <ul style="list-style-type: none"> <li>• The incident is dealt with using CIMS Multi-Agency Event structures and processes.</li> <li>• Nature of the incident will usually determine the Lead Agency</li> <li>• Immediate joint decision as to Lead Agency/Incident Controller necessary if Lead Agency is unclear.</li> </ul>  | <p>Local Coordination Centres / Lead Agency/TA EOCs may be alerted or be partially operative in support of the Multi-Agency Response.</p>   | <p>Local Controller and Group EMO notified if Local EOC is likely to be involved</p>   |
| <p><b>Level 2</b></p> <p>Local incident for which a declaration is not required or appropriate</p> <ul style="list-style-type: none"> <li>• Can be dealt with by Emergency Services and/or Local Authority resources alone.</li> <li>• Higher level of inter-agency coordination required.</li> <li>• Specialists may be required for specific circumstances</li> </ul> | <p><i>Not Designated</i></p> <ul style="list-style-type: none"> <li>• The incident is dealt with using CIMS and Joint Coordination through Lead Agency EOC.</li> <li>• Nature of the incident will dictate the Lead Agency</li> <li>• CDEM Welfare needs likely driver for TA CDEM involvement</li> <li>• TA may become a Key Support Agency in terms of coordinating support/management functions designated on the day.</li> </ul> | <p>Lead Agency EOC / Communications Centre / commanders communicating event and response intelligence/information to Local EOC.</p> <p>Local EOC partially or fully activated and coordinating functions in support of joint-response and Lead Agency.</p> <p>Local EOC collecting and analysing event and response intelligence/information to assist with Joint Coordination and potential transition/escalation to Level 3.</p> <p>Group ECC in monitoring role.</p> | <p>Local Controller (or delegated staff = EMO):</p> <ul style="list-style-type: none"> <li>• Coordination of Local Authority functions.</li> <li>• Coordination / delivery of designated functions.</li> <li>• Notify and inform Group Controller</li> <li>• Inform MCDEM</li> </ul> |



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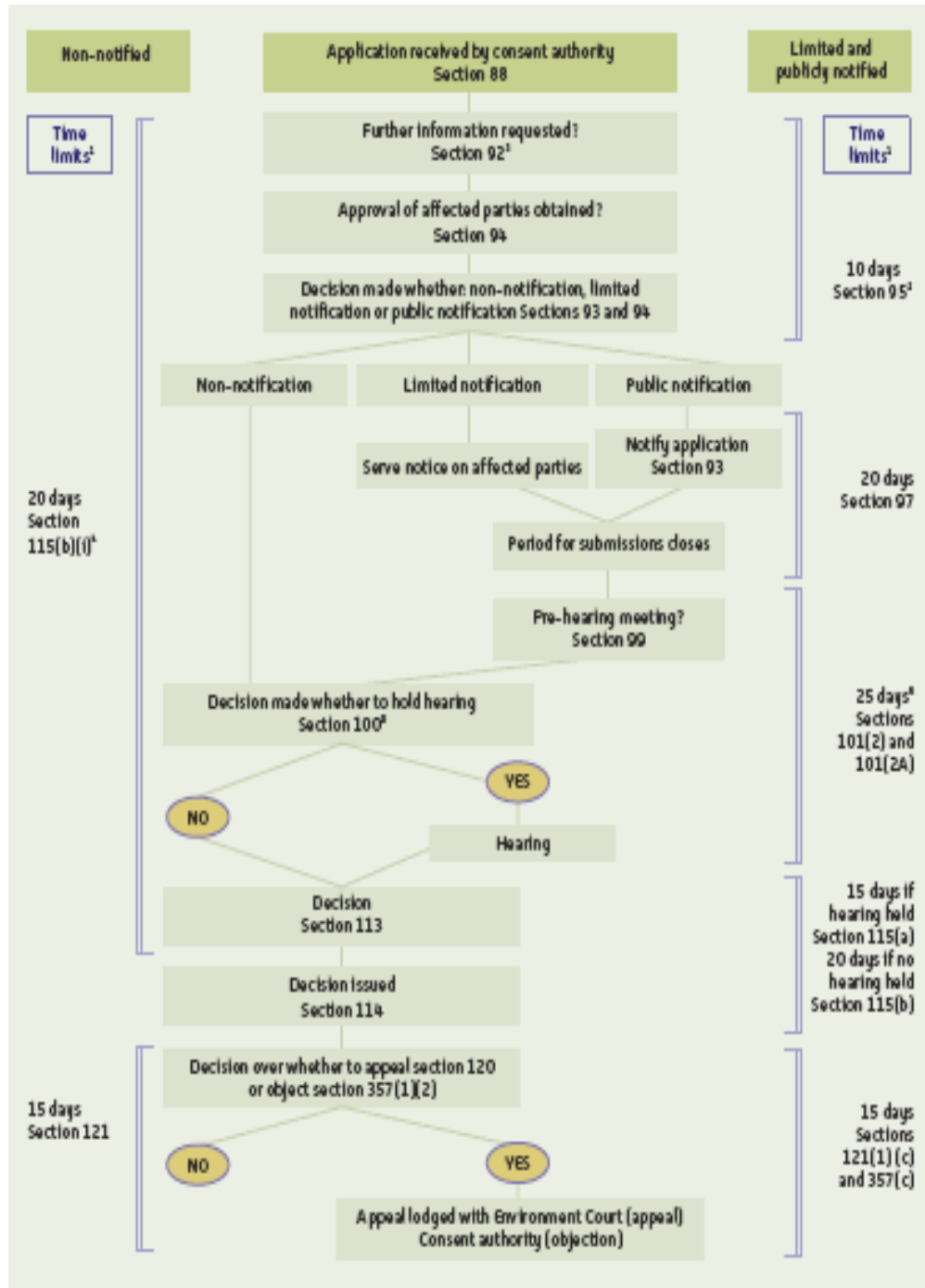
| Event Type   | Event Status / Procedures   | CDEM EOC/ECC Role   | CDEM Controllers' Roles   |
|--|---|---|---|
| <p><b>Level 3</b></p> <p>Imminent or State of Local Emergency involving a single TA</p> <ul style="list-style-type: none"> <li>Escalates from Level 1 or 2 event, or a warning of a major event is received, that may not be able to be managed without the adoption of emergency powers</li> <li>Or</li> <li>Immediately recognisable as an event that cannot be managed without the adoption of emergency powers.</li> </ul>   | <p><u>Declaration</u> of state of local emergency is being considered, or has been deemed necessary involving a single TA</p> <p>Declaration can be for an entire district or one or more wards.</p> <p>Plan and manage transition from Lead Agency EOC coordination to Local EOC coordination.</p> | <p>Local EOC fully activated and is coordinating response and management of the emergency.</p> <p>Group ECC and adjacent EOCs alerted or partially activated to monitor the situation and prepare to respond if the situation deteriorates.</p> <p>Group ECC collecting and analysing event and response intelligence/information to assist with Joint Coordination and potential transition/escalation to Level 4.</p> | <p>Local Controller:</p> <ul style="list-style-type: none"> <li>Coordination of local response</li> <li>Notify and inform Group Controller</li> </ul> <p>Group Controller:</p> <ul style="list-style-type: none"> <li>Support Local Response</li> <li>Inform MCDEM</li> <li>Consideration of escalation.</li> <li>Notify adjacent / partner CDEM Groups</li> </ul>  |
| <p><b>Level 4</b></p> <p>Imminent or State of Local Emergency that is regionally significant</p> <ul style="list-style-type: none"> <li>Due to the magnitude or geographic spread of the emergency, actual or predicted, a higher level or remote coordination of local responses and/or resources is required</li> <li>Or</li> <li>A warning of a significant event that will have a significant impact has been received</li> <li>Or</li> <li>Coordinated assistance is required to support other CDEM Group(s)</li> </ul> | <p><u>Declaration</u> of state of local emergency in the CDEM Group Area being considered, or deemed necessary, that involves the entire Group area, or one or more districts require external assistance.</p> <p>Or</p> <p>Adjacent or partner CDEM Group(s) require assistance</p>                | <p>Group ECC and affected Local EOCs fully activated</p> <p>National Crisis Management Centre (NCMC) and adjacent Group EOCs may be alerted or partially activated to monitor the situation and be ready to respond if the situation deteriorates.</p>  | <p>Local Controller:</p> <ul style="list-style-type: none"> <li>Coordination of local response</li> <li>Respond to priorities set by the Group Controller</li> </ul> <p>Group Controller:</p> <ul style="list-style-type: none"> <li>Set Group Priorities</li> <li>Coordination of Group response</li> <li>Support Local Responses</li> </ul> <p>National Controller:</p> <ul style="list-style-type: none"> <li>Support Group response(s)</li> <li>Consideration of escalation.</li> </ul> |

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| Event Type   | Event Status / Procedures   | CDEM EOC/ECC Role  | CDEM Controllers' Roles  |
|--|---|--|--|
| <p><b>Level 5</b><br/>                     Imminent or State of National Emergency</p> | <p>Declaration of State of National Emergency is being considered, or has been deemed necessary</p> | <p>NCMC, Group ECC and affected Local EOC(s) fully activated</p> | <p>Local Controller:</p> <ul style="list-style-type: none"> <li>• Coordination of Local response</li> <li>• Respond to priorities set by National and Group Controller.</li> </ul> <p>Group Controller:</p> <ul style="list-style-type: none"> <li>• Coordination of Group and Local responses</li> <li>• Respond to priorities set by the National Controller</li> </ul> <p>National Controller:</p> <ul style="list-style-type: none"> <li>• Coordination of national level-response</li> <li>• Support Group response(s)</li> </ul> |

## APPENDIX A2 - THE RESOURCE CONSENT PROCESS

Source: (Ministry for Environment, 2006)







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# Barriers to Post-Disaster Reconstruction

*Report on Workshop*

*Held: 11 April 2006 at Te Papa, Wellington*

**Resilient Organisations  
Research Report – 2006/03**

## Key contacts:

Resilient Organisations Research Programme: [www.resorgs.org.nz](http://www.resorgs.org.nz)

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# 1 Overview of Resilient Organisations

‘Resilient Organisations’ is a six year research project designed to assist New Zealand organisations to recover economic competitiveness after hazard events by improving their resilience. This programme is funded by the Foundation of Research Science and Technology (FRST). The research programme is a collaborative project between the University of Canterbury, University of Auckland, and Kestrel Group.

The programme integrates the planning, prioritisation and deployment and legal issues faced by New Zealand organisations for their readiness, response and recovery processes. The programme is divided into three inter-related objectives:

1. Organisational planning for hazard events
2. Prioritisation and deployment of physical and human resources for recovery
3. Legal and contractual frameworks

For full details of the research programme, check [www.resorgs.org.nz](http://www.resorgs.org.nz)

## 2 Introduction

A workshop was held to identify the challenges and barriers to post-disaster reconstruction in New Zealand to help guide research under Objective 3 of the Resilient Organisations project. The workshop brought together people with relevant experience in post-disaster reconstruction and/or specialist knowledge of the regulatory, legislative and contractual issues that could influence reconstruction. A list of attendees is given in Appendix A.

This report summarises the key issues from the workshop and develops these issues into research directions. On the basis of both student and funding resources available, the report identifies the research that will be carried out as part of the current FRST funded research project. Other research from the priority list could potentially be carried out in the future if further research resources become available.

The report is organised into the four key areas considered during the workshop: legislative and regulatory issues, coordination of reconstruction, contractual issues and resource issues.

### 2.1 Workshop Objectives

- To explore the challenges and opportunities for reconstruction in a post-disaster situation;
- To prioritise research efforts on those reconstruction issues that are most critical, and that the research team might be able to realistically influence;
- To identify potential barriers and opportunities for engaging the reconstruction stakeholders in addressing these issues.

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## 2.2 Workshop Format

The workshop started with presentations from David Hopkins, David Middleton and Jason Le Masurier, giving an overview of the research to date, the workshop aims and setting the scene for post-disaster reconstruction in New Zealand. Workshop participants were then divided into four groups to brainstorm and discuss the main issues of reconstruction under the headings of:

- Legislation and regulation
- Contracts and procurement
- Resources
- Co-ordination of reconstruction

After the breakout session, participants reconvened to report back the main issues identified; these are summarised in the sections of the following report. The main issues were then plotted on a matrix in terms of their importance and the ability of the research to influence. The issues were subsequently ranked and research outputs identified. The issues identified and the research priorities are summarised in this report.

Several of the issues raised at the workshop tend towards the operational aspects of emergency management and recovery and as such are specific to the government and NGO organisations in place. These lie outside the scope of the current Resilient Organisations research project. However, the research team would be happy to develop research proposals with relevant organisations to address those issues that are specific to their operations.

## 3 Legislation and Regulation

The various regulations that apply to routine construction provide for the safe development of infrastructure, capital improvements and land use, ensuring preservation and environmental protection. If the legislation and regulatory processes are well formulated they should not only be an effective means of reducing vulnerability to disasters, but also a means of facilitating reconstruction projects. However, legislation cannot be used for purposes other than those for which it is intended and where there is no provision in relevant legislation for post-disaster situations it can provide a barrier to reconstruction. For example, if all the routine construction regulatory and legislative processes are followed after a major disaster, it is unlikely that regulatory bodies would be able to cope with the volume of work.

### 3.1 Issues Identified: Legislation and Regulation

During the workshop, the following issues were identified and ranked as high priority for research.

- A1. Extent of liability for reconstruction and where it lies.
- A2. Simplification of consenting process for reconstruction.
- A3. Study of gaps in legislation and wider government initiatives and the consequent constraints on recovery.
- A4. Public acceptance of identified changes in legislation.

## 3.2 Research Priorities: Legislation and Regulation

An understanding of how legislation can facilitate or constrain reconstruction following a disaster is one of the original core aspects of Objective 3 of the Resilient Organisations project. Research will therefore be progressed in this area with James Rotimi (University of Canterbury PhD student) focussing on this aspect.

### *Research objectives*

- Aa1. Critically review the goals for and processes within the existing New Zealand legislation and guidelines for post-disaster reconstruction.
- Aa2. Identify the legislative and regulatory factors that governed the effectiveness of past reconstruction programmes and determine the relationships and levels of influence of these factors.
- Aa3. Develop scenarios with a range of disaster magnitudes that can be used to measure the effectiveness of existing and proposed reconstruction programme frameworks.
- Aa4. Develop process models that describe the existing legislative and regulatory framework as it applies to reconstruction and identify critical constraints within that framework.
- Aa5. Postulate improved regulatory processes and model and evaluate their response to the identified scenarios so as to quantify their improvement.
- Aa6. Recommend a suitable framework for reconstructing New Zealand's built environment affected by a major disaster.

### *Outputs*

The research outputs, expected to be of benefit to stakeholders of the post-disaster reconstruction process, including disaster managers, insurance companies and property owners, are as follows:

- Ab1. Process models that will make explicit the statutory recovery process from damage assessments to the completion of reconstruction projects.
- Ab2. Models of alternative processes and responsibilities for the coordination of reconstruction during and after emergencies to promote improved coordinating and monitoring arrangements for reconstruction.
- Ab3. Best practice guidelines for reconstruction works under different disaster scenarios.

Further details are given in Appendix B on how these research priorities and outputs will be achieved, together with estimates of the timescale for completion. (Delivery time for research in this area is dependent on whether we secure funding to allow the current PhD student to move to full-time study).

## 4 Contracts and procurement

A variety of contractual relationships to procure construction projects are used in New Zealand. Procurement is critical as it determines the overall framework for construction, embracing the structure of responsibilities, risks, and authorities of the stakeholders; these issues are especially important for smooth delivery of post-disaster reconstruction. New forms

of procurement such as partnering and alliancing are proving beneficial in improving the time, cost and quality performance in project delivery and may be applicable to reconstruction works.

Responsibility for payment for post-disaster reconstruction projects is a complex issue, involving national and local government, insurance companies and private organisations and individuals. Spending the money wisely is important and priorities need to be established. Cost-reimbursement payment mechanisms are often used for emergency works as there is a large degree of uncertainty over the scope and cost of the work. This places a large portion of the risk with the owner. If the construction sector work with infrastructure owners to prepare in readiness for a disaster, the outcome following a disaster will inevitably be more efficient and predictable than an ad hoc response.

## 4.1 Issues Identified: Contracts

During the workshop, the following issues were identified and ranked as high priority for research.

- B1. Analysis of money flow for different subsections, e.g. fully insured, under-insured and uninsured.
- B2. Suggested formats for pre-registration of contractors and for setting of rates for post-disaster work.
- B3. Review of whether or not it is likely to be socially acceptable to impose controls on industries in a post-disaster environment.
- B4. Review of international experience for how contractual issues have been managed.

## 4.2 Research priorities: Contracts

Contractual arrangements for reconstruction following a disaster are one of the original core parts of Objective 3 of the Resilient Organisations project. Research will be progressed with Kelvin Zuo (University of Auckland PhD student) focussing on this aspect.

### *Research objectives*

- Ba1. To examine international experience for how contractual issues have been managed.
- Ba2. To analyse who pays for reconstruction, the mechanism of payment and the contractual issues involved in payment for reconstruction.
- Ba3. To examine contractual pre-registration of contractors and for setting of rates for post-disaster work.

### *Outputs*

- Bb1. Recommendations on contractual arrangements and contract types for disaster reconstruction.
- Bb2. Recommendations on how the contractual payment mechanisms should work during reconstruction following a disaster and analysis of money flow for different stakeholders, e.g. fully insured, under-insured and uninsured.
- Bb3. Recommendation on how the construction industry can pre-register contractors for post disaster work and what rates should apply.

Further details are given in Appendix B on how these research priorities and outputs will be achieved, together with estimates of the timescale for completion.

## 5. Resources

New Zealand is resource constrained generally. There have been various studies carried out into resource requirements in post-disaster situations. The issue is highlighted in the new National Civil Defence Emergency Management Plan (July, 2006) which states that:

*‘effective response and recovery may necessitate mobilisation of all (New Zealand’s) available resources’.*

### 5.1 Issues Identified: Resources

During the workshop, the following issues were identified and ranked as high priority for research.

- C1. Cataloguing requirements and current availability of the full range of resource for reconstruction, then reflecting on sequencing/critical path/bottlenecks for their mobilisation.
- C2. Analysis of the gap between logistics planning and mobilisation for reconstruction
- C3. Ability to get offshore / national resources into a disaster zone.
- C4. Identifying barriers to getting suppliers to do pre-event planning and generally engaging industry in a shared awareness.
- C5. Prior commitment of resources and impact of regulators.
- C6. Assessing the practicalities and worth of a continuously updated national database of available resources.

### 5.2 Research Priorities: Resources

Research in this area overlaps with some aspects of the Objectives 1 and 2 of the Resilient Organisations research project.

#### *Research objectives*

- Ca1. To examine and compare the reconstruction resource requirements of various organisations (Some aspects of this are being researched by Beshram Singh, a University of Auckland Masters student).
- Ca2. To assess the availability of national and regional resources and their ability to be brought into a disaster zone (Some aspects of this are being carried out by Heri Setiawan, University of Canterbury PhD student, as part of Objective 2 of the Resilient Organisations research project, but a full analysis would require specific funding).
- Ca3. To understand the barriers to getting industry to do pre-event planning (not currently planned, but could be carried out as part of a proposed preparedness benchmarking project aligned with Objective 1 of the Resilient Organisations research project, if funding is secured).

*Potential Outputs*

- Cb1. A catalogue of the reconstruction resource needs of both public and private sector organisations and homeowners and suggested mechanisms for prioritising the allocation of resources.
- Cb2. A GIS database of the extent of regional and national resources and an assessment of resource availability and mobilisation for various disaster scenarios.
- Cb3. Summary of the preparedness of the industry and recommendations of the ways of engaging the industry in pre-event planning.

Further details are given in Appendix B on how these research priorities and outputs might be achieved.

## **6 Coordination of Reconstruction**

Responsibility for response and early recovery post disaster is well defined in the National Civil Defence Emergency Management Plan (MCDEM, 2006). However, responsibility for coordination and management of a major programme of reconstruction of housing and other infrastructure is not clear in the legislation and guidance and this lack of clarity has been proven to create barriers to reconstruction following previous disasters. The management and coordination of reconstruction following recent disaster events has fallen to insurance companies, the Earthquake Commission and local authorities; however none of these entities has a specific remit to work outside of their own interests.

### **6.1 Issues Identified: Co-Ordination**

During the workshop, the following issues were identified and ranked as high priority for research.

- D1. Establish criteria for assessing Local Government capability to coordinate reconstruction.
- D2. Gap analysis for coordination capacity – function provision versus resources.
- D3. Analysis of potential impacts of jurisdictional boundaries.
- D4. Greater analysis of the issues inherent in the transition from response to recovery.
- D5. Characteristics of leaders/leadership required for effective recovery.

### **6.2 Research Priorities: Co-Ordination**

*Research objectives*

- Da1. To understand the priority reconstruction needs of a community during the response and recovery stages (being carried out by John Hewitt University of Auckland PhD student).



- 
- Da2. To undertake a gap analysis for coordination capacity in terms of function provision versus resources (on hold).
  - Da3. To propose criteria for assessing Local Government capability to coordinate reconstruction (on hold).
  - Da4. To analyse the potential impacts of jurisdictional boundaries on reconstruction (on hold).
  - Da5. To define the talents required of people to operate effectively in times of crisis and strategies for developing these talents (on hold).

#### *Potential Outputs*

- Db1. A checklist to evaluate reconstruction priorities.
- Db2. A map of New Zealand's capacity for coordination of post-disaster reconstruction for various scales of disaster in various locations (on hold).
- Db3. A checklist of criteria, for self assessment or survey, to enable Local Government organisations to assess their current and required capability for coordinating reconstruction (on hold).
- Db4. A catalogue of potential conflicting reconstruction issues between government jurisdictions for several geographically widespread disaster scenarios (on hold).

Further details are given in Appendix B on how these research priorities and outputs might be achieved.

## **7 Other Issues from the Workshop**

There was significant overlap in the discussions between the four areas identified above. Some other broad issues raised in the workshop, that cut across those given above, are as follows:

- E1. Community requirements in terms of reconstruction sequencing and how this maps across to co-ordination.
- E2. Community acceptance of changes in legislation in advance of and following a disaster.
- E3. Insurance mechanisms for reconstruction and in particular the insured/uninsured interface – what to do with uninsured?
- E4. Ways to bring relevant stakeholders/industries together to managed shared risks.

Research in these areas is not currently envisaged under the existing Resilient Organisations research project due to limited research resources and a lack of clear alignment with the core themes of the Resilient Organisations project. However, if additional funding is forthcoming in the future we would be happy to work with the funding organisation to develop research objectives to address these issues.



## **8 The Next Stages**

### **8.1 Feedback and involvement in the research proposed**

The research will involve significant interaction between the researchers and key stakeholders of reconstruction – in particular the workshop participants. The research team would welcome expressions of interest from the workshop participants to provide more detailed input into each of the proposed research objectives given in this report and/or suggestions of names of relevant key people who may have an interest and who we should approach.

We would also welcome feedback on this report and any other suggestions as to how the quality and value of the research outcomes could be improved. In addition we would be very pleased to hear of any sources of funding which would allow objectives of particular interest to an organisation, that are currently on hold, to be moved to the ongoing research schedule.

### **8.2 Timeline**

Time lines are given in the attached summary tables (Appendix B) for the various outputs. As the outputs become available we will forward them on to stakeholders and participants in the research.

### **8.3 Dissemination of research findings**

Progress of the research will be shown on the Resilient Organisations website ([www.resorgs.org.nz](http://www.resorgs.org.nz)). As the research outputs are completed they will be disseminated to interested parties in the form of project reports. When opportunities arise the research findings will be presented in academic journals and at national and international conferences.

The Resilient Organisations team will be hosting the 2008 conference for I-Rec (International Group for Research and Information on post-Disaster Reconstruction) in Christchurch Wednesday 30 April – Friday 2 May 2008. This is a bi-annual conference which brings together international practitioners and researchers on post-disaster reconstruction. The focus of the conference will be on the four themes discussed in this document.

## **9 Conclusion**

Despite the extensive research and planning that has already been undertaken by various organisations in New Zealand, there remain challenges and opportunities for improving the processes for reconstruction in a post-disaster situation. A key challenge is to overcome the apparent division between those who, in practice, take responsibility for reconstruction and those who set policy and legislation. It is important therefore that the further research engages with a broad range of reconstruction stakeholders, to overcome such barriers.

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## 10 References

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## Appendix A Workshop Attendees

Bruce Shephard – EQC  
Hugh Cowan – EQC  
John Balmforth – AMI  
Anita Middleton, IAG  
Laurie Brady – AMI  
Dean Myburgh – SOLGM and Manukau City Council  
Terry Winyard - Tauranga City Council  
Roger Crimp – Telecom  
Geoff Swainson – Local Government NZ  
Graham Rowe – NZ Society for Earthquake Engineering  
Andrew Hazelton – Hazelton Law  
David Middleton – EQC  
Simon Chambers – MCDEM  
David Oughton  
Rian van Schalkwyk – Greater Wellington Regional Council  
Dave Bates – Transit NZ  
Reagan Potangaroa – Unitec  
Braden Austin - Manawatu Wanganui Infrastructure Recovery Manager  
John Christianson – Connell Wagner  
David Hopkins – David Hopkins Consulting  
Richard Sharpe - Beca  
Rudolph Kotze – Transit NZ  
Ian Page - BRANZ  
Adrian Bennett - Building Research

## Research Team

1. Dave Brunson
2. Erica Seville
3. Andre Dantas
4. Jason Le Masurier
5. Suzanne Wilkinson
6. Bruce Deam
7. James Rotimi (Ph.D. student)
8. Kelvin Zuo (Ph.D. student)
9. John Hewitt (Ph.D. student)

## Research Summary: Regulation and Legislation

| Issue   | Research output  | How                                  | Who to consult   | When          |
|---|--|--------------------------------------|--|---------------|
| Critically review the goals for and processes within the existing New Zealand legislation and guidelines for post-disaster reconstruction.  | Literature review  | James Rotimi (part-time PhD student) | MCDEM  | December 2006 |
| Identify the legislative and regulatory factors that governed the effectiveness of past reconstruction programmes and determine the relationships and levels of influence of these factors. | Case studies   | Ditto                                | Stakeholders in reconstruction following past disasters (insurance companies, lifelines, local government) | December 2007 |
| Develop scenarios with a range of disaster magnitudes that can be used to measure the effectiveness of existing and proposed reconstruction programme frameworks.                           |  | Ditto                                | Disaster recovery managers   | December 2008 |
| Develop process models that describe the existing legislative and regulatory framework as it applies to reconstruction and identify critical constraints within that framework.             | Process models that will make explicit the statutory recovery process from damage assessments to the completion of reconstruction projects.  | Ditto                                | Lawyers, regulators,   | December 2009 |
| Postulate improved regulatory processes and model and evaluate their response to the identified scenarios so as to quantify their improvement.  | Models of alternative processes and responsibilities for the coordination of reconstruction during and after emergencies to promote improved coordinating and monitoring arrangements for reconstruction | Ditto                                |  | December 2010 |
| Recommend suitable framework for reconstructing New Zealand communities affected by a major disaster.   | Best practice guidelines (in the form of manuals) for reconstruction works under different disaster scenarios.   | Ditto                                |  | December 2010 |

### Research Summary: Contracts and procurement

| Issue   | Research output  | How  | Who to consult   | When          |
|---|--|--|--|---------------|
| To examine international experience for how contractual issues have been managed.   | Recommendations on contractual organisations and contract types for disaster reconstruction  | Kelvin Zuo, PhD<br>Student Univ. of Auckland, funded by FRST Resilient Organisations | Construction Industry  | December 2006 |
| To analyse who pays for reconstruction, the mechanism of payment and the contractual issues involved in payment for reconstruction. | Recommendations on how the contractual payment mechanisms should work during reconstruction following a disaster and analysis of money flow for different stakeholders, e.g. fully insured, under-insured and uninsured. | Ditto  | Stakeholders in reconstruction following past disasters (insurance companies, local lifelines, local government) | December 2008 |
| To examine contractual pre-registration of contractors and for setting of rates for post-disaster work                              | Recommendation on how the construction industry can pre-register contractors for post disaster work and what rates should apply.   | On hold  |  |               |

**Research Table: Resources**

| Issue  | Research output  | How   | Who to consult   | When   |
|--|--|---|--|--|
| To examine and compare the reconstruction resource requirements of various organisations                           | A catalogue of the reconstruction resource needs of both public and private sector organisations and homeowners and suggested mechanisms for prioritisation the allocation of resources                                      | Beshram Singh, ME thesis student, Univ. of Auckland   | Public and private sector organisations and homeowners | August 2007                                    |
| To assess the availability of national and regional resources and their ability to be brought into a disaster zone | The communication and information sharing aspects of this issue are being addressed as part of Objective 2 research, with the development of a dynamic GIS framework for supporting the effective mobilisation of resources. | Heri Setiawan, PhD student Univ. of Canterbury (working under Objective 2 of Res. Orgs. Research project) | Lifelines organisations                                | Prototype available Aug. 2007, testing in 2008 |
| To understand the barriers to getting industry to do pre-event planning  | Summary of the preparedness of the industry and recommendations of the ways of engaging the industry in pre-event planning   | On hold, could be conducted as part of a resilience benchmarking study under Res. Orgs. Objective 1       |  |  |

**Research Table: Coordination of reconstruction**

| Issue  | Research output   | How  | Who to consult   | When    |
|--|---|--|--|---------|
| To understand the priority reconstruction needs of a community during the response and recovery stages | A checklist to evaluate reconstruction priorities   | John Hewitt, PhD student Univ. of Auckland | Architects, town planners, communities facing reconstruction | By 2009 |
| To undertake a gap analysis for coordination capacity in terms of function provision versus resources. | A map of New Zealand's capacity for coordination of post-disaster reconstruction for various scales of disaster in various locations.   | On hold                                    |  |         |
| To propose criteria for assessing Local Government capability to coordinate reconstruction             | A checklist of criteria, for self assessment or survey, to enable Local Government organisations to assess their current and required capability for coordinating reconstruction. | On hold                                    |  |         |
| To analyse the potential impacts of jurisdictional boundaries on reconstruction                        | A catalogue of potential conflicting reconstruction issues between government jurisdictions for several geographically widespread disaster scenarios.                             | On hold                                    |  |         |

**THESIS TITLE: AN EVALUATION OF THE IMPLEMENTATION OF POST-DISASTER RECONSTRUCTION STRATEGIES IN NEW ZEALAND**

*This brief is a summary of recommendations for the review of some aspects of legislation around disaster recovery in New Zealand. It is a work-in-progress serving to keep the research team informed of matters that arose from an opinion survey of disaster practitioners. It is intended for the considerations of supervisory members only.*

**Scope**

This brief covers recommendations for the reviews of some aspects of three Acts; the Civil Defence and Emergency Management (CDEM) Act; the Building Act (BA) and the Resource Management Act (RMA). These Acts have been the focus of the current research and the object of an on-line questionnaire that was administered to disaster practitioners between March and April 2008.

To put the recommendations in proper context, the research questions are presented followed by an outline of the issues of concern (ex ante) and an outline of the survey results (ex post) for each Act. Attempt has been made to make reference to portions of the legislative documents where possible.

**The Research Question**

- What improvements could be made existing legislation and regulatory provisions so that they facilitate the implementation of large scale reconstruction programmes in New Zealand?

**Outline of areas of concern in Legislation****Building Act (2004)**

- Building Consent process and compliance requirements.
- Procedural arrangements for building/damage evaluations (on-the spot assessment).
- Approval and certification of BCAs and IQPs.
- Training requirements for new and external evaluators/assessors.
- Insurance cover for buildings with section 71-74 notices etc.
- Decision making liabilities etc.

**Resource Management Act (1991)**

- Resource consent process and statutory requirements.
- Consultation in the RMA.
- RMA and pragmatism of post disaster decisions.
- Conflicts during implementation of RMA and BA.



### Civil Defence and Emergency Management Act (2002)

- Adequacy of statutory powers for recovery.
- Extension of Recovery Coordinators powers beyond declared emergency period.
- Recovery modalities, adequate?
- Application of CDEM vis-à-vis BA and RMA, Any conflict?

### Other Issues

- NZ recovery capacity.
- Effect of resource availability.
- Collaboration amongst TAs and Councils.
- Public acceptance of legislative reviews.

### **Outline of Survey Results and Findings**

#### Building Act (2004)

- There is little doubt that building consent processing will slow down reconstruction work BUT respondents are not in favour of a short cut to the process OR outright deregulation. The general opinion is that the benefits for 'development control' outweigh those of speedy recovery.
- Consent processing problems perceived more as a logistic issue that could be resolved through adequate resourcing (availability of Assessors, Engineers etc).
- BCAs and IQPs are central to post-disaster reconstruction. The certification process must be flexible yet robust.
- Pro-active rather than reactive response/recovery is generally preferred. Reconstruction would also benefit from prior arrangements (detailed modalities for action and re-action).

#### Resource Management Act (1991)

- Current resource consent process is burdensome BUT necessary. Concern is for individual house owners who may be frustrated by the process post-disaster.
- RMA will impact reconstruction activities and programmes. Emphasis placed on consultation may slow the anticipated rate of recovery. Some flexibility is desired.
- Recovery Managers should be able to veto certain RMA requirements/provisions to allow for reconstruction work to progress with little hindrance.
- Jurisdictional conflicts may arise in RMA implementation between TAs and local councils. There are subtle differences between the implementation/interpretation of the RMA and District Plans; these may become sources of conflicts.

### Civil Defence and Emergency Management Act (2002)

- There should be provisions for the extension of Recovery Coordinators tenure beyond the 28days stipulated.

- Recovery Coordinators statutory powers should extend beyond a declared emergency period. This would allow for more pragmatic decisions during response and recovery activities.
- Greater coordination responsibilities expected from CDEM officials under the Act.
- Clearer linkages between the CDEM Act and RMA envisaged particularly in the realm of hazard reduction activities.

### **Draft Recommendations**

The following recommendations are made to facilitate both efficient and effective reconstruction of the built environment after a significant disaster. Reference is made where possible to portions/aspects of legislation that may be affected by the recommendations.

#### Relative to the Building Act

The building consent process is a potential bottleneck considering that there will be a spike of applications that could overwhelm the capacity of BCAs and IQPs. The process needs to be simplified by allowing approvals to be granted in retrospect, this is without a compromise to applicable building codes. There are only two situations where the consent process can be bypassed under current BA provisions. One is if an application was made by a building owner under 'urgency'; and the other is reliant on local council prerogatives. In the latter situation, works can be carried out if such is certified with a Producer's Statement certificate (PS) or for reasons of safety. There needs to be a broader acceptance of PS certificates than would be the case under normal circumstances. It is expected that BCAs prepare policies and guidelines on how this discretionary powers can be exercised.

**Action:** *BCAs to prepare such policies as a matter of priority.  
Review sectn: 41, 48 and 93 of BA, for bypass of normal consent processing.  
Review sectn: 124-... OR New Sectn on: Powers of TAs in the event of catastrophe.*

In similar vein, BCAs need to address concerns of parity between Certificates of Acceptance (COA) granted in retrospect (as above) and Code of Compliance Certificates (CCC). It is feared that COAs may not be acceptable to private insurers and there is the likelihood of reduced 'sale values' of properties with a COA. The BA has to allay such fears by providing a clause which would explain that the difference is the result of process rather than in performance standard.

**Action:** *Review sectn: 96-99 of BA, to address parity of CCC and COA.*

Training and re-training of Inspectors, Assessors and Evaluators must be given priority. Particularly packaged-induction schemes need to be prepared for loaned/external resource persons so that they come to grips with local procedures in a short duration. It is important that the modalities for the exchange of resources persons be prepared in advance of a disaster event.

**Action:** *Review of relevant sectn Local Govt Act (2002).*

#### Relative to the Resource Management Act

The RMA has been a source of frustration in previous recovery programmes largely because of procedural requirements for wider consultations. It is recommended that the scale of consultations/public notification be limited in a manner that permits a speedy approval process.

**Action:** *Review sectn 93-95 to limit the scope of public notifications in catastrophes, possibly limiting decisions to the new Environment Protection Agency (modalities not clear yet).*

The RMA should demand greater consideration of the importance of recovery after hazards by TAs and councils. This should be incorporated in regional and district plans. Current emphasis is on prevention/avoidance and mitigation of hazards.

**Action:** *Review sectn 62, 67 and 75 to contain 'recovery from catastrophes'.*

#### Relative to the CDEM Act

There should be greater integration of the CDEM with the RMA and BA so that all respective recovery-related policies are streamlined to avoid misinterpretations.

**Action:** *Review relevant sectn CDEM Act, BA and RMA to harmonise aspects concerning relationship between these documents.*

The CDEM agencies have to be pro-active in facilitating the 4Rs (reduction/mitigation, readiness/preparedness, response and recovery activities). More emphasis is needed on reduction activities. For example, CDEM group should be more involved in the long term community planning of the local (or regional) councils - LTCCP. Their involvement would ensure that District plans have stronger hazard-resilient principles and undertones.

**Action:** *Review CDEM Act to expand scope of MCDEM activities beyond coordination of emergency activities.*

## General Recommendations

The study recommends the development of a National Policy Statement that provides an overarching framework/guideline for post-disaster reconstruction. This would bring all post-disaster considerations into a single document but with references to related legislation. Issue that could be covered by the Policy Statement include:

- Definition of hazard types that will refer to the policy.
- Guidelines on collaboration of stakeholders towards recovery (above current suggestions). Recovery considerations to transcend commercial decisions and silos.
- Addressing external aid and assistance.
- Cross referencing to related legislation/guidelines.
- Relationship and harmonisation of related legislation (both development and re-development control guidelines)
- Process-based information under different disaster scenarios

**Action:** *MCDEM, MEF, DBH to facilitate development of National Policy Statement*

The study recommends the establishment of memoranda of understanding between neighbouring councils and TAs. Such MoUs could address the following issues:

- Procedural arrangements for the implementation of salient differences between local regulations e.g. District Plans.
- Responsibility and Liability issues as a fall out from joint decisions.
- Modalities for information dissemination and sharing.
- Modalities for resource sharing and deployments.
- Training and Induction of personnel.
- External aid/assistance and their participation in recovery.

**Action:** *Review relevant sectns of the LG Act and CDEM Act.*

## **APPENDIX B**

### **Survey Documents**

**B1** – Human Ethics Committee Approval Letter

**B2** – Summary of Interviews

**B3** – Survey Participants' Information Sheet

**B4** – Survey Participants' Consent Form

**B5** – Questionnaire Analysis

**B6** - Verification Questionnaire CDEM Act

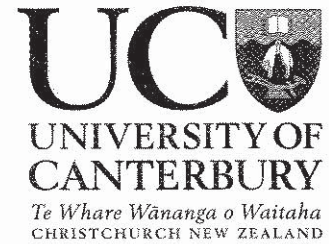
**B7** - Verification Questionnaire RMA

**B8** - Verification Questionnaire BA

Human Ethics Committee

Secretary

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Ref: HEC 2007/148

30 November 2007

Mr James O B Rotimi  
7 Pickens Crescent,  
Mt Albert 1003,  
AUCKLAND

Dear James

The Human Ethics Committee advises that your research proposal “An evaluation of the implementation of post-disaster reconstruction strategies under the Resource Management and Building Acts in New Zealand.” has been considered and approved.

However this approval is subject to the incorporation of the amendments you have provided in your email of 23 November 2007.

Yours sincerely

A handwritten signature in black ink, appearing to read 'M Grimshaw'.

 Dr Michael Grimshaw  
*Chair, Human Ethics Committee*

## APPENDIX B2

### SUMMARY OF INTERVIEWS WITH INDUSTRY EXPERTS (18 & 19 JULY, 2006)

#### 1.0 Rian Van Schalkwyk (Coordinator, Recovery Management Forum)

Rian was receptive and forthcoming as to the level of assistance we could get from him. He gave an overview of the functioning of the command and operational centres of the Wellington Emergency Management Department, explaining however that both centres were not completely immune to the risks of being dysfunctional in the event of large-scale disasters. The up side is that 90% of previous incidents have been relatively small scale.

#### **Comments on Research Objectives**

He agreed with most of the issues raised in the research proposal, but cautious that there needs to be a fine balance between the demands for expediency after disasters and the protection of the environment, which the RMA stands for. The former case may increase the risks & vulnerabilities of communities (e.g. depositing disaster debris in flood paths).

Rian is of the opinion that different disaster scenarios were taken into consideration when preparing regional group plans. James will need to look at these documents closely to avoid duplication.

He complained about the poor impact that his public education campaigns for disaster preparedness have made on the community. Surveys give only 1% increase (26 to 27% from the previous year's poll) in the level of preparedness of the community in spite of monies committed.

On appointed Recovery Coordinators, he explained that they had little powers to coordinate recovery coupled with interferences from political backers, they mostly lacked any formal training in Disaster management, which could impair effective decision-making and commitment during reconstruction works.

#### **Available Study Resources**

- Recovery framework - developed from the recovery groups brainstorming sessions.
- Phoenix Workshop (Bi-monthly) - a meeting of the 16 regional recovery managers where the details of each regions activity in the intervening period are discussed. Next meeting will be 6-8 weeks and James may be invited to participate.
- National Emergency Management Exercise (end of November '06) - A 3-day exercise to check the level of preparedness of Emergency agencies using the Wellington fault scenario. All aspects of reduction, readiness, response and recovery might be put to test. James may be invited to witness the exercise.

#### **Action points**

- To send email requesting contact details of all Regional Recovery Managers.

- To request for document detailing recovery framework.
- Link up with the regions disaster recovery manager.
- To maintain contact and active communication flow.

**Useful links:** [www.wrcdemng.govt.nz](http://www.wrcdemng.govt.nz)

## 2.0 Hugh Cowan (EQC)

Hugh confirmed EQC's support for the research programme. He considered the research focus topical and relevant to the achievement of post-disaster reconstruction objectives in New Zealand.

### **Comments on research objectives**

- Need to choose disaster case studies from countries with similar social, cultural, economic etc. setting as New Zealand. Therefore to exclude Kobe earthquake, Asian Tsunami etc. from the case studies. Northridge/Santa Monica earthquakes or cases from Europe may be more relevant.
- Lessons can be learnt from the Napier (1931) earthquake, particularly the enactments made by the Bara Council and other measures on resource allocation, Urban Renewal etc.

### **Available Study Resources**

- EQC Bulletin - A rich source of information on recovery issues.
- Post-Earthquake Reconnaissance Reports (e.g. Northridge earthquake, Asian Tsunami etc.) would provide information on what lessons were learnt, usefulness and if such information have been used.
- Data from the Insurance and Claims department on coordination, speeding-up of application processes, application of EQC policies etc.

### **Action Points**

- To maintain contact and active communication flow.

## 3.0 Roger Crimp (Telecom)

Roger explained that the effectiveness of reconstruction/restoration work is determined by the priorities attached to the damaged facilities. Priority of lifelines like Telecom is the restoration of services, not necessarily rebuilding of built infrastructure. The speed by which restorations can be made is often times dependent on the speed of non-Telecom structures that terminate Telecom's services i.e. customer premises. These premises would often need to wait for insurance payouts before being constructed after a major disaster. The CDEM Act gives priority to Telecom, which may facilitate its work during disasters.

RMA and OSH requirement may be an impediment because of the large volume of consent applications.



Incidents that have had major impacts on Telecom services are flooding incidents in Manawatu etc. and snowstorms (e.g. Canterbury 2006). Telecom has a national agreement with OPUS for assistance in the event of major service outages. The agreement covers areas of impact assessment, skills shortages etc.

### Comments on Research Objectives

- Advised to consider how effectiveness of reconstruction programmes will be measured because of the different priorities attached to damaged facilities.
- To incorporate lifelines in the process models and demonstrate its criticality to achieving efficiency and effective reconstruction programmes.
- Consider the use of the *impact assessment* as against *damage assessment* in the literature.
- The word *best practice guidelines* preferred to *manuals*.
- Need to make clear the benefits of the research to the community and lifelines.
- Consider rainstorm at Sydney, Australia in the case study because of the impact on different lifeline agencies.
- May need to narrow down scope of research the effects of the RMA and CDEM Act on reconstruction works.
- Plan effectively the information gathering approach to lifeline agencies. May not be very receptive to research works.

### Available Study Resources

- Report on post-impact assessment of performances e.g. Auckland power outage, flooding and snowstorms etc.
- Disaster impact on storage of fuel (recently published).

### Useful Links

Brian Porter (telecom) - for Auckland power outage report.

Rodney Walker (Work Management Officer) - for flooding & snowstorms report.

John Lamb (Engineering Lifelines Coordinator) - for report on storage of fuel.

Laurie brady (AMI Insurance) - for report on Sydney rainstorm.

### 4.0 Peter Kingsbury (MCDEM Canterbury)

Peter gave an overview of the MCDEM Emergency Management Planning offices located in Wellington, Auckland and Christchurch.

He and Simon Chambers are prepared to assist the research in whatever form possible. He hinted on the possibility of scholarship grant to research students in the area of procurement and contractual processes. Jason is to inform Suzanne of this development.

### Available Study Resources

- Prepared regional group plans have included strategic recovery objectives. This gives information on different regional priorities, disaster scenarios (probabilities) and disaster case studies (actual). James is to request for a CD compilation of these group plans.

- Organisational and operational structure of MCDEM from which the right people within the hierarchy can be identified for interviews. James is to request for this.
- Since the submissions of the RMA reviews, Messrs Anthony Harper is currently interviewing Emergency Management personnel to find out their experiences on actual events in relation to the RMA etc. James is to meet with Paul Rogers (representative of the Law firm).
- Listing of some of the regional EMO's that may be disposed to the research study, Mark Harrison, Shane Bailey, Richard Steele, John Thornston, John Mitchell, Dallas Bradley etc. James is to request this list from Simon Chambers.

#### **Useful Links**

- Lifelines that may be consulted: Orion, Mighty River Power (for Auckland power outage) etc.

#### **5.0 David Brunsdon (Chairman, Engineering Lifelines Group)**

David was instrumental to our meeting with Roger Crimp at Telecom. He had discussed the research objectives with his project manager, Torben Poirot. Torben leaves for Vancouver, Canada for a PhD programme in Disaster Management.

#### **Comments on Research Objectives**

- Advised to demonstrate the importance of the research output to all stakeholders.
- Plan effectively the interview/questioning techniques to lifelines.
- Be more specific i.e. narrow down scope of research.

#### **Useful Links**

- Torben Poirot may be a useful academic resource in terms of research methodology and will need to establish a symbiotic relationship.
- Other lifelines: gas pipelines, VECTOR (power services), Water & Energy Supplies etc.

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**February, 2008**

**Participant Information Sheet**

**Topic: An Evaluation of the Implementation of Post-Disaster Reconstruction Strategies under the Resource Management and Building Acts in New Zealand.**

This project is being carried out by James Olabode Bamidele Rotimi as a requirement for the award of a Doctor of Philosophy degree, under the supervision of Dr. Bruce Deam.

The aim of this project is to facilitate both efficient and effective reconstruction of the built environment after disasters, through the implementation of enabling provisions within the Resource Management Act and Building Act.

You are invited to participate in this survey as a professional who has knowledge of legislation that may influence post-disaster reconstruction of the built environment. It will be highly appreciated if you can fill out the attached questionnaire and supply any additional information which you may find useful based on your experience. Completion of the questionnaire should take approximately 20 minutes.

The questionnaire has the following objectives:

- To determine the effect that existing provisions within the Resource Management and Building Act will have on the reconstruction of the built environment after major natural disaster events in New Zealand.
- To determine how the span of control and liabilities of appointed Recovery Coordinators could be enhanced through legislation, so that they retain control of reconstruction after the initial response.
- To determine how the existing arrangements for emergency readiness and response can be extended to cater for the longer-term recovery period especially after the expiration of declared state of emergencies.
- To determine how the consenting process can be simplified and made more responsive to potential higher demands during the reconstruction period, reducing the frustrations experienced under the current process.

As a follow-up to this questionnaire, the researcher may ask you to participate in an interview to discuss your responses. You will be able to review the transcript of this interview.

You are assured of strict confidentiality in the research process and in subsequent publications. All identifying features of you or your organisation will be coded. You are free to ask the researcher to not use any of the information you have given, and, if you wish, you can ask to see the report before it is submitted for examination.

The project has been reviewed and *approved* by the University of Canterbury's Human Ethics Committee (Ref. No. 2007/148). If you have any questions or concern about the research, please contact Dr. Deam by email ([bruce.deam@canterbury.ac.nz](mailto:bruce.deam@canterbury.ac.nz)) or phone him on 03 364 2601.

**APPENDIX B4**

February, 2008

**CONSENT FORM**

**An Evaluation of the Implementation of Post-Disaster Reconstruction Strategies  
under the Resource Management and Building Acts in New Zealand.**

I have read and understood the description of the above-named project. On this basis I agree to participate as a subject in the project, and I consent to publication of the results of the project with the understanding that anonymity is preserved.

I understand that I may at any time withdraw from the project, including withdrawing any information I have provided. I understand also, that I can review the transcript of any follow-up interview.

**Name (Please print):** .....

**Signature:**

**Date:**

*Note: Completed form may be sent back by Fax to 09 8156795*

## APPENDIX B5

### Questionnaire Analysis

#### SECTION 1:

A. How often do you make reference to the following Acts?

| The Acts        | Very Often    | Rarely        | Never         |
|-----------------|---------------|---------------|---------------|
| CDEM Act (N=79) | 27<br>(34.2%) | 28<br>(35.4%) | 24<br>(30.4%) |
| RMA (N=75)      | 45<br>(60.0%) | 22<br>(29.3%) | 8<br>(10.7%)  |
| BA (N=75)       | 41<br>(54.7%) | 22<br>(29.3%) | 12<br>(16.0%) |

B. How would you rate your understanding of the following Acts?

| The Acts        | Not Much      | Average       | High          | Very High     | N/A         |
|-----------------|---------------|---------------|---------------|---------------|-------------|
| CDEM Act (N=77) | 23<br>(29.9%) | 24<br>(31.2%) | 14<br>(18.2%) | 13<br>(16.9%) | 3<br>(3.9%) |
| RMA (N=75)      | 14<br>(18.7%) | 21<br>(28.0%) | 13<br>(17.3%) | 27<br>(36.0%) | 0<br>( )    |
| BA (N=75)       | 17<br>(21.2%) | 23<br>(28.8%) | 22<br>(29.3%) | 10<br>(13.3%) | 3<br>(3.8%) |

C. Please indicate the Acts/Regulations that are useful in the discharge of your duties.

| S/No | Acts/Regulations                              | Response      |
|------|---|---------------|
| 1    | Local Government Act 2002                     | 61<br>(76.2%) |
| 2    | District Plan                                 | 22<br>(27.5%) |
| 3    | Earthquake Commissions Act 1993               | 15<br>(18.8%) |
| 4    | Housing Improvement Regulations 1947          | 8<br>(10%)    |
| 5    | Historic Places Act 1993                      | 24<br>(30%)   |
| 6    | Soil Conservation and Rivers Control Act 1941 | 12<br>(15%)   |

**SECTION 2:**

Qs. Please rate the following statements according to how best they represent your opinion of the CDEM Act

| Statements   | Strongly Agree | Agree         | Neutral/ Unsure | Disagree      | Strongly Disagree |
|--|----------------|---------------|-----------------|---------------|-------------------|
| The statutory powers of appointed Recovery Coordinators as contained in the CDEMA are <b>NOT</b> adequate for large-scale disasters. (N=61)    | 3<br>(4.9%)    | 11<br>(18.0%) | 34<br>(55.7%)   | 12<br>(19.7%) | 1<br>(1.6%)       |
| Recovery Coordinators have enough powers to decide on reconstruction priorities under the present regulatory framework. (N=61)                 | 3<br>(4.9%)    | 15<br>(24.6%) | 32<br>(52.5%)   | 11<br>(18.0%) | 0                 |
| The maximum specified days (28) for which Recovery Coordinators are appointed need to be extended beyond the declared emergency period. (N=61) | 4<br>(6.6%)    | 26<br>(42.6%) | 30<br>(49.2%)   | 1<br>(1.6%)   | 0                 |
| Extending emergency powers beyond the emergency period may <b>NOT</b> facilitate reconstruction works. (N=61)                                  | 2<br>(3.3%)    | 18<br>(29.5%) | 29<br>(47.5%)   | 11<br>(18.0%) | 1<br>(1.6%)       |
| The CDEMA provides for a speedy implementation of reconstruction projects. (N=61)  | 0              | 10<br>(16.4%) | 36<br>(59.0%)   | 14<br>(23.0%) | 1<br>(1.6%)       |
| Large scale implementation of reconstruction projects have been catered for under the current regulatory regime. (N=61)                        | 0              | 6<br>(9.8%)   | 38<br>(62.3%)   | 15<br>(24.6%) | 2<br>(3.3%)       |
| There is <b>NO</b> foreseeable hindrance to reconstruction posed by the CDEMA. (N=61)  | 0              | 13<br>(21.3%) | 40<br>(65.6%)   | 5<br>(8.2%)   | 3<br>(4.9%)       |
| There are potential areas of conflict in the implementation of the CDEMA with other legislation during the recovery phase. (N=60)              | 4<br>(6.7%)    | 20<br>(33.3%) | 33<br>(55.0%)   | 3<br>(5.0%)   | 0                 |

**SECTION 3:**

Qs. Please rate the following statements according to how best they represent your opinion of the Building Act

| Statements  | Strongly Agree | Agree         | Neutral/ Unsure | Disagree      | Strongly Disagree |
|---|----------------|---------------|-----------------|---------------|-------------------|
| Strict application of the BA provisions will affect efficiency of construction operations (N=66)  | 14<br>(21.2%)  | 23<br>(34.8%) | 19<br>(28.8%)   | 9<br>(13.6%)  | 1<br>(1.5%)       |
| The consents/approval procedure outlined in the BA may become cumbersome during large scale disaster reconstruction. (N=66)   | 19<br>(28.8%)  | 32<br>(48.5%) | 7<br>(10.6%)    | 5<br>(7.6%)   | 3<br>(4.5%)       |
| Councils will <b>NOT</b> struggle to meet the requirements for consent processing after a major disaster event (N=66)   | 3<br>(4.5%)    | 7<br>(10.6%)  | 7<br>(10.6%)    | 31<br>(47.0%) | 18<br>(27.3%)     |
| The BA is clear as to the damage inspection procedure on built facilities (N=66)  | 1<br>(1.5%)    | 11<br>(16.7%) | 41<br>(62.1%)   | 12<br>(18.2%) | 1<br>(1.5%)       |
| There is <b>NO</b> potential for conflicts while applying the BA and other Acts relating to the reconstruction of the built environment. (N=66)                       | 0<br>0         | 4<br>(6.1%)   | 23<br>(34.8)    | 31<br>(47.0%) | 8<br>(12.1%)      |
| The BA consent application process is <b>NOT</b> a major source of concern in post-disaster reconstruction. (N=64)  | 3<br>(4.7%)    | 13<br>(20.3%) | 20<br>(31.2%)   | 20<br>(31.2%) | 8<br>(12.5%)      |
| There could be jurisdictional conflicts (i.e. between local and regional councils) in the implementation of BA provisions after a major disaster. (N=65)              | 5<br>(7.7%)    | 24<br>(36.9%) | 16<br>(24.6%)   | 17<br>(26.2%) | 3<br>(4.6%)       |
| The current insurance cover (liabilities) for Building Consent Authorities (BCA) and their Independent Qualified Persons (IQP) is adequate for decision making (N=63) | 2<br>(3.2%)    | 19<br>(14.3%) | 43<br>(68.3%)   | 8<br>(12.7%)  | 1<br>(1.6%)       |
| There are enough provisions for bypassing consent processing in the BA for post-disaster reconstruction (N=5)   | 4<br>(6.2%)    | 12<br>(18.5%) | 33<br>(50.8%)   | 12<br>(18.5%) | 4<br>(6.2%)       |
| Section 71-74 Notices in the BA will prevent some disaster-affected property owners from receiving compensation (N=63)  | 4<br>(6.3%)    | 13<br>(20.6%) | 44<br>(69.8%)   | 1<br>(1.6%)   | 1<br>(1.6%)       |



|  |             |               |               |               |             |
|--|-------------|---------------|---------------|---------------|-------------|
| The arrangements made by councils for the on-the-spot assessment of damaged properties are adequate. (N=65)            | 0<br>0      | 14<br>(21.5%) | 25<br>(38.5%) | 20<br>(30.8%) | 6<br>(9.2%) |
| The building consent and compliance process must be followed through irrespective of the scale of the disaster. (N=65) | 6<br>(9.2%) | 33<br>(50.8%) | 10<br>(15.4%) | 14<br>(21.5%) | 2<br>(3.1%) |

#### SECTION 4:

Qs. Please rate the following statements according to how best they represent your opinion of the Resource Management Act

| Statements  | Strongly Agree | Agree         | Neutral/ Unsure | Disagree      | Strongly Disagree |
|---|----------------|---------------|-----------------|---------------|-------------------|
| The RMA will <b>not</b> impede the effective achievement of reconstruction of built infrastructure. (N=62)                      | 2<br>(3.2%)    | 20<br>(32.3%) | 15<br>(24.2%)   | 22<br>(35.5%) | 3<br>(4.8%)       |
| The RMA will have a negative effect on efficiency during reconstruction works. (N=62)   | 3<br>(4.8%)    | 26<br>(41.9%) | 14<br>(22.6%)   | 15<br>(24.2%) | 4<br>(6.5%)       |
| There is the possibility of conflict between the different tiers of government concerning the implementation of the RMA. (N=61) | 5<br>(8.2%)    | 33<br>(54.1%) | 14<br>(23.0%)   | 7<br>(11.5%)  | 2<br>(3.3%)       |
| The application process for resource consent will <b>NOT</b> slow down reconstruction programmes. (N=62)                        | 4<br>(6.5%)    | 10<br>(16.1%) | 12<br>(19.4%)   | 33<br>(53.2%) | 3<br>(4.8%)       |
| The RMA places too much emphasis on consultation. (N=62)  | 3<br>(4.8%)    | 12<br>(19.4%) | 22<br>(35.5%)   | 21<br>(33.9%) | 4<br>(6.5%)       |
| The consultation process needs <b>NOT</b> to be limited in scope because of reconstruction demands. (N=62)                      | 2<br>(3.2%)    | 22<br>(35.5%) | 24<br>(38.7%)   | 13<br>(21.0%) | 1<br>(1.6%)       |
| The RMA will <b>NOT</b> become a regulatory burden on disaster-affected property owners. (N=62)                                 | 1<br>(1.6)     | 21<br>(33.9%) | 10<br>(16.1%)   | 29<br>(46.8%) | 1<br>(1.6%)       |
| Recovery Managers should be allowed to veto some aspects of the RMA, where there is a clear need to do so. (N=62)               | 3<br>(4.8%)    | 23<br>(37.1%) | 17<br>(27.4%)   | 15<br>(24.2%) | 5<br>(6.5%)       |
| There could be jurisdictional conflicts between councils and regions etc during reconstruction works under the RMA. (N=62)      | 3<br>(4.8%)    | 31<br>(50.0%) | 12<br>(19.4%)   | 13<br>(21.0%) | 3<br>(4.8%)       |

|   |             |             |               |              |             |
|---|-------------|-------------|---------------|--------------|-------------|
| The RMA was a source of frustration in previous disaster situations. (N=62) | 1<br>(1.6%) | 6<br>(9.7%) | 43<br>(69.4%) | 7<br>(11.3%) | 5<br>(8.1%) |
|---|-------------|-------------|---------------|--------------|-------------|

## SECTION 5

A. Please indicate what you feel about the following suggested solutions to operational/logistic problems associated with large scale disasters

| Statements  | Strongly Agree | Agree         | Neutral/ Unsure | Disagree    | Strongly Disagree |
|---|----------------|---------------|-----------------|-------------|-------------------|
| Continuous training of emergency personnel (N=61)   | 30<br>(49.2%)  | 28<br>(45.9%) | 1<br>(1.6%)     | 2<br>(3.3%) | 0                 |
| Disaster exercises and personnel role plays (N=61)  | 23<br>(37.7%)  | 29<br>(47.5%) | 5<br>(8.2%)     | 4<br>(6.6%) | 0                 |
| Public disaster awareness campaigns (N=61)          | 29<br>(47.5%)  | 28<br>(45.9%) | 3<br>(4.9%)     | 1<br>(1.6%) | 0                 |
| Pre planned programmes and courses of action (N=61) | 24<br>(39.3%)  | 33<br>(54.1%) | 4<br>(6.6%)     | 0           | 0                 |
| Others, please specify:                             |                |               |                 |             |                   |

B. Please indicate your priorities on how large scale reconstruction may be facilitated by the following.

|   | High Priority | Low Priority  | Not Necessary | Not Sure     |
|---|---------------|---------------|---------------|--------------|
| Prior MoUs between responders (councils, lifelines). N=61   | 42<br>(68.9%) | 11<br>(18.0%) | 3<br>(4.9%)   | 5<br>(8.2%)  |
| Accelerated registration of BCAs and IQPs. (N=61)   | 23<br>(37.7%) | 16<br>(26.2%) | 14<br>(23.0%) | 8<br>(13.1%) |
| Selective implementation of parts of legislation for expediency (eg. disposal of debris requirements in the RMA) (N=61) | 27<br>(44.3%) | 23<br>(37.7%) | 4<br>(6.6%)   | 7<br>(11.5%) |
| The development of a National Reconstruction Policy Statement (overarching policy document for reconstruction) N=61     | 31<br>(50.8%) | 14<br>(23.0%) | 8<br>(13.1%)  | 8<br>(13.1%) |
| Others, please specify:   |               |               |               |              |

C. Are there memoranda of understanding (MoUs) between different regions for resource sharing during a major disaster? (N=66)

|          |            |
|----------|------------|
| Yes      | 27 (40.9%) |
| No       | 10 (15.2%) |
| Not Sure | 29 (43.9%) |

D. Do the MoUs extend to councils within the regions? (N=64)

|          |            |
|----------|------------|
| Yes      | 17 (26.6%) |
| No       | 14 (21.9%) |
| Not Sure | 33 (51.6%) |

E. If MoUs exist between councils, please indicate how well these set of issues have been clearly expressed in the documents

| Details of MoUs  | Mentioned & Clearly Expressed | Mentioned BUT not clearly expressed | Not mentioned | Not Sure  |
|--|-------------------------------|-------------------------------------|---------------|-----------|
| Procedural arrangement (responsibilities, liabilities etc.) (between the regions/councils. (N=45)) | 7(15.6%)                      | 12(26.7%)                           | 4(8.9%)       | 22(48.9%) |
| Information dissemination/sharing. (N=45)  | 11 (24.4%)                    | 11(24.4%)                           | 2(4.4%)       | 21(46.7%) |
| Personnel sharing & deployment arrangements. (N=42)  | 14(17.5%)                     | 7(16.7%)                            | 0             | 21(50.0%) |
| Operational logistics & assistance. (N=46)   | 9(19.6%)                      | 11(23.9%)                           | 5(10.9%)      | 21(45.7%) |
| External aid/assistance & their participation. (N=45)  | 5(11.1%)                      | 11(24.4%)                           | 7(15.6%)      | 22(48.9%) |
| Any other issue  |                               |                                     |               |           |

F. How would you rate New Zealand's preparedness for a large-scale reconstruction programme? (N=61)

|                     |            |
|---------------------|------------|
| Very prepared       | 0          |
| Prepared            | 6 (9.8%)   |
| Moderately prepared | 33 (54.1%) |
| Not prepared        | 16 (26.2%) |
| Cannot Say          | 6 (9.8%)   |

**SECTION 6: TRANSCRIPT OF RESPONSES TO OPEN ENDED QUESTIONS**  
*(For anonymity participants have been identified with codes P001 to P080)*

**A. Reasons for choosing 'Not Much' understanding or 'N/A' of any of the three Acts.**

Any potential Civil Defence issues discuss directly with Council's Civil Defence Officer. (P002)

Have no responsibilities with Building Act. (P004)

Civil Defence and Emergency Management Act not well publicised or used in my everyday role. (P005)

I rarely if ever have need to use these in my role. (P006)

I am an Emergency Manager involved in CDEM and Rural Fire. I rely on others for information regarding the RMA and Building Act. (P008)

Lack of formal training. (P009)

Involvement is with the Soil Conservation and Rivers Control Act, not the Building Act. (P010)

Not required to use in my role, I will reference the appropriate staff when required. (P012)

I have some knowledge of the Civil Defence and Emergency Management Act in my capacity as a headquarters manager for civil defence matters. I however rarely refer to this legislation in my capacity as Principal Planner. (P022)

I am a team leader for Building Controls; although I participate in Civil Defence I am not involved in the management. (P023)

Because I have had no involvement in that area. (P024)

Involved in Emergency Management. (P026)

I have not really had much training. (P029)

Council has lead officer in the form of - Emergency Management Manager, and whilst Building Compliance liase on procedure and protocols in the event of an incident/event, any actions we take would be taken under the provisions of the Building Act 2004. (P032)

There has been little need for me to have knowledge of the Civil Defence and Emergency Act. The Resource Management Act and the Building Act are used regularly and so my knowledge of them is much greater. (P034)

Not a core responsibility in my role. (P035)

Not relevant to my areas of responsibility and of little relevance (other than some particular parts) to the work of a regional council. (P039)

I don't use them much and I don't need much knowledge of them to do my job. (P040)

Role is policy and reactive to emergencies, but in context of Building Act only. (P041)

BA not so relevant to CDEM work which has its own Act. RMA relevant to reduction and readiness work. (P042)

Limited involvement. (P045)

My employment relates primarily to Emergency Management procedure, although it will be developing into hazard reduction etc. (P062)

Not really relevant to the day to day activity in Health. (P063)

I leave this to the relevant experts; not my field. (P064)

Never had to use it. Know nothing about it. (P067)

Have a working knowledge only. Reliant on Planning section and Building compliance section to provide resources and response post disaster. (P069)

The Building Act has no relevance to my work. (P070)

CDEM Act and relevant documentation provides CDEM practitioners with a recovery framework. However, Recovery Plans differ from CDEM Group to Group and there does not exist a National Recovery Plan that facilitates reconstruction objectives. The Building... (P074)

Don't need to reference very often. (P077)

Don't work with them often. (P079)

#### **B. Other issues connected to the BA and post disaster reconstruction.**

The ability of designers to produce sufficient details to allow reconstruction to begin and the ability of builders to source sufficient materials. (P005)

Not applicable in my role as HR Unit coordinator. (P006)

Reconstruction will be slowed up to be manageable for TLA's as there will be a lack of materials and tradespeople to do the work. We need good systems to carry out assessments and record what they are for future reference. Most serious cases will also require assessment by a structural engineer. The availability of engineers will be another delaying factor. (P019)

Availability of qualified inspectors. (P025)

It is up to the earthquake commission to decide if they will pay out on section 71 - 74 political influences may affect this area. The Idea of the Building act hand its purpose and principles have a large and important effect on society to throw those principles out in the reconstruction phases may make society the loser. (P028)

Council's are obliged to adhere to the Accreditation requirements. (P029)

Lack of qualified staff for BCA's may mean time delays. Licensing regime for builders will create shortage of necessary skills for supervision/monitoring. (P033)

I do not understand the question on conflicts with Regional Councils. Their BA role is limited to dams! The availability of staff is problematic, but reversion to paper based systems will stand us in good stead. Application of the Building Code will ensure that "practical/pragmatic" building solutions post-disaster do not become additional problems in the recovery period eg during after shocks. (P035)

The BA allows for emergency or urgent works to be assessed and enabled. (P041)

I am not a Building Control Manager so are unable to answer appropriately the questions above. (P043)

There may be a need for some application of common sense in disaster situations which may not apply at other times. (P045)

Works are able to be carried out without BA approval provided that: 1) It is for reasons of safety and 2) It is certified for both design and construction through a PS4 certificate. (P051)

Perception that a COA is less robust than a BC, which could affect future value/sale for properties that need urgent remedial work after an event. (P052)

The Building Act provisions tend to conflict with the Resource Management Act at the re-construction stage, particularly where Section 10A of the RMA allows an activity to be carried out as of right, under the "Existing Use Rights" provisions. If a building affected by disaster is rebuilt again, the Consent Authority under the BA is mandated to require the property owner to register a Section 72 notice on the affected title, which may affect the right to the property being insured, etc. While one Act facilitates the re-building process, another sets off a series of inhibitions to the affected property. (P055)

Sections 96-99 would be promulgated to ease the process. (P057)

Some questions are hard to answer because of the lack of relevancy. Insurance provisions and compensation are not relevant to any decision making under the BA. Potential for conflict exists between BA and RMA but has no affect on a decision on whether or not to issue a building consent. The only way to 'By-pass' the building consent process is to apply for an exemption or if the work has been done under urgency, confirm with a certificate of acceptance. In any of these situations the work has to be documented, an application made and the council assess compliance with respect to the building code to... (P065)

Certificate of Acceptance (COA) work is currently viewed with extreme caution. Many COA applications are not accepted and of those that are accepted very few will receive a COA, the liability risk is too high as there has been no council inspections of the work. In a major damage event most homeowners will want to proceed on the basis of a COA and can legally do so, I would be very surprised if any council granted the COA on completion. With this council I have argued the

case for actual building inspections during the COA process where repair/replacement only is being completed. To date I have got n... (P066)

The immediate impact on communities post disaster and the need for all forms of temporary accommodation will require relaxation of all sorts of conditions; this will not mean the best practice can be followed up in the future. Communities must be seen to return as quickly as possible to some sort of normality. Communities are best where possible left on their own properties and in the community that they know. (P069)

**C. Suggested solutions to operational/logistic problems associated with large scale disasters.**

Better co-ordination between Emergency Services, particularly on training matters. (P001)

A major advantage of training and exercises is staff from the various sectors get to know each other and work together more effectively both in risk reduction and avoidance (District and Regional Plans, etc), during emergencies and post-event recovery. (P010)

Political buy-in from Local Authorities and Central Govt agencies to all the above is very important. More Central Government funding/support in areas where national planning makes more sense than piecemeal efforts in regions. (P011)

Training, or at least awareness programmes, should be included for council staff throughout the organisation e.g. Resource Consent officers, Asset Management Officers, RMA Monitoring Officers etc. (P032)

The role of Reduction is imperative. It is through understanding of likely effects under any given scenario, that programming can be forecast. You can then be proactive rather than reactive and have an accurate plan of action ready to go. This is what would be 'honed' in the exercises. (P051)

Local Council staff should be encouraged to become Emergency Officials too. (P055)

Good training is essential; standard operating procedures allow flexibility in responding. Role plays in quick time are valuable however nothing beats responding to a real event. Public campaigns are useful however to many people switch off (just like TV adverts disappear) if there is... (P066)

Public education is essential. There is an expectation in N.Z. that restoration of communities with the minimum of delay can be achieved. This is not the case as has been shown with many relatively minor events compared to what happens in other Countries. We are for instance a cashless... (P069)

MoUs with neighbouring countries. (P078)

**D. Comments on means by which large scale reconstruction programmes may be facilitated.**

The example of debris disposal can be avoided by identifying the potential need and pre-planning, rather than "selective" implementation (observance?) of the RMA. (P010)

RMA's not an impediment if have right relationships in place and know how to use the tools it provides like emergency works provisions in a disaster. (P017)

Co-ordinated, uniform and consistent application of provisions of Building Act by Councils within a region. Regional co-operation and production of common protocols and procedures. (P032)

We already have too much policy - what we need is sound contingency planning with an element of compulsion to it. (P033)

There is a clear need to identify what can, and cannot, be done under 'emergency works'. This will negate the potential backlog of regulatory 'red tape' whilst still providing surety of maintaining acceptable standards. Bypassing the regulatory [provision] is a 'licence' to build substandard buildings. (P051)

Improvements to RMA and BA to better provide for emergency works, AND better training and information to support Councils using these provisions (there is currently a lot of inconsistency in how emergency works provisions under the RMA are implemented, for example). (P052)

Integration between the CDEMA, RMA and the BA is crucial. These three legislative instruments have parallel processes in my view which seldom interact. For example, the CDEMA is somehow silent on 'Reduction', says a lot about Readiness, Response and Recovery. I believe the reduction phase is crucial to ensure less occurrences of disasters in New Zealand. Also, the CDEM Group, I believe should make more submissions to the RC process, particularly where development is proposed in places that are in close proximity to hazard-prone areas. That is not the case at present. I believe the CDEM Group should be more proactive, and stand as the mediator and/or integrator between emergency procedures/provisions across different sectors in NZ. Somehow, this crucial function of 'reduction' has been left to the RMA - there's got to be a clear linkage between the RMA and CDEMA in this regard, which should then tie into the BA. Further to this the CDEM group should be more involved in the long term community planning of the local (or regional) councils - LTCCP. Their involvement would see that resulting District plans have stronger hazard-resilient principles/undertones to facilitate the building of sustainable communities - meaning less disaster to respond to. (P055)

I have real concerns about the building act, it simply does not allow any movement and the DBH are ramping up (their words) of the requirements in regard to providing full drawings and details of ANY work. Our building unit will not cope in a Gisborne level event. Some form of national response to building and land damage is required so that homeowners and councils have a guideline to follow. Liability issues abound in building now, after an event even greater. (P066)



Too little and certainly too late. The restoration of utilities alone cost wise is horrendous even on a good day with the normal maintenance on local utilities and services. Past emergencies in NZ have seen Local Authorities procrastinate for months; this will not be acceptable post major event. (P069)

**E. Other issues connected with MoUs between councils in New Zealand.**

Through Civil Defence activation (declared emergency) resources can be shared across Regions/Districts. (P016)

The MoU is set up for sharing resources (ability to process consents and Inspections) but not specifically for disaster situations. (P027)

We form part of the Nelson-Tasman Civil Defence Group. Not sure if we have a MOU but we are equal participants in a regional Civil Defence Plan. (P035)

You need to discuss this with our Civil Defence Officer. (P043)

These MOU are expressed through Group Civil Defence plans - high level, but do incorporate a commitment to resource sharing. (P052)

MoUs are very generic and the intent is to implement a resource (including personnel) sharing arrangement. I personally think the MOUs need to... (P062)

Our Council does not have any memorandums of understanding except with neighbouring councils who will also be impacted in a post disaster situa... (P065)

There is a loose cluster group in this area, building staff do discuss issues but as far as I am aware there are no inter council support agree. (P066)

The Group Civil Defence Plan and the associated Local Authorities are starting to embrace and see the value of joint approach to resource sharing. (P069)

**F. Reasons given for response to NZ state of preparedness.**

Small country, reasonable distance away from closest large neighbour. It will take time to obtain materials for reconstruction. (P005)

Limited media exposure to civil defence exercises and their outcomes would indicate there is a level of preparedness (P006)

NZ is a small country with a reasonably resilient population. We will NEVER be 'Very Prepared' as no two disasters are ever the same. We have spent considerable time and money in promoting being 'on your own for three days'. I believe this is now largely understood. In fact my experience in Taiwan suggests the larger the event the smaller the outrage. While many in the industry feel the restructuring over recent years is detrimental to effective 'response' I take a different view. I think we have a far better idea of what our resources are and where they can be located. Hence we are moderately prepared. (P008)

Small country small resources, lack of comprehensive and consistent CD response and resourcing in district councils. (P009)

I know how we are placed but cannot express an opinion on NZ as a whole. (P010)

NZ does not have resources to deal with this and there has only been slow progress as far as I am aware with regard to gain the correct long term assistance from overseas (P011)

I think NZ has learnt lessons from worldwide disasters and we could our own disaster. (P012)

NZ has the capability to deal with a disaster recovery plan but does not necessarily have the resources immediately on hand. In terms of Wellington as the example given it is strategically the worst metropolis given there is only one road in and out of the city. (P014)

Apart from the consent process, there are the logistics to consider of finding an adequate workforce and provision of materials in the time when supply routes and availability are at a premium. (P016)

In my experience people react appropriately regardless of statutory systems. National assistance needs to be guided or controlled by local people. (P019)

No direct experience. In addition, the building industry can barely keep up with demand right now... let alone an unprecedented demand. (P020)

Communications between regional authorities and district authorities are not very cohesive at times. (P020)

As I see it New Zealand is well prepared for the type of event that occurs frequently i.e. floods, storms. However preparedness for a major Wellington earthquake is moderate. I do not see this as a criticism, just a fact that it is simply not possible to really be prepared for that type of event. (P022)

All Councils will have a civil defence management. How well it is implemented will depend on the Council. (P023)

Outcomes from exercises i.e. capital quake are slow in being identified and improved on. (P025)

The Emergency Management team in the Hutt City is well organised. For a major event it will depend on the co-operation of a number of organisations (Police, Fire, Councils and Government) to be deemed Very Prepared. (P027)

Its what I have been lead to believe until the disaster happens no one knows how prepared you are no matter how good the planning it Depends what happened who survived and access available to the areas of disaster. (P028)

Considerable work has gone into contingency planning. (P029)

In the area of building consents etc there has been minimal activity except for localised events in the past, however for Emergency Management and Lifelines there is an active liaison and activities group in the Wellington Region. (P030)

The recent EQ event at Gisborne clearly showed that, whilst councils can react and can deal with such events, that they are not sufficiently prepared to deal with it effectively as they could. Regular refresher training is required for all stake holders, including mock events, following the implementation of any procedural documentation. Post disaster recovery provisions need to be tested on a regular and planned basis. (P032)

I have no confidence that we are prepared with the necessary response systems at a national level to assist communities as they try to help themselves. (P033)

This is quite a difficult question to answer in a national context. I am familiar with the District Plan in this District, but have no idea how District Plan's in other Districts would affect the level of preparedness achievable for those Districts. In this District I do not see the District Plan or Resource Management Act as being a major barrier to reconstruction following a disaster. (P034)

USA particularly south and south east have numerous events (Hurricane), which really keeps their pencils sharp as it were. A million people evacuated off the Caribbean coast in 24 hrs. No problems. Practice makes perfect. (P037)

I see no evidence that the Government has addressed this issue. (P039)

Even if we understand the scale of the job and what would be involved I don't think it is something that can be prepared for. (P040)

I believe there is insufficient logistical provision for any major disaster recovery, i.e. lack of current lack of air support heavy lift and transport capability to the level that may be required in a major event. Also not covered by naval access to beach landing. (P041)

Only two recent national scale exercises held - Capital Quake (2006?) and Ruamoko 2008. Quite a lot of planning has been undertaken but very little on the ground exercising. (P042)

We are doing civil defense exercises continuously. There is a national exercise coming up shortly. However I am sure for a national emergency we will never be fully prepared. (P043)

Have had limited recent exposure to major disasters recently, since 1980s flooding, to test preparedness. (P045)

A very worthwhile re-focusing of CDEM has taken place over the past 5 years or so, including its mainstreaming within Internal Affairs. The present Minister Rick Barker has taken an active interest in developing CDEM capacity and there have been several good initiatives e.g. 'get ready get through'. So - we are better prepared than the US was with respect to Katrina. But - I think you have hit the nail on the head drawing attention to the potential difficulties, particularly under the Building Act, likely to be faced during recovery. (P049)

Current emphasis is on recovery of essential infrastructure. The sourcing of skilled labour together with required materials is not the role of Civil Defense as it is a private property owners' responsibility. You would find that the hold-up will be with

Insurance inspections to evaluate properties prior to work being started that will create the backlog. (P051)

I simply don't believe that it is possible to prepare for a disaster of that magnitude other than having a recovery plan in place for those left to follow as far as practicable. (P054)

In my view, this generation of NZ has not been opportuned to participate in or experience the reconstruction phase of a 'large-scale' disaster. There are so many issues that could be a barrier to this reconstruction process. The major one being the geography of Wellington itself. It is bounded by water and high grounds (I believe); Major parts are probably no more than 2m also what mode of transport will help arrive on? What about the co-ordination of international relief? Where will the debris go, into the sea? What about recovery of survivors etc... To my understanding, I think the re-construction process would be complex and challenging and I'm not aware of Wellington's level of preparedness... (P055)

New Zealand is too small a country to be able to provide the level of assistance required in a short time period. (P056)

EM teams are well prepared, but the general public have the attitude "the big one will come eventually, but hopefully it won't affect me!". (P057)

Based on observed experience with smaller earthquakes in NZ and disaster recovery after floods. (P060)

While we do not have a lot of processes in place, as a single jurisdiction we have the capacity and will to direct resources to the task in hand. (P063)

Knowledge of the state of preparedness of this Council. There is no real appreciation of what a big earthquake for example would be like. There is a public perception that the recent Gisborne incident was a big earthquake for example. (P065)

Not prepared, I see a general conception that a; government will provide, b; councils will assist locally. There is little thought given to extended disaster situations, we tell people to prepare for 3 days. Our own plans indicate that we will be without essentials such as mains water, sewage, gas, power, telephone for up to and exceeding 42 days. Sure we will be able to provide some of those in limited amounts but that is not what people are hearing nationally. In major disaster such as a Wellington quake of R+7 we will have huge problems. My greatest concern is sewage and contamination of ground water and sea areas. Disposal of sewage is not being addressed and we do not tell people NOT TO USE THE... (P066)

We do a lot of talking and theorising in this Country with bugger all practical action. Many Local Authorities sill pay lip service to this most serious of problems. They are happy to talk about problems and carry out planning, but never to any real extent. Life Lines is a wonderful opportunity for Authorities to seriously kick start a really good snap shot of the security of their infrastructure and maintenance programme. It Authorities are not prepared to take the basic first life lines step then how the hell does the rest work? (P069)

No one would know what to do, where to start, how to even survive something like hurricane Katrina. Reconstruction would take years. (P071)

Whilst many plans exist at local, regional and national levels, coupled with the relationships that have developed to the extended CDEM community, many realisms need to be addressed. Public realism needs to accept that in this event, they are responsible for their own and their families safety, which means personal preparedness. This is an ongoing battle for CDEM agencies and whilst some headway is being made, there is still a long to go. Nationally, a lead role needs to be taken in much of the planning activities. With no National Recovery plan for the Wellington Earthquake, it is left to region and local recovery plans to grapple with the issues where clear national governance exists. (P074)

Consents processes are lengthy; no prefabrication facilities readily available for transitional housing, transport routes in south island are of poor quality. (P078)

Some thinking has been done but not nearly enough. (P079)

Much work has been done to plan or such events. However more planning is required, especially with respect to reconstruction. Contract management and coordination of resources need attention. (P080)

## APPENDIX B6 - Verification Questionnaire CDEM Act

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October, 2009

### Participant Information Sheet

#### **Topic: An Evaluation of the Implementation of Post-Disaster Reconstruction Strategies under the Resource Management and Building Acts in New Zealand.**

This questionnaire is a follow-on exercise to an online survey administered in February/March 2008. The data from the online survey have been analysed and the results are now presented to you for verification and additional input.

The aim of the research project is to facilitate both efficient and effective reconstruction of the built environment after significant disasters in New Zealand, by implementing enabling provisions within the Civil Defence Emergency Management Act (2002), Resource Management Act (1991) and Building Act (2004).

You are invited to participate in this survey as a professional who has knowledge of legislation that may influence post-disaster reconstruction of the built environment. It will be highly appreciated if you can fill out the attached questionnaire and supply any additional information which you may find useful based on your experience.

You are assured of strict confidentiality in the research process and in subsequent publications. All identifying features of you or your organisation will be coded. You are free to ask the researcher not to use any of the information you have given, and if you wish, you can ask to see the report before it is submitted for examination.

Completion of the questionnaire should take approximately 15 minutes.

The project has been reviewed and *approved* by the University of Canterbury's Human Ethics Committee (Ref. No. 2007/148). If you have any questions or concern about the research, please contact Dr. Deam by email ([bruce.deam@canterbury.ac.nz](mailto:bruce.deam@canterbury.ac.nz)) or phone him on 03 364 2601.

**SECTION A – AREAS OF CONCERN IN THE IMPLEMENTATION OF LEGISLATION**

The following issues relate to the CDEM Act. An initial survey had highlighted the issues as deserving consideration so that reconstruction programmes can be executed with the least hindrance.

*You are required to indicate to what extent you agree or disagree with the statements made under each sub-section on a scale of 1 to 5. 1 being Strongly Agree and 5 being Strongly Disagree.*

**Civil Defence Emergency Management Act (2002)**

St.1 - The statutory powers for directing all emergency services have to be extended beyond a declared emergency period, so that consistency in policy is ensured across the transition phases of emergency response and recovery. Much more leadership responsibilities should be permitted by the Act allowing for pragmatic decision making by MCDEM officials. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

St.2 - There is a need to streamline emergency response and recovery activities by different stakeholder agencies towards common goals and objectives. In other words, even though individual agencies (e.g. lifelines) have their recovery objectives, the CDEM Act should commit these agencies to a larger recovery programme to be coordinated by MCDEM. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

St.3 - There has to be clearer linkage between the CDEM Act and other legislative documents in all aspects of disaster management. A streamline of parallel provisions and operating procedures within these legislative documents (CDEM Act, RMA and BA) will benefit disaster management. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

## **SECTION B – GENERAL ISSUES PERTAINING CDEM IN NEW ZEALAND**

Qs 1 – Could you provide information on what you see as significant impediment to the realisation of post disaster reconstruction under current CDEM framework (Alternatively: Do you see the current CDEM framework capable of supporting the activities of Recovery Managers/Coordinators in the event of a large scale reconstruction programme?)

Qs 2 - Could you provide information on significant policy changes either on-going or in the near future that has emphasis on allowing for more effective/efficient reconstruction or recovery after disasters in New Zealand (especially outside the issues I have raised above).

## **SECTION C – OTHER ISSUES OF CONCERN IN THE IMPLEMENTATION OF LEGISLATION IN NEW ZEALAND**

St.1 - There is a need to address how government agencies (and councils) can collaborate to exchange information and share commitments in the event of a disaster. It has been suggested that councils should prepare memoranda of understanding (MoU) with pre-conceived arrangements on how recovery can be achieved through the collaborative efforts of affected councils or regions. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

St.2 – Responsible organisations need to be encouraged to breakdown existing silos so that common recovery priorities can be achieved. Prior research shows that current silo mentality amongst agencies result in barriers to efficient and effective recovery. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

St.3 – Disaster recovery legislation has not provided enough for the issues around the use of external resources in a disaster event. Availability, accessibility and means by which disaster resources are applied, require the attention of responding agencies, especially where external resources are brought in to help with the task of a major recovery programme. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**



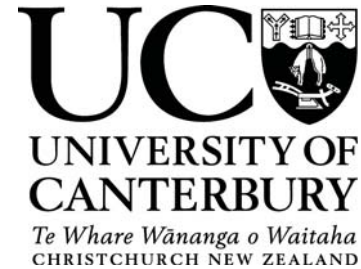
## SECTION D – DEMOGRAPHIC INFORMATION

| <i>Please indicate how well you understand the provisions of these three Acts (please tick)</i> |  |               |            |
|---|--|---------------|------------|
|   | Very Well  | Not Very Well | Not At all |
| <b>CDEM Act</b>   |  |               |            |
| <b>Resource Management Act</b>  |  |               |            |
| <b>Building Act</b>   |  |               |            |
| <i>Please indicate with a tick which of this applies to you</i>                                 |  |               |            |
| <b>Type of organisation you work in</b>   | Lifelines (Telecom, Transit NZ etc)                    |               |            |
|   | Research and Education                                 |               |            |
|   | Private/Consultancy (Disaster Mngt, Legal, Engrng etc) |               |            |
|   | Government Dept (MCDEM, DBH, MfE etc)                  |               |            |
|   | Insurance including EQC                                |               |            |
|   | Territorial/Local Councils                             |               |            |
|   | Others, please specify:                                |               |            |
| <b>NZ Region/Island</b>   | North Island   |               |            |
|   | South Island   |               |            |
| <b>Gender</b>   | Male   |               |            |
|   | Female   |               |            |
| <b>Place(s) in which you have practiced.</b>  | New Zealand only                                       |               |            |
|   | Overseas only  |               |            |
|   | Both   |               |            |
| <b>Work Experience</b>  | Above 20yrs  |               |            |
|   | 16-20 years  |               |            |
|   | 11- 15 yrs   |               |            |
|   | 6 – 10 yrs   |               |            |
|   | 0 – 5 yrs  |               |            |
| <b>Highest Qualification</b>  | Postgraduate   |               |            |
|   | Degree or Equivalent                                   |               |            |
|   | Diploma  |               |            |
|   | Others   |               |            |

## APPENDIX B7 - Verification Questionnaire RMA

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October, 2009

### Participant Information Sheet

#### **Topic: An Evaluation of the Implementation of Post-Disaster Reconstruction Strategies under the Resource Management and Building Acts in New Zealand.**

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The aim of the research project is to facilitate both efficient and effective reconstruction of the built environment after significant disasters in New Zealand, by implementing enabling provisions within the Civil Defence Emergency Management Act (2002), Resource Management Act (1991) and Building Act (2004).

You are invited to participate in this survey as a professional who has knowledge of legislation that may influence post-disaster reconstruction of the built environment. It will be highly appreciated if you can fill out the attached questionnaire and supply any additional information which you may find useful based on your experience.

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Completion of the questionnaire should take approximately 15 minutes.

The project has been reviewed and *approved* by the University of Canterbury's Human Ethics Committee (Ref. No. 2007/148). If you have any questions or concern about the research, please contact Dr. Deam by email ([bruce.deam@canterbury.ac.nz](mailto:bruce.deam@canterbury.ac.nz)) or phone him on 03 364 2601.

**SECTION A – AREAS OF CONCERN IN THE IMPLEMENTATION OF LEGISLATION**

The following issues relate to the RMA and other general issues around the implementation of post-disaster reconstruction programmes. An initial survey had highlighted the issues as deserving consideration so that reconstruction programmes can be executed with the least hindrance.

*You are required to indicate to what extent you agree or disagree with the statements made under each sub-section on a scale of 1 to 5. 1 being Strongly Agree and 5 being Strongly Disagree.*

**Resource Management Act (1991)**

St.1 - Resource consent processing and statutory requirements are burdensome but necessary. However the logistics of consent processing during chaotic response and recovery deserves consideration particularly in a large-scale disaster event. Some flexibility is desired in procedural requirements for householders who may be frustrated by the process rather than the purpose of the Act. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.2 – The RMA should consider critical infrastructure that are likely catalyst to community recovery as projects of national significance. Thus their execution could be fast-tracked with minimal notification procedures. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.3 – The RMA should allow for pragmatic decision making post disaster. Within boundaries of reason, Recovery Managers should be able to veto certain RMA requirements to allow for reconstruction work to progress with little hindrance. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.4 – There are subtle differences in the interpretation and implementation of the Act between different territorial and regional authorities, which may become potentials for jurisdictional conflicts between coordinating councils (especially where a hazard event cuts across geographical boundaries).

(1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

## **SECTION B – OTHER ISSUES OF CONCERN IN THE IMPLEMENTATION OF LEGISLATION IN NEW ZEALAND**

St.1 - There is a need to address how government agencies (and councils) can collaborate to exchange information and share commitments in the event of a disaster. It has been suggested that councils should prepare memoranda of understanding (MoU) with pre-conceived arrangements on how recovery can be achieved through the collaborative efforts of affected councils or regions. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.2 – Responsible organisations need to be encouraged to breakdown existing silos so that common recovery priorities can be achieved. Prior research shows that current silo mentality amongst agencies result in barriers to efficient and effective recovery. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.1 – Disaster recovery legislation has not provided enough for the issues around the use of external resources in a disaster event. Availability, accessibility and means by which disaster resources are applied, require the attention of responding agencies, especially where external resources are brought in to help with the task of a major recovery programme. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

**SECTION C: COMMENTS SPECIFIC TO THE RMA SUBMISSION (See attached document)**

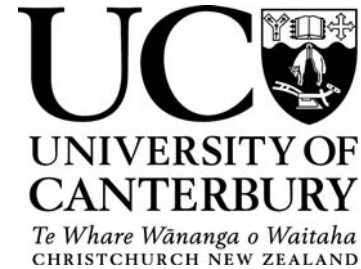
Please provide your general comments on the issues that were raised in the submission to the Select Committee on Local Government and Environment in April 2009.

**SECTION D – DEMOGRAPHIC INFORMATION**

| <i>Please indicate how well you understand the provisions of these three Acts (please tick)</i> |  |               |            |
|---|--|---------------|------------|
|   | Very Well  | Not Very Well | Not At all |
| <b>CDEM Act</b>   |  |               |            |
| <b>Resource Management Act</b>  |  |               |            |
| <b>Building Act</b>   |  |               |            |
| <i>Please indicate with a tick which of this applies to you</i>                                 |  |               |            |
| <b>Type of organisation you work in</b>   | Lifelines (Telecom, Transit NZ etc)                    |               |            |
|   | Research and Education                                 |               |            |
|   | Private/Consultancy (Disaster Mngt, Legal, Engnrg etc) |               |            |
|   | Government Dept (MCDEM, DBH, MfE etc)                  |               |            |
|   | Insurance including EQC                                |               |            |
|   | Territorial/Local Councils                             |               |            |
|   | Others, please specify:                                |               |            |
| <b>NZ Region/Island</b>   | North Island   |               |            |
|   | South Island   |               |            |
| <b>Gender</b>   | Male   |               |            |
|   | Female   |               |            |
| <b>Place(s) in which you have practiced.</b>  | New Zealand only                                       |               |            |
|   | Overseas only  |               |            |
|   | Both   |               |            |
| <b>Work Experience</b>  | Above 20yrs  |               |            |
|   | 16-20 years  |               |            |
|   | 11- 15 yrs   |               |            |
|   | 6 – 10 yrs   |               |            |
|   | 0 – 5 yrs  |               |            |
| <b>Highest Qualification</b>  | Postgraduate   |               |            |
|   | Degree or Equivalent                                   |               |            |
|   | Diploma  |               |            |
|   | Others   |               |            |

**APPENDIX B8 - Verification Questionnaire BA****Department of Civil and Natural Resources Engineering**

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**October, 2009****Participant Information Sheet****Topic: An Evaluation of the Implementation of Post-Disaster Reconstruction Strategies under the Resource Management and Building Acts in New Zealand.**

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You are invited to participate in this survey as a professional who has knowledge of legislation that may influence post-disaster reconstruction of the built environment. It will be highly appreciated if you can fill out the attached questionnaire and supply any additional information which you may find useful based on your experience.

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Completion of the questionnaire should take approximately 15 minutes.

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**SECTION A – AREAS OF CONCERN IN THE IMPLEMENTATION OF LEGISLATION**

The following issues relate to the Building Act. An initial survey had highlighted these issues as deserving consideration so that reconstruction programmes can be executed with the least hindrance in New Zealand.

*You are required to indicate to what extent you agree or disagree with the statements made under each sub-section on a scale of 1 to 5. 1 being Strongly Agree and 5 being Strongly Disagree.*

**Building Act (2004)**

St.1 – There has to be a realignment of BA provisions with the RMA and CDEM Act. For example conflicts are envisaged with the application of ‘existing use rights’ under s10 of the RMA. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St. 2- There are subtle differences in the implementation of BA provisions between local councils (in relation to District Plan requirements). These differences may impact the implementation of reconstruction projects that cut across regional boundaries. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.3 – There is need to address the disparity in the interpretation of Code Compliance Certificate (CCC) and Certificate of Acceptance (COA) by home owners as this may affect the marketable value of properties with either of the two certificates. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St. 4 – Section 70-74 notices should be reviewed in the light of the effect that a major disaster could have on a large geographical area and the implication on insurance cover to affected properties. Further categorisation may be necessary to accommodate buildings exposed to minor natural hazards.

(1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.5 - Pro-active rather than reactive response/recovery is generally preferred in disaster management. The current research shows that reconstruction activities would benefit from prior arrangements, which provide detailed modalities for action and re-action under the Building Act provisions in New Zealand.

(1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.6 - Building consent processing and compliance requirements under the Building Act cannot be avoided in any disaster. What is needed is a resourcing of building control departments to cater for the spike in applications after disasters. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.7 - The capabilities of territorial and regional authorities to make decisions on built facilities that are affected by a disaster are a great influence on recovery progress. The BA should cause councils to prepare training and packaged inductions for operating procedures during disasters when situations become chaotic. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**

St.8 - Rapid property evaluation for damages during the early phases of response is a pre-cursor to/and determinant of the success of subsequent recovery and reconstruction activities. (1, 2, 3, 4, 5)

**Please provide comments to support your response above:**



**SECTION B – OTHER ISSUES OF CONCERN IN THE IMPLEMENTATION OF LEGISLATION  
IN NEW ZEALAND**

St.1 - There is a need to address how government agencies (and councils) can collaborate to exchange information and share commitments in the event of a disaster. It has been suggested that councils should prepare memoranda of understanding (MoU) with pre-conceived arrangements on how recovery can be achieved through the collaborative efforts of affected councils or regions. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

St.2 – Responsible organisations need to be encouraged to breakdown existing silos so that common recovery priorities can be achieved. Prior research shows that current silo mentality amongst agencies result in barriers to efficient and effective recovery. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

St.3 – Disaster recovery legislation has not provided enough for the issues around the use of external resources in a disaster event. Availability, accessibility and means by which disaster resources are applied, require the attention of responding agencies, especially where external resources are brought in to help with the task of a major recovery programme. **(1, 2, 3, 4, 5)**

**Please provide comments to support your response above:**

## SECTION C – DEMOGRAPHIC INFORMATION

| <i>Please indicate how well you understand the provisions of these three Acts (please tick)</i> |  |               |            |
|---|--|---------------|------------|
|   | Very Well  | Not Very Well | Not At all |
| <b>CDEM Act</b>   |  |               |            |
| <b>Resource Management Act</b>  |  |               |            |
| <b>Building Act</b>   |  |               |            |
| <i>Please indicate with a tick which of this applies to you</i>                                 |  |               |            |
| <b>Type of organisation you work in</b>   | Lifelines (Telecom, Transit NZ etc)                    |               |            |
|   | Research and Education                                 |               |            |
|   | Private/Consultancy (Disaster Mngt, Legal, Engnrg etc) |               |            |
|   | Government Dept (MCDEM, DBH, MfE etc)                  |               |            |
|   | Insurance including EQC                                |               |            |
|   | Territorial/Local Councils                             |               |            |
|   | Others, please specify:                                |               |            |
| <b>NZ Region/Island</b>   | North Island   |               |            |
|   | South Island   |               |            |
| <b>Gender</b>   | Male   |               |            |
|   | Female   |               |            |
| <b>Place(s) in which you have practiced.</b>  | New Zealand only                                       |               |            |
|   | Overseas only  |               |            |
|   | Both   |               |            |
| <b>Work Experience</b>  | Above 20yrs  |               |            |
|   | 16-20 years  |               |            |
|   | 11- 15 yrs   |               |            |
|   | 6 – 10 yrs   |               |            |
|   | 0 – 5 yrs  |               |            |
| <b>Highest Qualification</b>  | Postgraduate   |               |            |
|   | Degree or Equivalent                                   |               |            |
|   | Diploma  |               |            |
|   | Others   |               |            |

## APPENDIX C

### List of Intermediate Research Outputs

#### Chapter(s) in Published Book

- Le Masurier J., Wilkinson S., Zuo K. and **Rotimi J.** (2008) ‘Building resilience by focusing on legal and contractual frameworks for disaster reconstruction’, in Boshier, L.S. (ed), (2008) *Hazards and the Built Environment: Attaining Built-in Resilience*, Taylor and Francis, London. ISBN: 9780415427296 (HB); 9780415427302 (PB). [Chapter 13. Pp. 264-281]

#### Journal Papers (Academic)

- **Rotimi J.O.**, Wilkinson S, Zuo K and Myburgh D. (2009). ‘Legislation for effective post-disaster reconstruction’. *International Journal of Strategic Property Management*. Vol.13 No.2, pp. 143-152

#### Conference Papers (Peer Reviewed)

- **Rotimi J.O.B.**, Wilkinson S., Myburgh D. and Zuo K. (2008). ‘The Building Act and post-disaster reconstruction: Matters arising’. *Proceedings of the Building Abroad Conference on Procurement of Construction and Reconstruction Projects in the International Context*. University of Montreal (grif), Canada. 23-25 October. Pp. 373-383
- Le Masurier J., **Rotimi J.O.** and Wilkinson S. (2007). ‘Regulatory Framework for Post-Disaster Reconstruction: Improving resilience in the process’. *Proceedings of the CIB World Building Congress on Construction for Development*. International Council for Research and Innovation in Building and Construction (CIB), Cape Town, South Africa. 14<sup>th</sup> - 18<sup>th</sup> May. Pp. 2954-2967 ISBN 1-920-01704-6 [CD-ROM]
- Le Masurier J., **Rotimi J.O.B.** and Wilkinson S. (2006). **[Best Paper]** ‘Comparison between routine construction and post-disaster reconstruction with case studies from New Zealand’. *Proceedings of the 22nd ARCOM Conference on Current Advances in Construction Management Research*. Association of Researchers in Construction Management (ARCOM), Birmingham, U.K. 4<sup>th</sup> -6<sup>th</sup> September.
- **Rotimi J.O.B.**, Le Masurier J. and Wilkinson S. (2006). ‘The regulatory framework for effective post-disaster reconstruction in New Zealand. *Proceedings of the 3<sup>rd</sup> International Conference on Post-Disaster Reconstruction: Meeting Stakeholder Interests*. Information and Research for Reconstruction (i-REC) and University of Florence, Italy. 17<sup>th</sup> -19<sup>th</sup> May. Pp. 119-126

#### Extended Abstract (Peer-Reviewed)

- **Rotimi J.O.B.**, Wilkinson S. and Myburgh D. (2008). ‘Towards a National Policy Framework for post-disaster reconstruction in New Zealand’. *Proceedings of the 4<sup>th</sup> International Conference on Building Resilience: Achieving Effective Post-disaster Reconstruction*. Information and Research for Reconstruction (i-REC) and Resilient Organisations, Christchurch 30<sup>th</sup> April – 2<sup>nd</sup> May

**Other Conference/Seminar Papers**

- **Rotimi J.O.B.** (2006). 'Achieving reconstruction objectives within appropriate regulatory frameworks'. Paper presented at the *31<sup>st</sup> AUBEA Conference on Building in Value*. Australasian Universities Building Educators Association (AUBEA), Sydney, Australia. 12<sup>th</sup>-14<sup>th</sup> July
- **Rotimi J.O.B.** (2006). 'The framework for effective post-disaster reconstruction in New Zealand'. Paper presented at *Postgraduate Seminar*. Organised by Resilient Organisations, University of Canterbury, New Zealand. 25<sup>th</sup> May.

**Research Poster**

- **Rotimi J.O.B.** (2006). 'The framework for effective post-disaster reconstruction in New Zealand'. Poster presented at the *7<sup>th</sup> Natural Hazards Management Conference: From Science to Practice*. GNS Science, Christchurch, New Zealand. 25<sup>th</sup> August.

**Government Submission**

- Submission to the Select Committee on Local Government and Environment, New Zealand Parliament. Memo on the Resource Management (simplifying and streamlining) Amendment Bill. (April 2009)

## **APPENDIX D**

### **Selected Publication List**

- D1** – Submission to the Select Committee on Local Government and Environment, New Zealand Parliament. Memo on the Resource Management (simplifying and streamlining) Amendment Bill. (April 2009)
- D2** – Rotimi J.O., Wilkinson S, Zuo K and Myburgh D. (2009). ‘Legislation for effective post-disaster reconstruction’. *International Journal of Strategic Property Management*. Vol.13 No.2, pp. 143-152
- D3** – Rotimi J.O.B., Wilkinson S., Myburgh D. and Zuo K. (2008). ‘The Building Act and post-disaster reconstruction: Matters arising’. *Proceedings of the Building Abroad Conference on Procurement of Construction and Reconstruction Projects in the International Context*. University of Montreal (grif), Canada. 23-25 October. Pp. 373-383
- D4** – Rotimi J.O.B., Wilkinson S. and Myburgh D. (2008). ‘Towards a National Policy Framework for post-disaster reconstruction in New Zealand’. *Proceedings of the 4<sup>th</sup> International Conference on Building Resilience: Achieving Effective Post-disaster Reconstruction*. Information and Research for Reconstruction (i-REC) and Resilient Organisations, Christchurch 30<sup>th</sup> April – 2<sup>nd</sup> May
- D5** – Le Masurier J., Rotimi J.O.B. and Wilkinson S. (2006). [Best Paper] ‘Comparison between routine construction and post-disaster reconstruction with case studies from New Zealand’. *Proceedings of the 22nd ARCOM Conference on Current Advances in Construction Management Research*. Association of Researchers in Construction Management (ARCOM), Birmingham, U.K. 4<sup>th</sup> -6<sup>th</sup> September.
- D6** – Rotimi J.O.B. (2006). ‘The framework for effective post-disaster reconstruction in New Zealand’. Poster presented at the 7<sup>th</sup> *Natural Hazards Management Conference: From Science to Practice*. GNS Science, Christchurch, New Zealand. 25<sup>th</sup> August.
- D7** – Rotimi J.O.B., Le Masurier J. and Wilkinson S. (2006). ‘The regulatory framework for effective post-disaster reconstruction in New Zealand. *Proceedings of the 3<sup>rd</sup> International Conference on Post-Disaster Reconstruction: Meeting Stakeholder Interests*. Information and Research for Reconstruction (i-REC) and University of Florence, Italy. 17<sup>th</sup> -19<sup>th</sup> May. Pp. 119-126



## **SUBMISSION on the Resource Management (Simplifying and Streamlining) Amendment Bill**

**To:** The Local Government and Environment Committee

### **Introduction**

This submission on the Resource Management Act (Simplifying and Streamlining) Amendment Bill is from Resilient Organisations.

The Resilient Organisations research group is a multi-disciplinary group of researchers and practitioners that is New Zealand based and with global reach. A collaboration between top New Zealand research Universities and key industry players, including the University of Canterbury and the University of Auckland, Resilient Organisations is funded by the NZ Foundation for Research, Science and Technology. The research group represents a synthesis of engineering disciplines and business leadership aimed at transforming NZ organisations into those that both survive major events and thrive in the aftermath. The research group consists of 17 core researchers and dozens of industry partners and advisors.

We are committed to making New Zealand organisations more resilient in the face of major hazards in the natural, built and economic environments. Resilient organisations are able to rebound from disaster and find opportunity in times of distress. They are better employers, contribute to community resilience and foster a culture of self reliance and effective collaboration.

A major aspect of research embarked upon by the research team is the analysis of New Zealand's legal frameworks for reconstruction – specifically the CDEM Act, RMA and Building Act. The research looks at the relevance of these Acts to post-disaster reconstruction, and to determine whether they would help or hinder significant post-disaster reconstruction programmes.

There is strong research evidence to suggest that the RMA (which is the focus of our current submission) and other legislation will constrain reconstruction efforts in New Zealand should there be a major national disaster. We are therefore of the opinion that the current review and realignment of the RMA is timely. We are hopeful that the review will result in a

robust framework for both environmental and other physical re-development programmes after a major disaster.

Resilient Organisations can be contacted at:

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Should you consider that an oral defence is necessary in support of this submission, Resilient Organisation wishes that the following be allowed to appear before your committee:

- Dr Erica Seville, University of Canterbury
- Associate Professor Suzanne Wilkinson, University of Auckland
- James Rotimi, Unitec

## **Summary**

Resilient Organisations is in support of the intent of this Amendment Bill. A simplified and streamlined framework for considering resource management decisions will be of particular importance in a post-disaster environment, when the sheer volume and complex nature of consent applications are likely to overwhelm current arrangements.

We therefore make specific suggestions under some of the themes that have been identified by the Ministry for Environment.

## **Specific Suggestions**

### Theme 2: Streamlining processes for projects of national significance

The Ministry for Environment has proposed key changes for streamlining projects of national significance through the proposed formation of the Environmental Protection Agency (EPA). We provide the following suggestions:

- There needs to be great clarity on projects that could be considered nationally significant. Criteria such as the cost of a project, scale of the project, sphere of influence on the public etc. may be established; most importantly there should also be a specific criterion added that identifies reconstruction programmes following large-scale disasters as nationally significant.

We suggest the criterion should refer to Level 4 and 5 disaster event types (which are regionally and nationally significant respectively, as defined in CDEM Group Plans). We believe this is consistent with the provisions for *immediacy, necessity and sufficiency* contained in **Section 330** of the Act.

### Theme 3: Creating an Environmental Protection Authority (EPA)

The Ministry for Environment has proposed the establishment of the EPA as an independent business unit to handle nationally significant consent applications. We suggest the following:

- That a Recovery Manager or National Recovery Coordinator (if appointed) be co-opted into membership of the Agency or any Board of Inquiry set up to review environment matters in the event of a large scale disaster.

Membership of the EPA by key officer(s) engaged in recovery programmes is essential so that consenting of nationally significant re-instatement projects could be better facilitated.

### Theme 4: Improving plan development and plan change processes

Recommendations made by the Ministry for Environment for improving plan development and plan change processes are to be commended. However we wish to make the following specific suggestions:

- That the revised RMA should require Territorial Authorities and Councils to give greater consideration to recovery after disasters in their regional and district plans. We observe that the current focus of regional and district plans is skewed towards the prevention, avoidance and mitigation of hazards (pre-event planning). Whilst not limiting the importance of this current focus, we are of the opinion that Councils could be made more proactive by considering and incorporating post-event issues into their plans.
- That upon consideration and inclusion of recovery issues, there is a need to ensure neighbouring areas align their regional and district plans as differences can impede the implementation of reconstruction projects that may spread across geographical boundaries.



### Theme 5: Improving resource consent process

We are in support of the recommendations made by the Ministry for Environment concerning the improvement of the current RMA consent process. Such recommendations will go a long way to reducing the current procedural burden experienced by consent applicants.

Resilient Organisations are very concerned by an expected spike in consent applications for minor works in the aftermath of a major disaster. Our research indicates there are likely to be severe limitations in the capacity of Councils to process these applications within the timeframes required, significantly hampering the community's ability to recover. An improvement in the consent process particularly for *minor repairs and replacements* will be beneficial to post-disaster recovery efforts as to business as usual construction.

### Theme 6: Improving national tools (NPS/NES)

Resilient Organisations suggest the development of a National Policy Statement on Recovery that will provide an overarching framework/guideline for post-disaster reconstruction work. We consider this is a responsibility for all disaster management agencies including the Ministry for Environment.

Such a NPS would bring all post-disaster considerations into a single document. We suggest a cross-reference system within this NPS with associated legislation like the RMA, Building Act, and other environmental standards.

Some of the issues that could be covered by this National Policy Statement include (but are not restricted to):

- Definition of hazard types that will be referred to in the policy.
- Guidelines on collaboration of stakeholders towards recovery and mechanisms by which recovery considerations transcend existing commercial decisions and silos.
- Addressing external aid and assistance e.g. training requirements for external resource persons during a catastrophic response and recovery programme.
- Process-based information on recovery and the reconstruction of the physical environment under different disaster scenarios
- Description of the relationships between all disaster-related legislation (and development and re-development control guidelines). This will provide a framework for the alignment of all related legislation so that the differences that exist under the current system are eliminated.

## **Conclusions**

While Resilient Organisations is in support of the intent of this Amendment Bill, our submission highlights the need to ensure that the unique challenges posed by a post-disaster environment are addressed.

Our research indicates that there are significant barriers created by the current RMA arrangements that would significantly hamper an efficient and effective post-disaster reconstruction effort. The proposed amendments, with minor changes as suggested, create a real opportunity for New Zealand to be in a better position to rebuild and recover when a major disaster strikes.

## Appendix D2

### LEGISLATION FOR EFFECTIVE POST-DISASTER RECONSTRUCTION

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**ABSTRACT.** New Zealand is vulnerable to natural disasters. When disasters occur, the effects can be devastating on the built environment. As one aspect of a major programme of research in New Zealand, the authors address the recovery issue in terms of how legislation either facilitates

or hinders reconstruction. The results of a survey to building control officers and other disaster practitioners in New Zealand on the application of the Building Act 2004 post-disaster are presented in this paper. There are indications that the New Zealand Building Act 2004 will not be supportive or enabling in post-disaster reconstruction environments, particularly in large-scale disaster events. Key problems found were procedural constraints as a result of high consenting standards and logistic considerations. The desire is to create the best possible conditions that will encourage rapid rebuilding of lives and communities after large-scale disasters in New Zealand and that can only be done within a supportive legislative environment.

**KEYWORDS:** Reconstruction; Legislation; Building Act; Post-disaster reconstruction

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## THE BUILDING ACT AND RECONSTRUCTION PROGRAMMES IN NEW ZEALAND: MATTERS ARISING

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### Abstract

The study is an on-going research initiative to determine the effects that the implementation of the Building Act 2004 will have on post-disaster reconstruction programmes in New Zealand. Particularly, in large-scale disaster events with sudden-onsets, the provisions of this Act and other legislative provisions need to be supportive and enabling so as to facilitate speedy reconstruction and reinstatement.

An on-line survey of building control officers and other disaster practitioners in New Zealand was undertaken and their responses to issues connected with application of the Building Act 2004 are analysed quantitatively.

The results indicate that there remain challenges to meeting reconstruction objectives both efficiently and effectively under the new Building Act regime. Prevalent amongst the matters raised were those of procedural constraints as a result of high consenting standards and other logistic considerations.

Considerable attention is required to implement the Building Act and other legislation during the two overlapping phases of response and recovery. The desire is to create the best possible conditions that will encourage rapid rebuilding of lives and communities after large-scale disasters in New Zealand.

**Keywords:** Building Act; Legislation; Post-Disaster Reconstruction.

### Introduction

There is no doubt that 21st century communities are more vulnerable than ever to most forms of natural disaster. The scale and magnitude of recent destructions are unprecedented. There has to be a proactive engagement in disaster management activities that will not only reduce these



impacts but also increase the resilience of vulnerable communities to future events. Pre-planning activities are therefore both socially and economically desirable.

One aspect of pre-planning is the need to put in place viable policies and procedural arrangements that will facilitate recovery after disasters. Such disaster management policies may include one of a number suggested by Petak & Atkisson (1982): action-forcing, attention-focusing, recovery, technology development and transfer, regulatory, financial planning, system management and optimisation, and direct-action policies. However only recovery and regulatory policies are the focus of the research on which this paper is based. These policies give guidelines for participatory roles of stakeholders, the assignment of authorities and responsibilities to those stakeholders, and how disaster activities are to be coordinated to achieve recovery objectives.

An important recovery objective is to re-settle displaced persons as quickly as possible after a catastrophic event. This will help to stem the risks of permanent harm and other psychosocial losses. It is often the case that evacuees to temporary shelter and accommodation end up being permanently kept away from their homes. Reasons for this are traceable to their inability to build back their homes because of restrictive institutional policies or legislations. Studies allude to the fact that subsisting legislations have become impediments to the realisation of post disaster reconstruction objectives (Meese III, Butler et al. 2005; Rotimi, Le Masurier et al. 2006; Middleton 2008).

There is always the tension between strictly applying re-development regulations, which aim at preventing a recurrence of the previous community's vulnerability, and on the other hand, allowing the affected community to move back to their former habitation. Clearly, the quicker communities return to habitability in as many of their homes as possible, the better it will be for restoring a sense of normality (. However disaster management agencies will aim for a 'build back safer' situation. Thus it is unwise to allow a deregulated post disaster reconstruction.

Decisions pertaining the application and implementation of development regulations will always be a trade-off between idealistic goals and expediency. The current study therefore describes one aspect of a larger research initiative that seeks a compromise between regulatory requirements and post disaster reconstruction objectives in New Zealand. The paper highlights some of the issues that may arise from the implementation of the Building Act (2004) in the event of a large scale reconstruction programme in New Zealand.

### **The Building Act 2004, New Zealand**

The Building Act provides for the regulation of building work, the establishment of a licensing regime for building practitioners, and the setting of performance standards for buildings, to ensure that :

- (a) people who use buildings can do so safely and without endangering their health; and
- (b) buildings have attributes that contribute appropriately to the health, physical independence, and well-being of the people who use them; and
- (c) people who use a building can escape from the building if it is on fire; and
- (d) buildings are designed, constructed, and able to be used in ways that promote sustainable development.

The Act prescribes the requirements of the national building code which requires buildings and other associated features to meet certain performance standards like durability, fire safety, sanitation (services and facilities), moisture control, energy efficiency and access. It is administered at the national level by the Department of Building and Housing (DBH) and at the local level by Building Consent Authorities (BCA) through a building consent process. The responsibilities of BCAs under the Act can be assigned to Independent Qualified Persons (IQP). IQPs include building and engineering professionals who have undergone an accreditation and certification process to act in the capacity of consent and compliance officers. This provision in



the Act for IQPs is useful as it devolves responsibility from the BCAs to IQPs and helps to reduce workloads in times of needs.

Building Consent Authorities are themselves required to be accredited by the Department of Building and Housing. Only a few of the local councils have so far received certification under the new Building Act regime.

Building consent processing involves the house owners, the designer/builders and the Building Consent Authorities. Consent is required for all building work in connection with the construction, alteration, demolition or removal of a building; and is only granted when the BCA is satisfied that works are in accordance with the building codes and associated regulations. Works cannot commence until approval/consent is granted. Under normal circumstances the building consent process would be expected to last 20 days but the reality is far from this.

The Act requires a strict inspection of work progress during construction at 'hold points' corresponding to progress milestones. Each defined stage must be inspected and certified before subsequent stages can be started. Inspection provides some certainty about code compliance and construction quality; and that constructed works are in accordance with the original specified in the approved consents. At completion of all works a Code of Compliance Certificate (CCC) is issued.

### **The problems with legislative provisions**

Legislations that apply to routine construction provide for the safe development of infrastructure, capital improvements, and land use, ensuring preservation and environmental protection. However, there appears to be little provision in several areas of legislations to facilitate reconstruction projects. Feast (2004) identified several issues in relation to planning and construction legislation that would impede reconstruction of Wellington, New Zealand following a major earthquake. The study suggests that much of the existing legislation was not drafted to cope with an emergency situation and was not developed to operate under the conditions that will inevitably prevail in the aftermath of a severe seismic event. For example the Resource Management Act (RMA) places heavy emphasis on a consultative process, whereas the problem of meeting the reconstruction requirements of a devastated city within a reasonable period will preclude such consultative procedures (Feast 2004). In spite of current revisions to both the Building Act and RMA, evidence from flooding events in the Bay of Plenty 2005, suggest that little has changed over the intervening period and the same issues apply to relatively minor disasters as well (AELG 2005).

Table 1 gives a situation report of the housing situation 300 days after the Bay of Plenty storm in New Zealand. Only 35 households were permanently re-housed out of a total 300 compulsory evacuations. By the same period, 9 households were still occupying temporary accommodation. Middleton (2008) suggests that this situation could be the result of a poor processing of consents for reconstruction work.

Apparently there is clear gap between the process of identifying homes that are suitable or unsuitable for occupation and helping households to recover from a disaster so that they get back to their normal life. A number of reasons could have caused this situation to happen. One may be the lack of resources to carry out stipulated safety investigations, or the problems connected with damage assessments and compensations.



**Table 1.** Temporary Accommodation Requirements (Bay of Plenty storm, 2005)  
*Source: Middleton (2008)*

| Period in temporary accommodation | Number of households permanently re-housed | Number of households in temporary accommodation |
|-----------------------------------|--|---|
| Up to 60 days                     | 0  | 293   |
| 60 – 150 days                     | 71   | 222   |
| 150 – 200 days                    | 140  | 82  |
| 200 – 300 days                    | 38   | 44  |
| Over 300 days                     | 35   | 9   |

Details not available after 16<sup>th</sup> March 2006 (303 days after the event)

Processing of building consents at the early stages of reconstruction and recovery are a potential bottleneck (Anon 2004). Access to normal resource levels is unlikely and inadvertently there will be shortages of qualified persons and material resources to handle impact assessments and consent processing. It is suggested within this report that a more flexible approach to the standard consent process might be necessary to expedite the process and help cope with the high volume of consent applications after a major disaster. Although MCDEM, (2005) proposes a management structure that could obtain fast-track building consents at the immediate post-impact, such schemes only last as long as a declared state of emergency is in force. This issue is likely to remain an onerous challenge.

Under the Building Act, there is a special waiver to allow alterations to take place without necessarily complying with the relevant provisions of the Building Code. The Act provides for such an application to be granted if the BCA is satisfied that:

- If the building were to comply with the relevant provisions of the Building Code the alteration would not take place.
- The alterations will result in improvements to the means of escape from fire or access and facilities for people with disabilities.
- The improvements outweigh any detriment likely to arise as a result of non-compliance with the Building Code.

BCAs are expected to prepare policies and guidelines on how this discretionary power can be exercised (DBH 2005). There is anecdotal evidence that this may not have been done across many councils.

In probably the same vein, BCAs are to prepare modalities for collaboration with other councils and disaster agencies for resource sharing and deployments to relieve the likely demands for external services when consent applications increase. More so after disasters when house owners are eager to re-occupy their buildings.

Another dimension to consent processing is with the effect that the process will have on the rights to compensation. The Building Act requires that Territorial Authorities must refuse to grant building consents on land subjected to natural hazards unless they can be protected from the hazard, and where waivers are granted, it requires that notices be placed on the land to indicate the risk of natural hazards they are exposed to. If this provision is strictly implemented, then house owners may not qualify for insurance claims where there is an identified large risk to their facilities. In the same vein, complications may arise from ongoing revisions to New Zealand hazardscape. This would mean that previously risk-free buildings may become risk-prone, hence notices will be placed on them that may prevent them from being compensated in future disasters.



## The Implications for Post-Disaster Reconstruction

Having highlighted some of the issues that may be connected to the implementation of the Building Act; it can be summarised that legislations and regulatory provisions have the following implications on post-disaster reconstruction:

- Loss of vital momentum of action as a result of delays caused by poor planning and implementation; restrictive legislation and regulatory provisions; and lack of government commitment to reconstruction programmes (Aysan and Davis 1993).
- Loss of commitment to the reconstruction process because disaster practitioners are unable to apply pragmatic solutions to real-time reconstruction problems, due either to inflexible legislation or fear of being held liable for decisions taken.
- Difficulties in achieving reconstruction deliverables and inability to: accelerate the process of reinstatements (Ye 2004); introduce measures for risk and vulnerability reduction; and aid planning for sustainable developments, Jigyasu (2004), Shaw, Shiwaka, Kobayashi & Kobayashi (2004).
- Impairment of overall community recovery and quality of life. Of essence, reconstruction should become a tool for empowerment till a level of functioning is reached where communities are self sustaining and require no external interventions, Ofori (2004), Sullivan (2003), and also a therapeutic process for overall community recovery (Aysan and Davis 1993).

The study on which this paper is based therefore seeks best practice approaches that will facilitate reconstruction programmes within an enabling legislative and regulatory framework in New Zealand. Such a legislative framework should prepare disaster agencies to meet recovery objectives whilst not compromising the need to build back safer environments.

## Research methods

The primary source of data for this research was an on-line questionnaire (n = 200) administered to building control officers and other disaster practitioners in New Zealand. The invitation for participation was made through 85 local councils including web links to the on-line survey. The questions were largely in the form of ordinal and Likert scales, with respondents required to rate some statements about the Building Act, in line with their opinions on how the Act will affect the implementation of reconstruction works after disasters.

### Research hypothesis:

Some of the provisions of the Building Act will constitute significant impediments to the realisation of large-scale reconstruction programmes after a natural catastrophe in New Zealand.

The research hypothesis was arrived at based on the premise that the provisions for consent processing within the Building Act will be a source of frustration for disaster-affected building owners as it will slow down the reconstruction work, particularly when there is a wide scale devastation of the built environment in New Zealand.



**Research Objectives:**

- To determine the effect that existing provisions within the Building Act will have on the reconstruction of the built environment after major natural disaster events in New Zealand.
- To determine how consent/compliance processes can be simplified and made more responsive to potential higher demands during the reconstruction period, thus reducing the frustrations experienced under the current process.
- To determine if there are memoranda of understanding (MoUs) between different councils for resource sharing during a major natural disaster.

The objective was therefore to determine what the effects of building consent processing will have on reconstruction works and how, if possible, the process can be simplified in a way that it facilitates reconstruction work. A final objective was to determine if the local councils had thought through the establishment of memoranda of understanding amongst themselves as a way of sharing and deploying resources to assist their reconstruction needs.

**Research results****The responses**

Respondents were required to rate their understanding of the Building Act and to indicate how often they make reference to the Act in the course of their work. This was done for the purpose of reliability; hence only respondents who were familiar with the Act were used for the analyses.

A total of 80 responses were received altogether. Of this number 54 (67.5 percent) of the respondents have an average to very high understanding of the provisions of the Building Act; while 41 (50.5 percent) very often make reference to the Building Act in the course of their daily work activities.

Generally the respondents (above 65 percent) have working experiences, in their various local councils, of more than 15 years. This represents a good profile of the respondents and serves to demonstrate how reliable the responses received from this category of people could be.

**The building consent process**

With regards to the building consent process and the potential effects this would have on post disaster reconstruction, 77 percent of the total responses (65) agree that the process may become cumbersome during a large scale reconstruction programme; and 74 percent agree that councils will struggle to meet the requirements for consent processing after a major disaster. These reflect the reality that there will be a spike of consent applications for reconstruction that will overwhelm the local councils' capacity to cater for.

Obviously this is in consonance with current fears of a slowing down of the consent process by the Building Acts procedural requirements. However the process in itself may not be cause of the problem but rather the resources available to facilitate the process. Most of the respondents have indicated that the capability of the building consent authorities, coupled with designers and engineers (independent qualified persons, IQPs) for on-the-spot assessments of built facilities, is in doubt. During normal times, councils struggle with the consent process because of inadequate resources and would be challenged further by a larger volume of requests if the current resource levels are maintained during 'abnormal times'.

Councils will need to make prior arrangements for the deployment of resources from neighbouring councils and from outside the country to meet resource demands. On-the-spot assessments of affected built facilities would facilitate decisions on whether: facilities are safe enough to be re-occupied; will require minor repairs before occupation; or that the repairs would be extensive. Such timely assessments are a necessity. This will depend largely on prior arrangements and preparations for the high demands. However, only 39 percent believe that the local councils have made adequate arrangements for such on-the-spot assessments.

On whether section 71-74 notices in the Building Act will prevent disaster-affected built facilities from receiving compensation for damages, there is little agreement on this statement. 27 percent opine that this provision will prevent compensation; 21 percent disagree; while the remaining 52 percent are unsure of the effects that the provision will have on insurance claims.

### **Simplifying consent processing**

Generally, 55 percent of respondents hold the view that the strict application of the Building Act provisions will result in inefficient reconstruction operations. However very few (25 percent) are of the opinion that the procedural arrangements can be shortened in anyway for post disaster reconstruction.

The view commonly held is that the benefits outweigh the disbenefits. Therefore New Zealand communities are more likely to suffer from a relaxation of the provisions for thoroughness in the processing of consents. 61 percent are of the opinion that the building consent and compliance process must be followed through irrespective of the scale of the disaster.

There appears to be only two circumstances by which the consent process can be bypassed. One is if an application is made by the facility owner under Urgency or where an allowance is made by a council to allow for construction work to take place without complying with the relevant provisions of the building code.

### **Memoranda of understanding for resource sharing**

Considering the importance of resource availability in the consent process, respondents were requested to indicate if there were memoranda of understanding, between councils in New Zealand, for resource sharing in the event of a major disaster. 45 percent confirm the existence of loosely written memoranda. These memoranda are considered very generic documents that may not commit neighbouring councils to their implementation. 16 percent of respondents are not aware of its existence in their councils; and 39 percent are unsure.

An average 50 percent of the respondents are not aware of the contents of such memoranda. However of the those that indicate that memoranda of understanding exist; indicated that such memoranda contain the following: procedural arrangements (responsibilities, liabilities etc) between councils, information dissemination and sharing, personnel sharing and deployment modalities, arrangements for financial contributions and financing, operational logistics and assistance, and the participation of external aids/agencies.



## Discussion and conclusions

### Key Lessons Learned

- Building consent processing in accordance with the Building Act at post disaster may be cumbersome, and may slow down reinstatements and reconstruction programmes.
- The benefits for controlling the reconstruction of the built environment outweigh those of a deregulated reconstruction process.
- Reconstruction can be facilitated through prior arrangements for resource sharing and deployment to hasten structural and safety assessments.
- Local councils need to prepare memoranda of understanding that detail the modalities for exchange of resources, and of receiving external aid and assistance.

Recovery is an integral part of the comprehensive emergency management process (Sullivan 2003). Recovery activities begin immediately after the initial response to a disaster situation and would normally extend until the community's capacity for self-help has been restored. In other words, the end-state is when the assisted community reaches a level of functioning where it is able to sustain itself in the absence of further external intervention (Sullivan 2003).

The effectiveness of every recovery process will depend on how much planning has been carried out and what contingencies are provided for in preparing for the disaster. Recovery objectives will include reinstatements (reconstruction of the built environment) to improved states that will be guided by regulations such as the Building Act. From a recovery perspective the Act would prevent among others, a reduction of the previous vulnerabilities by disallowing construction to pre-disaster situations. The consent and compliance process may be cumbersome but is largely unavoidable considering the benefits they are from.

The current study has established that Local councils in New Zealand would have to facilitate the reconstruction process by making resources available for structural and safety assessments. This can be achieved through prior memoranda of understanding between councils that gives details on the modalities for exchange of resources and of receiving external aid and assistance. If this can be arranged prior to disasters, assessment activities at the immediate post-impact will be both efficient and effective.

The study believes that provisions of the Building Act can be implemented without a compromise to the needs of the community for quick recovery. The challenge is to consider all logistic issues before the actual disaster.

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**Suzanne Wilkinson** graduated with her BEng (Hons) and PhD from the Oxford Brookes University. Her PhD was in the area of construction management. She then moved to New Zealand and worked at Unitec before joining The University of Auckland in 1996. She is now an Associate Professor in the Civil and Environmental Engineering Department, University of Auckland. Her research interests are in project management, construction management and construction law. She is currently involved in two large Government funded research projects (over \$5 million). The first project is Resilient Organizations, where she is leading the contract management component of the project (see [www.resorgs.org.nz](http://www.resorgs.org.nz) for all research publications and project details). This project examines the management problems associated with post-disaster reconstruction. The second project is "Retrofit Solutions" where she is also leading the financial analysis section of the project which is examining retrofitting New Zealand buildings to protect them against seismic damage (see [www.retrofitsolutions.org.nz](http://www.retrofitsolutions.org.nz) for all research publications).



**Dean Myburgh** holds a Doctorate in Industrial Relations from RAU (now University of Johannesburg) and an MBA from the University of Stellenbosch. He is a Director of two consultancies, 80-20 Options NZ Limited and Emergency Planning Limited and has a keen interest in enhancing organisations' resilience through organisation development interventions. Dean's consulting focus is the facilitation of strategic and operational decision-making related to organisational change management, process improvement, and risk and emergency management. A Fellow of the NZ Institute of Management, Dean has held senior leadership roles in public and private sector organisations, both within New Zealand and abroad. He was a member of the Committee that prepared the NZ Handbook *Risk Management for Local Government* (SNZ HB 4360:2000) for the Standards NZ Council and has authored '*The Risk Management Toolbox – A Guide to Facilitating Risk Thinking and Problem-solving in Organisations using the Risk Management Diagnostic Survey (RMDS)*'. As a member of the Resilient Organisations Steering Group and Industry Researcher, Dean has also authored publications related to the Resilient Organisations research programme (refer [www.resorgs.org.nz](http://www.resorgs.org.nz)).



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# **Towards a national policy framework for post-disaster reconstruction in New Zealand**

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## **Introduction**

The vulnerability of New Zealand to most forms of natural disaster demands its proactive engagement in management programmes that will not only reduce these impacts but increase its resilience to future events as well. The need for post-disaster reconstruction policy guidelines that will address these objectives cannot be overstated.

In spite of a well acclaimed capacity for response and recovery, New Zealand has a relatively low experience in the management of large scale catastrophes. The character of recent natural events have been confined to rural communities, are of low-magnitude and with relatively low scope of impact on the physical environment. Several major natural disaster scenario and exercises have indicated that there will be considerable physical, economic and social challenges on the task of reconstruction and recovery if, and when such disasters occur.

The study on which this paper is based explores improvement on the existing legislative and regulatory framework so as to allow for the implementation of large-scale reconstruction programmes in New Zealand. It seeks to address the following pertinent questions:

- *How will the existing legislation and regulatory provisions be made to facilitate the implementation of large scale reconstruction programmes?*
- *How can a balance be achieved between the needs for speedy reconstruction programmes and the specific requirements for regulatory compliances?*

## **Motivation**

Motivation for the current study came from a stakeholder workshop held in Wellington, 2006, where implementation problems that may be experienced during post-disaster reconstruction were highlighted (Full report is available on [www.resorgs.org.nz/pubs.htm](http://www.resorgs.org.nz/pubs.htm)). Some other commissioned studies (MWH, 2004; Page, 2005; AELG, 2005; and Messrs Anthony Harper, 2006) report on potential gaps and inconsistencies in recovery

legislation; and the possibility of procedural constraints in the implementation of current policy guidelines.

There are therefore opportunities for improving the existing legislation and regulatory provisions so as to guide the performance of reconstruction works in achieving resilience in New Zealand. The study believes that without appropriate policy guidelines, there could be loss of vital momentum of action resulting from delays caused by restrictive provisions; loss of commitment to the reconstruction process by disaster practitioners who are unable to apply pragmatic solutions to real-time reconstruction problems; inability to introduce measures for risk and vulnerability reduction; and finally an overall impairment of community recovery and quality of life.

## **The Research**

The study involved a documentary analysis of past reconstruction programmes both locally and internationally so as to record the set of policy approaches pursued during the reinstatement of built facilities. Focus is made on the adjustments made to subsisting legislations to allow for reconstruction programmes to be progressed. These set of information provided relevant benchmarks for suggested improvements to New Zealand reconstruction policies.

Following this was an evaluative study of three regulatory policy documents; Civil Defense and Emergency Management Act (2002), Building Act (2004) and the Resource Management Act (1991), with the aid of an online survey of disaster management practitioners within New Zealand. The questionnaire was designed to provide a synthesis of views for improving post-disaster reconstruction processes within a regime of supportive regulatory provisions and implementation guidelines.

## **Conclusion**

The need for a national policy framework for post-disaster reconstruction cannot be overemphasized. Putting a robust reconstruction framework in place before the 'major one', would demonstrate a conscious approach to achieving the desired objectives for building resilience in New Zealand communities.

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James research is within the ambit of Objective 3 – Resilient Organisations research programme. He is evaluating the provisions of the Building, Resource Management and the Civil Defence and Emergency Management Acts to determine if they are in tandem with the likely demands for the reconstruction of physical facilities in the event of a major natural disaster in New Zealand. His evaluative study should proffer suggestions towards a policy framework for post-disaster reconstruction in New Zealand.

# A COMPARISON BETWEEN ROUTINE CONSTRUCTION AND POST-DISASTER RECONSTRUCTION WITH CASE STUDIES FROM NEW ZEALAND

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Abstract

Legislation that applies to routine construction provides for the safe development of infrastructure, capital improvements and land use, ensuring preservation and environmental protection, however there is often little provision in legislation to facilitate reconstruction projects. Much existing legislation was not drafted to cope with an emergency situation and was not developed to operate under the conditions that will inevitably prevail in the aftermath of a severe disaster. If well articulated and implemented, the regulations should not only provide an effective means of reducing and containing vulnerabilities (disaster mitigation), but also a means of facilitating reconstruction projects.

The purpose of this work is to examine how reconstruction differs from routine construction, focussing on the interrelated reconstruction challenges of allocation of responsibility for coordination, scarcity of resources and the application of legislation and regulations that were written for routine construction rather than post-disaster reconstruction.

Case studies of reconstruction following recent small scale disasters in New Zealand are presented to support the points raised. Extrapolation of the main issues to larger scale disasters identifies some significant challenges which, if not addressed in advance, are likely to hinder the reconstruction process.

The paper concludes that whilst routine construction processes have proved adequate for small-scale disasters, the greater degree of coordination required for programmes of reconstruction following a larger disaster has not been adequately addressed in policy and legislation.

Keywords: Reconstruction; Coordination; Legislation; Regulation

## INTRODUCTION

Disaster management and the need to develop a resilient community capable of recovering from disasters is of increasing concern in many countries. The recovery process may present an opportunity for improvement in the functioning of the community, so that risks from future events can be reduced while the community becomes more resilient. The effectiveness of the process will depend on how much planning has been carried out and what contingencies are put in place prior to the disaster.

In preparation for disasters there is often an emphasis on readiness and response, with poor understanding and little consideration given to the implications of recovery (Angus 2005). Experience has shown that recovery is often carried out by modifying routine construction processes on an ad hoc basis following a disaster. Whilst this can work reasonably well for small scale disasters, the effectiveness of reconstruction could be improved by modifying the legislative and regulatory framework in advance of a disaster. For larger scale disasters there is a greater imperative to have appropriate systems in place in advance, to allow effective coordination and delivery of reconstruction works.

This paper defines reconstruction within the overall disaster management context and explores the issues of reconstruction frameworks through case studies of recent flood events in New Zealand.

## RECONSTRUCTION IN A POST-DISASTER SITUATION

Two stages can be identified in reconstruction activity following a disaster, generally referred to as response and recovery. The response stage is concerned, among other things, with clearing debris, making damaged structures safe, erecting temporary structures and restoring basic levels of transportation, sanitation, communication and power. The response stage tends to receive the most attention, both prior to an event in terms of planning, preparation and research of the processes; and after an event in terms of media and general public interest and expediency of regulatory processes.

Recovery is an integral part of the comprehensive emergency management process (Sullivan 2003). It refers to all activities that are carried out immediately after the initial response to a disaster situation. This will usually extend until the community's capacity for self-help has been restored. In other words, the end-state is when the assisted community reaches a level of functioning where it is able to sustain itself in the absence of further external intervention (Sullivan 2003). The components of recovery as defined by the Ministry of Civil Defence and Emergency Management (MCDEM, 2005a) are shown in Figure 1. This paper is concerned principally with the built environment.

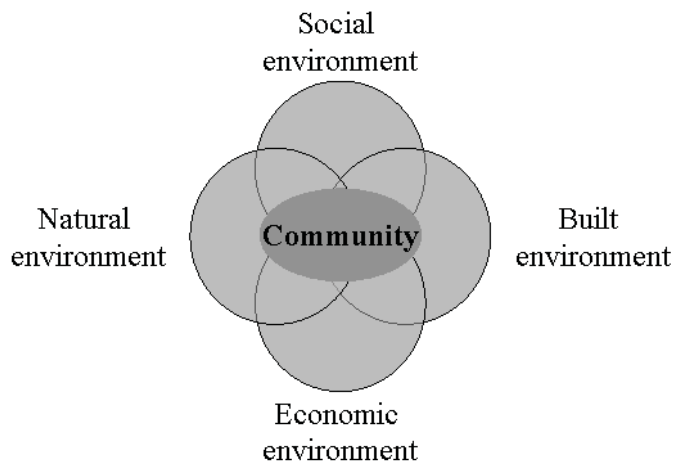


Figure 1. Components of recovery (Ministry of Civil Defence and Emergency Management, 2005a)

Recovery is defined as “the coordinated efforts and processes to effect the immediate, medium and long-term holistic regeneration of a community following a disaster” (MCDEM 2005). Recovery requires a concerted approach that will support the foundations of

community sustainability and capacity building and which will eventually reduce risks and vulnerabilities to future disasters. Jigyasu, (2004) describes an increase in vulnerability of local communities after the Latur earthquake in India, where sustainable recovery interventions were poorly planned and implemented.

## **REGULATORY AND LEGISLATIVE FRAMEWORK FOR RECOVERY**

In comparison to routine construction, there is often little provision in legislation to cater for post-disaster reconstruction processes as part of recovery. When an official state of emergency is declared following a major disaster special powers become available and routine statutory processes can be circumvented. However, once the state of emergency has been lifted the routine statutory processes become applicable, which can create sluggishness in the recovery process. The recovery stage can last several years and eventually transitions back to the point when construction processes can be considered routine.

To ensure robustness in the process, the rational starting point is the setting up of an institutional infrastructure for emergency management, which will formulate public policies for mitigation, response and recovery (Comerio 2004). These recovery policies should then be integrated into other emergency management areas as well as policies of sustainability and community capacity building (Coghlan 2004). The Ministry of Civil Defence and Emergency Management (MCDEM) in New Zealand encourages a holistic approach to the issue of recovery planning and believes this will be most effective if it is integrated with the remaining 3Rs of reduction, readiness and response (MCDEM, 2005a).

New Zealand's recovery planning and management arrangements are contained in the National Civil Defence Emergency Management Strategy (MCDEM, 2004). Recovery is delivered through a continuum of central, regional, community and personal structures (Angus, 2004).

Responsibility for coordination of recovery will be determined by a number of factors including the scale of the disaster. The MCDEM, together with cluster groups of agencies, coordinate planning at the central level. Regional and Territorial authorities are encouraged to produce group plans that will suit peculiar conditions of their local areas. However, unless lines of responsibility are made clear, management of recovery may involve an element of competition between central, regional and local levels of government for control of the process (Rolfe and Britton, 1995).

Unless provision is made for recovery in regulations and legislation that apply to routine construction, then the coordination and management of a major programme of reconstruction could become cumbersome and inefficient. For example it is unlikely that coordinating authorities and regulatory bodies would be able to cope with the volume of work, due to shortfalls in experienced personnel.

## **EXPERIENCES IN RECENT NATURAL DISASTERS**

In recent years there have been two locally significant disasters due to flooding events, at Manawatu in 2004 and Matata in 2005. The circumstances of these events are described briefly and some lessons learnt are summarised below.

### **The Manawatu Flood**

Flooding in Manawatu was caused by heavy rain and gale force winds from the 14<sup>th</sup> to 23<sup>rd</sup> of February 2004. A Regional State of Civil Emergency was declared on 17<sup>th</sup> February. The flooding caused over 2,000 people to be evacuated from their homes at the height of the event. Many rivers breached their banks and considerable areas of farmland were inundated by silt and floodwaters. There was significant damage to infrastructure with damage to roads, bridges, and railways. In addition, there were telecommunication, power, gas and water supply outages to tens of thousands of people. Remarkably no lives were lost as a direct result of the event.

Recovery costs are estimated at \$160-180million for the rural sector and \$120million for roads and council infrastructure. In addition \$29.5 million and \$3.5 million will be required to stop future flooding of the lower Manawatu and Rangitikei rivers respectively.

### **The Matata Debris Flow**

A debris flow occurred on the 18<sup>th</sup> of May 2005 when a band of intense rain fell in the catchments behind Matata in the Bay of Plenty region. This triggered floods and several large debris flows.

The highly erosive debris flows cleaned out the valley bottoms and destabilised the slopes along the channel, causing secondary landslides. The debris flows were structurally damaging to all buildings and bridges in their paths and at several locations the associated debris floods also were structurally damaging.

In response to the Matata disaster a Civil Defence Emergency was declared on 18<sup>th</sup> May 2005 and this remained in place until the end of May. Total government valuation including land value and capital value of properties affected along the flood path hazard was estimated to be \$9,740,000 for unsafe buildings and \$2,937,000 for buildings subject to restricted use.

### **Reconstruction following the floods**

Reconstruction was carried out through collaboration between CDEM agencies, local authorities, utility companies and insurance companies during recovery in the two cases. For the Manawatu-Wanganui region recovery was coordinated through the regional council's new CDEM Group arrangements under the provisions of the Civil Defence Emergency Management Act (CDEM Act) 2002. For the other territorial authorities the event was managed through their Civil Defence Act 1983 arrangements. The CDEM Act provides a structure appropriate for dealing with events such as the floods and did not introduce any structures or procedures that hindered authorities in dealing with the event. In Matata the state of emergency was extended to allow work to be completed on critical road access routes but still only lasted two weeks.

The roading authorities did not diverge from normal legislation and regulations and building consents were sought and granted as usual. Road users were consulted and kept updated on reconstruction issues.

A source of frustration for utility companies in the Manawatu flood event according to AELG (2005) was the time taken to develop an understanding with the Regional Council about emergency actions that would cover all situations under the Resource Management Act, rather than require a formal process for each activity. A particular issue arose when the Regional Council initially required that slip material should be disposed of in a designated landfill; subsequently they allowed a more pragmatic approach which meant that slip material could be moved and redeposited locally.

The road funding authority, Transfund, should ideally become involved as early as possible following a disaster since Transfund has direct access to government funds. However this was not the case following the Manawatu floods and it is likely that more could have been done to secure certainty over funding in the early stages of recovery which would have helped with the physical works prioritisation process.

Recovery at Matata relied heavily on Central Government funding since the local council had a small number of rate payers and insufficient funds to cover the recovery costs itself. Funding took some time to come through whilst government requested and were awaiting details of the costs. This frustrated the local population.

Overall there was little difference between the routine construction process and the reconstruction process, due to the fact that the disasters were of a relatively small scale. The parties normally involved during routine construction projects were also involved during the reconstruction and using existing relationships eased the process. During the initial recovery stage local contractors volunteered their time, but this needed careful management. National scale contractors were a valuable source of resources, since they were able to use their networks to mobilise resources from the whole country.

## **CHALLENGES FOR LARGER SCALE DISASTERS**

### **Coordination of reconstruction**

Whilst relying on routine processes proved adequate in many ways for these small-scale disasters, a higher level of coordination and management would be needed for programmes of reconstruction following a larger disaster. CDEM agencies are provided with certain powers under the CDEM Act to direct reconstruction, however, these powers can only be exercised in a declared emergency situation. When a declaration is lifted, the designated Recovery Manager has no statutory power to direct resources for recovery. If they were to direct activities using powers under the Act the agency would become responsible for the oversight and management of those activities; since CDEM agencies do not generally have the resources and skills for these tasks, they are reluctant to take on such responsibility (AELG, 2005). Clearly there is still a need for coordination once a state of emergency ceases, and this role may be beyond the capacity of local authorities and insurance companies who have generally taken on this responsibly for smaller scale disasters.

EQC provides statutory funds to cover losses incurred by individual property owners as a result of natural disasters. This arrangement is clearly inefficient in a large-scale disaster and it has been suggested by Page (2005) for example, that bulk reconstruction contracts should be awarded by the EQC so as to relieve house owners from sourcing and managing the process. The EQC trialled a coordinated response to the Te Anau earthquake of 2003, using a large single contractor to coordinate and manage the recovery works on its behalf. The relatively small scale damage of this particular event did not allow definitive conclusions to be drawn on the benefits of such a coordinated approach, but coordination was clearly an improvement on the situation where individual property owners competed for the services of a limited number of building contractors.

MCDEM Director's Guidelines (2005b) proposes a management structure for coordinating recovery and it recommends the setting up of various task groups to achieve recovery objectives. Under the 'Built Environment Task Group' are sub-task groups for various parts of the built environment. For example, the 'Residential Housing Subtask Group' would be responsible to:

*'repair, reconstruct or relocate buildings – obtaining fast-track building and other consents, sufficient builders and materials, coordinating skilled trades and their work standards'*

This is a very challenging responsibility for the task force to take on and does not appear to concur with what has happened in practice following recent disasters.

### **Reconstruction resources**

The processing of building consents at the early stages of reconstruction and recovery after an event has been identified as a potential bottleneck. Access to normal resource levels will be unlikely and inevitably there will be shortages of qualified people to handle impact assessments and consent processing. A more flexible approach to the standard consent process would be necessary to expedite the process and help cope with the high volume of consent applications after a major disaster.

In terms of overall human resources Page (2004) suggests that the construction industry could cope effectively with a medium sized disaster if the base work load was at an average level, but a large scale disaster coinciding with a high base load could require up to 180,000 additional construction industry workers (this is based on an event causing \$10billion worth of damage in the Wellington region and with a base work load 7% higher than current levels). Hopkins, (2004) in a similar study estimates a combined resource requirement for reinstatement to be about \$7.73 billion. The National Civil Defence Emergency Management Plan, due to come into force in July 2006, acknowledges New Zealand may need to mobilise all nationally available resources because it has finite capacity and capability for response and recovery.

### **Hazard and risk assessment**

The need for a focussed assessment of potential hazards after an event cannot be overemphasised as it will enable the determination of risk levels and put in place the



mechanism for avoiding any increase in those risks by limiting future developments in those areas.

The new Building Act (2004) requires that Territorial Authorities must not grant building consents on land subjected to natural hazards unless they can be protected from the hazard and, where waivers are granted, it requires that notices be placed on the land to indicate the risk of natural hazards they are exposed to. Implementing this Act will have far reaching implications on insurance claims as the Earthquake Commission Act indicates that the EQC is not liable to settle any claim where there is an identified large risk. Current revisions to the mapping of vulnerable natural disaster zones may prevent existing properties from being compensated at all.

The CDEM Act is the only piece of legislation that requires specific identification of hazards by councils. However, the scope of this identification is limited to the hazards already identified through the Resource Management Act (RMA) process and for which building works have been undertaken in hazard zones. Hazard identification can only be inferred from other pieces of legislation such as the Building Act and RMA where in the course of discharging council duties, information concerning natural hazards is deemed collected.

The implication of council's inability to gather information on hazards is that development control outside recognised hazard zones are limited, thus the provisions of the various acts concerning land use cannot be effectively applied. For the incident at Matata, the extents of the flood and debris flow were outside known hazard zones.

## **CONCLUSION**

The task of reconstruction after a major event can be an onerous challenge. It requires deliberate and coordinated efforts of all stakeholders for effective and efficient recovery of the affected community. The paper has shown that the issues surrounding the implementation of the pieces of legislation concerning reconstruction after a major disaster are complex and interrelated. Though the existing regulatory framework seems to point to the right direction, more issues have to be addressed in practice.

Legislation cannot be used for purposes other than those for which it is intended and there appears to be little provision in several areas of legislation for post-disaster situations. These polices need to be revised before hand as hasty revisions during the course of reconstruction works do not provide the best solution to major disaster problems.

Should the routine regulatory and legislative processes be followed after a major disaster it is unlikely that regulatory bodies would be able to cope with the volume of work. The conflicts in the interpretation of the different pieces of legislation need to be harmonised, whilst the roles and responsibilities of the various CDEM agencies and other stakeholders need to be made clear. The apparent division between those who, in practice, take responsibility for reconstruction and those who set policy and legislation create barriers that need to be overcome. Failing this, implementation of reconstruction works will be cumbersome in the event of a major disaster.



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# The Framework for Effective Post-Disaster Reconstruction in New Zealand

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## Abstract

New Zealand's vulnerability to natural disasters demands its proactive engagement in disaster management programmes so as to reduce risks and eventually increase its resilience to future events. Previous disaster studies indicate opportunities for improving recovery and reconstruction.

This research study adopts a tripartite approach to evaluate current reconstruction strategies for effectiveness, while also exploring improvement schemes within policies and regulatory provisions. These learning oriented evaluations would provide information and data relevant to support best practice guidelines that will be suggested for achieving more robust reconstruction programmes.



### Motivation

- To focus on issues pertaining reconstruction of the built environment (a subset of holistic recovery processes). This will complement considerations in the area of reduction, readiness and response.
- To address perceived implementation problems for large-scale reconstruction programmes within current legislative and regulatory provisions e.g. RMA, Building Act etc.
- To enhance New Zealand's capability to recover from disasters (Goal 4 of the CDEM Act 2002 through proposed best practice guidelines.

### Questions

- Are existing recovery strategies capable of ensuring effective and efficient reconstruction of built infrastructures after disasters whilst also meeting stakeholder objectives?
- Will existing legislation and regulatory provisions facilitate recovery during large-scale reconstruction programmes?
- What practice changes would improve the robustness of existing reconstruction guidelines to enable its implementation under different disaster scenarios?

### Objectives

- Review the goals and processes of the existing emergency management framework within the context of policies, legislation and guidelines for post-disaster reconstruction.
- Identify the factors governing success of previous reconstruction programmes and their levels of influence.
- Generate disaster scenarios for measuring the success of existing and proposed reconstruction programmes.
- Develop process models that describe the existing system and identifying critical constraints to its success.
- Postulate improved processes and models and evaluate their response to different disaster scenarios.
- Recommend suitable best practice frameworks for post-disaster reconstruction.

## Research

## Methods

Essentially scientific, a systematic process of problem identification, data collection and analyses, and objective conclusions for problem solving and decision-making. Three major approaches are being developed concurrently.

### Case Studies and Scenario Writing

- In-depth contextual analyses of post-disaster reconstruction programmes in New Zealand e.g. Manawatu and Matata floods 2004 and Canterbury snowstorm 2006.
- Evaluation of research information from incidents in other parts of the world, while translating the reconstruction dynamics to New Zealand situations e.g. Cyclone Tracy in Australia (1974), Northridge Earthquake, in USA (1994), Kobe Earthquake in Japan (1995), Asian Earthquake and Tsunami (2004).
- Develop disaster scenarios, with a range of magnitudes in order to measure the effectiveness of existing and proposed reconstruction programmes.

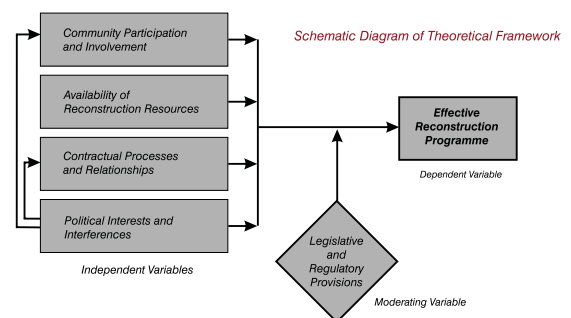


### Process Modelling

- Model the variety of roles and interactions within the existing reconstruction framework.
- Evaluate the models to identify critical constraints to their effectiveness.
- Suggest improvements using rich descriptive models for clarity and ease of understanding.

### Empirical Testing

The diagram below is a theoretical framework showing the relationship between variables generated from a conceptual model that will facilitate empirical testing.



Hypotheses will be formulated so that statistical methods for tests of hypotheses, tests of significance, regression analysis etc. could be applied.

Data will be obtained using semi-structured interviews and questionnaires to Recovery Managers, Coordinators and other emergency management practitioners, Lifeline agencies, property and infrastructure owners, EQC and other insurance companies.

## Outcomes

- Models of the statutory recovery process from initial impact assessments to final reconstruction project delivery, and alternative processes and responsibilities for coordinating.
- An understanding of the complex interactions between the different disaster agencies.
- Best practice guidelines for reconstruction works under different disaster scenarios, which will promote improved coordination and monitoring of reconstruction activities.

# THE REGULATORY FRAMEWORK FOR EFFECTIVE POST-DISASTER RECONSTRUCTION IN NEW ZEALAND

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## Abstract

New Zealand has extensive infrastructure networks and localised, dense urban populations that make it vulnerable to natural disasters. When they occur, the effects can be devastating on the natural and built environment. Organisations therefore need to be well prepared, rather than rely on a reactive recovery process after an event.

As one aspect of a major programme of research in New Zealand, the authors address the recovery issue in terms of how the local legislative and regulatory frameworks either facilitate or hinder reconstruction projects and programmes. If well articulated and implemented, the regulations should not only provide an effective means of reducing and containing vulnerabilities (disaster mitigation), but also a means of facilitating reconstruction projects.

This paper highlights the interrelated reconstruction challenges of allocation of responsibility for coordination, scarcity of resources and the application of legislation and regulations that were written for routine construction rather than post-disaster reconstruction. Examples of reconstruction following recent small scale disasters in New Zealand are presented to support the points raised. The paper concludes that whilst routine construction processes have proved adequate for small-scale disasters, the greater degree of coordination required for programmes of reconstruction following a larger disaster has not been adequately addressed in policy and legislation.

*Keywords: Reconstruction; Legislation; Regulation*

## INTRODUCTION

New Zealand invests heavily in relative terms, in research and development of disaster management plans. Government agencies such as the Ministry of Civil Defence and Emergency Management (MCDEM), Earthquake Commission (EQC),

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Institute of Geological and Nuclear Sciences Limited (GNS), and Resilient Organisations research programme funded by the Foundations for Research Science and Technology, have current research objectives to address pressing disaster management needs. Though disaster management and the need to develop a resilient community capable of recovering from disasters has become topical, focus until recently has been mainly on reduction, readiness and response and Angus (2005) suggests that there is poor understanding of recovery and little consideration is given to the implications of recovery in New Zealand.

In comparison to routine construction, there is little provision in several areas of legislation to cater for post-disaster reconstruction processes. Following a major disaster it is unlikely that coordinating authorities and regulatory bodies would be able to cope with the volume of work due to shortfalls in experienced personnel, thus the coordination and management of a major programme of reconstruction could become cumbersome and inefficient.

## **THE RECOVERY FRAMEWORK**

The MCDEM in New Zealand encourages a holistic approach to the issue of recovery planning and believes this will be most effective if it is integrated with the remaining 3Rs of reduction, readiness and response. The definition of recovery encapsulates the expectations of recovery as “the coordinated efforts and processes to effect the immediate, medium and long-term holistic regeneration of a community following a disaster” (MCDEM 2005)

Recovery requires a concerted approach that will support the foundations of community sustainability and capacity building and which will eventually reduce risks and vulnerabilities to future disasters. Jigyasu, (2004) describes an increase in vulnerability of local communities after the Latur 1993 earthquake in India, where sustainable recovery interventions were poorly planned and implemented. The rational starting point is the setting up of an institutional infrastructure for emergency management, which will formulate public policies for mitigation, response and recovery (Comerio 2004). These recovery policies should then be integrated into other emergency management areas as well as policies of sustainability and community capacity building (Coghlan 2004). New Zealand’s recovery planning and management arrangements are contained in the National Civil Defence Emergency Management Strategy (MCDEM 2004). Recovery is delivered through a continuum of central, regional, community and personal structures (Angus 2004).

Management of recovery may involve an element of competition between central, regional and local levels of government for control of the process (Rolfe and Britton, 1995). The MCDEM, together with cluster groups of agencies, coordinate planning at the central level. Regional and Territorial authorities are encouraged to produce group plans that will suit peculiar conditions of their local areas. Other discussion documents produced at the national level like *Focus on Recovery: A holistic framework for recovery*; and *Recovery Planning* both released in 2004, give context

to recovery planning while the Civil Defence and Emergency Management Act (CDEMA) 2002 provides the legislation and the foundations for the New Zealand Civil Defence and Emergency Management (CDEM) environment.

Legislation that applies to routine construction provides for the safe development of infrastructure, capital improvements and land use, ensuring preservation and environmental protection, however there appears to be little provision in several areas of legislation to facilitate reconstruction projects. Much existing legislation was not drafted to cope with an emergency situation and was not developed to operate under the conditions that will inevitably prevail in the aftermath of a severe seismic event (Feast, 1995).

Pieces of legislation that make reference to building work include, but are not restricted to the following:

- Building Act 1991 and 2004
- Resource Management Act 1992
- Housing Improvement Regulations 1947
- Historic Places Act 1993

This paper will consider the problems associated with the implementation of some of these pieces of legislation particularly in relation to recovery, so as to gain insight into the appropriateness of the CDEM framework.

## **THE RECOVERY PROCESS**

Recovery is an integral part of the comprehensive emergency management process (Sullivan 2003). It refers to all activities that are carried out immediately after the initial response to a disaster situation. This will usually extend until the community's capacity for self-help has been restored. In other words, the end-state is when the assisted community reaches a level of functioning where it is able to sustain itself in the absence of further external intervention (Sullivan 2003).

The effectiveness of the process will depend on how much planning has been carried out and what contingencies are provided for in preparing for the disaster. It is expected that recovery and reconstruction works will restore the affected community in all aspects of its natural, built, social and economic environment.

The recovery process may present an opportunity for improvement in the functioning of the community, so that risk from future events can be reduced while the community becomes more resilient.

Recovery is an enabling and supportive process, thus the heart of recovery is community participation. Consultation and communication is encouraged especially in identifying community needs and for collective decision making amongst all



stakeholders. This way all stakeholders understand the process and their commitment towards agreed objectives is ensured. Typical stakeholders will include:

- Asset owners (may be private or public and the business community)
- Lifeline Agencies
- CDEM groups (national, territorial and local government departments, police, fire brigade, relief and welfare agencies, health and safety personnel etc)
- Insurance companies
- Non-governmental agencies (charities, funding organisations etc.)
- Construction and reinstatement organisations

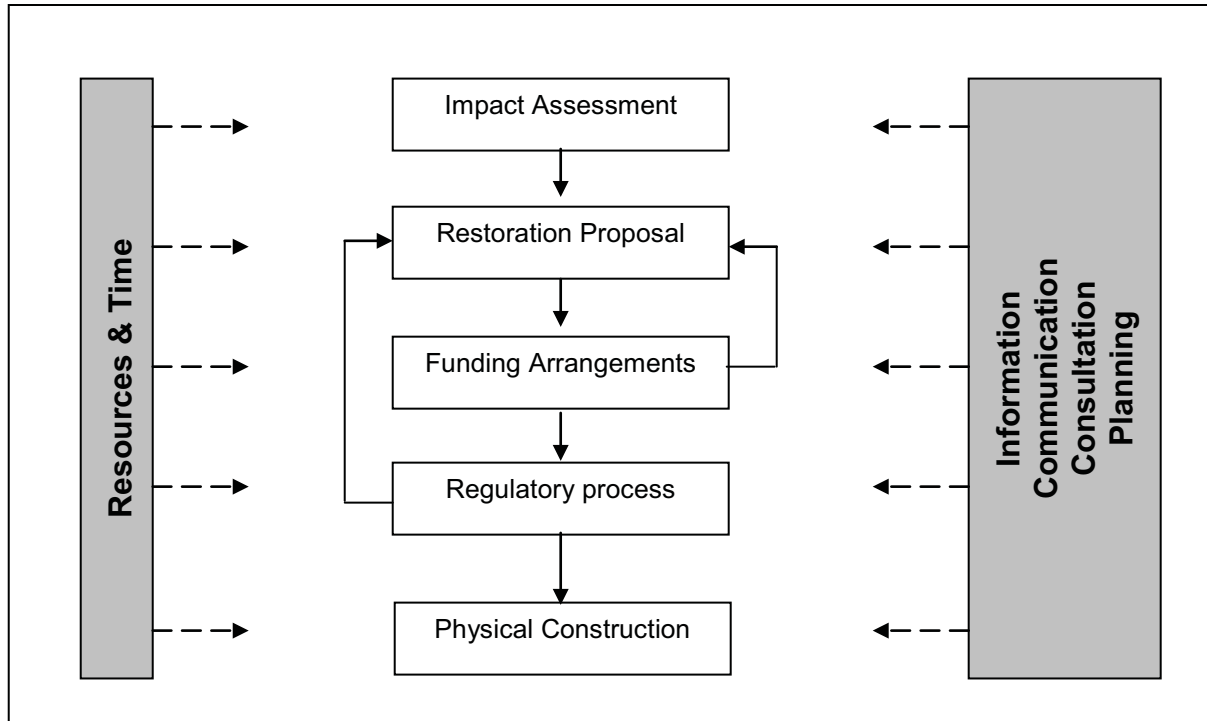
The recovery process will typically follow a conceptualised model (Figure 1) comprising five key stages (Brunsdon and Smith 2004) which are discussed below.

- Impact Assessment - This is the information gathering stage in the recovery process aimed at gaining knowledge on the impact of the disaster event on individuals, community and the environment. It involves all stakeholders as it is at this stage that the necessary inspections and surveys (needs assessment) are carried out that will form the basis for all reinstatement activities. The needs assessments will include building inspections, insurances, and health and safety assessments.

Success of this stage will depend on the levels of communication, consultation and planning between all stakeholders. The process must lend itself to reviews and updating to take account of new information at later stages.

- Restoration Proposal - This is the stage where decisions are made on whether to repair, replace or abandon affected properties. These decisions are reached based on the input of the impact assessment activities. Realistic proposals for meeting the anticipated recovery task are presented for funding organisations consideration.
- Funding Arrangements – in New Zealand affected parties may have access to two types of funds: funds from private insurance companies and from government. (Residential property owners are insured by the EQC, New Zealand's primary provider of natural disaster insurance. EQC insures against damages caused by earthquake, natural landslips, volcanic eruption, hydrothermal activity, and tsunami). Secondary funding may come from charity organisations and external donor agencies.
- Regulatory Process – design and regulatory approvals are sought for the reinstatement of damaged facilities. Processing of resource consents is usually painstaking and the target of approving authorities is to ensure that considerable level of resilience is incorporated in all developments. New knowledge gained on risk from hazards after the disaster will assist approving authorities to correct former design concepts to mitigate future disaster risk.

- **Physical Construction** - This is the regeneration stage in the recovery process where every aspect of the community and its environment (natural, built, social and economic environments) return to normalcy. Experience has shown that it is difficult to return to the pre-event status quo but effort is made to restore the functions of the affected community.



**Figure 1:** Key Stages in Recovery Process (Brunsdon and Smith 2004)

## RECENT NATURAL DISASTERS

In recent years there have been two locally significant disasters due to flooding events, at Manawatu in 2004 and Matata in 2005. The circumstances of these events are described briefly and some lessons learnt are summarised below.

### The Manawatu Flood

Flooding in Manawatu was caused by heavy rain and gale force winds from the 14<sup>th</sup> to 23<sup>rd</sup> of February 2004. A Regional State of Civil Emergency was declared on 17<sup>th</sup> February. The flooding caused over 2,000 people to be evacuated from their homes at the height of the event. Many rivers breached their banks and considerable areas of farmland were inundated by silt and floodwaters. There was significant damage to infrastructure with damage to roads, bridges, and railways. In addition, there were telecommunication, power, gas and water supply outages to tens of thousands of people. Remarkably no lives were lost as a direct result of the event.

Recovery costs are estimated at \$160-180million for the rural sector and \$120million for roads and council infrastructure. In addition \$29.5 million and \$3.5 million will be required to stop future flooding of the lower Manawatu and Rangitikei rivers respectively.

### **The Matata Debris Flow**

A debris flow occurred on the 18<sup>th</sup> of May 2005 when a band of intense rain fell in the catchments behind Matata in the Bay of Plenty region. This triggered floods and several large debris flows.

The highly erosive debris flows cleaned out the valley bottoms and destabilised the slopes along the channel, causing secondary landslides. The debris flows were structurally damaging to all buildings and bridges in their paths and at several locations the associated debris floods also were structurally damaging.

In response to the Matata disaster a Civil Defence Emergency was declared on 18<sup>th</sup> May 2005 and this remained in place until the end of May. Total government valuation including land value and capital value of properties affected along the flood path hazard was estimated to be \$9,740,000 for unsafe buildings and \$2,937,000 for buildings subject to restricted use (WDC Recovery Report Nr. 06).

### **Reconstruction following the floods**

Reconstruction was carried out through collaboration between CDEM agencies, local authorities, utility companies and insurance companies during recovery in the two cases.

For the Manawatu-Wanganui region recovery was coordinated through the regional council's new CDEM Group arrangements under the provisions of the Civil Defence Emergency Management Act (CDEM Act) 2002. For the other territorial authorities the event was managed through their Civil Defence Act 1983 arrangements. The CDEM Act provides a structure appropriate for dealing with events such as the floods and did not introduce any structures or procedures that hindered authorities in dealing with the event. In Matata the state of emergency was extended to allow work to be completed on critical road access routes but still only lasted two weeks.

The roading authorities did not diverge from normal legislation and regulations and building consents were sought and granted as usual. Road users were consulted and kept updated on reconstruction issues.

A source of frustration for utility companies in the Manawatu flood event according to AELG (2005) was the time taken to develop an understanding with the Regional Council about emergency actions that would cover all situations under the Resource



Management Act, rather than require a formal process for each activity. A particular issue arose when the Regional Council initially required that slip material should be disposed of in a designated landfill; subsequently they allowed a more pragmatic approach which meant that slip material could be moved and redeposited locally.

The road funding authority, Transfund, should ideally become involved as early as possible following a disaster since Transfund has direct access to government funds. However this was not the case following the Manawatu floods and it is likely that more could have been done to secure certainty over funding in the early stages of recovery which would have helped with the physical works prioritisation process.

Recovery at Matata relied heavily on Central Government funding since the local council had a small number of rate payers and insufficient funds to cover the recovery costs itself. Funding took some time to come through whilst government requested and were awaiting details of the costs. This frustrated the local population.

Overall there was little difference between the normal building process and the reconstruction process, due to the fact that the disasters were of a relatively small scale. The parties normally involved during routine construction projects were also involved during the reconstruction and using existing relationships eased the process. During the initial recovery stage local contractors volunteered their time, but this needed careful management. National scale contractors were a valuable source of resources, since they were able to use their networks to mobilise resources from the whole country.

## **CHALLENGES FOR LARGER SCALE DISASTERS**

### **Coordination of reconstruction**

Whilst relying on routine processes proved adequate in many ways for these small-scale disasters, a higher level of coordination and management would be needed for programmes of reconstruction following a larger disaster. CDEM agencies are provided with certain powers under the CDEM Act to direct reconstruction, however, these powers can only be exercised in a declared emergency situation. When a declaration is lifted, the designated Recovery Manager has no statutory power to direct resources for recovery. If they were to direct activities using powers under the Act the agency would become responsible for the oversight and management of those activities; since CDEM agencies do not generally have the resources and skills for these tasks, they are reluctant to take on such responsibility (AELG, 2005). Clearly there is still a need for coordination once a state of emergency ceases, and the responsibility for this is generally taken up by local authorities and insurance companies.

EQC provides statutory funds to cover losses incurred by individual property owners as a result of natural disasters. This arrangement is clearly inefficient in a large-scale disaster and it has been suggested by Page (2005) for example, that bulk

reconstruction contracts should be awarded by the EQC so as to relieve house owners from sourcing and managing the process. The EQC trialled a coordinated response to the Te Anau earthquake of 2003, using a large single contractor to coordinate and manage the recovery works on its behalf. The relatively small scale damage of this particular event did not allow definitive conclusions to be drawn on the benefits of such a coordinated approach, but coordination was clearly an improvement on the situation where individual property owners competed for the services of a limited number of building contractors.

MCDEM Director's Guidelines (2005) proposes a management structure for coordinating recovery and it recommends the setting up of various task groups to achieve recovery objectives. Under the 'Built Environment Task Group' are sub-task groups for various parts of the built environment. For example, the 'Residential Housing Subtask Group' would be responsible to:

*'repair, reconstruct or relocate buildings – obtaining fast-track building and other consents, sufficient builders and materials, coordinating skilled trades and their work standards'*

This is a very challenging responsibility for the task force to take on and does not appear to concur with what has happened in practice following recent disasters.

### **Reconstruction resources**

The processing of building consents at the early stages of reconstruction and recovery after an event has been identified as a potential bottleneck. Access to normal resource levels will be unlikely and inevitably there will be shortages of qualified people to handle impact assessments and consent processing. A more flexible approach to the standard consent process would be necessary to expedite the process and help cope with the high volume of consent applications after a major disaster.

In terms of overall human resources Page (2004) suggests that the construction industry could cope effectively with a medium sized disaster if the base work load was at an average level, but a large scale disaster coinciding with a high base load could require up to 180,000 additional construction industry workers (this is based on an event causing \$10billion worth of damage in the Wellington region and with a base work load 7% higher than current levels). Hopkins, (2004) in a similar study estimates a combined resource requirement for reinstatement to be about \$7.73 billion. The National Civil Defence Emergency Management Plan, due to come into force in July 2006, acknowledges New Zealand may need to mobilise all nationally available resources because it has finite capacity and capability for response and recovery.

## **Hazard and risk assessment**

The need for a focussed assessment of potential hazards after an event cannot be overemphasised as it will enable the determination of risk levels and put in place the mechanism for avoiding any increase in those risks by limiting future developments in those areas.

The new Building Act (2004) requires that Territorial Authorities must not grant building consents on land subjected to natural hazards unless they can be protected from the hazard and, where waivers are granted, it requires that notices be placed on the land to indicate the risk of natural hazards they are exposed to. Implementing this Act will have far reaching implications on insurance claims as the Earthquake Commission Act indicates that the EQC is not liable to settle any claim where there is an identified large risk. Current revisions to the mapping of vulnerable natural disaster zones may prevent existing properties from being compensated at all.

The CDEM Act is the only piece of legislation that requires specific identification of hazards by councils. However, the scope of this identification is limited to the hazards already identified through the Resource Management Act (RMA) process and for which building works have been undertaken in hazard zones. Hazard identification can only be inferred from other pieces of legislation such as the Building Act and RMA where in the course of discharging council duties, information concerning natural hazards is deemed collected.

The implication of council's inability to gather information on hazards is that development control outside recognised hazard zones are limited, thus the provisions of the various acts concerning land use cannot be effectively applied. For the incident at Matata, the extents of the flood and debris flow were outside known hazard zones.

## **CONCLUSION**

The task of reconstruction after a major event can be an onerous challenge. It requires deliberate and coordinated efforts of all stakeholders for effective and efficient recovery of the affected community. The paper has shown that the issues surrounding the implementation of the pieces of legislation concerning reconstruction after a major disaster are complex and interrelated. Though the existing regulatory framework seems to point to the right direction, more issues have to be addressed in practice.

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The conflicts in the interpretation of the different pieces of legislation need to be harmonised, whilst the roles and responsibilities of the various CDEM agencies and other stakeholders need to be made clear. The apparent division between those who, in practice, take responsibility for reconstruction and those who set policy and legislation create barriers that need to be overcome. Failing this, implementation of reconstruction works will be cumbersome in the event of a major disaster.

## Acknowledgement

We wish to acknowledge Jetske van der Zon (a student intern from University of Twente) whose report on *Post Disaster Reconstruction in New Zealand* was invaluable.

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