ORGANISATIONAL RESILIENCE AFTER THE CANTERBURY EARTHQUAKES: A CONTEXTUAL APPROACH

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

of Doctor of Philosophy in Geography

at the University of Canterbury

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2014

Acknowledgements

During my PhD journey I have spent a lot of time thinking about networks of support and resilience. Over the last few years my support network has provided a tremendous amount of knowledge, resources, and care that have helped me not only to survive but to thrive during the production of this thesis. I would like to extend sincere thanks to all of those who helped me during this time.

First and foremost, I acknowledge the contribution of my research participants. It is only through the generous access they provided to their organisations, homes, time, and stories that this research was made possible. This work was also enabled by financial support from the University of Canterbury and the Resilient Organisations research programme.

I am grateful to Resilient Organisations researchers: Dr. Erica Seville, Dr. Sonia Giovinazzi, Dr. Thomas Wilson, and Dr. Venkataraman Nilakant for their input and guidance at various stages of this process. I am especially grateful to the other two members of the original "3 PhDs," Dr. Zachary Whitman and Dr. Hlekiwe Kachali. It was an amazing experience to work with you both and inspirational to see you successfully come out the other side.

I have been incredibly fortunate to work under the guidance of two fantastic supervisors, Dr. John Vargo and Dr. David Conradson. John, thank you for challenging me to be a better communicator and to find the "silver linings;" your optimism and enthusiasm were a guiding light. David, there are not enough words. Because of you I am a better researcher, writer, runner, and person. Your hard work, high standards, and thoughtfulness were instrumental at every stage of this process. You have been an invaluable mentor and friend.

A number of other people have contributed to the construction and refinement of my PhD research and writing. I extend sincere thanks to the research assistants who helped at

various stages of this project, especially Oliver Baxter who spent dozens of hours helping me transcribe and audio check interviews. I acknowledge the support of my great friend Caroline who proofread the final thesis document. I am also indebted to my writing group: Helen, Claire, Collette, and Jillian for helping me to 'repack' my ideas in ways that might help readers stay awake. Many other colleagues and friends in the Department of Geography have provided valuable inspiration, feedback, and encouragement over the last few years.

Just as important as those who have contributed to the production of this research, are those who have stopped me from being consumed by it. I owe so much to my friend and running buddy Kelly, truly one of the best people I have ever met. You helped me to overcome literal and figurative mountains, and taught me that when I get to an icy river crossing the best option is to jump in and enjoy. Also, I would not be where I am today without the love and care of my family in the U.S. and New Zealand, especially my hard-working and unfailingly supportive parents. Even though we are on opposite sides of the world I know you are with me every step of the way. I am also indebted to my sister Lisa and brothers Nick and T.J. for reminding me to laugh, and to my sister-in-law Nicola for having a hot water bottle and baking ready at the end of a long day.

Finally, I need to express my love and endless gratitude to my husband, Mark. No matter what I do or where I go it is always easier with you at my side. Thank you for your patience, for hundreds of cups of coffee, for working hard, for nights out when I needed them, for listening even if you have heard it before, for everything, always.

Abstract

Following a disaster, an organisation's ability to recover is influenced by its internal capacities, but also by the people, organisations, and places to which it is connected. Current approaches to organisational resilience tend to focus predominantly on an organisation's internal capacities and do not adequately consider the place-based contexts and networks in which it is embedded. This thesis explores how organisations' connections may both hinder and enable organisational resilience.

Organisations in the Canterbury region of New Zealand experienced significant and repeated disruptions as a result of two major earthquakes and thousands of aftershocks throughout 2010 and 2011. This thesis draws upon 32 case studies of organisations located in three severely damaged town centres in Canterbury to assess the influence that organisations' place-based connections and relational networks had on their post-earthquake trajectories.

The research has four objectives: 1) to examine the ways organisations connected to their local contexts both before and after the earthquakes, 2) to explore the characteristics of the formal and informal networks organisations used to aid their response and recovery, 3) to identify the ways organisations' connections to their local contexts and support networks influenced their ability to recover following the earthquakes, and finally, 4) to develop approaches to assess resilience that consider these extra-organisational connections.

The thesis contests the fiction that organisations recover and adapt independently from their contexts following disasters. Although organisations have a set of internal capacities that enable their post-disaster recovery, they are embedded within external structures that constrain and enable their adaptive options following a disaster. An approach which considers organisations' contexts and networks as potential sources of organisational resilience has both conceptual and practical value. Refining our understanding of the influence of extra-organisational connections can improve our ability to explain variability in organisational outcomes following disasters and foster new ways to develop and manage organisational resilience.

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Abbreviations

CBD	Central Business District
CCC	Christchurch City Council
CDC	Canterbury Development Corporation
CDEM	Civil Defence and Emergency Management
CECC	Canterbury Employers' Chamber of Commerce
CERA	Canterbury Earthquake Recovery Authority
CREDS	Canterbury Regional Economic Development Strategy
CSO	Case Study Organisation
DEE	Detailed Engineering Evaluation
ECan	Environment Canterbury
ENC	Enterprise North Canterbury
EQC	Earthquake Commission
ESS	Earthquake Support Subsidy
ICT	Information Communication Technology
KI	Key Informant
KPA	Kaiapoi Promotions Association
LHBA	Lyttelton Harbour Business Association
WDC	Waimakariri District Council
WINZ	Work and Income New Zealand

Chapter 1: Introduction

1.1 Overview

This thesis explores how organisations' connections to places and networks of relations affect their ability to survive and adapt in a disaster disrupted context. When places are disrupted by disasters, organisations are also disrupted. At the same time, organisations are the primary vehicles for response and reconstruction activities. They are also essential for providing the jobs, services, and social opportunities for communities as they recover. Organisations that are resilient (i.e. able to survive a crisis and maintain positive functioning in challenging conditions (Vogus & Sutcliffe, 2007)) can play an essential role in producing resilience in the places and communities they inhabit (Bruneau et al., 2003; Cutter, Burton, & Emrich, 2010; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008a; Tierney & Bruneau, 2007).

In 2010 and 2011, the Canterbury region of New Zealand was affected by a series of damaging earthquakes in ways that had significant implications for organisations of all kinds. These earthquakes were the most expensive and socially disruptive disasters New Zealand has ever experienced. At the time of writing in 2014, the affected people, communities, commercial centres, and organisations are at various stages of recovery and reconstruction. Many organisations have moved on to other places. Others closed, never to reopen, while still others have completely reinvented themselves and are thriving in the new post-earthquake environment.

There is considerable interest from researchers and practitioners in identifying the determinants of organisational resilience. Current literature conceptualises resilience as a set of capacities that emerge from the people, processes, resources, and technology that make up organisations. Researchers have also identified various organisational capacities that enhance

resilience, including, leadership (Horne & Orr, 1998; McManus, 2008), a culture of learning (Burnard & Bhamra, 2011; James, 2011), transparent communications (Riolli & Savicki, 2003), and agile and collaborative supply chains (Christopher & Peck, 2004; Sheffi & Rice, 2005). These and other factors help organisations adapt and continue operating in dynamic environments. This is especially important when disasters significantly (and often suddenly) reshape the environments in which they operate. Because organisations are "the building blocks of our societies" (Baum & Rowley, 2002, p.1) a clear and integrated understanding of organisational resilience needs to be a central component of resilience building and disaster risk reduction across all levels of society.

1.2 Defining Organisations

'Organisation' is a broad term employed in this study for its inclusiveness. An organisation can be understood as a group with an existing structure (Dynes, 1970). Aldrich (1979) distinguishes organisations from other social-collectives on the basis of their structure and purpose, defining organisations as "goal-directed, boundary maintaining, and socially constructed systems of human activity" (p.2). This definition is consistent with characterisations of organisations in hazards and disaster studies (Dynes, 1970, Kreps 1994, Tierney 2003).

Some of the earliest published studies of disasters emphasized the role of organisations, arguing that they provided social "order, meaning, and continuity" (Fritz, 1960, p.155) and were therefore essential to disaster preparedness, response, and recovery. Kreps' (1994) work on organisations that emerge in response to disasters produced a useful system for distinguishing organisations from other forms of social collective. Kreps (1994) defines organisations as social structures that have identifiable *means* (i.e. resources and activities or goals) and *ends* (i.e. bounded areas of focus and tasks to achieve some desired

outcome). From this perspective, a wide range of social actors can be considered as organisations, including for-profit businesses, churches, government agencies, non-profit groups, and social clubs.

In this thesis, I discuss the activities of a range of organisation types, including businesses, government agencies, and non-profit groups, in a post-disaster context. I limit the discussion to (a) organisations that existed prior to the Canterbury earthquakes (as opposed to those that emerged in the response and recovery phase) and (b) to organisations that had a physical site or base prior to the earthquakes.

1.3 Problem Statement

Although organisations are a fundamental part of society and instrumental in the production of place or community resilience, there has been little consideration of the influence of society or place on organisational resilience. Most often, the organisational resilience literature conceptualises the organisation as a rational economic entity, with negligible consideration of where the organisation is located or with whom or what the organisation interacts (Pelling, High, Dearing, & Smith, 2008; Yeung, 1998). Current approaches to organisational resilience tend to imagine a rigid separation between an organisation and its external environment. With some notable exceptions (Gilly, Kechidi, & Talbot, 2013; Pelling et al., 2008), the resources necessary to create and maintain resilience are characterised as originating within the organisation, and the potentially enabling or hindering effects of extra-organisational factors are generally overlooked.

As with studies of organisational resilience, studies examining organisational outcomes post-disaster have demonstrated the influence of organisational characteristics, including organisational size (Dahlhamer & Tierney, 1996), sector (Kroll, Landis, Shen, & Stryker, 1991), market reach (Webb, Tierney, & Dahlhamer, 2002), and pre-disaster financial

health (Wasileski, Rodríguez, & Diaz, 2011) on organisational post-disaster recovery. Again, these organisation-level characteristics only portray a partial picture of the various influences on organisational processes and outcomes (Doerfel, Lai, & Chewning, 2010).

Organisations are "collectives that have agency," but they are also guided and constrained by the social structures in which they operate (Pelling et al., 2008, p. 869). Researchers in a number of disciplines, including sociology, management, and geography, have engaged with issues of structure and agency in exploring organisational processes and outcomes. The theory of embeddedness provides an avenue for exploring the influence of both structure and agency on organisations. This theory proposes that all economic (social) action is *embedded* in cultural and political institutions and networks of relations. It represents a middle path between an 'over-socialised' (exclusive focus on structure) and an 'under-socialised' (exclusive focus on agency) approach to organisations (Barber, 1995; Granovetter, 1985; Ibata-Arens & Dierkes, 2006). Economic geographers have extended consideration of embeddedness to explore how organisations engage with space and place, and the role space and place play in guiding organisational decisions and actions (Del Casino, Grimes, Hanna, & Jones, 2000; Dicken & Malmberg, 2001; Yeung, 1998). Commenting on the co-production of organisations and their social and geographic environments, Yeung (1998) noted that organisations "are *not* merely physical entities distinct from their operational environment. Rather, they should be conceptualized as social agencies possessing peculiar modes of rationality; they are reproduced through ongoing networks of social relations embedded in both society and space" (p.103). The theory of embeddedness offers new conceptual territory for considering how organisations build and enact resilience before and after disasters.

There is a growing body of research linking extra-organisational networks and social capital – resources embedded in and available through social relationships to organisational

resilience (Doerfel et al., 2010; Johnson, 2010; L'Heureux & Therrien; Lengnick-Hall & Beck, 2005). Very few of these studies, however, have examined how organisations participate in communities and places in ways that cultivate the networks and social capital that they activate following a disaster. Similarly, studies of extra-organisational networks tend to assume a certain economic rationality of post-disaster exchange, treating social networks as a form of informal supply chain without considering the intangible, multi-layered social-cultural and cognitive aspects of social engagement. Whereas, studies in management and organisation theory have linked elements of embeddedness to positive outcomes including improved knowledge exchange (Huggins & Johnston, 2009; Inkpen & Tsang, 2005; Kogut, 2000), survival in competitive environments (Walker, Kogut, & Shan, 1997), and resource sharing (De Wever, Martens, & Vandenbempt, 2005; Gulati, Nohria, & Zaheer, 2000) during business as usual, but not in the context of disasters. Disasters reshape the social and physical environments in which organisations engage, and therefore, it is valuable to translate and reinterpret the ideas of embeddedness and organisational social capital to the post-disaster context through empirical research.

1.4 Approach and Contribution

This thesis uses comparative longitudinal case-studies to examine the ways organisations connect to their local (place-based) and wider social-relational contexts. It focuses on how this connectivity influences an organisation's ability to survive and adapt following a major disaster. A focus on local connections is adopted for three reasons. First, the impacts of the Canterbury earthquakes were highly localised, and therefore the earthquakes most significantly disrupted organisations' connections to their local environments. Second, organisations' adaptive actions are most often planned and enacted at the local scale (Pelling et al., 2008). Certainly, organisations' recovery and reconstruction

activities following the Canterbury earthquakes were focused and driven at the local scale. Finally, close and frequent interaction in localities is often tied to the development of relationships that shape supportive environments for organisations (Gaggio, 2006; Knoben & Oerlemans, 2012).

The research presented here develops understandings of organisational resilience through an engagement with theories, such as embeddedness, that have proven fruitful for understanding the influence of social structures on organisational processes and outcomes. By retaining what is already known about the organisational properties that contribute to resilience while pushing organisational resilience into this new theoretical territory, I demonstrate ways that researchers and practitioners can explain more of the variability in organisations' post-disaster outcomes. In addition to this conceptual contribution, I also offer practical observations and insights into organisations' adaptive processes following the Canterbury earthquakes.

1.5 Thesis Structure

Following this introductory chapter, the thesis is laid out as follows:

Chapter 2 reviews the literature on the factors that lead to differential organisational outcomes following disasters, including exposure, vulnerability, and resilience. It focuses, in particular, on the development of and deficiencies in current approaches to theorising and assessing organisational resilience. The review then explores some of the community resilience and social capital literature that illustrate the relevance of embeddedness perspectives in understanding post-disaster processes. The review is intended to demonstrate the value of considering the extra-organisational connections that constrain and enable the development of resilience.

In Chapter 3, I introduce my ontological and epistemological approaches to this work and the methods I employed in the research. This chapter describes the approaches to data gathering and analysis of the 32 organisational case studies conducted between 2010 and 2013 and the key informant interviews and field observations used to provide context for the case studies.

Chapter 4 is an extended narrative description of the earthquake series that struck Canterbury between 2010 and 2011 and the regional and local study areas. I discuss the pre-earthquake and post-earthquake economic and social trends in the region of Canterbury and the three town centres (the Christchurch central business district (CBD), Kaiapoi, and Lyttelton) where the case study organisations were situated. I consider the influence of these trends on the organisations' post-earthquake experiences.

Chapter 5 explores the case study organisations' embeddedness in their local contexts, discussing the various ways in which organisations became locally embedded and the extent of their embeddedness. I examine the ways organisational embeddedness influenced how organisations were impacted by the earthquakes and how embeddedness both restricted adaptive options for some organisations and enabled survival and adaptation for others. This chapter focuses on organisations' local networks and also attempts to move beyond the network metaphor of engagement to examine other ways in which organisations connect to places.

Chapter 6 moves beyond the local context to examine the case study organisations' embeddedness in relational networks. This analysis and discussion focuses on the subset of the extra-organisational network that supported the CSOs in the earthquake aftermath. I compare the nature of different support networks and identify network features that hindered or enabled positive organisational outcomes following the earthquakes.

Chapter 7 concludes the thesis with an overview of the findings and contributions of this study. This chapter also provides recommendations for future research and suggests ways to expand upon some of the concepts developed in this thesis.

Chapter 2: Developing a Contextual and Relational Perspective of Organisational Resilience

We can think about organisations in many different ways. Organisations are aggregations of people, technology, and capital directed toward a shared purpose. It is this shared purpose or goal that defines an organisation's function and existence, and which unites its elements to act collectively (Baum & Rowley, 2002). Organisations are collectives that have agency or power and accountability over their actions (Pelling et al., 2008). They are also embedded in networks of connections and have a place in communities. They are part of institutional structures (e.g. governing bodies and cultural systems) that set the boundaries of acceptable political, economic, and social action and interaction (North, 1991).

If we recognise these aspects of organisations, then analyses of organisational learning, action, and adaptation need to account for both the influence of organisations' agency and their relationships with formal and informal structures. As we study organisations, we need a perspective that accounts for both the inside and the outside of the organisation, as well as the relationship between these two domains.

One way in which we can think about the interplay between an organisation's agency and external structures is through the concept of embeddedness. Embeddedness refers to the social, cultural, political, and cognitive structuration of economic action and organisational behaviour (Barber, 1995; Beckert, 2003; Dacin, Ventresca, & Beal, 1999; Granovetter, 1985). Many fields of social science seek to explain economic and organisational outcomes using an embeddedness framework (Ibata-Arens & Dierkes, 2006). This perspective accounts for both organisational agency and the influence of social structures on organisational experiences, actions, and outcomes.

Current understandings of the factors determining an organisation's capacity to survive and adapt following a disaster tend to over-emphasise an organisation's agency and

under-emphasise structure. By examining organisational resilience through an embeddedness lens, we may be able to explain a greater proportion of the variability in organisations' post-disaster outcomes.

To this end, this chapter reviews a range of literature to develop a contextualised understanding of organisational resilience. The arguments made in this chapter can be broken down into four related propositions:

1. Current approaches to organisational resilience do not adequately consider an organisation's interactions with its context and networks.
2. The field of community resilience offers useful conceptual resources for developing more contextual approaches to organisational resilience.
3. Developing a contextualised understanding of organisational resilience can improve our ability to explain organisational outcomes post-disaster.
4. A contextual approach to organisations can also provide practical guidance for researchers and practitioners aiming to measure and build resilience in organisations.

I develop and elaborate these propositions through a critical analysis of a range of relevant literature. This analysis forms the theoretical context for the research presented in Chapters 4, 5, and 6.

This chapter begins by examining different conceptualisations of vulnerability and resilience and builds toward the idea of geographic embeddedness. I introduce geographic embeddedness as an approach that can open new theoretical territory for organisational resilience, allowing for multidimensional contextual analyses that address a number of factors that influence organisational resilience.

The rest of the chapter is laid out as follows. Section 2.1 summarises current understandings of the determinants of an organisation's post-disaster trajectory, focusing on notions of exposure, impact, vulnerability, and resilience. Section 2.2 explores the ways we

currently understand and evaluate organisational resilience, and describe how the organisational resilience literature currently approaches the relationship between organisations and their environments. Section 2.3 critiques and extends the current understanding of organisational resilience by conceiving of organisations as part of wider social systems. Here I address the concept of embeddedness, demonstrating its potential for explaining how organisations and the systems in which they are situated co-produce resilience. Finally, section 2.4 reviews the four initial propositions in light of the reviewed literature, concluding with an explanation of how an integrated embeddedness perspective may enhance organisational resilience.

2.1 Post-disaster Trajectories

A disaster is an event that causes extensive human, material, or economic losses, and seriously disrupts a community or social system's ability to function (UNISDR, 2009). After disasters, the disrupted community or social system normally attempts to reorganise itself and return to an approximation of its pre-disaster functioning (i.e. to recover) (UNISDR, 2009). As this study focuses on organisations, 'recovery' after a disaster is understood here as an organisation re-establishing a level of performance that allows it to achieve its core objectives and financial sustainability.

When considered longitudinally, an organisation's reorientation following a disaster can be described as its post-disaster trajectory. A trajectory defines the path of an object through space and time, and an organisation's post-disaster trajectory is a reflection of its efforts to achieve a recovered state. The path to recovery, however, is seldom if ever linear, and an organisation's arrival at its desired state is not guaranteed. Organisations may experience both improvement and deterioration at various points along a post-disaster trajectory. Some organisations never arrive at a sustainably recovered state, and instead

experience chronic dysfunction (characterised by an inability to adequately perform key organisational tasks) or failure (i.e. permanent cessation of the organisation's business, usually resulting in a loss to the owners and the organisation's creditors) (Schrank, Marshall, Hall-Phillips, Wiatt, & Jones, 2012).

A central line of inquiry in disaster research is to understand why some people, organisations, or places recover following disruption while others do not. The ultimate goal of such research is to develop interventions that can improve the chances of recovery or, even better, reduce the chances that a disaster will disrupt functions in the first place. These studies focus on three characteristics of human systems that determine their recovery potential: exposure, vulnerability, and resilience. Exposure and vulnerability together determine the degree to which a disaster disrupts people, organisations, and places, while vulnerability and resilience determine their capacity to maintain or regain functionality and improve following such disruptions (Tierney, 2013). Exposure, vulnerability, and resilience, together, help to explain divergent post-disaster trajectories. The next sections explain each of these elements in more depth.

2.1.1 Exposure

Exposure is the first organisational characteristic, which may influence an organisation's post-disaster outcome. Organisations are exposed when they or any of their elements (i.e. members, markets, or assets) are in the zone where direct physical hazard impact may occur (UNISDR 2009). Organisations that are exposed may incur direct and indirect losses. Direct losses are the result of disaster-related damage, and include stock losses (i.e. physical damage to property or assets) and flow losses (i.e. business interruption or reduced productivity resulting from disaster induced damage) (Rose, 2004). Indirect loss covers all flow losses that are not directly linked to damage, and do not necessarily cause a

direct reduction in output. Indirect losses, for example, include decreased customer numbers or increased costs of labour or supplies (Rose, 2004).

Organisations can be exposed to direct and indirect losses from hazards whether or not the organisation itself (i.e. the physical building, operations, or assets) is located in the hazard zone. Within the hazard zone organisations are exposed to direct losses, such as building damage or damage to the electricity system that stops them from operating. They can also experience indirect losses as a result of being in the hazard zone. For example, an organisation may experience reduced productivity or have fewer customers as a result of post-disaster damage to neighbouring organisations, disruption to transport flows, and demographic shifts (Alesch, Holly, Mittler, & Nagy, 2001; Okuyama, 2007). Following the 2001 Nisqually earthquake in Seattle, Chang and Falit-Baiamonte (2002), for example, found that organisations suffered indirect losses as a result of people's perceptions that the business district was unsafe.

Organisations that are not located in the hazard zone, can still be exposed to hazards through connections to external elements, such as customers, suppliers, and resources. For example, ripple effects of physical damage in one sector of the economy may influence activities in another area, due to inter-sectoral requirements in production or consumption (Olshansky & Chang, 2009). Similarly, disruptions to crucial intermediate sectors, such as manufacturers or transport organisations, may affect businesses that are interconnected. As a result of these connections, "it is possible for businesses outside of the impact area to be more severely affected than one inside the impact area" (Zhang, Lindell, & Prater, 2009, p. 42).

The direct and indirect effects an organisation experiences after a disaster influence its post-disaster outcome (Hallegatte & Przyluski, 2010). Organisations that have greater property damage or that experience capacity reductions from indirect disruptions are more likely to have adverse outcomes, chronic poor performance, and failure (Webb et al., 2000,

Webb et al., 2002a, Alesch et al., 2001). Direct physical damage is also associated with forced business relocation and closure (Tierney, 1997; Wasileski et al., 2011). Similarly, a business is more likely to experience losses if its suppliers are disrupted (Tierney, 1995; Zhang et al., 2009). Thus, exposure to effects from disasters has a negative relationship with sustainable function. The impact that a disaster will actually have on an organisation, however, is moderated by its vulnerability and resilience.

2.1.2 Vulnerability

Vulnerability is the second characteristic seen as a determinant of organisational post-disaster outcomes. Vulnerability refers to an organisation's susceptibility and sensitivity to harm (Gall, 2007). Studies of vulnerability to hazards are rooted in three primary research perspectives: risk-hazard; political ecology and political economy; and social ecological systems (Tate, 2011). In all of these approaches, it is vulnerability, not the magnitude of the physical event that enables a hazard to become a disaster (Gaillard, 2010). Each of these perspectives has a different understanding of where vulnerability is produced in society, which has implications for how it is researched.

In the risk-hazard perspective, vulnerability is understood as the combined result of biophysical, social, and economic factors (Hewitt, 1997; Mileti, 1999). Vulnerability reduction is achieved through adjustment of physical exposure to hazard (e.g. by restricting development in floodplains) and through social interventions (e.g. by providing social services) (Tate, 2011).

Political economy and political ecology [1] perspectives argue that vulnerability exists in social systems regardless of physical exposure to hazards. In these approaches vulnerability is a result of root causes produced in social structures (i.e. political, economic,

[1] Political ecology, unlike political economy, explicitly considers the effects of social-political systems on constructing and changing the environment and people's experiences of the environment.

social, historical, and institutional contexts), which are subject to dynamic pressures that channel vulnerable populations into hazardous conditions, creating place-vulnerability (Cutter, 1996; Wisner, 2003).

Finally, in social-ecological systems (SES) theories, social and ecological systems are seen as complex, dynamic, and tightly coupled (Carpenter, Walker, Anderies, & Abel, 2001; Tate, 2011). SES are perpetually growing, accumulating, restructuring and undergoing renewal (Gunderson, 2010; Holling, 2001). As a result, vulnerability is understood not just as susceptibility to disruption as a result of physical exposure and social pressures, but also considers a system's capacity for renewal and adaptation (Adger, 2006; Turner et al., 2003).

Studies of organisational vulnerability tend to be implicitly situated in the risk-hazard paradigm, recognising interactions between physical and organisational systems but not characterising them as tightly-coupled as in SES research. Studies of organisational and particularly business vulnerability focus on identifying physical and organisation-led interventions to reduce vulnerability. Post-disaster studies of organisations have identified a number of organisational characteristics that increase their susceptibility to loss and reduce their coping capacity (Chang & Falit-Baiamonte, 2002; Tierney & Webb, 2001). Many of these studies focus on identifying factors that predict organisational failure in terms of permanent closure or a sustained reduction in financial viability post-disaster.

An organisation's vulnerability has two main dimensions — the organisation's antecedent conditions (e.g. attributes such as size and financial health) and the vulnerability of its interdependent systems. Thus, vulnerability emerges both from within the organisation and through interaction with the other systems to which it is connected. These are both important as we consider the interactions between the characteristics of an organisation and its environment. Previous studies of disaster-affected organisations provide some insights into the way these characteristics may influence organisations' post-disaster outcomes.

Size is a commonly identified contributor to organisational vulnerability. Smaller organisations (e.g. those that are sole proprietorships, have few employees, and are typically not industry leaders), are especially vulnerable to a disaster's negative impact (Alesch & Holly, 1996; Dahlhamer & Tierney, 1996). Small organisations are more likely to rely heavily on day-to-day cash flow, have fewer financial resources, and have less access to capital. They are often intensely competitive with one another and experience high failure rates under normal conditions (Runyan, 2006). They also tend to have smaller or less influential networks and access to fewer external resources compared to larger organisations (Alesch et al., 2001). In contrast, large organisations are typically better able to distribute their risk both financially and geographically, and often wield a greater degree of financial and political influence (Zhang et al., 2009).

An organisation's pre-disaster financial health is another common indicator of its vulnerability. Organisations that were performing poorly before a crisis tend to have less capacity to cope with disruption compared to those that were performing well (Alesch et al 2001). This relationship, however, is not always straightforward. For example, Tierney and Webb (2001) found that a substantial proportion of business respondents that reported poor performance prior to the 1994 Northridge earthquake saw that their business improved in the year following the earthquake. Their work also revealed that general trends in the local, regional, and national economies and institutional decisions post-disaster tend to have a greater long-term impact on organisational financial outcomes than an organisation's financial health prior to the event (Tierney & Webb, 2001).

There is some evidence that certain industry sectors are more vulnerable than others to the effects of disasters. Following the 1989 Loma Prieta earthquake in the San Francisco Bay Area of California, Kroll et al. (Kroll et al., 1991) found that single location retail, service organisations, and trades such as finance and real estate in the cities of Santa Cruz

and Oakland experienced proportionally greater losses and had more difficulty recovering than other types of organisations. Interestingly, Dahlhamer and Tierney (1996) did not find the type of sector to be a statistically significant predictor of *short-term* business recovery in Santa Cruz following the Loma Prieta earthquake or in South Dade following Hurricane Andrew. However, in a follow-up study with the same businesses, the industry sector was found to be a strong predictor of *long-term* recovery in South Dade but not in Santa Cruz (Webb et al., 2002). On the other hand, large disasters can stimulate activity for organisations involved in the construction (West & Lenze, 1994) and the manufacturing sectors (Tierney & Webb, 2001) through increased workloads during demolition and reconstruction.

Organisations with locally oriented markets, especially businesses that rely on foot-traffic, tend to recover more slowly than those with regional, national, and international market scope (Alesch et al., 2001; Chang & Falit-Baiamonte, 2002; Kroll et al., 1991). Disasters can cause population dislocation from local markets and increase competitive pressure from organisations in less affected areas (Xiao & Nilawar, 2013; Zhang et al., 2009). Thus, organisations with multiple locations tend to do better, because they can funnel resources from less- to more-affected parts of their organisations (Tierney & Webb, 2001). There is also evidence to suggest that organisations that reach markets via the internet are better able to diffuse the impacts of localised disasters (Pearson, Hickman, & Lawrence, 2010).

An organisation's vulnerability is also shaped by the vulnerability of the systems to which it is connected (e.g. its labour supply, market, and suppliers) (McManus, Seville, Vargo, & Brunsdon, 2008; Zhang et al., 2009). A significant amount of work has, for example, demonstrated links between infrastructure vulnerability and organisational disruption (Comerio, 2006; Rose, Oladosu, & Liao, 2007; Tierney & Nigg, 1995). In their

comprehensive review of business vulnerability, Zhang et al. (2009) defined the vulnerability of a business's labour input through two dimensions: 1) the potential for loss through casualty or relocation and 2) labour substitutability.[2] Similarly, customer vulnerability is the potential for loss, substitutability, and shifts in preference or demand (Xiao & Nilawar, 2013; Zhang et al., 2009). Vulnerability is thus, in part contingent upon the degree of exposure an organisation has in a disaster-affected area, but it can be moderated by organisational resilience.

2.1.3 Resilience

Resilience is the third characteristic understood as a determinant of organisational post-disaster outcomes. At its most general level, the concept of resilience offers an explanation for why some organisations are better able to absorb and adapt to stressors in their environment than others. Although the term resilience has classical etymological origins and a history of use in psychology and anthropology (Alexander, 2013), the generally accepted view is that resilience was brought into modern scientific prominence by Holling's (1973) paper in which he defined an ecological property,

> "…termed resilience, that is a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" (p.14).

Holling (1973) introduced the concept that dynamism and variability actually create stability and ensure system continuation. This is because the environments to which systems are connected change, and therefore the system often needs to adapt in order to continue functioning in the changed environment. In this ecological definition, resilience is assessed as the capacity of a system to resist a disturbance and the speed with which a system returns

[2] Labour substitutability refers to the ease with which staff members can be replaced. "All other factors being equal, a large labour pool and reliance on less skilled workers makes it easier to replace employees that have been displaced by disaster" (Zhang et al., 2009, p.43).

to equilibrium (Burton, 2012; Davoudi et al., 2012). The existence of an equilibrium state (in engineering) or multiple equilibrium states (in ecology) is a central, but controversial, component of Holling's conceptualisation of resilience (Davoudi et al., 2012; Klein, Nicholls, & Thomalla, 2004). Concerns about whether equilibrium exists at all for living systems, whether systems experience continuous state changes through adaptation, and whether 'returning' to some predefined state retains vulnerability in the system is a central challenge when conceptualising and assessing resilience (Alexander, 2013; Burton, 2012; Klein et al., 2004).

As shown in Table 1, as resilience has been translated from natural (ecological) and material (engineering) science to social science, theorists have developed more integrated approaches to resilience, focusing less on the attainment of equilibrium and giving more emphasis to interaction between systems at different scales and to system learning.

Table 1: A sequence of resilience concepts

Resilience perspective	Characteristics	Focus on	Resilient states
Engineering resilience	Return time, efficiency	Recovery, constancy	Vicinity of a stable equilibrium
Ecological/ecosystem resilience social resilience	Buffer capacity, withstand shock, maintain function	Persistence, robustness	Multiple equilibria, stability landscapes
Social-ecological resilience	Interplay disturbance and reorganization, sustaining and developing	Adaptive capacity, transformability, learning, innovation	Integrated system feedback, cross-scale dynamic interactions

Source: adapted from Folke (2006, p. 259)

SES approaches emphasise the inseparable interaction of social and ecological systems in creating and sustaining resilience.

Timmerman (1981) is one of the earliest cited researchers to discuss the resilience of society to hazards and disasters (Burton, 2012; Eakin & Luers, 2006; Klein et al., 2004). Timmerman (1981) defined resilience as "the measure of a system's or part of the system's capacity to absorb and recover from an occurrence of a hazardous event" (p.21). He introduced this term into a field that had a growing orientation in social-ecological

perspectives which rejected ‘human exemptionalism’ (Kates, 1971) instead, portraying human systems as inextricably embedded within ecological processes (McLaughlin & Dietz, 2008). From this perspective, resilience is a property created through the constant, fluid interaction of human and non-human systems.

Numerous definitions of resilience have proliferated in the hazards and disaster literature (and beyond) over the last three decades, referring to the capacity of a variety of systems to respond, adapt, and recover from changes or disruptions. As resilience has permeated different subfields of social sciences it has received a slightly different treatment, depending on the systems being analysed and the epistemological assumptions of the researchers. Table 2 includes a sample of resilience definitions developed with different ‘scales’ of human systems in mind.

Comparing the definitions in Table 2 reveals that, despite the different theoretical backgrounds and scales of analysis, there is a consensus around the point that resilience involves some degree of adaptation. Although there are exceptions, most discussions of resilience, if not the definitions themselves, also refer to elements of learning, mitigation, and vulnerability reduction as an important part of the resilience development process.

Some definitions of resilience refer to the maintenance of functionality under challenging circumstances or returning to a pre-disaster state. However, the stability that comes as a result of resistance to change can actually compromise resilience. In Table 2, only Wildavsky (1988) refers to the ‘bounce back’ principle. Bouncing back following a disruption can imply re-establishing vulnerabilities in the system. So researchers often avoid descriptions of ‘bounce back’ in favour of adaptation. Adaptation implies bouncing forward, and in doing so, learning from previous disruptions and evolving improved coping capacity.

Table 2: Selected definitions of resilience representing different 'scales' of human systems

Scale	Source	Definition
Individual	Egeland (1993)	The capacity for successful adaptation, positive functioning, or competence…despite high-risk status, chronic stress, or following prolonged or severe trauma.
	Norris et al. (2009)	The process of, capacity for, or outcome of successful adaptation after trauma or severe stress.
Organisational	Wildavsky (1988)	The capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back.
	Vogus and Sutcliffe (2007)	Maintenance of positive adjustment under challenging conditions such that the organization emerges from those conditions strengthened and more resourceful.
	McManus (2008)	A function of an organisation's situation awareness, management of keystone vulnerabilities and adaptive capacity in a complex, dynamic and interconnected environment.
	Seville et al. (2008)	The ability to survive a crisis and thrive in a world of uncertainty.
Community	Sonn (1998)	The process through which mediating structures (schools, peer groups, family) and activity settings moderate the impact of oppressive systems.
	Norris et al. (2008a)	A process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance.
	UNISDR (2009)	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.
Urban	Godschalk (2003)	A sustainable network of physical systems and human communities, capable of managing extreme events; during disaster, both must be able to survive and function under extreme stress.
	Campanella (2006)	The capacity of a city to rebound from destruction… [and] is largely a function of resilient and resourceful citizens.
Regional	Foster (2007)	The ability of a region to anticipate, prepare for, respond to, and recover from a disturbance.
	Hill et al. (2008)	The ability of a region…to recover successfully from shocks to its economy that either throw it off its growth path or have the potential to throw it off its growth path.
Society/social	Bruneau (2003)	The ability of social units to mitigate hazards, contain the effects of disasters when they occur, and carry out recovery activities in ways that minimise social disruption and mitigate the effects of future earthquakes.
	Paton & Johnston (2006)	A measure of how well people and societies can adapt to a changed reality and capitalize on the new possibilities offered.

2.2 Organisational Resilience

A body of literature has emerged that specifically addresses the resilience of organisations. Many of the general principles of organisational resilience are consistent with approaches in other fields. Organisational resilience refers to the capacity of an organisation to absorb or minimise the negative impacts of a crisis and continue to function after disruption. Resilience exists in an organisation's capacity to adjust its strategy, systems, and governance structure to dynamic environments (McManus et al., 2008).

This body of literature, however, has developed from a different theoretical background than work on communities and SES. Unlike examinations of community and place-based resilience which emerged from psychology, sociology, and human geography, work on organisational resilience typically draws upon knowledge developed in engineering, logistics, and business management. Research on organisational resilience builds on a large existing literature and practice in risk management, business continuity, and high reliability organisations (HRO) (Stephenson, 2010).[3] As a result of its conceptual origins, work on organisational resilience tends to focus less on organisational interactions and more on its internal capacity to manage and contain organisational risk.

Early approaches to organisational resilience focused on identifying and managing risk within organisational systems (Tarrant, 2010). Risk is understood as the probability of an event and its potential or probable negative consequences (UNISDR, 2009). This risk focus has a significant influence on the way practitioners developed interventions to improve organisational capacity to survive and adapt following a disruption. Risk management traditionally focused on hedging or distributing potential losses (e.g. through insurance or portfolio diversification) and on 'point solutions' which attempted to moderate risk by strengthening potential vulnerable spots against disruption (McManus, 2008; Starr,

[3] A high reliability organisation is defined as an organisation that operates in extremely challenging or high risk environments where errors are unacceptable (Bigley & Roberts, 2001).

Newfrock, & Delurey, 2003). Similarly, work in crisis management focused on developing organisational preparedness through training and planning, and by establishing organisational cultures, communication strategies, and management structures that better deal with crises (e.g. Mitroff, Pauchant, Finney, & Pearson (1989),Pearson & Clair (1998), Robert & Lajtha (2002), Smith & Sipika (1993)).

Since the 1990s, organisational systems management perspectives have moved from an exclusive focus on risk reduction and business continuity, toward resilience thinking, accepting "that adaptability will be the primary lifestyle for the future" (Horne & Orr, 1998, p. 29). Although Horne and Orr (1998) describe this transition from risk management to resilience thinking as a "wrenching shift," it might be more accurately described as a process of selective retention and expansion. Many of the key concepts in risk, crisis, and business continuity management remain integral to organisational resilience. The resilience construct, however, moves organisations past the prescriptive planning and top-down responses that dominated the risk mentality (Boin & McConnell, 2007). As a result, resilience has become an increasingly important approach and framing mechanism in business continuity management (Paton & Hill, 2006).

This move toward resilience thinking has strengthened and spread through the 2000s. Following the September 11, 2001 terrorist attacks in the U.S., research on organisational resilience increasingly emphasised the inability of organisations to mitigate the effects of specific events. The studies instead focused on the inter-personal dynamics within organisations, identifying practices and behaviours that could improve coping capacity, learning, and organisational innovation (Kendra & Wachtendorf, 2003; Linnenluecke & Griffiths, 2013).

In contrast to conventional risk and crisis management perspectives, resilience thinking seeks to avoid the compartmentalisation of risk. Resilience better accommodates

what Dalziel and McManus (2004) refer to as ontological uncertainties or ‘unknown unknowns.’ As a result, resilience approaches prioritise the development of inherent and adaptive capacities to facilitate flexibility over prediction and control (Gilpin & Murphy, 2008).

2.2.1 The resilient systems paradigm

At present, our understandings of organisational resilience are predominantly grounded in systems theory approaches developed in engineering and ecology. Complex adaptive systems (CAS) theory, in particular, has influenced the way organisational resilience is understood and approached. CAS are self-organising, capable of anticipating potential disturbances, and rearranging their components to enable survival and persistent function (Holland 1992; Meadows 2008). The defining feature of a CAS is its ability to bend, flex, and reorganise its components within a continuously changing environment (Holland, 1992; Horne & Orr, 1998).

From a complex systems perspective, resilience is an inherent characteristic emerging from the actions and interactions of elements in a dynamic system. Resilience decreases when the system organises itself around stability at the expense of flexibility and when the system does not adequately consider the influence of its environment. In other words, resilience is compromised when the system “is paying much more attention to its play than to its playing space” (Meadows, 2008, p. 78).

Complex systems approaches to organisational resilience emphasise flexibility and adaptation over prescriptive planning or mapping and controlling the entire system (Choi, Dooley, & Rungtusanatham, 2001; Gilpin & Murphy, 2008). Choi et al. (2001), for example, demonstrated this in their study of a leading automobile manufacturer who found that understanding the limitations of their possible knowledge and maintaining flexibility in

response to the unknown was a far more successful strategy than their attempts to comprehensively map and manage their complex and dynamic supply chain.

2.2.2 Assessing organisational resilience

The ultimate purpose of exploring organisational resilience is to identify the factors that enable organisations to resist the negative impacts of a crisis and adapt in a way that enables them to thrive in a changing environment (Seville et al., 2008). Thus, studies of organisational resilience often focus on identifying the components of an organisational system that contribute to resilience. These studies seek to develop tools that assess and promote organisational resilience before an organisation is faced with a crisis.

One of the earliest studies to examine organisational resilience in the context of an environmental disaster was Karl Weick's (1993) study of the Mann Gulch fire in Montana (U.S.). Weick's (1993) characterisation of pre-disaster capability building for improved adaptive capacity is now captured in most current assessments and measures of organisational resilience. In his study, Weick (1993) identified four dimensions of organisational resilience: improvisation, virtual role systems, the attitude of wisdom, and norms of respectful interaction. Each dimension refers to elements that emerged after the disaster but their foundations were developed by the group or individuals before the disaster. First, improvisation refers to maintaining creativity under pressure, but is associated with individuals that "routinely act in chaotic conditions" (p.639). Next, virtual role systems refer to an individual's willingness to take on all roles as needed in the crisis situation, but it comes from familiarity with the roles and processes within the organisation and communication patterns established prior to the disaster. Third, the wisdom to which Weick (1993) refers is knowledge without extreme confidence or extreme caution, emerging from familiarity with what is and an acceptance of what is unknown. Finally, respectful interaction describes intra-organisational transparency and trust.

In addition to its focus on adaptive capacities, much of the organisational resilience literature also integrates elements of formal planning, reminiscent of its management and business continuity roots. Some believe that anticipatory approaches, including formal planning, create space in systems to "organise for resilience" (Boin & Lagadec, 2000, p. 188). Planning and anticipatory action supplement flexible and adaptive processes, not supplant them (Stephenson, 2010). Anticipation is also captured in the cyclical feedback process of vulnerability reduction and adaptive learning that are incorporated in organisational resilience constructs (Mallak, 1998; McManus, 2008; Somers, 2009).

Table 3 displays several common indicators of resilience derived from both conceptual models and models designed to be deployed as organisational resilience assessment tools. In these assessments, resilience is considered an organisational property which can be developed prior to a crisis and activated both in anticipation of and response to a disruption.

Horne and Orr developed the Organizational Resilience Inventory (©1996), a 74-item survey tool, designed to identify organisational behaviours that contribute to resilience (Horne & Orr, 1998). Similarly, Mallak (1998) developed a scale for assessing latent resilience which Somers (2009) later expanded into the Organizational Resilience Potential Scale, a quantitative survey tool. McManus et al. (2008) introduced a model of organisational resilience developed from grounded theory analysis of 10 case study organisations in New Zealand. McManus (2008) developed a qualitative model to gauge the "relative overall resilience" (p.67) of organisations, based on 15 key resilience indicators.

These indicators represented three dimensions of organisational resilience: situation awareness, identification and management of keystone vulnerabilities, and adaptive capacity. McManus et al.'s (2008) work did not offer a tool that could quantify and compare

organisational resilience, but it was later developed by Stephenson (2010) and Lee et al. (2013) in these respects, as discussed in more detail below.

Table 3: Indicators of organisational resilience

	Indicator	Horne & Orr (1998)	Mallak (1998)/ Somers (2009)	McManus et al.(2008)	Burnard & Bhamra (2011)
1	Forward planning/participation in exercises		✓	✓	✓
2	Goal oriented solution seeking/ appropriate response and recovery priorities			✓	
3	Improvisation/ Innovation			✓	✓
4	Proactive posture/ change willingness			✓	✓
5	Processes for identifying and analysing vulnerabilities or risk		✓	✓	
6	Situation awareness of the external environment / ability to perceive and respond to emerging issues		✓	✓	✓
7	Effective leadership/ strategic vision	✓		✓	
8	Minimisation of organisational silos/ high permeability between organisational boundaries	✓	✓	✓	✓
9	Culture of knowledge sharing/ reporting and internal feedback processes			✓	✓
10	Culture of learning	✓		✓	✓
11	Devolved responsibilities and decision making		✓	✓	✓
12	Staff engagement and effective communication	✓		✓	
13	Access to and ability to mobilise appropriate resources (internal & external)	✓	✓	✓	✓
14	Critical understanding of organisational connectivity/ ability to manage complexity	✓	✓	✓	✓

Finally, Burnard and Bhamra (2011) provided a conceptual framework for organisational resilience that is geared toward identifying organisational features that contribute positively to crisis response.

Assessments of organisational resilience, such as those presented in Table 3, tend to be geared toward practitioners (those in a position to enact resilience interventions within an organisation). Practitioners may employ such tools or frameworks to: see where they stand against others in their area or industry, identify areas for improvement, and evaluate the effect of interventions intended to enhance resilience (Lee, Vargo, & Seville, 2013).

Because they are targeted toward practitioners, the majority of the resilience indicators that researchers identify fall within an organisation's management scope. The

majority focus on systems within the organisation and only a few consider any extra-organisational elements. For example, indicators 1-6 in Table 3 reflect attitudes and postures toward change, monitoring, and planning within an organisation that may lead to improved adaptability. Indicators 8-12 in Table 3 refer to relationships and culture within the organisation that develop transparency, empower staff members, and encourage collective improvement. Similarly, indicator 7 refers to leadership and strategic vision within the organisation.

Only indicators 6, 13, and 14 capture elements of extra-organisational interactions, and again they focus on an organisation's internal capacities to manage interactions with the external environment. Indicator 13 refers to connections to resources that might be accessed from others outside the organisation while indicator 14 reflects broader references to an awareness of the organisation's mostly formal relationships and operating environments. For example, McManus (2008) includes an indicator referred to as "connectivity awareness," described as an organisation's "awareness of the links between the organisation and its entire community of stakeholders, internally (staff) and externally (customers, local authorities, consultants, competitors" (p.134). Discussion of this indicator focuses primarily on managing potential disruptions that might flow between the organisation and these stakeholders. Finally, indicator 6 refers to an organisation's capacity for monitoring their operating environment to anticipate changes that might disrupt the organisation.

McManus's (2008) work formed the basis of the Benchmark Resilience Tool, a quantitative survey tool developed by Stephenson (2010) and further refined in Lee et al. (2013). This tool has a strong theoretical grounding in the organisational resilience and crisis management literature, and has been empirically tested and refined (Lee et al., 2013; Stephenson, 2010) (Table 4).

Table 4: New model of organisational resilience

Factors	Indicator	Definition
Adaptive capacity	Minimization of silos	Minimization of divisive social, cultural, and behavioural barriers, which are most often manifested as communication barriers, creating disjointed, disconnected, and detrimental ways of working.
	Internal resources	The management and mobilization of the organisation's resources to ensure its ability to operate during business-as-usual, as well as being able to provide the extra capacity required during a crisis.
	Staff engagement and involvement	The engagement and involvement of staff who understand the link between their own work, the organisation's resilience, and its long-term success. The staff is empowered, and they use their skills to solve problems.
	Information and knowledge	Critical information is stored in a number of formats and locations, and the staff has access to expert opinions when needed. Roles are shared and staff is trained so that someone will always be able to fill key roles.
	Leadership	Strong crisis leadership provides good management and decision making during times of crisis, as well as continuous evaluation of strategies and work programs against organisational goals.
	Innovation and creativity	Staff are encouraged and rewarded for using their knowledge in novel ways to solve new and existing problems and for utilising innovative and creative approaches to developing solutions.
	Decision making	Staff have the appropriate authority to make decisions related to their work and authority is clearly delegated to enable a crisis response. Highly skilled staff are involved, or are able to make, decisions where their specific knowledge adds significant value, or where their involvement will aid implementation.
	Situation monitoring and reporting	Staff are encouraged to be vigilant about the organisation, its performance and potential problems. Staff are rewarded for sharing good and bad news about the organisation including early warning signals and these are quickly reported to organisational leaders.
Planning	Planning strategies	Plans and strategies are developed and evaluated to manage vulnerabilities in relation to the business environment and its stakeholders.
	Participation in exercises	Staff participate in simulations or scenarios designed to practice response arrangements and validate plans.
	Proactive posture	Staff have a strategic and behavioural readiness to respond to early warning signals of change in the organisation's internal and external environment before they escalate into crisis.
	External resources	There is an organisation wide understanding of the relationships and resources the organisation might need to access from other organisations during a crisis, and plan and manage to ensure this access.
	Recovery priorities	There is an organisation wide awareness of what the organisation's priorities would be following a crisis, clearly defined at the organisation level, as well as an understanding of the organisation's minimum operating requirements.

The latest iteration of the Benchmark Resilience Tool, now called the New Model of Organisational Resilience, uses a 53-item quantitative survey that measures 13 indicators of resilience**.**

The indicators are grouped into two factors: planning and adaptive capacity (Lee et al., 2013; Stephenson, 2010). Each indicator is defined in (Table 4).

Table 4, which is adapted from Lee et al. (2013, p.34). The survey uses several items (declarative statements where the participant indicates his or her level of agreement on a Likert scale) to assess each indicator and these are then aggregated to generate a total resilience score.

Stephenson (2010) and Lee et al.'s (2013) tool offers additional specificity around some of the indicators. It also examines, in greater detail than the other models discussed, how organisations can manage their interactions with their extra-organisational environment. For example, Stephenson (2010) includes the indicator "situation monitoring" to "acknowledge input or feedback from the organisation's environment" (p.84), referring to the operational environment (e.g. supply web or markets). Lee et al. (2013) also notes that engagement with extra-organisational actors expands organisations' potential access to resources in times of need.

The New Model of Organisational Resilience offers a useful starting point for assessing the endogenous indicators of resilience (i.e. the aspects of resilience originating from within the organisation). In this thesis I use the New Model of Organisational Resilience as a reference point for discussing aspects of the relationship between an organisation's endogenous resilience including resources, management policies, attitudes, and procedures and its post-disaster trajectory.

2.2.3 Limitations of current approaches

Current models of organisational resilience tend to be 'under-spatialised' (to borrow a term from Yeung (2006)) and under-socialised. These limitations stem largely from the organisational resilience literature's roots in crisis management and systems engineering. By focusing exclusively on indicators directly within the management scope of an organisation, these models do not consider the potential co-creation of resilience between the organisation and its social, economic, political, and physical environments. This means that the New Model of Organisational Resilience and the other models discussed in the previous section are unable to explain adequately significant portions of the variability in post-disaster organisational outcomes.

In studies of organisational resilience there is a tendency to reify the boundary between an organisation and everything outside of the organisation.[4] This leads to an almost exclusive focus on the system of interest (the organisation), and only a fuzzy, abstract depiction of the 'environment,' even studies that employ CAS approaches. When resilience models do consider the organisation's environment, it is usually as a source of disruption or as a source of inputs and receptacle of outputs. And yet there is considerably more to an environmental context than these aspects alone.

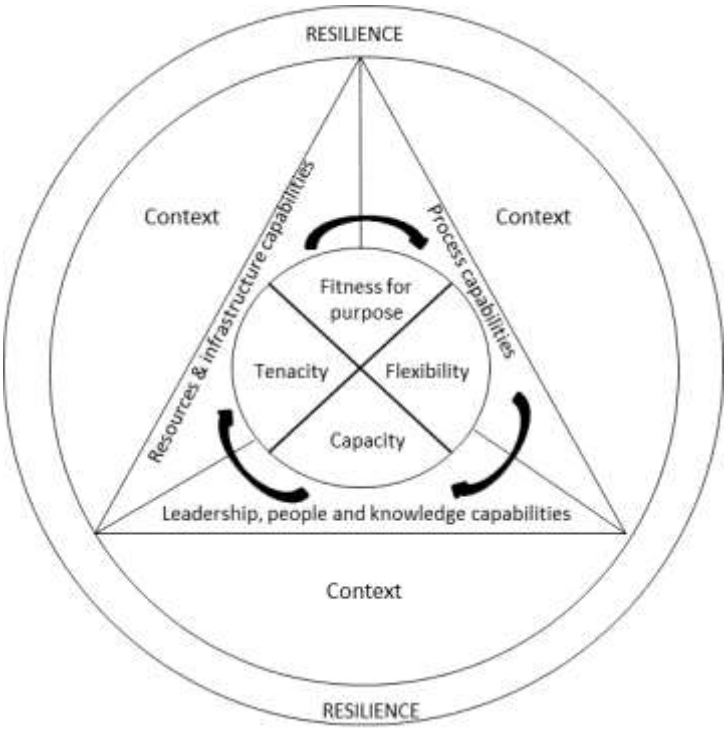
In systems approaches to organisational resilience, organisations tend to be abstracted from their physical environment. These approaches overlook important aspects of organisational location and spatial interactions, as well as issues such as the owner or employees' place attachment, organisational place identity, and other place-based interactions. This is the root of the first issue, the under-spatialised understanding of the organisation in resilience literature. If organisations are situated in a resilient neighbourhood,

[4] A researcher is responsible for identifying the boundaries of the system of interest (i.e. the set of interconnected elements that are coherently organised into a structure that produces a function such as an organisation or a supply chain). The researcher also identifies the extent of the 'environment,' which is defined as anything outside of the system's boundaries (Meadows, 2008).

are connected to resilient infrastructure, or operate in a region with a strong economy, then it is likely that this will influence their capacity to respond and recover from disruptions. These factors are, however, not considered in any of the previously discussed assessment tools of organisational resilience.

In these models, organisational context or environment is never considered as a place containing a set of vulnerabilities and capacities, as the hazardousness of place model developed by Hewitt and Burton's (1971). For example, Gibson and Tarrant (2010) present several conceptual models of organisational resilience, only one of which depicts the organisation as situated in a context (see Figure 1). In this model, the context is described only as "the changing internal and external environment" (p.10), while the organisational processes and capacities are defined in comparatively greater detail.

Figure 1 Resilience triangle model



Adapted from: Gibson and Tarrant (2010, p.10)

In Gibson and Tarrant's (2010) conceptual model, an organisations' context is presented as a set of conditions that can disrupt the system. From this perspective, resilience

is then seen as emerging from an organisation's internal resources, processes, leadership, and people. It is unclear from the model what effect, if any, context has on organisational resilience.

In addition to having a limited or underspecified sense of context, current approaches to organisational resilience are also under-socialised. Organisations tend to be treated as rational and utility optimising entities, whose interactions are devoid of social meaning and unaffected by culture and norms of interaction. If and when the models consider exchanges outside of the organisation's boundaries, there is an almost exclusive focus on organisations' formal and market-based relationships (e.g. suppliers, customers, government institutions). In systems theory approaches, organisations are seen as independent actors engaging in discrete transactions with others outside of their organisation, and they are rarely considered as part of wider social and cultural structures. Systems theory, therefore, "maintains the fiction that [disaster] 'events' and social actors are at the same time bound together and yet independent of each other" (Iversen & Armstrong, 2008, p. 184).

In systems perspectives on organisational resilience, the organisation's connections with networks, physical environments, and cultural and political institutions facilitate discrete transactions, but ultimately resilience is created and maintained within the organisation. This is depicted schematically on the left side of d extra-organisational entities.

In contrast, approaches to community resilience characterise it as emerging from the interaction of systems that compose each other (as depicted on the right side of **Error! Not a valid bookmark self-reference.**). The (usually spatially defined) community is understood as an integral part of its networks, built and natural environments, and cultural and political institutions.

The interactions among the various components create the conditions that restrict or enable the emergence of resilience. In this view, resilience is developed and maintained at

the convergence of the various systems of which the community is a part. In other words, the community is embedded in the various environments that compose its context. The community and its context are mutually constitutive and therefore co-produce both vulnerability and resilience.

Organisations, like communities, are social collectives that inhabit social and physical space. Given the aforementioned limitations of a systems theory approach to organisations, it is useful to consider other perspectives on the continuum of interactions that shape and guide organisational processes and outcomes.

Figure 2. An organisation tends to be portrayed as connected to but separate from the contexts they inhabit. This leads to over-simplified and incomplete understandings of the way organisations are shaped by and shape their environments.

In current approaches to organisational resilience, organisations connect with the various elements in their amorphous context including the physical environment, networks, and institutions. [5] Yet few studies of organisational resilience consider these contexts as significantly shaping the organisation. Instead, they focus on the organisations' direct formal exchanges between an organisation and extra-organisational entities.

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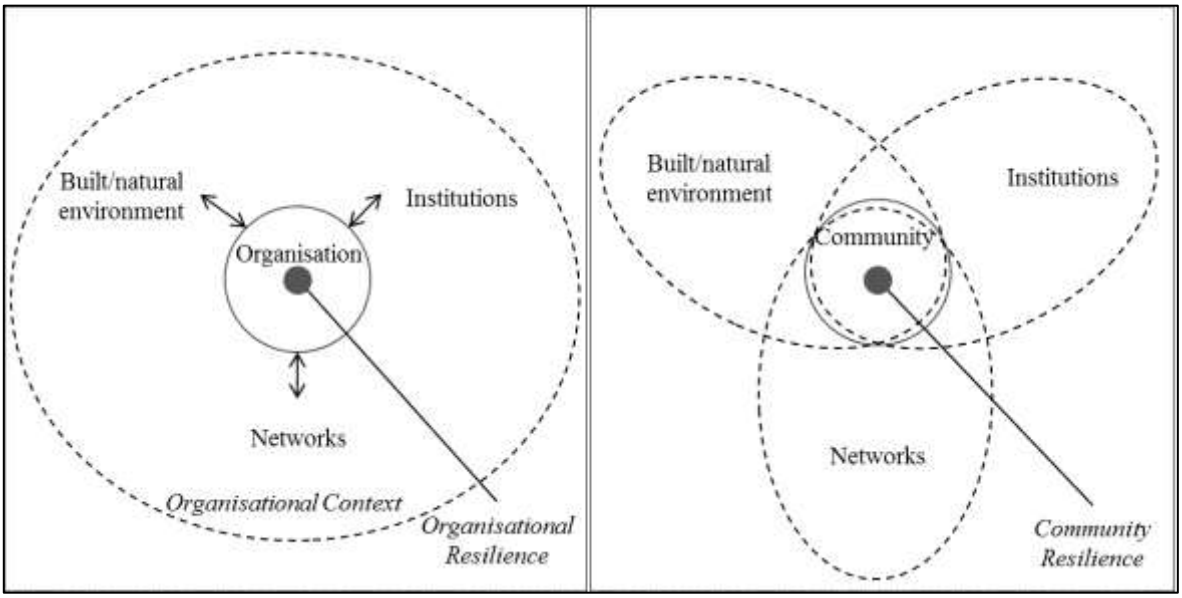
[5] Pelling et al., (2008) refer to both the formal regulatory *institutions* that penetrate and influence organisations and the informal "communities of practice…that are often not officially recognised by the organisations they permeate." The authors distinguish between communities and networks, describing communities as associations "founded in shared identity, where shared values and practices are reinforced" and networks as relationships "that cross boundaries of identity, providing an informal vehicle for the flow of information in an organisation," (p.870). All of these elements influence learning and adaptation in organisations both positively and negatively (Pelling et al., 2008; Pelling & High, 2005).

The interactions among the various components create the conditions that restrict or enable the emergence of resilience. In this view, resilience is developed and maintained at the convergence of the various systems of which the community is a part. In other words, the community is embedded in the various environments that compose its context. The community and its context are mutually constitutive and therefore co-produce both vulnerability and resilience.

Organisations, like communities, are social collectives that inhabit social and physical space. Given the aforementioned limitations of a systems theory approach to organisations, it is useful to consider other perspectives on the continuum of interactions that shape and guide organisational processes and outcomes.

Figure 2: Conceptual approaches to contextual interactions and the creation of organisational and community resilience



In the following section I introduce the theory of embeddedness and discuss how it can improve organisational resilience theory and research.

2.3 Organisational Embeddedness

Understanding how organisation's external interactions and environment shape its resilience requires seeing organisations as part of social systems. The theory of embeddedness offers an established theoretical basis for exploring the social and spatial aspects of organisations. Embeddedness refers to the complex interrelatedness of economic actors[6] within their social environments (Ibata-Arens & Dierkes, 2006). Proponents of embeddedness, the concept that "social relations shape economic action" (Uzzi, 1996, p. 674), argue that all economic behaviour is embedded in a social context (Borgatti & Foster, 2003; Granovetter, 1985). Some of the earliest considerations of embeddedness were motivated by opposition to neoclassical economists' attempts to exclude social and political processes from our understandings of market exchanges (Barber, 1995; Dacin et al., 1999).

Embeddedness emerged from Karl Polanyi's (1944) consideration of exchange in 'market' and 'non-market' societies, where he identified three types of economic exchange: reciprocal, redistributive, and market. *Reciprocal* exchange refers to exchanges within close social relationships, the terms of which are dictated by values and social norms (Barber, 1995; Hess, 2004). *Redistributive* exchanges are also dictated by collective values and norms, but in this instance each participant contributes taxes, goods or services and a central agency (e.g. the government or the church) redistributes these contributions (Barber, 1995; Hess, 2004). Finally in *market* exchanges, price is the only factor considered and all actors treat each other "impersonally and honestly" (Barber, 1995, p. 398). Polanyi (1944) argued that the concept of the market began as a utopian ideal but was subsequently reified as an establishment ideology, becoming a powerful structuring ideal in capitalist societies (Barber, 1995).

[6] All actors that exchange with one another in a society are considered 'economic' actors.

In the utopian market ideal (and neoclassical economic theory), people and organisations are characterised as rational actors (Baum & Rowley, 2002). The rational actor places the notion of efficiency maximisation (greater value output for lesser value input) as the central driver behind all action. In the rational economy, environments are only considered as sources of inputs and outputs. Opportunism (the rational tendency of economic actors to pursue their own interests with every means necessary) is managed through hierarchies and authority relations (Powell, 1990).

Markets as they exist outside of the purified ideal are a more complex mix of reciprocal, redistributive, and market exchanges. Exchange is laden with social, cultural, and institutional values, norms and meanings. Thus, as Polanyi (1944) concluded, all exchange is *embedded* in social relations.

The concept of embeddedness was revitalised by Mark Granovetter's (1985) seminal paper linking economic action of individual businesses and social structure. Granovetter (1985) utilised the embeddedness framework to address the 'under-socialised' view of neoclassical economics and the 'over-socialised' view of social structure in the economy promoted by reformist economists in sociology (Dacin et al., 1999). The theory of organisational embeddedness addressed "the classical problem of how it can be that daily economic life is not riddled with mistrust and malfeasance" (Granovetter, 1985, p.488). While mistrust, opportunism, and malfeasance are not absent from economic life, in many relationships they are regulated by norms, trust, and other investments in social relationships. Granovetter's work demonstrated that organisations have varying levels of embeddedness within a wider set of social and cultural processes. Embeddedness theory recognises that social relationships can be more important than authority relationships in bringing order to economic life (Ibata-Arens & Dierkes, 2006).

Iversen and Armstrong (2008) argue that embeddedness perspectives can open new theoretical territory for disaster researchers. Embeddedness perspectives recognise that processes are historically contingent and shaped by both institutional and relational structures, but they also recognise the agency of actors within those structures. This view is consistent with sociological approaches (as well as those in anthropology and geography) which understand disasters as socially constructed and socially produced (Quarantelli, 2005), and explore the production of vulnerability and resilience as relational processes, formed through interaction, and shaped by social structures (Cutter, Boruff, & Shirley, 2003; Tierney, 2007).

2.3.1 Embeddedness of what in what?

Organisations develop connections with people, organisations, economies and places. Organisations may strategically cultivate connections to gain a competitive advantage (Coe, Johns, & Ward, 2012; Dacin et al., 1999; Dicken & Thrift, 1992), and organically accumulate resource dependencies and shared understandings over time as the unintentional result of frequent interaction (Aldrich and Pfeffer 1976; Bakker et al. 2011; Burt 1992). This multiplicity is reflected in the various types of embeddedness that researchers examine, including cognitive (Bakker, Cambre, Korlaar, & Raab, 2011; Kalantaridis & Bika, 2006), economic or market (Kalantaridis & Bika, 2006), institutional (which is also variously characterised as societal, cultural, and political) (Jessop, 2001; Pallares-Barbera, Tulla, & Vera, 2004; Zukin & Dimaggio, 1990), and relational or network embeddedness (Barber, 1995; Hess & Coe, 2006; Zukin & Dimaggio, 1990).

In their influential book on the social organisation of the economy, Zukin and DiMaggio (1990) identify four types of embeddedness: cognitive, cultural, political, and relational (network) embeddedness. Each type of embeddedness explores a different dimension of society that shapes organisational decision, actions, and outcomes. *Cognitive*

embeddedness refers to people's shared representations and systems of meaning (Bakker et al., 2011), and the way the "structured regularities of mental processes limit the exercise of economic reasoning" (Zukin & Dimaggio, 1990, pp. 15–16). In social collectives, cognitive rules, patterns of reasoning and interpretation result from shared experiences, histories, and interaction, and also underpin collective learning processes in organisations (Kalantaridis & Bika, 2006; Malmberg & Maskell, 2002). Accepting that due to complexity, imperfect information, and other social factors economic actors experience bounded rationality, cognitive embeddedness can form a kind of rationality inside of a particular social collective (e.g. through accepted organisational procedures or community practices) which help organisations make decisions in uncertain or volatile environments (Zukin & Dimaggio, 1990). For example, Zaheer and Nachum's (2011) description of organisational sense of place is a form cognitive embedding. If an organisation's members collectively identify with a location, then the organisation is better able to recognise and interpret location-specific resources and how to appropriate them.

Cultural embeddedness refers to the imprint of shared heritage on actors in ways that influence their economic behaviour even if the actor leaves its 'home' territory (Hess & Coe, 2006; Hess, 2004). Culture and social institutions provide the norms, rules, and frames of action and interaction that are often developed among people in a common geographic location (Dequech, 2003; Pallares-Barbera et al., 2004).

Political embeddedness refers to "the manner in which economic institutions and decisions are shaped by a struggle for power that involves economic actors and nonmarket institutions" (Zukin & Dimaggio, 1990, p.20). This most commonly manifests itself in terms of the local, regional, or national policies that dictate organisational form or constrain behaviour, for example promoting certain economic forms (e.g. high-tech agglomerations) through development efforts or tax incentives.

Finally, *structural* embeddedness most closely follows Granovetter (1985) in referring to the entrenchment of economic exchange "in patterns of ongoing interpersonal relationships" (Zukin & Dimaggio, 1990, p.18). Structural embeddedness is commonly evaluated as the degree of closeness of organisational actors or the reported level of trust between actors in a network (Bakker et al., 2011; Uzzi, 1996).

The cognitive frames, cultural and political institutions, and structural networks represent the different elements of society of which organisations are a part. Organisations are differentially connected to these elements and as a result are shaped by embeddedness in different ways. Much of the research exploring the effect of embeddedness on organisational behaviours and outcomes focuses on networks. In the next sections I highlight some of insights provided by examinations of network embeddedness.

Aspects of network theory in embeddedness

Network embeddedness is arguably the most important form of embedding for organisations (Zukin & DiMaggio, 1990), and it can have both positive and negative implications. As it has evolved in sociology and economic geography, the study of embeddedness has been strongly guided by the network paradigm. Granovetter's approach to embeddedness, for example, focused almost exclusively on the role of "concrete personal relations and structures (or 'networks') of such relations" in generating order in systems of exchange and shaping business behaviour (Granovetter, 1985, p.490).

There are two aspects of network embeddedness. The first is r*elational embeddedness*, which is characterised by sets of dyadic ties (pairs of actors in the network). Relational embeddedness describes the nature of an organisation's dyad relationships, accounting for the reciprocal, on-going, preferential and mutual exchanges that are neither price driven (i.e. markets) nor regulated by administrative sanctions (i.e. hierarchies) (Podolny & Page, 1998; Powell, 1990). The second is s*tructural embeddedness*, which

encompasses the overall network structure in which an organisation is situated. Structural embeddedness involves not only the organisation's direct ties but its position in a larger network of 'third parties' (Emirbayer & Goodwin, 1994, p.1422). This dual view of network embeddedness encompasses the nature of an organisation's one-on-one relationships and the broader societal networks.

In inter-organisational networks, strong relationally embedded ties are associated with increased knowledge transfer and cooperative behaviours (Gulati, 2007). Moran (2005) found that even when controlling for variations in the structure of organisational networks (e.g. network size or density of connections), organisations with high relational embeddedness (i.e. a larger number of deep, high-trust relationships) produced better innovation outcomes, in part because these relationship types were conducive to 'thicker' information exchange (Moran, 2005). Similarly, a high degree of relational embeddedness facilitated greater technical success for companies working in open source environments (Grewal, Lilien, & Mallapragada, 2006), influenced the formation of corporate alliances (Gulati, 1998, 1999, 2007), and increased the ability of small businesses to obtain lower interest rates from financial institutions with whom they have longer and more complex relationships (Uzzi & Gillespie, 1999). Non-relationally embedded ties or 'strategic' network relations tend to be characterised by less open information and resource flows, and are often regulated through power relations, formal contracts, or arms-length market exchanges (Grabher, 2006).

Studies of network structure focus, in large part, on how the structure of network connections influences the benefits that organisations obtain from their networks (Gulati, Lavie, & Madhavan, 2011; Gulati, 2007). For example, structural holes – a lack of interaction between two individuals or groups in a network – offer opportunities for network actors to broker the flow of information between the groups and control the ways the groups

work together (Burt, 1992). Similarly, network density – the proportion of group members who are tied to each other – can influence an organisation's access to unique resources from their network (Borgatti, Jones, & Everett, 1998). Organisations may face challenges as a result of high relational embeddedness (i.e. many strong ties and few weak ties). They may experience isolation from external information and resources and expend energy supporting unhelpful network members (Pallares-Barbera et al., 2004; Uzzi, 1996).

From a competitive perspective, the more structurally embedded an organisation is in a network, the more information actors know about that organisation, and the more constraints there are on that organisation's behaviour (Burt, 1992; Pallares-Barbera et al., 2004). Theories of organisational resource dependence (Aldrich & Pfeffer, 1976) and network constraint (Burt, 1992) suggest that organisations which draw heavily upon the resources of external actors become increasingly dependent upon and influenced by these actors. This ultimately limits the organisation's strategic choices (Aldrich & Pfeffer, 1976; Burt, 1992; Knoben, 2008).

Networks and resilience

Considerations of organisational networks in the hazards and disaster literature tend to focus on the role of inter-organisational networks in post-disaster response and the early phases of recovery (Hutter, 2011; Raab & Kenis, 2009). These studies, for the most part, analyse the way inter-organisational networks can be managed to enhance the abilities of organisations directly involved in disaster response. They consider how organisational networks' facilitate flexible communication systems (Comfort, Lin, & Hauskrecht, 2008; Zagorecki, Ko, & Comfort, 2010); effective emergency response coordination and integrated crisis management (Corbacioglu & Kapucu, 2006; Kapucu, Arslan, & Collins, 2010; Topper & Carley, 1999); the transmission of resources that allow organisations to perform response

actions such as mass evacuations (Waugh & Smith, 2006; Zakour, 2008); and collaboration and task coordination during disaster response (Nolte & Boenigk, 2012).

Only a small handful of studies offer empirical insights about how networks facilitate or speed the recovery of the organisations themselves (e.g. Bowden, 2011; Chewning, 2009; Graham, 2007). Yet these studies indicate that there is great potential for improving our understanding of organisational recovery and resilience by closely examining an organisation's post-disaster extra-organisational networks, and especially its relationally embedded ties. An excellent example is Doerfel et al.'s (2010) examination of the role of inter-organisational communication and social capital on organisational recovery following Hurricane Katrina. Doerfel et al.(2010) interviewed representatives from 56 organisations in New Orleans over a period of several years and found that the disaster created an "open-resource environment in which organisations tend to collaborate with each other in order to obtain resources" (Doerfel, et al., 2010, p.128). They also found that organisation leaders (e.g. managers and owners) progress through different phases of post-disaster communication in which they communicate with different segments of their extra-organisational networks to address different needs as they emerge (Doerfel et al., 2010).

Social capital

Social capital is accumulated in networks characterised by repeated interaction. Social capital refers to the basic sociological principle that interpersonal engagement and involvement in groups can have positive consequences for individuals, organisations, and communities. I approach social capital as an important part of the much broader concept of structural and relational embeddedness.

Bourdieu (1986) offered the earliest systematic description of social capital (Table 5), focusing on the way benefits accrue to individuals through interaction, and how the quantity

and quality of resources available to an individual differed based on their acquaintances.[7] Like Bourdieu, Coleman (1988, 1990) an early and influential social capital theorist, defined the concept based on its form and function (Table 5). Coleman (1988) was influenced by Granovetter's (1985) work on embeddedness, extrapolating it to include all social action rather than focusing on economic action. Coleman (1988) describes both 'public' and 'private' good forms of social capital.

Table 5: Definitions of social capital

Author	Definition of Social Capital
Bourdieu (1986)	The aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition – or in other words, to membership in a group.
Coleman (1990)	A variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure.
Baker (1990)	A resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relations among actors.
Putnam (1993)	Features of social organisations, such as networks, norms, and trust that facilitate action and cooperation for mutual benefit.
Nahapiet & Ghoshal (1998)	The sum of the actual and potential resources embedded within available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network.
Burt (2000)	The social capital metaphor is that the people who do better are somehow better connected. Certain people or certain groups are connected to certain others, trusting certain others, obligated to support certain others, dependent on exchange with certain others. Holding a certain position in the structure of these exchanges can be an asset in its own right. That asset is social capital, in essence, a concept of location effects in differentiated markets.
Lin (2005)	Social capital is defined as resources embedded in one's social networks, resources that can be accessed or mobilized through ties in the networks.

The first form refers to the internalised norms that reinforce socially beneficial behaviour, for example obeying traffic rules or discouraging crime, that are then appropriable

[7] Bourdieu (1986) argued that the accumulation of social capital was a means of perpetuating and exacerbating social stratification, because elite members of society had access to farther reaching and better positioned social networks and therefore a greater quantity and quality of social resources.

as a generalised benefit to anyone operating in that social system. The second refers to the results of direct engagement with a network of actors which transfer instrumental resources to individuals (e.g. access to privileged information).

Robert Putnam, a prominent advocate of the social capital approach, characterises social capital as a property of communities and nations, and examined social capital created through active citizenship (Putnam, 1993, 1994, 2000). Bourdieu, Coleman, and Putnam in different ways examine social capital in the context of a critical theory of society.

Ronald Burt and Nan Lin, whose basic definitions of social capital are also included in Table 5, are proponents of the network based "utilitarian approach" to social capital (Adam & Roncevic, 2003, p.158). Network approaches focus on an actor's ability to access benefits as a function of their position within a network (Lin, 1999, 2001). Lin (2001) argued that integrating social capital research under the common conceptualisation of network theory would help maintain social capital as a rigorous scientific concept. Some, however, argue that the network approach focuses exclusively on elements that are easy to operationalise and measure, and therefore ignores the important notion of social capital as a collective good reinforced through structural norms, trust, and sanctions (Adam & Roncevic, 2003; Coleman, 1990). Thus, as I discuss social capital in this thesis, I refer to both the broader notion of structural cohesion that produces collective 'good-will' (Adler & Kwon, 2009, p.17), and the instrumental benefits garnered by individuals through their engagement with a relational network.

Organisations can also accumulate and use social capital. Baker (1990), Woolcock (1998), and Nahapiet and Ghoshal (1998) conducted some of the earliest work linking social capital to organisational advantage. Their work guided conversations about organisational advantage away from a consideration of the particular capabilities of the organisation and towards a focus on organisational advantage accrued through relational structures. These

studies found that the differences between firms, including their productive performance, often represented differences in the firm's ability to create and exploit social capital.

Social capital within organisations is associated with improved product innovation (Tsai & Ghoshal, 1998), increased knowledge sharing (Chow & Chan, 2008), reduced staff turnover rates (Krackhardt & Hanson, 1993), and smoothed intra-organisational resource exchange (Gabbay & Zuckerman, 1998). Research has also demonstrated how social capital between organisations and extra-organisational ties has reduced interest rates between corporate borrowers and banks (Uzzi & Gillespie, 1999), strengthened relationships with suppliers (Baker, 1990; Uzzi, 1997), eased the acquisition of strategic resources (De Wever et al., 2005), shaped patterns of collective innovation (Ahuja, 2000), and helped firms acquire new skills and knowledge (Inkpen & Tsang, 2005; Podolny & Page, 1998; Powell & Smith-Doerr, 1994).

Social capital has received an increasing amount of attention from researchers, practitioners, and policy makers interested in resilience to hazards and disasters. Those seeking to understand differential post-disaster outcomes increasingly account for social capital in individual psychological (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Norris et al., 2009) and community (Airriess, Li, Leong, Chen, & Keith, 2008; Chamlee-Wright & Storr, 2011; Dynes, 2006) resilience, response, and recovery. Aldrich (2010, 2012a, 2012b) for example, found that social capital was the best predictor of population recovery in disaster damaged neighbourhoods in New Orleans following Hurricane Katrina, Kobe following the 1995 earthquake, and Tokyo after the 1923 earthquake. In these studies Aldrich found that collectively held trust and resources mobilised through social networks drove place-based resilience, in terms of the speed at which the place was repopulated and reconstructed.

Similarly, community resilience indices developed by Norris et al. (2008a) (later expanded by Sherrieb et al.(2010) and Cutter et al.(2010)) include proxies for assessing

place-based social capital. While these indices tend to rely on relatively rough measures of community social capital, such as the number of civic and social advocacy organisations per 10,000 people (intended to measure social engagement or place attachment) and net migration in the community (to measure community bonds), they do facilitate analyses of the spatial variation of social engagement and community resilience.

To a lesser extent social capital has been linked to organisations' post-disaster experiences. For example, Zakour (2008) found that social service organisations that had diverse inter-organisational networks and strong ties with their client-base (defined as social capital) were better able to provide disaster evacuation services for their organisation and clients.

Although networks, particularly formal supply networks and strategic networks are often considered in systems perspectives of organisational resilience; the exploration of the relationship between social capital and organisational resilience is still in its nascent stages. Recent work by Noel Johnson and colleagues (i.e. Johnson, Elliott, & Drake, 2013; Johnson & Elliott, 2011; Johnson, 2010) uses case studies of organisations in the United Kingdom to explore intra- and inter-organisational social capital for organisations, public-private partnerships, and organisational supply chains. The authors use Nahapiet and Ghoshal's (1998) three dimensions of social capital to examine the structural, relational, and cognitive dimensions of organisational interaction. Their research shows, among other things, that elements of social capital, including the easy transfer of tacit information and the translation of codified lessons into practice, can supplement (generally insufficient) business continuity management processes. Although these studies do not include a systematic analysis of organisations' network structures or relational attributes, they do provide a useful theoretical precedent for more systematic analyses.

Lengnick-Hall and Beck (2005) offer another conceptualisation of social capital in their theoretical model of organisational resilience. They argue that some organisations are in a better position or have more capacity to access network resources than others. They propose a form of contextual resilience which refers to socially embedded relationships that create social capital in a network, and the broader structure of weak connections that give organisations access to a range of tangible and intangible resources. In their model "deep social capital evolves from repeated, personal interactions between people and between organizations and is most effective when based on trust" and "broad resource networks encompass both tangible and intangible resources" (p.752).

In this model organisations gain network advantages if they make highly visible contributions, occupy crucial economic positions, or are seen as essential factors of production (Lengnick-Hall and Beck, 2005). As a result these organisations in privileged social positions are able to obtain resources, concessions, and assistance that other organisations are denied.

Social capital is an important aspect of organisational network relations, but it should not be treated as the only or even most important role of organisational networks. Organisational networks can be conduits for impacts, vulnerability (Sheffi & Rice, 2005), formal or market exchanges, in addition to social capital. Relying too much on close network connections in business interactions was shown to increase the failure rate of business (Uzzi, 1996). Similarly, an exclusive focus on social capital creation through embedded networks can divert analysis from larger structural concerns that provide explanatory nuance in hazards and disaster research (Pelling & High, 2005).

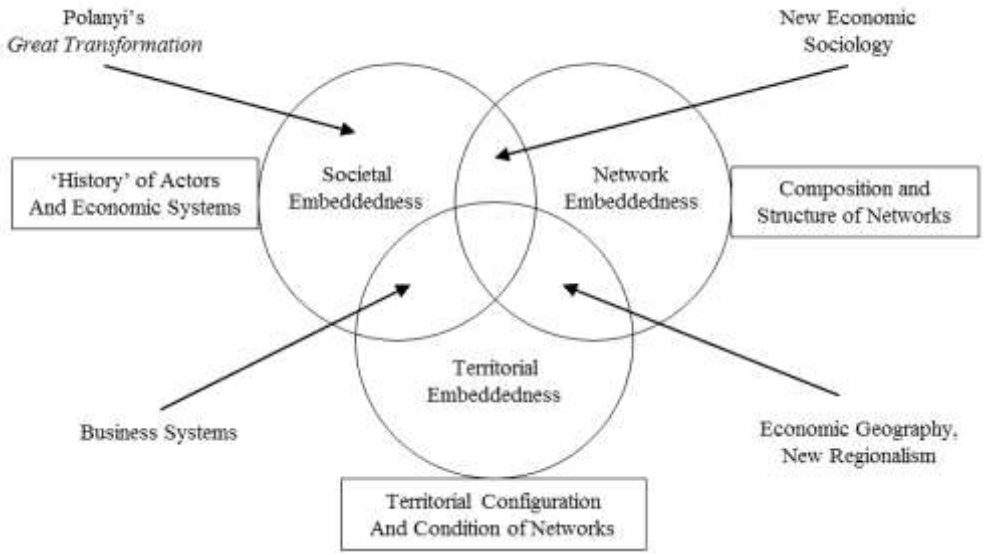
2.3.2 Geographic embeddedness

An organisation's embeddedness in society can cause it to become tied to specific places. Geographic embeddedness refers to an organisation's place rootedness. There are

many ways to understand embeddedness, and Hess (2004) offers a useful heuristic for engaging with the concept from a geographical perspective. The author specifies three major divisions of analysis that emerged from different disciplines: societal, network, and territorial.

Figure 3 (from Hess, 2004, p.178) shows each of these dimensions as overlapping but not completely contained within each other. For example, local policies such as tax advantages (e.g. societal dimension) and strong relationships with local labour markets (e.g. network dimensions) can increase territorial embeddedness. Similarly, an organisation's territorial embeddedness may encourage the development of further local networks (Hess, 2004).

Figure 3: Fundamental categories of embeddedness



Source: Hess (2004)

Organisations may be embedded across different geographic scales**.** For example, they may participate in knowledge sharing with other organisations in a local agglomeration (Knoben & Oerlemans, 2008), develop systems to suit a new host country's regulatory environment (Coe et al., 2012), and participate in transnational production networks (Henderson, Dicken, Hess, Coe, & Yeung, 2002; Hess, 2004). The scale of analysis in studies of embeddedness is often dictated by the researcher's interest in particular outcomes.

This thesis, for example, focuses on the embeddedness of organisations at the local (town) scale.

In addition to being a multidimensional and cross-scalar process, embeddedness changes over time as organisations and places change (Brouwer, Mariotti, & van Ommeren, 2004; Brouwer, 2004). Geographic proximity tends to facilitate relationship formation, and the longer an organisation is in place the more ties it tends to form with other local organisations and institutions (Brouwer, 2004). This may mean that organisations develop a competitive advantage as they cultivate local knowledge sharing networks or loyalty from local customers, and learn to navigate the local regulatory and social environments. But organisations may also experience a form of spatial 'lock-in,' where they become increasingly dependent on local resources, relationships, or other attributes in ways that constrain their adaptation or movement. Conversely, as organisations age and grow they may expand, develop ties with customers, suppliers, and like-organisations elsewhere, and become less anchored in a particular local area (Young, 2010).

The institutions, infrastructure, and relationships that form an organisation's local environment is generally "characterised by inertia and durability" (Martin, 2000, p.80), but it does shift over time. An organisation's embeddedness changes and the contexts in which it is embedded change requiring adaptation to avoid locking-in to local contexts that are no longer conducive to organisational success.

Geographic embeddedness in practice

Analyses of, what I broadly refer to as geographic embeddedness, offer useful insights into the way organisations differentially connect to places, the way networks of relations manifest in space, and the implications of these connections. Research on the implications of organisation's geographic embeddedness during business-as-usual, may inform how we approach embeddedness following disasters. In economic geography, considerations of

embeddedness have often focused on the strategic embedding of transnational corporations (TNCs) in their operational territories (Coe et al., 2012; Dicken & Thrift, 1992; Yeung, 1998), as seen in Table 6. For example, Coe et al.'s (2012) study of the embeddedness of foreign temporary staffing firms in their Japanese host-market shows that in order to operate in these environments organisations need to achieve legitimacy in a range of social, cultural, and institutional domains (Coe et al., 2012). Other studies have shown that organisations are more likely to succeed in different contexts if they are familiar with the local labour market practices and attitudes (Amin & Thrift, 1994), are mindful of local social norms in the way they operate (Agnes, 2000), and are able to utilise local routines and traditions to enable interactive learning and innovation with the organisation (Li, Bathelt, & Wang, 2011).

These studies also show how organisational networks are influenced by spatial proximity. Even though organisations are increasingly able to form virtual networks among others with whom they share a number of organisational characteristics (Copus, Dubois, & Hedström, 2011; Knoben & Oerlemans, 2012), being in the same place as network members continues to have a major influence on tie formation and exchange content (Knoben & Oerlemans, 2012; Knoben, 2008; Oerlemans, Meeus, & Boekema, 2001). For example, Dicken and Malmberg (2001) found that innovation and production flows through networks are typically stronger if network relations are local. The authors also argue that local relations facilitate more face-to-face contact, build more trustful relations, and encourage the exchange of non-codified and tacit information (Dicken & Malmberg, 2001).[8]

Geographic embeddedness perspectives are not limited to cultivating organisational advantage (though most examples in Table 6 focus on the potential benefits in this respect). Organisations operate within social and cultural systems that influence non-rational, informal, and moral bases of conduct and cooperation (Baum & Rowley, 2002). For example, Pallares-

[8] Tacit information refers to "disembodied know-how that can only be diffused in personal interaction and face-to-face contacts" (Hauser et al., 2007, p.76 in Powell, (2008)).

Barbera et al. (2004) examined the effects of what they termed ‘spatial loyalty’ on territorial embeddedness. The authors found that the usual motivations for economic agglomeration and geographic clustering, such as favourable regional policies and intra-industry collaboration, were less important than the effect of “territorially embedded links to social and cultural events and local institutions” in driving organisational retention and growth (Pallares-Barbera et al., 2004, p.636).

High levels of geographic embeddedness can also have negative consequences for organisations. Additionally, Hess (2004) discussed the anchoring in place that can limit organisations’ adaptive options. Organisations that are closely tied to a place or a particular social network (both proximate and dispersed) may be more vulnerable to path dependent lock-in (Dicken & Thrift, 1992).

Lock-in means that previous decisions or actions determine the following decisions and actions, and such that organisations may become trapped in potentially negative cycles that decrease their real or perceived adaptive capacity (Hassink, 2010). Lock-in or high levels of spatial inertia potentially tie organisations to places that are no longer optimal for their health. An organisation with a large number of local partners in its network or a large proportion of its strong ties within a particular location may experience greater spatial inertia if its knowledge and resource availability are likely to be compromised by relocation (Knoben, 2008).

Some organisations are deeply embedded through economic and social ties in a place, while others have a greater capacity to operate in multiple places but have limited access to local economic and social capital in specific locations (Dicken & Malmberg, 2001). The nature and degree of an organisation’s local embeddedness has potentially significant influence on organisational decisions, capacities, and outcomes.

Table 6: Geographic embeddedness in the literature

Citation	Definition	Influence on organisation
Dicken & Thrift (1992)	"The interaction between the specific cognitive, cultural, social, political and economic characteristics of a firm's 'home territory' [...], those of its geographically dispersed operations and the competitive and technological pressures which impinge upon it" (p.287).	Corporations are able to, "mobilize cognitive, cultural, social and political resources in a search for security as well as profit […] These resources enable them to 'bend' their environments in numerous ways to their product and competitive advantage" (p.283).
Pallares-Barbera et al.(2004)	Organisational links to social and cultural events and local institutions.	Leads to 'spatial loyalties,' influences relocation decision, and drives local activity and growth
Coe et al.(2012)	Transnational corporations' (TNCs) knowledge of host market business networks and external business environment that shape institutional experience. Includes considerations such as awareness of laws, regulations, how to achieve local 'organisational legitimacy,' labour market cultures etc.	Affects TNC's success in a host market.
Hess (2004)	The extent to which actors are 'anchored' in particular territories or places (p.178). Includes localised manifestations of broader networks.	Affects the relocation behaviours of the organisation. The organisation absorbs and can be 'constrained by' the economic activities and social dynamics in their territory or place.
Knoben & Oerlemans (2008)	A firm's ties within a region's collective pool of knowledge, institutional structures, and social conventions. The number and strength of a firm's localised innovative inter-organisational relationships	Higher levels of relational embeddedness and a greater number of direct innovative inter-organisational relationships in a place can make an organisation less likely to relocate (i.e. 'spatial lock-in effect').
Yeung (1998)	Organisations are reproduced through ongoing networks of social relations embedded in both society and space, i.e. the socio-spatial nexus.	Enables access to markets, and can influence organisation's strategic advantage in contexts where they are embedded in well-positioned networks.
Copus et al.(2011)	Number, strength, and frequency of firm's relationships within a local area –region – (within and across sectors). Specifically focusing on non-market relations.	Can guide place-based economic development to reflect a balanced awareness of the importance of both "local 'embedding' and global engagement." Improved communication and transportation technology influence transaction and non-market interaction.

Embeddedness and post-disaster trajectories

Disasters disrupt geographic and relational space, making recovery a process of disorientation and reorientation. Individual and collective identities, relational networks, and relationships with place often need to be reconstructed along with buildings and

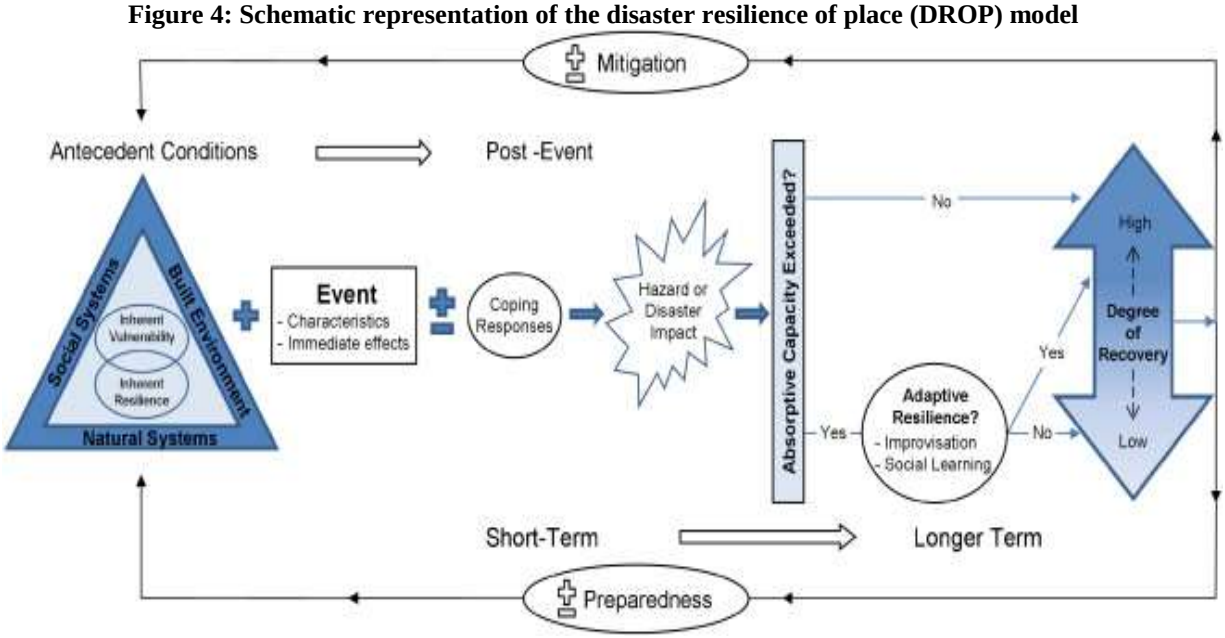
infrastructure. Place plays an essential role in shaping the discourse and practice of disaster recovery and resilience (Cox & Perry, 2011).

From a social-ecological systems perspective, each scale of analysis in the resilience definitions in Table 2 is part of embedded systems which produce vulnerability and resilience. Organisations, for example, are integral components of a community's capacity to function, and this is explicitly recognised in several of the community resilience or resilience of place models and metrics that have evolved within the last decade (e.g. Zhou, Wang, Wan, & Jia (2009), Norris et al.'s (2008), and Mayunga (2007)). These place-based models of resilience tend to characterise organisations as embedded components of a community. Organisations, in these models, are instrumental to the creation of resilience in the places they operate.

For example, Cutter et al.'s (2008) Disaster Resilience of Place (DROP) (Figure 4) model examines the linkages between place-based vulnerability and the social factors that contribute to the resilience within a specific geographic domain (Cutter, et al., 2008). In this model resilience is an inherent property emerging from the antecedent conditions produced by the interaction of the social, built, and natural systems, and an adaptive property developed through improvisation and social learning.

Cutter et al. (2010) operationalised the DROP model as a place-based resilience index, allowing for comparisons of the resilience of various geographic units (e.g. census blocks, counties, states). The five subcomponents that compose this index are: social resilience, economic resilience, institutional resilience, infrastructure resilience, and community capital.

Figure 4: Schematic representation of the disaster resilience of place (DROP) model



Source: Cutter et al. (2008, p.208)

Organisations are implicitly and explicitly considered in several components of economic, institutional, community, and infrastructure resilience. For example, an indicator of institutional resilience is municipal services. Infrastructure resilience relies, in part, on the medical system, and economic capacity on businesses. These components rely on organisations that are able to resist the negative impacts of a disaster and continue functioning (optimally stepping-up their functionality) to facilitate rapid community response and recovery.

Bruneau et al.(2003) and Tierney and Bruneau (2007) distinguish organisational resilience as its own domain of resilience, among their four domains: technical, organisational, social, and economic. The organisational domain refers to the capacity of organisations to reduce community vulnerability and impacts, while economic refers to the capacity of economies generally and business firms specifically, to limit and absorb economic losses as a result of a disaster.

These approaches, depict organisations as part of the wider social system, and are supported by empirical research in disaster-affected communities that demonstrate how

organisations contribute to community resilience. Studies such as, Airriess et al.(2008), Chamlee-Wright and Storr (2011), and Cox and Perry (2011) found that organisations play a fundamental role in facilitating social network development and enhancing the sense of place that is considered central to rebuilding communities. Organisations in these and other works are considered explicitly as providers of goods, services, spaces of interaction, and jobs, as post-disaster responders and drivers of recovery, and implicitly as part of healthy and functioning social systems and economies.

The literature specifically addressing organisational resilience often acknowledges that "having more resilient organisations is a key component of achieving more resilient communities because it is organisations that deliver essential services and provide employment for a large proportion of the community" (Dalziell & McManus, 2004). There is, however, limited consideration of how social, community, and place-based resilience influence organisations' adaptive capacities.

Extrapolating from studies conducted during business as usual, we begin to see the implications of embeddedness for organisational resilience and post-crisis adaptive resilience. For example, embedded relationships produce higher quality information exchange and help firms manage uncertainty (Uzzi, 1996). This also reduces the need for formal contracts and governance mechanisms, thereby increasing the flexibility and adaptability of the organisation (Uzzi & Gillespie, 1999). Resource allocation, high quality information, and adaptability are all implicated in models of organisational resilience.

By considering the way interaction and social structures influence the development of organisational resilience, embeddedness perspectives can lead to more participatory and inclusive disaster recovery and infrastructure planning (Iversen & Armstrong, 2008). Iversen and Armstrong (2008) claim that researchers examining Hurricane Katrina recovery from a systems perspective, social vulnerability approach, or a mix of the two were implicitly

moving toward embeddedness approaches, by emphasising the social production of the disaster, the historic path-dependence, and social structures. I extend this logic, to argue that studies of organisational post-disaster trajectories and resilience can be improved by applying an embeddedness framework.

2.4 Conclusion

At the start of this chapter I presented four propositions that I have attempted to justify through critical analyses of the resilience and embeddedness literature. To conclude I will review these propositions in the context of that analysis. The first proposition referred to the under-socialised and under-spatialised nature of current approaches to organisational resilience.

> Proposition 1: Current approaches to organisational resilience do not adequately consider an organisation's interactions with its context and networks.

As discussed in the chapter, organisations have neither sharply defined boundaries nor are they boundary-less. They are constantly interacting with the contexts and networks in which they are embedded directly and indirectly through porous organisational boundaries. Yet, current approaches to organisational resilience (a) conceptualise the organisation as only vaguely connected to an environment and (b) employ a very limited conception of that environment treating it either as a source of inputs and outputs or as a source of change and disruption.

Organisations (firms) and territories are mutually constitutive. They are inherently spatial and territorial (Dicken & Malmberg, 2001) in that they respond to geographic distance and variations in resources and business opportunities. They are shaped by relations with territorial entities, and through interaction they derive some of their characteristics from and deliver some of their characteristics to specific territories and places (Dicken & Malmberg,

2001, p.355). Organisations "internalize social space, and they do so differently…Organizations, therefore, do not simply produce geographies; they are, rather, infused with them" (Del Casino et al., 2000, p.524). Organisations cannot be adequately understood separately from specific geographic contexts and the social processes that create those contexts.

Organisations become embedded in networks of relations that anchor them in places and connect them to resources and information far beyond their local areas. There is an extensive and growing body of literature linking organisational networks and social capital to organisational advantage and adaptation. Advancing our understanding of how networks and social capital contribute to organisations' capacity to anticipate negative changes, adapt, and capture opportunities in dynamic social environments has great potential for enhancing approaches to organisational resilience.

Second, work on community resilience provides an approach that considers the co-production of resilience through interaction.

Proposition 2: The field of community resilience offers useful conceptual resources for developing more contextual approaches to organisational resilience.

The literature on community resilience characterises organisations as important providers of goods, services, and spaces of interaction and social capital creation. Community resilience, in part, depends on organisations that are able to resist the negative impacts of a crisis and respond and recover quickly in the aftermath. In the organisational literature, however, resilience tends to been seen as cultivated internally and all of these interactions are either reduced to discrete exchanges with external networks, considered as potential sources of instability, or not considered at all.

As indicated in the third proposition, contextualised approaches to organisational resilience can explain more of the variability in post-disaster outcomes, by considering the

ways embeddedness shapes organisational capacities. Embeddedness perspectives take into account organisational place-rootedness and their spatial connectedness, and explore the social and institutional processes that restrict or enable organisations' adaptive options.

> Proposition 3: Developing a contextualised understanding of organisational resilience can improve our ability to explain organisational outcomes post-disaster.

Embeddedness perspectives more closely align with theoretical developments in modelling place-based community vulnerability and resilience (e.g. Cutter, Boruff, & Shirley (2003); Cutter et al.(2008); Norris et al.(2008); and Burton (2012)) and ecological models of individual and household resilience (e.g. Norris (2008b; 2009)). These models were developed from epistemologies that view disasters as socially constructed and consider the role of historic processes and social structures in households' and communities' capacity to respond and recover.

Considering organisations' relationships to their social and geographic contexts in a dynamic post-disaster environment can foster a deeper understanding of the interconnected, extra-organisational components of resilience (Proposition 4), and help us draw closer links between community resilience and organisational resilience. The desire to manage resilience and develop positive interventions has driven much of the current research that seeks to measure and model organisational resilience. The final proposition indicated that approaches to organisational resilience that incorporate elements of embeddedness have practical implications.

> Proposition 4: A contextual approach to organisations can also provide practical guidance for researchers and practitioners aiming to measure and build resilience in organisations.

Embeddedness approaches can supplement current approaches that focus on the endogenous properties of the organisation in three ways. First, by examining network embeddedness, organisations can develop a better understanding of how trust based and reciprocal exchanges facilitate access to generalised support and create resilient relationships that can survive and adapt in dynamic environments. Second, organisations that are geographically embedded are better equipped to interpret and navigate their local environment. If we do not consider organisational 'environments' as places it is impossible to guide organisations toward approaches that allow them to cultivate the positive elements of geographic embeddedness. Finally, by integrating organisational and community resilience approaches we can better understand how extra-organisational actors (e.g. community members, governments, business associations) can work to co-produce resilience with organisations.

Chapter Three: Research Design

3.1 Introduction

In this research, I evaluated how context influenced organisational trajectories following the Canterbury earthquakes. I approached organisational context from two perspectives. First, I considered the way organisations became differentially rooted in places, and how their forms of 'geographic embeddedness' shaped organisational responses in the post-disaster context. The second approach examined how organisations accessed resources from their support networks to aid recovery, including the ways networks adapted and were managed in the aftermath of the earthquakes.

This chapter explains my philosophical and methodological approaches to the research. I begin by explaining how I arrived at the research topic, and discuss how my ontology (understanding of what exists in the world) and epistemology (how we know about the world) shape my methodology and guide this investigation. I then outline the various data collection methods I employed throughout the research, including surveys, semi-structured interviews, field observations, and participant aided sociograms (PAS). Finally, I discuss the way I analysed the various data sources and note how I synthesized the data to facilitate comparative cross-case analysis.

3.2 Ontological & Epistemological Approach

An important factor that contributed to the shape of this research is my lived experience of the events about which I am writing. I moved to Canterbury two months before the initial September 2010 earthquake, and have remained a Canterbury resident throughout the earthquake series. I, therefore, conducted my research not as a distant observer but as an inhabitant of the contexts I was investigating. Prior to beginning this study, I had explored

the processes that shape exposure, vulnerability, and resilience in other contexts, investigating volunteer emergency response teams in the U.S. Midwest (Flint & Stevenson, 2010), flooding and associated damage to the built environment in the United Kingdom, and residential recovery disparities after Hurricane Katrina devastated the U.S. Gulf Coast in 2005 (Stevenson, Emrich, Mitchell, & Cutter, 2010; Stevenson, 2010).

Being on the ground during the response and recovery following the Canterbury, however, allowed me to experience the emotional, sensory, and physical process of the disaster, response, and recovery in a way that I had not previously. These experiences made me conscious of the way we create knowledge about lived realities through research. Our attitudes and assumptions about what knowledge is and our ability to access it shape the way that we structure questions about hazards, disasters, and related social processes. These attitudes and assumptions influence the methods researchers choose, how we interpret the data we collect, and how we seek to apply (or not) these interpretations (Stefanovic, 2003). Observing the way communities, government responses, and the physical environment were influencing organisations' post-earthquake experiences shaped my formation of an integrated epistemology and methodology that embraced this complexity.

I have taken a critical realist approach to my research. Critical realists propose that it is possible to gain knowledge about phenomena through observation and empirical research, but that there is an important distinction between the real world and the accounts of it that are available or constructed through research (Ackroyd, 2010; Bhaskar, 1976). From this perspective, all accounts created through research are both partial and shaped by the interaction between the "knower and the known" (e.g. in this case, the researcher and the apparent reality of an organisation) (Peters, Pressey, Vanharanta, & Johnston, 2013, p.338).

Critical realist perspectives in disaster research are informed by constructionist ontologies. Constructionists argue that disasters and their impact are socially constructed and

are the product of the broader forces that shape society (Tierney, 2007). There is a two-way interaction between human entities and the biophysical environment, as well as a process of cultural and political framing that contributes to disasters, vulnerability, and resilience. Researchers working from constructionist perspectives have, for example, examined the role inequality and power play in the development of vulnerability and risk (e.g. Klinenberg, 2002; Oliver-Smith, 1996; Pelling & Uitto, 2001; Wisner, 2003).

From this perspective causal relationships cannot be reduced to empirical observations of cause and effect. Critical realists instead locate causal relationships at the level of 'generative mechanisms' which are produced through the interactions between human agency, social structure (e.g. the roles and routines enacted within and between people, households, organisations, communities, and the state), and the environment (Given, 2008; McLaughlin & Dietz, 2008).

Critical realist approaches embrace complexity (instead of trying to reduce systems to their component parts), but also "desire to render complexity intelligible" through research, "strong conceptualization," and "rigorous description" (Given, 2008, p.169). Research in the critical realist approach should, therefore, be an iterative process that explores the relationships between outcomes and causal mechanisms in the social contexts in which they occur (Ackroyd, 2010).

Although critical realism is not associated with any particular methodology, case studies are a valued approach to knowledge generation in this tradition (Ackroyd, 2010; Elger, 2010). Case studies allow the researcher to progressively clarify the relationships between events, causal mechanisms, and the contexts or structures that produce the causal mechanisms (Yin, 2009). Case studies tend to deploy mixed methods of data collection and analysis (Yin, 2009), facilitating iterative and multi-layered explorations of a subject (Johnson & Onwuegbuzie, 2004). Further, the critical engagement encouraged by case study

methods allows researchers to consider voids, absences (e.g. what kinds of support were not received), and non-linear relations that are not directly observable but may still have important implications for the phenomena being researched (Elger, 2010; Stefanovic, 2003).

In this study, I conducted 32 case-studies of organisations affected by the Canterbury earthquakes. Case studies allow the researcher to examine the relationship between causal mechanisms, outcomes, and the different contexts that enable various mechanisms to exist (Ackroyd, 2010). By exploring organisational case studies in the post-earthquake Canterbury environment, I set out to generate knowledge that could add nuance, critical reflection, and in-depth insights about the contexts and causal mechanisms shaping events and outcomes for organisations in a post-disaster environment.

3.3 Research Questions

The questions that guided this research address several issues identified in the previous chapter. As noted earlier, current approaches to organisational resilience do not adequately consider organisational interactions with context and networks (proposition 1). The research questions use an embeddedness lens to improve our current under-spatialised and under-socialised approaches to organisational resilience.

The research questions consider organisational embeddedness from two perspectives. The first question addresses an organisation's geographic embeddedness.

RQ1: How does an organisation's embeddedness in its local context influence its post-disaster trajectory?

The next questions address organisational relational embeddedness within the context of post-disaster support.

RQ2: What is the nature of an organisation's post-disaster support network?

RQ3: What is the relationship, if any, between the organisations' post-disaster trajectories and the nature of these support networks?

The second and third questions are informed by House's (1981) fundamental question about the nature of social support networks: "Who gives what to whom regarding which problems?" (p.22). Exploring the nature of organisational social support networks may help explain the variable post-disaster outcomes of organisations with more or less resources and information (Hurlbert, Haines, & Beggs, 2000; Renzulli, Aldrich, & Carolina, 2005).

Each of the research questions is concerned with the causal mechanisms that contribute to the organisations' post-disaster experiences. Rather than focusing on the way the earthquakes impacted the organisations, or on cause and effect relationships between organisational characteristics and organisational outcomes, I seek to consider the relationships between organisational agency, the structures in which they were embedded, and organisational processes and outcomes in a post-disaster context.

The remainder of the chapter discusses the methods I employed to explore the three research questions. I begin with a brief introduction to my study area and case study selection process. This is followed by descriptions of how I collected and analysed the data.

3.4 Study Context & Sample Selection

In 2010 and 2011 there were five significant earthquakes in Canterbury, New Zealand. Two of these earthquakes in particular, the September 2010 and February 2011 events, caused extensive damage and disruption across the region. Immediately following the September 2010 event I became involved in a longitudinal study of organisations affected by the earthquakes. This study was run through the Resilient Organisations research programme. This aims of the research were to catalogue the earthquakes' impact on organisations and the organisational resources, mitigation techniques, and adaptive behaviours that enabled their

recovery. After the second major earthquake in February 2011, researchers from the Resilient Organisations research programme followed up with organisations that had completed the first survey, distributing another survey to this group in May 2011.[9]

The organisations in the Resilient Organisations study were selected using a stratified sampling technique. They selected two broad survey samples. The first organisational sample was selected from six industry sectors and the second sample of organisations were selected based on their geographic location. The industry sectors were: building suppliers, critical infrastructure, fast moving consumer goods, hospitality, information and communication technology (ICT), and trucking organisations (for more on these sectors and the industry sampling methodology see Kachali (2013) and Whitman (2014)).

The location-based survey sample was intended to enable comparisons between organisations in urban and rural settings and to examine neighbourhood effects on organisations in commercial districts. Organisations in the rural location-based sample group were chosen based on their location relative to the Greendale fault (which ruptured during the September 2010 earthquake). The urban sample consisted of organisations located in one of three business centres: the Christchurch central business district (CBD), the Kaiapoi town centre, or the Lyttelton town centre.

The earthquakes and associated aftershocks affected an estimated 64 commercial centres across the Canterbury region, as well as many organisations outside of business districts, and in rural areas (CCC, 2012). The three centres examined in this study were selected because they experienced some of the highest concentrations of commercial building damage. The Christchurch CBD experienced severe damage as a result of both the September 2010 and February 2011 earthquakes. Kaiapoi, a town approximately 12 miles north of Christchurch, was heavily damaged in the September earthquake. Kaiapoi was

[9] Social science research related to the earthquakes prior to May 2011 was banned by New Zealand's Natural Hazards Research Platform, which is a multi-party research platform and oversight body funded by the New Zealand Government.

affected by severe liquefaction and lateral spreading. Lyttelton, a port town about 7 miles east of Christchurch, was seriously affected by the February earthquake, principally as a result of shaking damage and rock fall hazards.

Kaiapoi and Lyttelton are geographically separated from Christchurch (Kaiapoi by the Waimakariri River and Lyttelton by the Port Hills) and are distinguished by different historic-economic drivers of growth. These differences made comparisons among organisations in the three centres more distinct than comparisons among damaged centres of Christchurch suburbs. The earthquake series and study areas are discussed in much greater depth in Chapter 4.

I selected the case study organisations (CSOs) examined in this thesis from the pool of organisations that responded to one or both of the surveys deployed in 2010 and 2011. Starting with the surveyed organisations was in part selected based on convenience (I already had up-to-date contact information for these organisations), but the surveyed organisations also offered the benefit of starting each case study with a thorough set of baseline data gathered soon after both earthquakes. As I was interested in the ways organisations interacted in town and urban settings, I focused specifically on organisations that had been located in either the Christchurch CBD or the Kaiapoi or Lyttelton town centres at the time of the September or February earthquakes. Of the 75 organisations that fitted this criterion, 32 organisations agreed to participate in the more in-depth case study research.

Although I was a significant contributor to the broader Resilient Organisations post-earthquake project, it is beyond the scope of this thesis to discuss contents or results of that larger project. There are several excellent resources that elaborate on the methods and findings of that work (e.g. Stevenson et al. (2011b; 2011c), Kachali et al. (2012), Kachali (2013), and Whitman (2014), and Whitman et al. (2014)).

3.5 Data Collection Overview

The aim of an organisational case study is to achieve a broad and in-depth assessment of phenomena in context. Thus, case studies typically combine multiple, complex data sources, and often include both qualitative and quantitative information (Dul and Hak 2008; Yin 2008; Voss et al., 2012). In this study, case study organisation (CSO) representatives participated in surveys, interviews, and field observations. I also collected information about the organisations' local contexts through a series of key informant interviews with local leaders and advocates in the Christchurch CBD, Kaiapoi, and Lyttelton. As shown in Table 7, I deployed some of these tools concurrently and others sequentially. The surveys, interview questions, sociogram template and human ethics approvals can be found in Appendices A-I.

Table 7: Data collection overview

Data Collection Tool	Description	Dates	Responding CSOs
Survey 1	40 mostly closed response questions	Nov 2010 – Feb 2011	23 (366 total)*
Survey 2	56 mostly closed response questions	May-Aug 2011	26 (176 total)*
Key informant interviews	Face-to-face semi-structured interview with local leaders and advocates	May-June 2011	22
Semi-structured CSO interviews	Face-to-face semi-structured interview with organisation owner/operator or senior level management.	Mar-Jun 2012	32
Participant aided sociograms	Interactive social network data generation tool. Conducted directly after the interview, face-to-face with respondent.	Mar-Jun 2012	32
Survey 3	48 mostly closed response questions	Apr-May 2012	15 (62 total)*
Organisational health structured interviews (OHS)	8 questions, with a balance of open and closed response formats	Mar-Apr 2013	31
Field observations	Site visits to the organisation's operating premises during the study period (or previous damaged or cordoned location of their premises). Purpose was to obtain a sense of the organisation's physical setting. Observations recorded as field notes.	May 2011- Apr 2013	29

*The total counts refer to the number of respondents to the Canterbury-wide survey, including the case study organisations.

Each tool described in Table 7 contributed something different to the case study as a whole. Questionnaire surveys captured a large amount of simple quantifiable data (e.g. the number of days an organisation closed, and whether or not the organisation lost electricity). The answers were standardised and therefore easier to compare among respondents. Structured interviews provided a similar degree of standardisation in the questions, but allowed room for a greater range of answers and interpretations. Both the data from surveys and the structured interviews formed an important quantitative baseline for comparative analyses (e.g. gathering standardised revenue figures which determined the organisation's post-disaster trajectory categorisation).

Semi-structured interviews, on the other hand, proceeded on the notion that questions, interpretations, and meanings cannot and should not always be standardised and that the relevant questions are not necessarily known before an interview commences (Liamputtong & Ezzy, 2005). Interviews and field observations were much more useful for constructing narratives of the events, explanation building, and exploring complex issues, such as the ways decision makers felt connected to their towns or how they chose where to relocate. Finally, the participant aided sociogram combined structured and semi-structured interview techniques with an interactive visualisation exercise to gather specific information about an organisation's support network.

After the initial earthquake in September 2010 (prior to beginning my PhD in 2011) I began working with the Resilient Organisations, [10] a public good research programme based in New Zealand. As part of the Resilient Organisations research group, I aided the deployment of a Canterbury-wide organisational survey beginning in November 2010 (Table 7). The survey captured perishable data in the near aftermath of the earthquakes, including

[10] For more on Resilient Organisations, including a description of their research agenda and copies of reports and publications resulting from the on-going work throughout Canterbury and the rest of New Zealand go to www.resorgs.org.nz.

the type and impact of disruptions that organisations experienced, their mitigation and recovery strategies, and an indicative assessment of organisational resilience based on the benchmark resilience tool (see Chapter 2 for more discussion on this tool).

The CSOs encompass a range of organisational forms and are drawn from numerous industry sectors. They range from micro-businesses, with fewer than five employees, to large scale community non-profit organisations with over 100 full-time-equivalent staff. Although this range added a degree of difficulty to the cross-case analysis it also enabled rich insights into how very different organisations dealt with similar post-earthquake challenges. This diversity includes instances of what comparative case-study researchers refer to as 'polar types', in the sense of extreme cases which can be used to highlight contrasting patterns in the data (Eisenhardt & Graebner, 2007). Although I did not select the cases using the polar types' criteria, by having such a wide range of organisations, I was able to examine the extremes of post-disaster organisational fortunes (ranging from complete failure through to remarkable improvement). This breadth provided valuable insights.

3.6 Key Informant Interviews

Before selecting the case studies examined in this research, I gathered baseline information on the organisational contexts. The 'key informant' (KI) interviews were an important part of contextualising and interpreting the broader systemic and institutional processes that shaped the CSO's post-earthquake experiences.

In the first few months following the February earthquake, decision makers and community players developed strategies and policies that would influence the direction of the earthquake recovery in these town centres in the months and years to come. Organisations' long-term functioning and success are inarguably influenced by the strategies and policies that help shape the post-disaster environment (Burby, 2006; Olshansky, 2006). In order to

capture various perspectives on these critical processes, I conducted 22 semi-structured interviews [11] with 24 key informants in the Christchurch CBD, Kaiapoi, and Lyttelton business and economic recovery and redevelopment. The respondents included business association representatives, government officials, planners, property developers, and local community and business advocates, among others.

I made initial contact with several interviewees while attending many of the earthquake information nights, open business recovery strategy meetings, and town planning events that proliferated in the months following the February 2011 earthquake. I initially employed a theoretical sampling technique, identifying individuals who possessed certain desired attributes (e.g. business association representatives) or who were best situated to advance the data gathering and research objectives (Morgan, 2008). I then used non-probability snowball sampling (Saumure & Given, 2008) to make further connections.

All of the KI interviews took place between May and June 2011. The interviews lasted between 1 and 3 hours, were audio-recorded, and supplemented by field notes. I used field notes to document unrecorded discussions, observations, and speculative reflections directly following the interviews. [12]

I used content and thematic analysis to extract and contrast themes emerging from the interview data. As themes emerged from the interviews, I assessed the participant's (re)construction of the events that unfolded during the response and early phases of recovery from the February earthquake and their more general characterisations of the town. Due to time constraints, I did not use the more robust constant comparative content analysis approach (described in section 3.7.2) for these interviews. These interviews also provided important background on some of the key debates, issues, and various players in each of the town centres, which proved useful in later discussions with CSO respondents.

[11] Another PhD student working with Resilient Organisations conducted three of these interviews using a slightly modified version of my semi-structured interview guide.
[12] C.f. Brodsky (2008) on the relevance and purpose of field notes in qualitative research

3.7 Case Study Data Collection

The unit of analysis in this research is the organisation. Organisational case studies, however, need to specify a set of conditions or phenomena of interest in order to constrain and focus the investigation (e.g. the case may be a business' decision process leading up to and following a merger, as opposed to the case being 'a business') (Yin, 2009). In this study, I constrain the examination of these particular organisations to a specific period of time (2010-2013), to a specific series of events (the Canterbury earthquakes), and geographically (to three centres). [13] Further, I focused my data collection and analysis on aspects of organisational embeddedness and organisational recovery processes following the Canterbury earthquakes.

Cross-case analysis treats each organisation as a separate case but allows evidence from each organisation to be compared to produce generalized observations (Yin 2009). Through cross-case comparisons, I identified issues and processes that are not generalizable to all organisations but illustrative of different relationships between organisations' post-earthquake outcomes and the causal mechanisms related to organisations' social and geographic connections. I collected data from each organisation separately, constructing a thorough narrative of each organisation using the methods outlined in Table 7. I describe these methods in more detail in the next sections.

3.7.1 Surveys

The case study data collection began with Canterbury-wide surveys of organisations in 2010 and 2011. The survey responses of each case study organisation provided a baseline of comparable quantitative data for each organisation. The survey data offered a thorough and comparable overview of the organisation's post-quake losses, mitigation activities, and response and recovery strategies. I collated each CSO's survey responses into a 'case

[13] Organisations that are part of a multidivisional enterprise and other complex CSOs responded in their capacity as a semi-autonomous unit (their particular Canterbury based local office or branch).

profile,' which I brought with me to in-depth interviews with the CSO leaders. Survey 3 was deployed just after I began interviewing CSOs. This survey, also part of the larger Resilient Organisations research project, continued tracking the medium-term financial and operational impacts of the earthquakes, organisational changes, and adaptations (e.g. location of key suppliers before and after the Feb 2011 earthquake).

3.7.2 Interviews and field observations

Between March and June 2012, I conducted interviews with the CSO leaders (i.e. owner/operator, CEO, manager, or equivalent) that would be best positioned to answer questions about the organisation's post-earthquake experiences from a strategic operational perspective. In five cases, this was the CEO or organisation director. In 22 cases the respondent was the organisation's owner/operator (either a sole proprietor or part of a partnership/joint venture). In one case it was the only employed member of an incorporated society (an operations manager), and in four cases, it was a branch or regional manager. In one CSO, the regional manager did not feel capable of giving a comprehensive strategic overview of the organisation's decision-making and financial situation following the earthquake, because much of the response was coordinated by the main office in Wellington (NZ). In this instance, I interviewed both the regional office manager in Christchurch and the Wellington-based recovery coordinator for the organisation.

In several cases, another organisational leader or staff member participated in part of the interview. For example, in three of the CSOs owned by partnership, both partners participated in at least part of the interview and contributed to the PAS exercise (described in the next section). In three different cases, an employee participated (in an unplanned and informal way) in a significant part of the interview.

The interviews lasted between 1.5 and 4 hours. I recorded the interview's audio with the respondent's permission, and transcribed the audio for textual analysis. The interview structure aimed to:

- Obtain a general narrative of what happened to the organisation between the September 2010 earthquake and the time of the interview in mid-2012.
- Explore the relationship of the organisation to its local context, and how this relationship had changed following the earthquakes;
- Explore the organisation's perception of its recovery progress, challenges, and ability to adapt to changes in its environment following the earthquakes; and
- The organisation's perceptions and utilisation of locational capital (location specific resources such as labour market, reputation, and infrastructure that were utilised by the organisation for its benefit).

If the organisation was operational at the time of the interview, I tried to conduct the interview at its primary premises during work hours. [14] I was able to do this with 19 CSOs, and for all but two of the remaining cases I was able to visit the premises on a separate occasion. [15]

Location was an important consideration for these interviews. Interview location can play a significant role in the way knowledge is constructed during an interview (Elwood & Martin, 2000; Herzog, 2005). It was my view that conducting the interview in the physical setting of the organisation could help respondents to answer from an organisational perspective. When undertaken in a work environment, an interview situates the participant in

[14] Four CSOs were not operating and did not have physical premises at the time of the earthquake. In three of those cases, I made a separate visit to the site of either the demolished or closed building. For the remaining case, I visited the organisation after it reopened in a new location about a month after the interview.

[15] In two instances, I did not visit an operational organisation's premises. In one case, the premises was a workshop and was scheduled for an engineering safety assessment. As a result, the respondent did not feel comfortable conducting the interview there. The building was later red-stickered and demolished. In the other instance the respondent was only available for an interview on a weekend, and wanted to conduct it at his house. Soon after the interview the business relocated to new premises in a new development that I was only able to see the outside of during the study period.

a space where they routinely interact with others, and in which they will have certain roles and identities (Elwood & Martin, 2000). For example, the respondents in this study were asked to answer questions 'on behalf of' their organisation. Yet, the respondents also experienced the earthquakes and subsequent recovery as parents, church, club, or community members, and homeowners.

Many of the interview questions explored aspects of space (e.g. the organisation's premises and location) and the ways these affected organisations before and after the earthquakes. The interview setting often acted as an elicitation tool, evoking and sharpening specific memories of the respondent's post-earthquake experiences in the organisation.[16] For example, cracks in the walls served as a visual prompt for one respondent to discuss their anxiety about the degrading condition of the building caused by on-going aftershocks.

I refer to visits to organisations' premises, either to conduct the interview or on a separate occasion, in Table 7 under the category, "field observations." My visits to organisations might be considered relatively brief (0.5-4 hours), especially if compared to ethnographic case study research where the observer typically embeds herself with an organisation for an extended period of time. Yet, conducting interviews at the organisation's premises during work hours provided an efficient way to observe the organisation's premises, surroundings, and everyday interactions (e.g. among staff, customers, suppliers and others visiting the organisation). Here is an example of a field note written when interviewing the owner/operator of a hospitality organisation:

> "[The respondent] transitioned easily from the interview to work and back…He had conversations with customers as they entered, recalling a personal detail or carrying on some previous conversation with each person that came in" (Field Notes, May 2012).

[16] C.f. Dick (2006) for further discussion of visual elicitation techniques in interviews.

These field observations allowed me to connect with the sensory experiences that can be difficult for respondents to verbally articulate and for the researcher to comprehend. For example, my comprehension of the stress that a respondent attributed to being located near a large construction site was enhanced by experiencing the persistent and jarring vibration from a nearby pile driver, and by hearing the noise of metal striking metal as I visited the organisation's premises and nearby area. In the dynamic post-disaster environment, the additional degree of information provided through field observations was very useful for interpreting organisations' experiences.

3.7.3 Support networks & participant aided sociograms

A social network is composed of nodes – which represent entities such as individuals, organisations, and institutions or socio-political units (e.g. governments) – and a set of relationships connecting these nodes (Knoke & Yang, 2008; Scott, 2000). The relational structure of the network can be analysed at three primary levels: the individual (egocentric), the dyadic (relations between pairs of actors), and the system or whole-network level (Mizruchi & Marquis, 2006).

Egocentric analyses focus on a set of relationships of an individual entity, such as a business or a CEO (Burt, 1992). Egocentric networks are depicted with the ego (focal object of study) in the centre with links to all of the nodes with whom the ego has relations. Analyses in this study focused specifically on egocentric networks of each case study organisation and the dyadic relationships within its networks. I examined the egocentric networks of each CSO separately and compared the CSOs' networks in the cross-case analysis.

To capture data about each CSO's ego network, I used a structured survey composed of two types of questions or prompts: name generators and name interpreters. *Name generators* ask respondents the names of actors with whom the respondent has relations, and

name interpreters ask the respondent about these actors' attributes (Burt, 1997; Marsden, 2002).

An organisation's network changes over time and is context dependent. It was therefore necessary to restrict the name generator questions to specific types of interactions, periods of time or events, and to specific attributes (Burt, 1997; Hogan, Carrasco, & Wellman, 2007). The name generator I employed in this study (Box 3.1) asked CSOs about the entities they found helpful for their recovery following the Canterbury earthquakes.

Box 3.1 CSO support network name generator

"Think of everyone that helped your organisation following the Canterbury earthquakes (September, February and everything after). This help could have come from other businesses, charitable groups, friends, or anyone. They might have given your organisation resources and information or even emotional support that you found helpful for running your business and adjusting to changes following the earthquakes. Please list those that your organisation found helpful on the sheet provided."

The name generator question was followed by several 'name interpreters', questions designed to gather more information about the nodes, the attributes of the relationship between the ego and the nodes, and among the nodes (i.e. dyadic relationships).

Gathering and interpreting network data can be time consuming for both the researcher and the respondent. For example, if the respondent lists 15 nodes in her network and the researcher uses three name interpreters, then the researcher needs to ask forty-five questions following the initial name generator. It can be difficult to keep respondents engaged during this prolonged and repetitive questioning (Hogan et al., 2007). As a result, researchers will often restrict the number of nodes that respondents can list (e.g. 'the three people with whom you discuss your business's finances most often') (Marsden, 2005). The effectiveness of this approach may be limited by a respondent's cognitive biases. For example, respondents tend to recall nodes in social clusters, so they might list people from their family one after the other and then list people from work(Brewer, 2000; Marsden,

2005). They are also more likely to recall their strong ties and ties to people of higher social status (Brewer, 2000).

In an attempt to counteract some of these limitations, I used participant aided sociograms (PAS) to support the generation and interpretation of each CSO's support networks. A sociogram is a diagram that charts interpersonal relations. In the PAS methodology the study participant creates the sociogram displaying all of the actors that supported the organisations and ties among them (see Figure 5). Using the PAS methodology, the respondent created a network visualisation during the interview process. I later coded the information from that visualisation into a data matrix for further analysis.

Studies comparing PAS network data collection with other non-visual data-gathering techniques show that PAS techniques assist respondents to recall more nodes, producing larger networks (Marsden, 2005). Respondents also tend to find the PAS process visually compelling and thus stay engaged for longer when compared to non-visual techniques (Bernardi, 2011; Hogan et al., 2007). Proponents of PAS also believe that it leads to more robust results by allowing the participant to review and modify the network in real time (Bernardi, 2011; Hogan et al., 2007). Sociograms are both a mechanism for recording information and stimulating conversation and co-analysis between the researcher and participant.

I used a version of the PAS method applied in Hogan et al.(2007) and Carrasco et al.(2008). This method is deployed using a series of sequential steps:

1. First, I recited the name generator prompt and asked the participant to write actor names on a series of note tags.[17]
2. The respondent filled out the names in order of free recall.

[17] I brought a 'name template' to every interview with 50 (~1cm x 3cm) Post-It ™ notes already laid out and pre-numbered.

3. I then gave the respondents a card with a numbered list of actor groups or role categories (see Box 3.2 for the role categories used in this study).[18] Then the respondent wrote the corresponding number on the note tag.

Box 3.2
Role response card

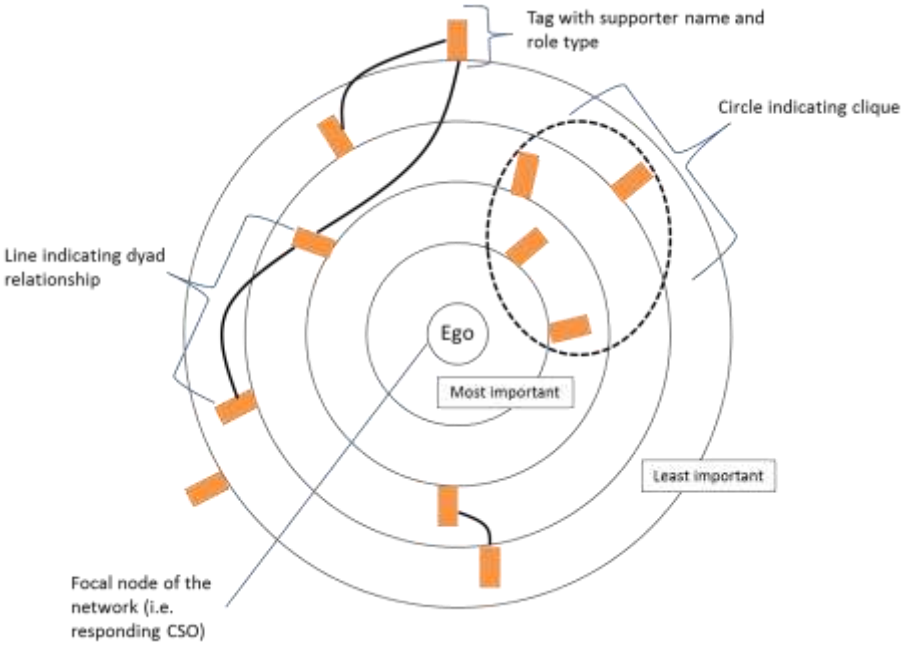
1. Family
2. Friend
3. Supplier
4. Customer
5. Another part of our organisation (e.g. another store in same franchise etc., department in different location)
6. Competitor in same/similar industry
7. Non-competitor in the same/similar industry
8. Business association/Industry group
9. Community group/Charitable group/Not-for-profit
10. Other business
11. Government agency
12. Other

4. Next, I presented a large sheet of paper with four concentric circles (the sociogram) and gave the respondents three basic instructions:
    a. The circles represent importance [19] (to the organisation following the earthquakes), so place the most important people/organisations to your organisation on the inner circle and work outward.
    b. Place tags on lines, not between them.
    c. Rearrange the ties until you are satisfied.
5. The respondent placed the tags appropriately. Then they drew links between actors that knew each other (Hogan et al., 2007) and circles around actors where everyone knew each other (also described as cliques).[20]

Figure 5 presents a schematic diagram of the PAS.

[18] The idea of using role categories came from Hogan et al., (2007), but I adjusted the categories to suit organisational networks and refined the wording during the pilot interviews (discussed later).
[19] Following Bernardi (2011), "The meaning of the term importance purposefully was not specified; the aim was to explore the borders of this dimension from the point of view of the respondents" (p.794)
[20] Drawing allowed the participant to identify dyad ties without being asked repetitive questions about which alters know each other, significantly shortening the network data collection process.

Figure 5: Participant aided sociogram components



The final sociogram contained information about the names and roles of the nodes, their relative importance to the organisation, and which nodes knew and interacted with each other. The sociogram has already 'interpreted' information about the nodes and their relationships without the need for repeat questioning.

After constructing the sociogram, I then followed up with additional name interpreter questions. In the interest of the respondents' time and patience, I only asked name interpreter questions for up to fifteen nodes,[21] following the sampling algorithm from Hogan et al. (2007).

I asked seven name interpreter questions about each node (so for a network with 15 nodes, I asked a total of 105 questions). For five of the seven questions, I provided response cards with closed responses. This standardised the responses which eased coding and

[21] Manfreda et al., (2004) found that respondents completing an online network-interpreter abandoned the task after fifteen nodes. I used this finding as a guideline for my sampling procedure.

improved answer speed if the respondent chose to use them.[22] Table 8 summarises the name interpreter questions and closed responses included on the response cards.

Table 8: Name interpreters and response card answers

Question	Possible answers	
How long has your organisation known or worked with this person/ organisation?	Less than 6 months Less than 1 year 1-5 years 6-10 years More than 10 years Unknown	
What kinds of support did your organisation received from this person/organisation following the earthquake?	*Open response*	
About when did your organisation receive this support?	Following the September 2010 Earthquake	Following the February 2011 Earthquake
	1 – Almost immediately 2 – Within a few days 3 – Within a few weeks 4 – More than a few weeks	5 – Almost immediately 6 – Within a few days 7 – Within a few weeks 8 – More than a few weeks
	9 – Other (please specify)	
What kinds of support was your organisation able to offer this person/organisation?	*Open response*	
Where (geographically) was this person/organisation located before the earthquakes?	1- In same town as your organisation 2- Outside of town, but in same region 3 -Outside of region, but in New Zealand 4- Outside of New Zealand 5- Unknown	
Where (geographically) was this person/organisation located after the earthquakes?	1 - In same town as your organisation 2 - Outside of town, but in same region 3 - Outside of region, but in New Zealand 4 - Outside of New Zealand 5 - Unknown	
What is/was the primary form of communication?	1 – Face-to-face 2 – Telephone 3 – Personal email 4 – Mass communication (e.g. post, email) 5- Other	

[22] Most respondents used the response cards initially and then anticipated the questions with comprehensive answers covering all or most aspects of the name interpreters without the need for constant repeat questioning.

Networks possess both interactional and structural attributes (Coviello, 2005). This means that both 'soft' and 'hard' data are necessary for a complete network analysis. Qualitative network data generated through discussion of the PAS were especially valuable where "rich, deep, process-based network information is required" (Coviello, 2005, p.43). Qualitative interpretations helped me avoid falling into static interpretations and oversimplification of CSO networks, a possible risk if relying solely on the statistical outputs produced by the network analysis software package (Coviello, 2005). Although network generators and interpreters form a structured interview process, the interaction facilitated by the PAS created room for discussion and engagement. I audio recorded the entire exercise, which always directly followed the semi-structured interview, and included the discussions that occurred during this exercise as part of the interview transcripts.

Following the main network generation and interpretation exercise I finished with several questions to evaluate network absences, gaps, and what might be called support hindrances (i.e. "important in a negative sense" (Bernardi 2011, p.795)). I included two boxes on the right hand side of the sociogram, and respondents identified and discussed: 1) "People or organisations who were important to your organisations before the earthquakes, that you did not associate with after the earthquakes [for any reason]" and 2) "People or organisations that have been unhelpful, damaging, or disruptive to the recovery of your organisation." I finished the reflection by asking the respondent about unfulfilled expectations of support and what the organisation needed before it would be fully recovered.

Both the semi-structured interviews and the PAS exercise enabled participants to produce explanations and evaluate their own practices. By using questions that did more than ask participants to recall events, I was able to engage in active dialogue and collaborative learning with them.

3.7.4 Organisational health structured interview

The interview and PAS data collection period ended in June 2012, approximately 16 months after the February 2011 earthquake. During the interviews, many of the respondents discussed impending moves, reopening, and other major changes that were planned in the coming months. As a result I decided to follow-up with each organisation again in early 2013 to broadly assess the organisation's financial health, [23] operational and recovery status, and other organisational changes that may have occurred in the intervening months.

To decrease respondent burden, I conducted this final follow up as a brief structured interview. I sent the survey as a Microsoft Word document and followed up over the telephone. I provided included a link to an online survey engine (Qualtrics) for organisations that preferred not to follow up by telephone. All but one CSO completed the final structured interview. [24]

3.7.5 Integrating multiple methods

There are four general reasons for combining multiple methods in case studies: complementarity, development, triangulation, and initiation (Wolfram & Hassard, 2010). Each of these reasons played a part in my decision to collect quantitative and qualitative data using the methods described above. The first, complementarity, refers to methods that explore overlapping and deviating aspects of a phenomenon. For example, in the initial surveys, respondents noted that they had relocated all or parts of their organisations for varying lengths of time. A substantial part of the in-depth interview in 2012 unpacked the process of organisations' relocation, expanding on these different forms and processes of

[23] CSOs reported their revenue between financial years 2008 and 2012 on a scale with the options of excellent, good, satisfactory, poor, very poor or N/A. Revenue refers to the income generated by the organisation (from sales, capital and assets) before deducting costs and expenses.

[24] I was able to answer many of the questions for the remaining respondent by conducting a final unobtrusive site visit. This confirmed that the organisation was still open and operating in the same temporary location that they had been during the interview.

relocation. Similarly, field observations added a layer of depth and description to phenomena recorded in surveys and interviews.

The next reason, development, describes the use of one research method to develop another (Wolfram & Hassard, 2010). The in-depth interviews and preliminary analysis of those interviews guided the development of the final follow-up structured interview in 2013.

The third reason, triangulation, in this study refers to data source triangulation and triangulation of methods.[25] I captured information about the same phenomena (e.g. the effects of building damage on the organisation) in different forms using multiple methods: surveys, interviews, and field observations. Integrating data sources allowed me to corroborate evidence received in another form (e.g. quantitative or qualitative) or collected using a different method (e.g. interviews and field observations). Collecting data with a number of different tools provided different layers of evidence about the same phenomenon (Yin, 2009).

Finally, initiation is the process of analysing qualitative data using quantitative methods and vice versa (Wolfram & Hassard, 2010). For example, it includes analysing interview results qualitatively and then reanalysing the same data quantitatively to draw out different components. I utilised this approach at several points in the cross-case analysis. For example, I quantised qualitative data about the types of support that organisations mobilised from their network data by coding the data and counting frequencies and proportions of the various types of support. Similarly, after quantitatively analysing the network data, I also visually analysed the network structures and used information from the interviews to explain network properties.

Two additional factors influenced my choice to integrate the survey data with the interviews, network data, and field observations. First, surveys were less intrusive, more

[25] There are two other types of triangulation in addition to data and methodological; these are investigator triangulation and theory triangulation (Wolfram & Hassard, 2010).

flexible, and quicker to deploy than interviews. This was important in the immediate aftermath of the earthquakes in 2010 and 2011. Organisations were often significantly disrupted and most respondents expressed a preference to do the survey on their own time at their own pace, as opposed to conducting it in person or over the telephone. The relative speed of deployment meant that I was able to capture standardised data about disruptions and earthquake-induced changes while it was still relatively recent in the respondents' experience.

Second, surveys and the structured interviews provided an efficient way to capture a large amount of data from a greater number of case study organisations, and to have that data in a format that was relatively easy to analyse, acquiring data depth while avoiding unnecessary data bulk (Voss, Tsikriktsis, & Frohlich, 2002). By capturing a significant amount of basic data about the organisations and their immediate earthquake impacts and recovery strategies (i.e. insurance status, whether they were accessing grant funding), I was able to better target the interviews and focus on developing a depth of explanation and understanding.

3.7.6 Confidentiality

All research participants (both CSO representatives and key informants) signed a confidentiality agreement that guaranteed that their name and any uniquely identifiable information would be omitted from any future use of this study's results. In this study, confidentiality was the default option. Only one of the 32 CSOs, *God Save the Queen* in Lyttelton, opted out of the confidentiality agreement and allowed their organisation's name to be used in reporting. I assigned all of the other organisations pseudonyms, and only refer to the research participants by their general organisational position description (e.g. regional manager, owner).

There are benefits and drawbacks to confidentiality in case study research. Confidentiality is the dominant paradigm in social science research, advocated by researchers

as a way of reducing potential risks to participants and of facilitating more open conversation between the researcher and the participant (Guenther, 2009). Conversely, naming research participants can be empowering, allowing the participant to have a more active voice in the research (Baez, 2002; Guenther, 2009), and incentivises more sensitive and nuanced portrayals of study subjects (Guenther, 2009). In this instance, I felt that the potential loss of access to organisations and my desire to respect participant concerns about how they or their organisation might be portrayed in a rapidly changing environment outweighed the potential benefits of using organisations' names.

Similarly, for key informants, I use only very general positional and organisational descriptions. Some of the interviewees are prominent members of their communities and may be easily recognised in the descriptions with even small amounts of affiliation information. Although the ramifications of identification are likely quite minimal for the respondents, I prioritise the promise of confidentiality over specificity of description.

3.8 CSO Analysis

The same features that make case studies useful and interesting (e.g. different methodological perspectives, the richness and depth of data, and the temporal scope) also make case studies difficult to analyse and interpret. Case study analysis depends heavily on the interpretive skills of the researcher (Yin, 2009). Cross-case analyses are even more challenging because they require two forms of analysis: 1) data have to be synthesized within each case study to produce a meaningful analysis of the mechanisms driving organisational outcomes, and 2) data have to be synthesized across the case studies, allowing the research to make links between different contexts (situations, circumstances, environments) and the causal mechanisms that influence organisations' outcomes.

The following discussion of my analytical process begins with a reflection on validity and reliability in cross-case analyses. I consider the challenges and theoretical considerations that I accounted for in my analyses and interpretation of the data, and the strategies put in place to achieve validity in this research. I then outline the specific procedures I used to process and interpret the CSO data.

3.8.1 Validity, reliability, situated knowledges, & positionality

There are limits to any researcher's ability to reliably represent reality or even respondents' constructions of reality. Yet, in keeping with critical realist approaches to research, through a process of reflexivity and rigour, it is possible to gain valuable information about social worlds through case study methods, including in-depth interviewing.

The participants in this research were almost exclusively organisational leaders, responding to the best of their ability from the perspective of the organisation. Accessing information from one or two organisational representatives (as opposed to interviewing multiple organisation members occupying different levels of the organisation) narrows the scope of perspective. No one can offer an objective rendering of an organisation or present the omnipotent "view from nowhere"; all information is a "view from somewhere" (Haraway, 1988).

By targeting upper level organisational representatives, I did not presume that leaders had the only or even the most complete or accurate perspectives. Leaders do, however, tend to be well situated to provide a strategic overview of an organisation's operations and decision making. At the same time, they may be more invested in portraying their organisation in a positive light, though I attempted to reduce this effect by providing confidentiality. Although focusing my efforts on organisational leaders provided a limited view of the organisation, this approach allowed me to gather comparable data from a relatively large number of case studies which offers its own analytical benefits. These

benefits include, for example, being able to observe the way a mechanism influenced organisations in different contexts and to consider the different processes that organisations of different sizes and in different industry sectors employed to achieve similar goals.

As the researcher, I entered a relationship with research participants "who [were] themselves embedded in a nexus of relationships" both inside and outside of the organisation (Bradbury & Lichtenstein, 2000, p. 560). Our relative positions in various social structures not only influenced the way knowledge was reported by the interview respondent but also how I interpreted and reported it. For example, my position as an 'outsider' in a number of regards (e.g. as an academic not a business owner, a relatively recent immigrant to New Zealand, and as young in comparison to respondents whose average age was between 40 and 50 years old), may have caused respondents to approach exchanges with me differently than they would with someone else, such as another business owner from their town. Conversely, respondents often asked me about my experiences with the earthquake and that sense of common experience often opened doors to further conversation.

Research participants produce knowledge through interaction with the researcher which the researcher then interprets, situates in the context of a relevant body of literature, and uses to generate questions for further enquiry (see Brogden (2010) for more on the concept of the double hermeneutic in case study research). As a researcher, I cannot completely control, standardise, or even recognise the implications of these multi-layered interactions, but it is still possible to produce useful knowledge about the world. As Miller and Glassner (1997, p. 99) argue, "two persons can communicate their perceptions to one another, [while] knowing full well that there are both structures and pollutants in any discussion."

There are several strategies for improving validity and reliability in case study research. I employed two particular strategies to improve the internal validity[26] of my case study processes: triangulation and respondent validation. First, triangulating multiple methods, as discussed earlier, enables researchers to integrate their research participants' situated knowledges by capturing different aspects of the same phenomenon (Bowker, 2001). The second method for improving validity is respondent validation, and it involves presenting results and analyses to research participants, soliciting feedback, and incorporating this feedback into the ongoing case interpretation process. I was able to do this at two points in the data collection process. First, I discussed CSOs' survey responses during the interview process. Second, during the PAS exercise participants could see the picture of their network, manipulate and explain it to aid the network interpretation process. The PAS provided immediate visual feedback as a basis for ongoing discussion. Furthermore, at the conclusion of this research process I will send the participating case studies copies of the reports and publications (including this thesis) produced from this research. Although it does not improve the validity of the research presented here, it is an important part of maintaining accountability and continuing the collaborative learning process with CSOs.

Finally, by creating and following a case study protocol and analytical procedure I sought to standardise those aspects of my interactions with research participants that I was able to control (Yin, 2009). The details of these efforts are described in the next two sections. Establishing reliability means that another investigator following exactly the same procedures would arrive at the same or similar conclusions. It requires the researcher to establish a chain of evidence and maintain a case study database (Yin, 2009). The case study database ensures that raw data are systematically stored and catalogued, ready for examination by an independent investigator. Although my data was collected under confidentiality agreements,

[26] Internal validity is especially relevant to explanatory case studies as it is concerned with demonstrating causal relationships between variables where causes cannot be directly observed. This is different from external validity which is concerned with gernalisability to a larger population (Yin, 2009).

I have maintained copies of all the raw data, including surveys, field notes, audio files, transcripts, and PAS diagrams in locked storage (for hardcopies) and password protected files (for electronic data). My chain of evidence links the final theorisations in this thesis to a body of evidence in the case study database. The production of evidence is clearly linked to the case study protocol (justification for case studies and records of the processes involved in developing the study and data collection – recorded in an ongoing review document). And these are then clearly linked to the original guiding research questions in the final comparative case study results.

Construct definitions

I utilise a number of constructs in this research, some of which I explore theoretically and others that I measure and compare among the CSOs. In this section, I outline several key constructs, providing definitions of the specific concepts as they relate to the objectives of the study (Yin, 2009), and where applicable, I outline the 'operational measures' used to evaluate the concepts. The process of tightly specifying the constructs assessed in the research not only increases validity in case studies, but enhances reliability by outlining systematic measures to ensure that I am measuring and analysing the constructs consistently for every case (Yin, 2009).

Construct 1: Organisational post-disaster trajectory

The term trajectory refers to the path of an object moving through time or space. In this study, I use the term trajectory to refer to the path that an organisation's health has taken between the 2008 and the end of 2012. The term trajectory suggests any measure of an organisation's post-disaster health is a point on a longer temporal trajectory. In the two years of disruption that occurred between 2010 and 2012 organisations experienced downturns and

temporary surges, and will likely continue to experience shifts as the recovery process continues.

In the organisational health survey (OHS) conducted in March and April 2013, CSOs reported their revenue each year for a five year period (between 2008 and 2012) on a scale from very poor to excellent. If the organisation did not feel that revenue was an appropriate measure (e.g. for non-profit organisations), they reported their assessment of "the financial resources available to support your mission for each financial year."

The trajectories, as depicted in Figure 6, are divided into three general categories. If the organisations experienced sustained improved revenue into 2012, they were placed in the developmental change category. If they experienced sustained revenue worse than before the earthquakes, they fell into the degenerative change category. If the organisation experienced no change or a temporary decrease or increase followed by readjustment, they fell into the restoration of pre-disaster trends category.

The categories are based on, Bates and Peacock's (1989, p.353) categories of post-disaster community recovery. Each category is defined more broadly as follows:

1. Developmental change: Positive adaptive changes leading to reduced vulnerability of the system or a sustained and obvious improvement in revenue following the earthquakes (also categorised as a 'resilient' response)
2. Restoration of pre-disaster trends: No sustained increase or decrease in revenue beyond pre-disaster trends
3. Degenerative change: Negative changes that increase vulnerability, sustained and obvious decrease in revenue

Figure 6: Examples of CSO financial trajectories

In order to verify that the revenue trajectory corresponded with the CSO leader's assessment of the organisation's general situation, in the OHS CSOs also indicated whether they felt their organisation was significantly better off, slightly better off, the same, slightly worse off, or significantly worse off compared to before the earthquakes. Respondents further explained this response in an open follow-up question.

There were four cases (out of 32) where the subjective self-assessment and the revenue trajectories did not match. In all of these cases, I deferred to the self-assessment. As in all of these cases, self-assessment reflected a change that the very general revenue categories could not. For example, one retail CSO consistently reported 'good' revenue from 2009-2012, but reported that the business was 'slightly better off' compared to before the earthquakes explaining in an open response question in the 2013 structured interview:

> "Just getting the population influx now from [new residential developments]… Lots of shops pulled down around us, on our own, makes us stand out quite conspicuous" (Owner, Amherst Retail).

They also predicted further improvement due to their new location near a complementary business, which was likely to generate further income for their organisation. Thus, in this instance and others where the qualitative assessment differed from the financial indicator, I deferred to the opinion of the respondent.

Construct 2: Organisational social capital

In this study, I needed to consistently define what constituted organisational social capital. Social capital can be understood as the resources, information, social support and acceptance created and mobilised through relational networks. A basic premises of social capital is that investment in social relations yields a return (Lin, 2001).

Organisational social capital comes from two sources. First, organisations as a collective entity engage in networks of relations. Through a history of interaction, which can outlast or exceed the capacity of any single member of staff, the organisation builds reputational resources and accumulates expectations and obligations of support from other people and organisations. Staff members can then mobilise this social capital on behalf of the organisation when needed. Second, people working within the organisation can mobilise resources from their networks formed both inside and outside of the organisational context to aid the organisation. This latter form refers to the concepts of social capital aggregation and appropriable organisation (where networks formed in one context are used in another), as discussed in Chapter 2.

In this study, it was difficult to clearly distinguish between personal and organisational forms of social capital. The earthquakes blurred the boundaries between people's personal and professional lives in ways that made clear distinctions between personal and professional irrelevant. For example, in many cases, people literally had to move their businesses into their homes. Similarly, organisations were often navigating unfamiliar territory while under serious time and resource constraints after a disaster,

necessitating quick decisions and improvisation when resources are unavailable through traditional channels. In many cases organisation members accessed support from friends and family members to meet organisational needs. Yet, particularly in small firms, this can be a viable adaptive strategy for organisations post-disaster.

I therefore define organisational social capital as the benefits accruing *to the organisation* through inter-organisational and inter-personal networks. In the CSO analyses, I removed any reference to support that was not directly or obviously beneficial to the CSO. In instances where a supporter only provided personal support to the respondent, I removed the node from the network generated in the PAS exercise. For example, a CSO respondent representing a building supply firm reported that a district council member helped them obtain building consents for their earthquake damaged church. In this instance, I removed both the reference to the support and the node from the network as it was unrelated to the building supply firm's recovery.

Construct 3: Geographic embeddedness

As I considered research question 3 about an organisation's relationship to its local context, I assessed the degree to which organisations become embedded in places and the mechanisms that drive this differential embedding. As I developed theories about these mechanisms and their consequences, I referred back to three definitions of geographic embeddedness discussed in the previous chapter, to ensure a consistent interpretation of this phenomenon. For the purposes of this study, geographic embeddedness encompasses:

1. Organisational links to local social and cultural events and institutions (Pallares-Barbera, Tulla, & Vera 2003).
2. The number, strength, and frequency an organisation's relationships within a local area or region within and across sectors, specifically focusing on non-market relations (Copus, Dubois, & Hedström, 2011).

3. The extent to which actors are ‘anchored’ in particular territories or places. This includes localised manifestations of broader networks (Hess, 2004, p.178).

These elements provided guidance for analysis and interpretation of the organisational geographic embeddedness.

3.8.2 Analytical procedures

Comparative case study research requires a process of constant reflection and analysis (Yin, 2009). It would be impractical and compromise the quality of the research to gather all of the case study data and analyse it at the very end of the process. My analytical procedures were not only concerned with producing the final cross-case theoretical results, but with guiding the progress of the research. For example, early key informant interviews, field observations and survey analysis informed my decision to examine organisational connectivity in the first place. Analysis of the knowledge gaps in the survey data following the September 2010 earthquake guided the selection of case study methodology to provide more in-depth understanding of the causal mechanisms we were not able to capture with purely quantitative approaches.

Similarly, the sequential development of the data collection techniques required preliminary analysis of the data to inform the development of the next step. The survey results informed the development of the interview questions. I then piloted the interview questions and the PAS with three volunteers representing three different organisations in March 2012. The participants provided feedback immediately following the process on what they liked, disliked, and wanted to add or change. I then sent them analytical notes including a digital visualisation of their network and some preliminary results, and again requested feedback from the pilot participants. I conducted each pilot interview in turn, incorporating changes as appropriate before piloting the altered version with the next participant.

During the interview and PAS data collection period, I collected and analysed the data in parallel. My approaches have their foundations in a modified grounded theory approach referred to as constant comparative, which requires an iterative process of data collection, reflection, and refinement (Charmaz, 2003; Saldaña, 2011). I conducted interviews a few at a time, read the transcripts and field notes, and revised the process allowing 'early leads' to shape the subsequent data collection (Charmaz, 2003, p.318). Although the core content of the interview guide remained mostly unchanged, I identified questions to rephrase, concepts to follow-up in greater depth, and began forming questions and assertions for later analyses.

The field notes I recorded directly after each interview were an important part of this reflective process (Mason, 1998). They allowed me to document my reaction to the respondent and the situations I observed, provide a fresh interpretation of what I had seen and experienced, and to identify themes that felt significant in the moment.

Finally, data gathered using one tool often needed to be analysed to allow further analyses and cross-case synthesis. For example, the last data collection tool deployed, the OHS, was essential in determining the comparative quantitative measure of the CSOs' recovery trajectory. These trajectories formed the basis for comparing organisational and support network trends derived from the interview and PAS data.

Survey analysis

In this study, the survey data does not form a representative sample of Canterbury organisations from which meaningful generalisations can be derived. Rather, these data form the quantitative backbone for the cross-case analysis, aiding in the process of systematic pattern recognition. Additionally, data gathered from the OHS formed the basis for allocating organisations to particular trajectory groups.

Unlike interview data, structured surveys with closed choice, numerical, or short answer responses were not subject to further interpretation and engagement. Data was taken

as a reflection of the respondent's situated experience of the world. An advantage to the sequential data collection process in this study, however, is that I was able to achieve a slightly greater level of depth in the interpretation of the survey results by asking for clarification or elaboration of survey responses during the interviews (e.g. "You mentioned in the survey you filled out last year, that you had to make two staff members redundant after the February earthquake. Can you talk a little more about that?").

Participant aided sociogram analysis

Interpreting the support network data required blending and cross-analysing the interview and PAS data. The quantitative analyses considered several types of variables including: organisational attributes (e.g. size, age) gathered using the surveys, dyad variables (e.g. duration of relationships, description of support transferred), and structural network attributes (e.g. density of ties in the ego network) gathered using the PAS.

After gathering the network data in its paper form in the field, I coded the data into matrices in Microsoft Excel in a format that was compatible for import into UCINET [27] and IBM SPSS Statistics 19 (SPSS). UCINET (and its ego network analysis sub-programme ENet) is capable of executing some statistical and multivariate analyses (Borgatti, Everett, & Freeman, 2002). I visualised the networks in the compatible program NetDraw (Borgatti et al., 2002). I completed the more advanced statistical analyses in SPSS (i.e. correlations, Chi-squared, and Kruskal-Wallis). Additionally, as participants completed the PAS exercises, I recorded, transcribed, and coded qualitative responses (e.g. descriptions of support types) in QSR NVivo 9. Open responses to name generator questions as well as other discussions that were prompted by the PAS exercise aided interpretation of the network results.

[27] UCINET is a comprehensive programme for analysing social network datasets. It also has a companion programme (ENet) which is helpful for summarising and comparing data from multiple egocentric networks (Halgin & Borgatti, 2011).

Interview analysis

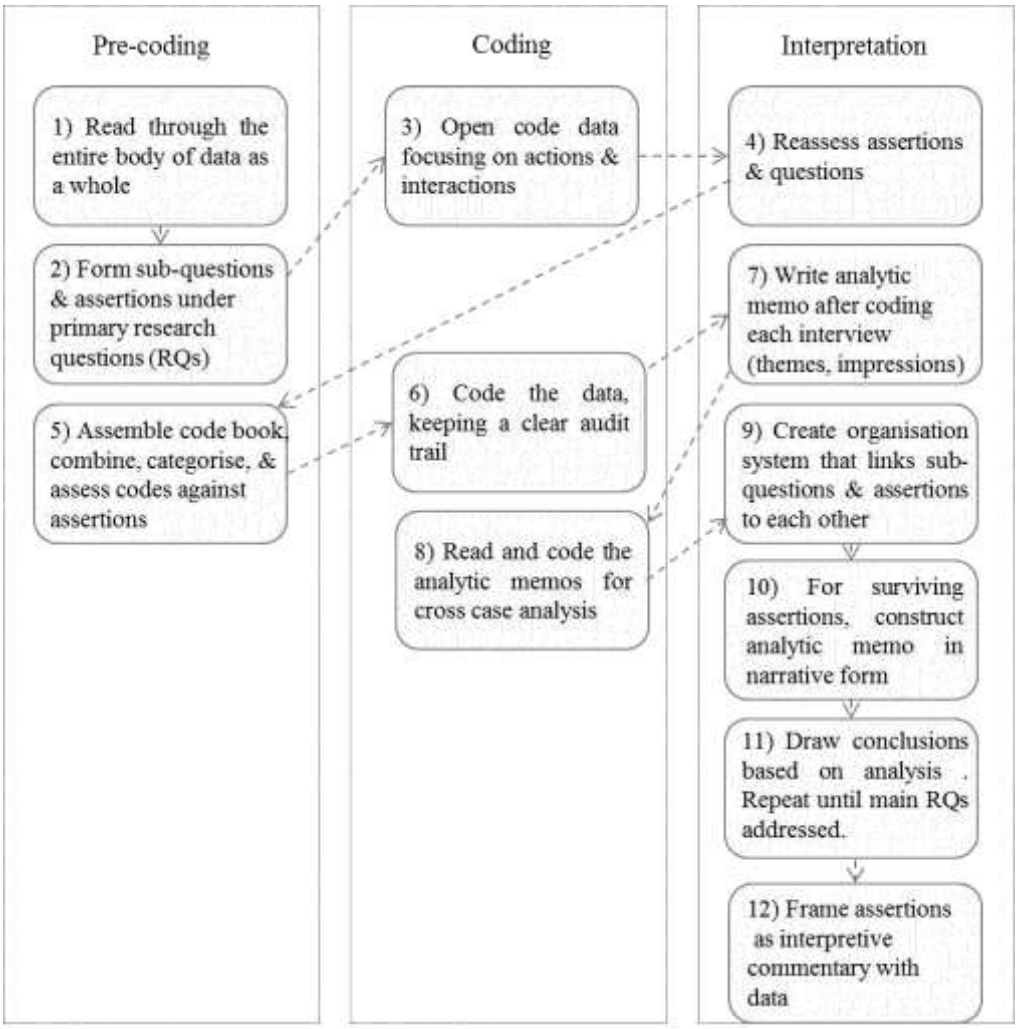
The constant comparative methods I employed in this research consisted of a set of inductive strategies for analysing data (Charmaz, 1995). I started with individual cases and developed progressively more abstract conceptual categories to synthesize, explain, and understand my data and to identify patterns relationships among the cases. The procedure I followed is presented as a sequential algorithm in Figure 7.

Familiarisation with the data and reflection on its production is a critical first step in the analysis (Mason, 1998), thus pre-coding begins by reading the full body of data including survey results, field notes, and transcripts. Then, following Yin (2009), I generated preliminary assertions and questions by inductive means. I processed the data in a series of steps, based on constant comparative approaches that constantly compare small units of data through iterative coding, form categories based on patterns and interrelationships between the codes, and abstract the findings to form theories about the underlying processes being examined (Maykut & Morehouse, 2005; Saldaña, 2011).

The procedure outlined in Figure 7 required three different forms of coding. First, open coding focuses on the actions and interactions in each line of text. This step provides the initial evidence that allows reassessment of the original assertions and questions. This is followed by full coding of the interviews with a set of codes defined and categorised in a codebook. Finally, as part of the cross-case analysis, I coded the analytic memos produced from each CSO interview.

This last coding iteration was necessary because I had two lines of inquiry. I wanted to be able to theorise about the causal mechanisms driving the events and outcomes for each CSO and to identify emergent themes across the cases. This dual approach created the need to produce additional analytic memos and comparisons.

Figure 7: Iterative analysis procedure for semi-structured interviews



By focusing on a detailed description of the data before attempting to produce more general theoretical statements, I was able to generate theories that were firmly based in the data collected (Liamputtong & Ezzy, 2006). Although it is impossible to remove researcher bias from the interpretation of data, people employing these methods approach the analysis with an open mind and avoid pre-formed theoretical assumptions or hypotheses (Martin & Turner, 1986). In the final step, I reframe the assertions made in step 2 (Figure 7) as part of an interpretive narrative supported by the data analysed and generated during the coding process. Throughout this rigorous procedure, the explanations and theory were "fashioned directly from the emerging analysis of the data" (Mason, 1998, p. 142).

3.8.3 Cross-case synthesis & interpretation

Thematic cross-case analysis is an approach that treats each organisation as a separate case but allows evidence from each organisation to be compared to produce generalized observations. This analysis produced elements of both explanation building and hypothesis generation (Yin, 2009). The process I used for this thematic analysis is very similar to the constant comparative approach described in the previous section. Burns (2010) adapts Glaser and Strauss' (1967) constant comparative approach to cross-case synthesis and interpretation. I followed the approach described by Burns (2010) as I analysed the cases.

My study includes a relatively large number of cases for comparison. Although I did not have the depth of information that might be typical of a single case or two case comparative approach, I did have a large body of data gathered using a number of data collection tools over a 2-3 year period for each organisation. To integrate this data and aid cross-case thematic analysis I developed a template to systematically synthesize the data that I gathered on the case studies. As a result I produced 32 standardised case study reports.[28]

Using the analytic memos from the in-depth interview analysis and the case study reports I identified several major themes (e.g. "communication/information technology adaptations"). Following the process described in Burns (2010), I compared various incidents where the theme occurred in the cases and compared different aspects of each occurrence across the cases. I then integrated the themes and their different associated properties, noting variations within and across the categories and cases or across different types of cases. For example, "When does an organisation implement changes to its communications/IT systems and under what conditions? Are there differences between organisations that had positive versus negative financial trajectories?" I then delimited the

[28] Due to the high degree of specific information about each organisation in these reports, after some deliberation, I decided that the risk of breeching confidentiality meant that they could not be included as appendices.

theory, combining patterns of relationships across the different categories to develop broader theories that answer my central research questions.

For each of my case study organisations, I wanted to understand the way relational and geographic embeddedness manifested in the post-earthquake environment. I examined extra-organisational networks to understand the ways organisations mobilised support after the earthquakes and discussed other aspects of intra- and inter-organisational relationships into the ways CSOs managed and accessed social capital. I also examined the way the CSO respondents understood the relationship between the organisation and its location prior to the earthquakes and the way this relationship evolved post-earthquake. This allowed me to construct theories about the mechanisms that influence geographic embeddedness, how these mechanisms evolve as a result of the earthquakes, and how these mechanisms influence post-earthquake organisational recovery outcomes including: relocation decisions, capital reinvestment in an area, and adaptations that the organisation implemented to cope in the altered post-disaster environment.

3.9 Conclusion

Building a bridge between two fertile areas of disaster research — the political-ecological and SES community resilience literature and systems approaches to organisational resilience — requires a method that facilitates in-depth contextual analysis. The multiple comparative case study approach described in this chapter enabled me to examine the complex social and geographic interactions that influenced organisations' post-disaster trajectories.

A defining feature of case studies is that they allow the researcher to explore a phenomenon in context. The contextualised, complex, and longitudinal perspectives facilitated by case studies were important to advancing the central aim of this study: to move

beyond abstracted and atomised perspectives prevalent in current organisational resilience thinking, and to find ways to consider the implications of an organisation's embeddedness.

The final step in cross-case analysis is to take all of the data and analyses produced throughout the study period and place them in our current understanding of organisational resilience to create new theoretical territory. In the next three chapters, I attempt to build a robust and engaging narrative that draws on the richness of the longitudinal comparative case studies and key informant interviews, while capturing the strengths of the standardised and comparable quantitative survey and network analyses. The intention is to shed light on the contextual and relational determinants of organisational resilience.

Chapter 4: The Canterbury Earthquakes and Post-disaster Contexts

4.1 Introduction

This chapter has two purposes. First, it provides background information about the earthquakes and the damage and disruption they caused in Canterbury. The earthquakes were critical pivot points that now punctuate Canterbury's development timeline, forming the 'pre- and post-' boundary around which many of the organisational changes discussed in this thesis have occurred. Second, the chapter provides information about the regional and local institutional, economic, and social contexts in which organisations were pursuing recovery.

In organisational case studies, context refers to the environmental conditions that enable or constrain organisational processes (Tsang, 2013). 'Context' is composed of the layered social-economic (e.g. labor-market trends), cultural (e.g. cultural expectations of reciprocity), physical (e.g. urban layout or infrastructure availability), and institutional (e.g. tax incentives or development policies) environments in which organisations are situated at a particular time and place. Contextualised studies capture the complexity and interaction that shape organisational processes better than those that focus on organisations in isolation, offering more complete explanations of organisational outcomes (Tsang, 2013; Yin, 2009).

The case study organisations (CSOs) that I examine in this thesis were situated in one of three commercial districts in Canterbury: the Christchurch CBD, the Kaiapoi town centre, or the Lyttelton town centre. Each of these centres has a unique history of development and provided different environments for the CSOs as they established and grew. These three centres sustained among the highest concentrations of damage in Canterbury (CCC, 2012). Even if the CSOs' buildings and stock were unaffected, the significant environmental changes from the earthquakes shaped where, how, and with whom they operated after the

earthquakes. Studying organisations in these centres offers unique insights into organisational responses to major contextual shifts.

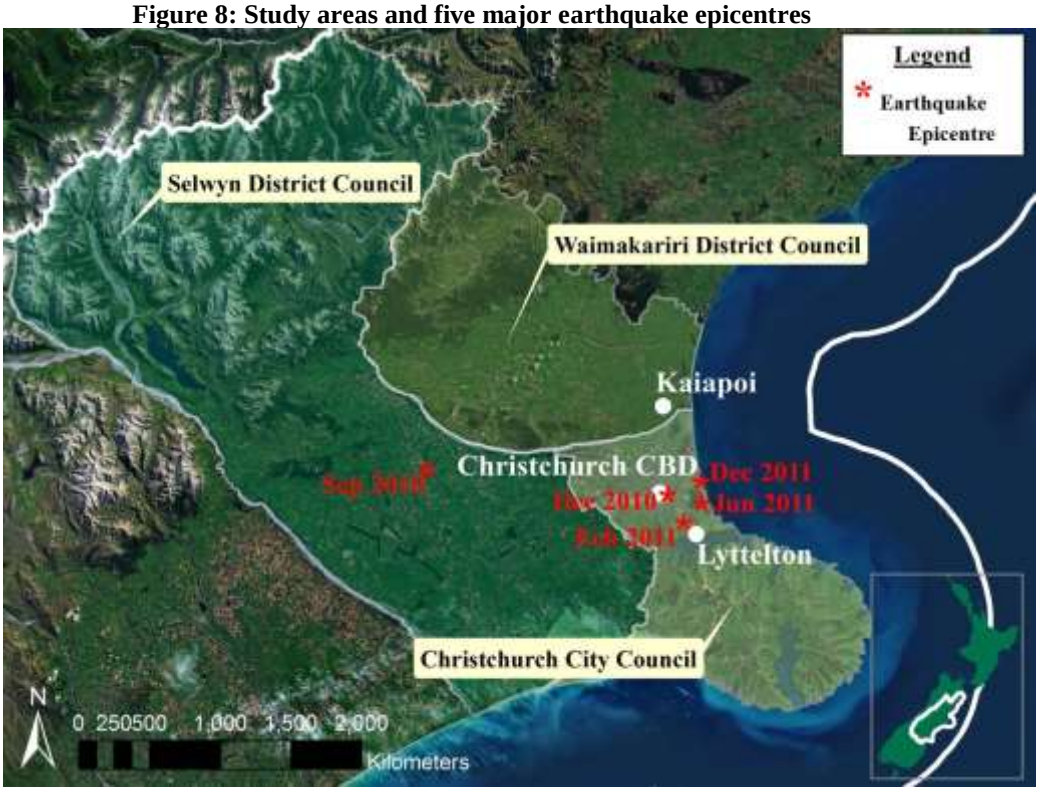
Prior to the Canterbury earthquakes, each of these town centres was developing and changing. The earthquakes interrupted and altered these development trajectories, while also shaping the post-earthquake environments for organisations in this study.

The discussion in this chapter draws on a combination of primary data from interviews with key informants (KIs) and field observations, and secondary data from reports, planning documents, and published literature. The contexts are presented here in the form of narrative reflections on the changing environments in Canterbury and the study town centres. They are intended as background for the in-depth contextualised analysis of the case studies which follow in chapters 5 and 6.

4.2 The Earthquake Events

During 2010 and 2011, Canterbury experienced five large earthquakes and thousands of aftershocks (the approximate location of the epicentres for these events are shown in Figure 8). The earthquake series unfolded with separate faults rupturing at different points in time, creating an uneven landscape of disruption and recovery. Prior to 2010, experts were aware that an estimated 50 per cent of Canterbury's seismic hazard was due to unknown faults (Stirling, Yetton, Pettinga, Berryman, & Downes, 1999). Public awareness of the area's seismic risk focused on the known and active Alpine fault about 150 km west of Christchurch, Canterbury's largest city. Canterbury has experienced disruptive earthquakes on other faults throughout its recorded history, but before 2010, there had been relatively little seismicity for nearly 100 years.

Figure 8: Study areas and five major earthquake epicentres



The 2010/2011 earthquakes are by far the most expensive disasters in New Zealand's modern history. The potential cost of recovery and reconstruction has been estimated at about NZ$40 billion, distributed between residential property ($18 billion), commercial and social assets [29] ($15 billion), and infrastructure ($5 billion) (NZ Treasury, 2013). The total estimated cost of the damage is equivalent to around 19 per cent of New Zealand's GDP (NZ Treasury, 2013). The following sections describe the main features of each of the five earthquake events.

4.2.1 September 4, 2010

An M 7.1 earthquake struck at 4:36 a.m. on September 4, 2010. The earthquake occurred on a previously unmapped fault approximately 40 km west of Christchurch at a depth of 10 km, in a rural area near the town of Darfield (see Figure 8). Areas near the fault rupture experienced ground accelerations that were 1.26 times the acceleration due to gravity

[29] Social assets include publicly owned buildings and property, for example, schools, libraries, and hospitals.

(GNS Science, 2011b). Due in part to its timing and location, there were few serious injuries and no fatalities attributed to the Darfield earthquake.

The September 2010 earthquake caused a large amount of shaking damage and significant but localised liquefaction damage. Damage was especially extensive in low-lying areas such as historic waterway channels and wetlands, particularly in Christchurch and Kaiapoi. Most of the damaged buildings were unreinforced masonry buildings and residences with foundations in areas experiencing ground failure (Wood, Robins, & Hare, 2010). Liquefaction and lateral spreading caused region-wide disruptions to buried infrastructure (including water and wastewater pipelines and some power and communications cables) and transportation infrastructure (road, bridge, and rail). Between September and December 2010, Canterbury homeowners lodged 142,635 claims with the Earthquake Commission, New Zealand's national insurance provider for damage caused by geophysical events (Wood et al., 2010).[30] The total estimated damage to buildings from this event was approximately NZ$4 billion, with an additional NZ$1 billion in lifeline utility damage (Bascand, 2011; Eidinger, Tang, & Rourke, 2010).

4.2.2 December 26, 2010

More than three months after the initial event, on Boxing Day 2010, a swarm of more than 32 shallow aftershocks (the largest of which was M 4.9), occurred on a fault almost directly below the Christchurch CBD. This is traditionally one of the busiest shopping days in New Zealand, and many Christchurch retailers were having sales and promotions to encourage customers to return to the CBD after the September event. As a result of the earthquake, a number of streets in the CBD were cordoned off, many areas temporarily lost power, and buildings experienced further damage. This event served to exacerbate people's

[30] Specifically, EQC insures residential property and contents against earthquakes, landslips, volcanic eruptions, hydrothermal activity, and tsunami (EQC, 2013).

perception that the central city was dangerous, and continued to negatively impact retailers and hospitality businesses in the following months.

4.2.3 February 22, 2011

Approximately six months after the September 2010 earthquake, a separate fault ruptured in Canterbury leading to a much different set of effects. On Tuesday February 22, starting at 12:51p.m., two relatively shallow and intense (M 6.3 and M 6.1 respectively) earthquakes occurred on a fault under the Port Hills near Lyttelton, approximately 10 km east of the Christchurch CBD. The energy release from this fault rupture was highly directional, with the horizontal East-West shaking effectively 'pointing' at Christchurch. The M 6.3 earthquake produced peak ground accelerations (PGA) of 2.2, which were significantly larger than those during the September earthquake, despite the February earthquake's lower magnitude (GNS Science, 2011b; Kam, Pampanin, & Elwood, 2011).

This earthquake again triggered widespread liquefaction, especially in central and eastern Christchurch, and damaged an estimated 46 per cent of greater Christchurch's road, water, and sewage infrastructure (CERA, 2012). This event also resulted in substantial rockfalls and landslides in the Port Hills to the south and east of the city, and high intensity shaking caused extensive building damage throughout Canterbury. Unlike the September earthquake, there were 185 fatalities (NZ Police, 2012). The majority (133) of the deaths occurred in two major building collapses in the Christchurch CBD (the Canterbury Television and the Pine Gould Corporation buildings).

4.2.4 June 13, 2011

On June 13, 2011, Canterbury was struck by an M 5.6 earthquake and about 80 minutes later by a more powerful M 6.3 aftershock (GNS Science, 2011a). These earthquakes were centred approximately 13 km southeast of Christchurch. There were no

fatalities, but an estimated 46 serious injuries and further damage to property. These aftershocks aggravated existing damage and caused some new damage to buildings and infrastructure in parts of Christchurch that had not been badly affected by earlier shocks (Taylor, Chang, Elwood, Seville, & Brunsdon, 2012). These earthquakes again caused widespread business interruption and affected the psychosocial well-being of the population. This had significant effects on organisations operating in disrupted areas, exacerbating strain among co-workers, leading to higher error rates at work, and resulting in staff and customers relocating from the area due to the on-going nature of the disruptions (Stevenson, Vargo, Seville, Mcnaughton, & Powell, 2011).

4.2.5 December 23, 2011

The last major earthquake occurred on December 23, 2011. Three aftershocks, the largest of which was M 6.0, occurred just after 3 p.m. and were centred near Lyttelton (GNS Science, 2012). This event caused localised liquefaction in places that had already been hit multiple times and caused further damage to infrastructure. Many shops and buildings were closed for engineering inspections, and the Christchurch cathedral, which had been severely damaged in the February earthquakes, sustained further damage.

4.3 Post-disaster Environments

The 2010/2011 earthquakes significantly altered the regional and local contexts for the case study organisations in this research. The earthquakes caused widespread damage to the built environment, but also catalysed social and institutional responses that had major implications for Canterbury organisations. Organisations navigated and adapted to the post-disaster environments differently. Some successfully rebuilt in Canterbury, others left the region, and still others closed, never to reopen. In the next sections, I provide an overview of

the pre-earthquake development trajectories and post-earthquake disruptions for the Canterbury region and the Christchurch, Lyttelton and Kaiapoi town centres within it.

4.3.1 Earthquake impacts on the Canterbury region

Situated on the eastern side of New Zealand's South Island (Figure 8), Canterbury is the country's largest region by land mass and the second-largest by population, bordered by the Pacific coast in the east and the Southern Alps in the west (Dalziel & Saunders, 2012). The governance of the region is divided into 10 councils: the Christchurch City Council and nine District Councils.

Although the region's development roots were based in agriculture, which remains an important part of Canterbury's economy, Christchurch city and the surrounding suburban area is now the region's economic engine. Most of the region's land area remains rural, but 341,400 (over 60%) of the estimated 539,433 people in Canterbury lived in Christchurch in 2013 (Statistics New Zealand, 2013a).

At the time of the earthquakes the Canterbury regional economy was relatively strong and growing. 'Business and property services' and 'wholesale and retail trade' were the top two industry sectors in terms of contribution to regional GDP and contribution to regional employment (Infometrics Ltd., 2012). Like the rest of New Zealand, Canterbury experienced increased unemployment during the Global Financial Crisis (GFC) in 2008 and 2009, but the region enjoyed stronger GDP growth during that period than New Zealand on average (CDC, 2013).

The 2010/2011 earthquakes occurred relatively close to Christchurch and, therefore, close to the highest concentrations of businesses and infrastructure in the region. Interestingly, after the earthquakes, between 2010 and 2012, the total number of people employed in Canterbury increased, but the total number of businesses decreased (Table 9). This growth in employment, but decline in business numbers is due in part to companies in

post-earthquake growth sectors (e.g. construction and critical infrastructure) taking on additional workers to meet the reconstruction demands while businesses in other sectors remained closed or relocated. The greatest employment reductions occurred in the retail and hospitality sectors (Statistics New Zealand, 2012).

Additionally, the badly damaged centres of Christchurch, Lyttelton, and Kaiapoi experienced both reduced employee and business numbers between 2010 and 2011 (Table 9). Following the February earthquake business numbers experienced a net decrease in Canterbury. Kaiapoi, however, which was relatively unaffected by the February event, experienced a net increase.

Table 9: Business and employee counts by geographic area[31]

		2001	2006	2010	2011	2012
Canterbury	Businesses	49,926	61,986	64,894	64,405	63,471
	Employees	219,370	253,880	254,400	254,610	256,560
Christchurch CBD	Businesses	5,584	6,139	5,983	5,705	3,731
	Employees	49,690	52,500	51,370	47,460	29,250
Kaiapoi	Businesses	436	518	535	521	512
	Employees	1,330	1,660	1,715	1,600	1,760
Lyttelton	Businesses	288	388	407	416	394
	Employees	1,440	1,430	1,230	1,180	1,170

Source: Statistics New Zealand (2013a)

Overall, as of August 2013, there were still more businesses migrating out of Canterbury to other parts of New Zealand than arriving into the region (CERA, 2013).

Between June 2010 and June 2012, earthquake affected parts of Canterbury experienced a population reduction (estimated at -2% for the Greater Christchurch area)[32]

[31] Businesses in Statistics New Zealand (2013) counts include "individual, private-sector and public-sector enterprises that are engaged in the production of goods and services… which generally includes all employing units and those enterprises with GST turnover greater than $30,000."

[32] The Greater Christchurch area is defined by drawing a line around Christchurch City that takes in the communities within the 'commuter belt' (approximately half an hour drive from the Central City). Greater Christchurch therefore includes the urban area of Christchurch City and Lyttelton, the area of Selwyn District

(Infometrics Ltd., 2012). After nearly two years of decline the trend started to reverse, with June 2013 estimates showing net population growth for the region as a whole (Table 10). Table 10 also shows that in areas that were more heavily impacted, including the Christchurch CBD, Kaiapoi, and Lyttelton, residential populations had not returned to pre-earthquake levels by 2013.

Table 10: Residential population by area

	2001	2006	2013
Canterbury	481,431	521,832	539,433
Christchurch CBD	7,269	7,653	4,905
Kaiapoi	6,885	7,554	6,900
Lyttelton	3,042	3,072	2,859

Source: Statistics New Zealand (2013)

Organisations anticipating positive outcomes from reconstruction, and a return to pre-earthquake levels economic growth have had to wait longer than initially projected following the earthquakes (NZIER, 2012). Real GDP growth for the region between 2010 and 2012 was steady but dampened by a weak global economy, central government deleveraging to reduce the debt to GDP ratio (e.g. asset sales at the national level), and financial and regulatory uncertainty about the rebuild (exacerbated by recurring earthquakes, which repeatedly set back progress) (NZIER, 2012).

Despite the slow pace of recovery, the overall effect of the earthquakes on the regional economy has been relatively subdued, with employment and business numbers stabilising through 2012 and 2013. A reassessment of the Canterbury Regional Economic Development Strategy (CREDS) in 2012 concluded that the development strategies adopted prior to the earthquakes remained a useful framework for guiding Canterbury's recovery and future development (Dalziel & Saunders, 2012). At the time of writing it is still difficult to know what the full impact of the earthquakes will be in these areas. Even though the last

north of the Selwyn River and east of Kirwee, and Waimakariri District south of the Ashley River and east of Swannanoa (including the towns of Rangiora, Waikuku, Woodend/Pegasus and Kaiapoi) (GCUD, 2012, p. 1).

significantly damaging earthquake was in 2011, it may be some years before the full extent of the impact and outcomes of the recovery process are evident.

4.4.2 Canterbury's post-disaster institutional environment

Several national and regional level institutional responses significantly influenced the post-disaster environment for Canterbury organisations. The development of new legislation, new agencies, and new power-sharing arrangements to facilitate the unprecedented response and recovery process altered the physical, regulatory, and resource environments for Canterbury organisations. Here, I focus on three changes that had substantial impacts on organisations in this study: changes to formal institutional structures, changes to commercial accommodation, and residential land zoning.

First, changes to formal institutional structures initiated through post-disaster legislation meant that organisations had to learn to navigate new bureaucracies, but some of the changes also enabled access to new support resources. Less than two weeks after the September earthquake, Parliament passed the Canterbury Earthquake Response and Recovery (CERR) Act, which facilitated central government response and recovery activities in the affected region. The CERR Act 2010 was accompanied by the appointment of a Minister for Canterbury Earthquake Recovery, a position with special powers to coordinate the recovery and reconstruction activities on behalf of the central government (CERA, 2013).

After the far more disruptive February 2011 earthquake, the government declared New Zealand's first ever 'state of national emergency,' which lasted two months (Brookie, 2012) and gave the national Director of Civil Defence special powers to coordinate the earthquake response (New Zealand Parliament, 2011). In March 2011, Parliament passed the Canterbury Earthquake Recovery (CER) Act 2011 and created the Canterbury Earthquake

Recovery Authority (CERA).[33] CERA is a national government department responsible for coordinating recovery activities with the Christchurch City Council, the Selwyn and Waimakariri District Councils, the Regional Council known as Environment Canterbury (ECan),[34] and Te Rūnanga o Ngai Tahu (TRoNT)[35] (Brookie, 2012).

The involvement of the national government increased the availability of financial resources for both public and private organisations in Canterbury. The national government entered cost-sharing agreements with Christchurch City, Selwyn, and Waimakariri District Councils to help finance recovery costs as well as infrastructure and building repairs. The government also created the Earthquake Support Subsidy (ESS), administered by Work and Income New Zealand (WINZ), to aid small and medium businesses affected by the earthquakes. The ESS helped employers continue paying wages while owners of earthquake-affected business made decisions about the future (Fischer-Smith, 2013).

The large scale response and recovery required by the earthquakes catalysed unprecedented collaboration among existing organisations and institutions in Canterbury, which provided support and resources for businesses. For example, two business associations the Canterbury Employers Chamber of Commerce (CECC) and the Canterbury Development Corporation (CDC) combined to form Recover Canterbury in March 2011. Recover Canterbury sent out mobile business recovery centres, hired business recovery coordinators to advise businesses, ran workshops and networking events, and administered the Canterbury Business Recovery Trust Fund which provided grants directly to organisations in need following the earthquakes (Stevenson, Kachali, et al., 2011).

Despite these benefits, at times following the earthquakes, poor coordination between CERA, local authorities, and their various partners led to stagnated reconstruction, redundant

[33] This law simultaneously repealed and replaced the Canterbury Earthquake Response and Recovery (CERR) Act, which was passed in September 2010 (Brookie, 2012).
[34] ECan is responsible for environmental resource management and emergency management in Canterbury.
[35] The tribal council established by the Runanga o Ngai Tahu Act 1996

planning and other processes, and miscommunication in ways that challenged organisations trying to pursue recovery. For example, miscommunication between CERA and local representatives in Lyttelton about who was responsible for the cost of building demolitions ordered by civil defence led to several building owners pursuing demolition under the false premises that the cost would be covered by CERA. Owners were billed for the demolition work, and the matter required arbitration by national government representatives. Ultimately, the Civil Defence National Controller issued a statement acknowledging this misleading communication and clarifying that in cases where insurance did not cover the demolition work: "… a lien over the property will be taken, to be settled on subsequent sale of the property or the land" (John Hamilton, as quoted in Turner (2011)). For the affected building owners, however, the miscommunication was costly both financially and emotionally, and led to an increased sense of uncertainty for Lyttelton building owners and tenants. For some owners, it acted as a disincentive against actively pursuing reconstruction in the area.

The second issue affecting organisations, reduced availability of commercial accommodation, was the combined result of earthquake damage and subsequent regulatory decisions. The CER Act empowered CERA to mandate the demolition of buildings 'deemed dangerous,' and required all commercial buildings to have detailed post-earthquake engineering evaluations (DEEs). As of May 2012, engineers had completed around 300 DEEs out of the approximately 7,000 required. Of those inspected, roughly one third had been closed by building owners as a result of the DEE recommendations (Taylor et al., 2012). In some cases, this has led to the sudden closure of entire blocks of commercial accommodation, significantly disrupting some organisations while also creating opportunities for those that remained open.

These changes to commercial accommodation shaped organisations' relocation options following the earthquakes. Due to the high demand on an increasingly limited

building stock, commercial tenants had less bargaining power after the earthquakes. As a result tenants were more likely to agree to premium rents and sign up for leases with lengthy initial terms (4-5 years) (Robertson, 2012).

Finally, organisations across Canterbury were affected by CERA's June 2011 decision to implement a zoning system for all residential land in Christchurch (CERA 2011). Affected residential areas were initially divided into four colour-coded zones:

1. Red: not suitable for continued residential occupation without extensive land remediation,
2. Green: suitable for continued residential occupation,
3. Orange: mapped areas in which engineers needed to undertake further investigation, and
4. White: unmapped or non-residential land.

As part of this announcement, the central government declared it would purchase insured residential homes and land in the red-zone. As a result of these earthquakes, 7,857 residential properties (in some cases large parts of entire neighbourhoods) were red-zoned, and approximately 10,000 required rebuilding or significant foundation repairs (Statistics New Zealand, 2013b).

Institutional responses in Canterbury both challenged and enabled organisational recovery. Government systems continued functioning and adapted to suit the altered post-disaster environment, drawing on competencies established before the earthquakes and creating new avenues and partnerships in the aftermath. For many organisations, however, the responses to the earthquakes were just as, if not more, disruptive than the earthquakes themselves. Regulatory changes and long-term planning often complicated organisations' short-term recovery goals. For organisations wanting to continue operating in the dynamic Canterbury environment, a combination of vigilance and adaptability was required.

4.4.3 Town centre contexts

Organisations' post-disaster experiences were also shaped by the distinctive pre-earthquake trends and post-disaster environments of their town centres. In the decade leading up to the earthquakes, the Christchurch CBD, Kaiapoi, and Lyttelton were all experiencing moderate levels of population and economic growth, and were all to varying degrees viable commercial centres. At the same time, the Christchurch CBD and Kaiapoi had experienced a degree of 'hollowing out' over several decades, as industry activity abandoned the town centres and retailers increasingly struggled to compete with suburban malls and peripheral shopping centres. Both the Christchurch CBD and Kaiapoi were struggling to maintain relevance as economic and social centres for their respective communities, and were in the midst of planning revitalisation initiatives. The realisation of these initiatives, however, was constrained by aging buildings and infrastructure in each place.

At the time of the earthquakes, the Christchurch CBD was characterised by a high level of vacant commercial buildings, a relatively old and low-quality building stock, and depressed rental prices when compared to other major cities in New Zealand (Ernst & Young, 2012). This was largely a result of the ongoing process of hollowing-out, and of office building development that had outpaced demand in the 1960s and 1970s. This over-development had been exacerbated by the stock market collapse of 1987 and the deregulation and subsequent recession of the early 1990s. Between 1990 and 2007, only one office building was constructed in the Christchurch CBD, and only three high quality 'A+ grade' commercial buildings were built between 2007 and 2012 (Ernst & Young, 2012). Kaiapoi was characterised by a similar situation of low quality buildings, but had lower commercial vacancy rates than the Christchurch CBD at the time of the earthquakes (Property Economics 2010).

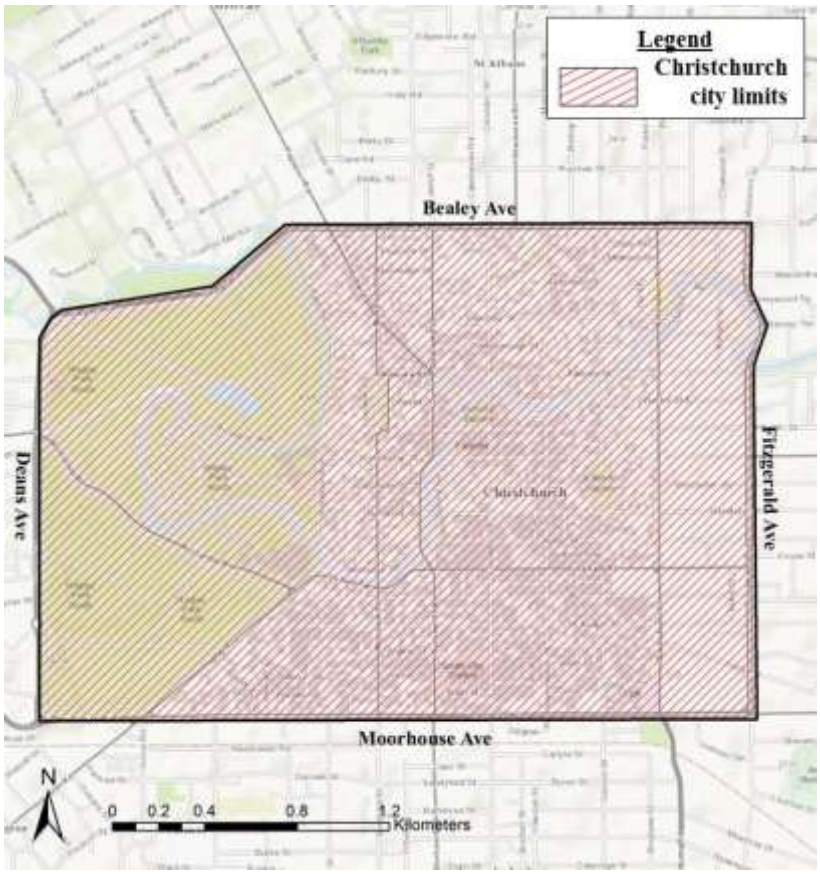
Lyttelton, on the other hand, had experienced lesser degrees of population and economic growth in the 2000s compared to Christchurch and Kaiapoi. This difference was in part due to the lack of space to expand in Lyttelton, in view of its steep surrounding topography and sea boundary. However, this lack of expansion meant that the Lyttelton town centre remained both fairly concentrated and relevant as the retail and entertainment heart of the community. Nevertheless, like the Christchurch CBD and Kaiapoi, Lyttelton had initiated a gradual revitalisation process for its built environment. In the years prior to the earthquakes, several historic buildings in the centre had been converted to retail and hospitality venues to serve the growing young, white collar residential population and an increased number of visitors to the area.

In summary, each town centre provided a unique set of benefits and challenges to organisational operations prior to the earthquakes. At the time of the earthquakes, the Christchurch CBD's residential population was growing, but retail and hospitality businesses struggled to compete with growing suburban areas. Similarly, Kaiapoi's residential population was also growing steadily, but the town centre had lost significant anchor industries over previous decades, and local retailer struggled to compete with other nearby areas. The CBD and Kaiapoi were at different stages of urban revitalisation projects meant to counteract some of the negative trends and retain these centres' relevance as social and economic hubs. Lyttelton's anchor industry the Lyttelton Port Company of Christchurch, on the other hand, was performing well before the earthquakes and the town centre was becoming an increasingly vibrant hub for local residents and visitors.

Christchurch CBD, post-earthquake

The Christchurch CBD (Figure 9) was both the geographic centre of Christchurch and, for most of its history, the economic and social heart of the city as well.[36] The Christchurch CBD had experienced employment and business growth between 2001 and 2006, though growth contracted slightly during the GFC. In 2009, the Christchurch CBD had an estimated 6,135 businesses or employing organisations with nearly 51,300 employees (Stats NZ 2013b).

Figure 9: Christchurch Central Business District



As a result of extensive damage to the built environment and the imposition of a central city cordon, the post-earthquake Christchurch CBD assumed a very different form and function. In total, nearly 1,600 commercial buildings (an estimated 70% of the total) will

[36] The three census areas that comprise the Christchurch CBD (Hagley, Cathedral Square and Avon Loop) are bound by four major avenues (Deans Ave., Moorhouse Ave., Fitzgerald Ave., and Bealey Ave) and crossed diagonally by the Avon River.

have been totally or partially demolished at the end of the Christchurch CBD's reconstruction (Brownlee, 2012).[37] Several major cultural and visitor amenities in the CBD were demolished or closed long term. These demolitions or closures included the Christchurch Cathedral (around which the city was initially planned), the central Bus Exchange (through which an estimated 25,000 people travelled each day prior to the earthquake), and several large entertainment venues, including the AMI Stadium and The Christchurch Convention Centre (CCC, 2006).

Following each of the major earthquakes, the CCC and the Ministry of Civil Defence and Emergency Management erected a fence and barriers around all or parts of the CBD. The decision to cordon the CBD in this way was a defining feature of the post-disaster environment in Christchurch. A CBD cordon was in place for approximately one week following the September 2010 earthquake, and again briefly after the 2010 Boxing Day aftershock. After the February 2011 earthquake, the cordon was again erected around almost the entire area contained within the four avenues (Figure 9), and substantial parts remained in place for nearly 2.5 years. In March 2011 the Christchurch City Council progressively allowed people with businesses into some zones of the cordon, so that they could access their organisations, but some people never regained access to their buildings.

The decision to cordon the CBD was officially characterised as a safety measure, but in the KI interviews local business advocates and economic development officials also characterised it as a strategic decision. The cordon eased demolition management, making it faster and cheaper to proceed with a large number of demolitions. The cordon also, according to a local business association leader, made the buildings within the cordon "the insurance companies' problem". Building occupants were not required to pay rent or pursue

[37] Many of these demolitions occurred not because the buildings were dangerous or beyond repair, but because they were deemed not economical to repair (Brown, Seville, & Vargo, 2013). The high level of insurance coverage in New Zealand means it is sometimes cheaper and more appealing to demolish and use insurance money to reconstruct a new building than to try to remediate an existing building (Muir-Wood, 2012).

repairs while their buildings were cordoned, and they often qualified for business interruption insurance if they could not access their building. Another respondent reported that without the cordon there may have been pressure to reoccupy buildings in areas that were not conducive to work or safety.

For some CSO respondents, their inability to access the cordon caused a symbolic loss of ownership over that space and this seemed to promote further disengagement from the CBD. A local business advocate expressed concern in an interview that unclear timelines around the reduction of the CBD cordon prompted people to sign long-term leases elsewhere, for instance. Without proper management, this interviewee believed the cordon had the potential to "kill the city centre" long-term.

In the short term, the cordons, extensive building demolition, and loss of anchor businesses and attractions accelerated the pre-existing trend of urban decentralisation and further undermined the CBD's potential to function as the economic and cultural heart of the city. After the 2011 earthquakes, more than 80 per cent of the businesses in the CBD were displaced. Due to relatively high vacancy rates in the near suburbs, however, many of the businesses quickly relocated and unemployment in greater Christchurch did not rise significantly after the earthquakes (Dalziel & Saunders, 2012; Ernst & Young, 2012). [38]

Following the earthquakes, the CCC and business and city advocates proactively implemented programmes to minimize the disruptive effects of the damage and cordons, and to encourage people to continue interacting with the CBD. These responses can be placed into three categories: 1) promotion campaigns, 2) temporary spaces of economic and social engagement with the city, and 3) planning focused on re-establishing anchor attractions in the CBD. Following the September 2010 earthquake, the Central Christchurch Business

[38] A study completed by CERA in 2012 found that of the CBD commercial tenants responding to their survey that had to relocate, nearly a quarter of these respondents relocated to the near northwest suburbs of Addington/Middleton and Riccarton (Ernst & Young, 2012).

Association (CCBA) and hospitality and retail organisations worked with businesses on promotion campaigns for the central city. For example, after the Boxing Day aftershock the CCBA coordinated the Boxing Day Replay Sale on February 12, 2011, with the aim of encouraging a nervous public back into the city. Other campaigns, such as the Canterbury and Christchurch Tourism's "Pop Up City Christchurch" website, have sought to promote the CBD and local businesses as the city progressively reopened.

The second type of response, creating spaces of engagement with the city, also sought to draw people back into the city as the cordons were progressively removed. Within a month of the February 2011 earthquakes, business advocates and members of the CCBA started the Restart the Heart Trust [39] to establish a central retail hub in shipping containers populated by well-known or iconic Christchurch CBD retail and hospitality businesses. The Cashel St based ReStart Mall opened in October 2011 and, at least initially, served as a major draw for people to maintain contact with the city centre. Other groups including, Gap Filler and Life in Vacant Spaces, played an important role by working with community groups and people in creative industries, to establish temporary projects in vacant sites throughout Christchurch. These initiatives helped maintain some ongoing citizen engagement with the city.

Finally, planning in the CBD after the earthquakes focused on anchor projects and fostering industry agglomerations as important strategies to encourage medium and long-term return of businesses to the CBD. These plans attempt to remedy past issues with urban sprawl and the oversupply of commercial space. The plan developed by Christchurch Central Development Unit (CCDU) [40] includes several sector-specific precincts (e.g. retail, health,

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[39] The project was funded largely though sponsorship from ASB Bank and the Christchurch Earthquake Appeal Trust, an independent charity responsible for allocating money raised by the Christchurch Earthquake Appeal.

[40] In April 2012, CERA established the Christchurch Central Development Unit (CCDU) which was tasked with laying out a plan for the CBD. Many raised concerns that the CCDU was not established collaboratively with the Christchurch City Council and in some ways trumped the effort put into the planning and consulting process the CCC had undertaken. Some Christchurch leaders, however, felt that the CCDU was necessary to "overcome

and performing arts), and “The Frame” (pictured in Figure 10), a border of green space around the city designed to “contain the Core” of the city (CCDU, 2012, p. 31).

Figure 10: Diagram of proposed developments for the Christchurch CBD

Source: CCDU (2012, p.6)

With over 2,200 fewer businesses in 2013 than 2010 (a 38% reduction) and over 2,700 fewer residents compared to 2006 (a loss of about 36% of the 2006 population), the Christchurch CBD is still one of the worst affected areas in Canterbury. The Christchurch CBD’s recovery is characterised by a complex web of interactions between actors that represent different levels of government as well as private organisations and citizens. In the aftermath of the earthquakes, the CBD is characterised by greatly reduced commercial accommodation and disrupted patterns of interaction between organisations, residents, and

the number of small land titles and the complexities of existing use-rights, as well as to create confidence in the CBD through the siting of major [anchor] projects” (Taylor et al., 2012, p.14).

other visitors to the CBD; as well as efforts to counteract the hollowing-out of the central city.

Kaiapoi, post-earthquake

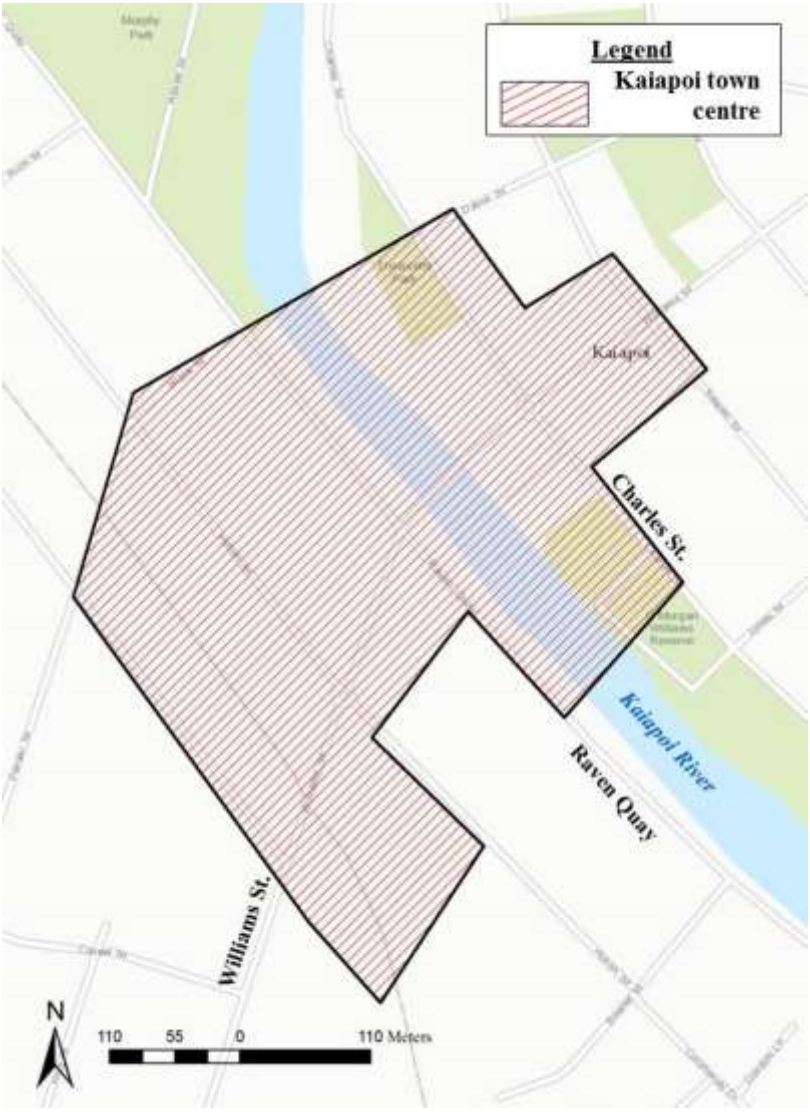
Kaiapoi is a small town located in the Waimakariri District of North Canterbury, approximately 20 km north of Christchurch. The town sits just over two metres above sea level and is built on alluvial soils, deposited by the Waimakariri and Kaiapoi Rivers, rendering it vulnerable to both flooding and earthquake liquefaction. The town centre itself straddles the Kaiapoi River (Figure 11).

Despite a number of challenges that include progressive loss of industrial anchor organisations over the last several decades,[41] between 60-70 per cent of residents working elsewhere, and an "aging and generally poor quality built environment" (Property Economics, 2010, p. 24), Kaiapoi experienced a moderate level of economic growth in the decade preceding the earthquake. The number of businesses and employees in Kaiapoi had increased fairly steadily between 2001 and 2010 (WDC, 2012). Similarly, the population of the town and nearby residential areas of Pines Beach and Kairaki grew throughout this period, reflecting a general trend of residential development in the Waimakariri District (WDC, 2012).

The September 2010 earthquake severely impacted both Kaiapoi's commercial and residential areas. As a result of the September 2010 earthquake, the Kaiapoi town centre lost a significant portion of its buildings, including several locally significant heritage sites. Like Christchurch, the initial response involved cordoning parts of the main street for nearly a week to assess buildings for safety (Vallance, 2013).

[41] The Kaiapoi Woollen Mills operated in Kaiapoi between 1860 and the 1972, and the North Canterbury Sheep farmers' Cooperative Freezing Works operated in Kaiapoi between 1917 and 1991. The closure of both of these companies caused large scale layoffs and prompted some people to question the town's economic viability (Shepherd, 2004; Wood, 1993).

Figure 11: Kaiapoi town centre (area designated in Kaiapoi town plan 2010)



This temporary closure directly affected 25% of local businesses. Earthquake damage also led to the demolition of one of Kaiapoi's main supermarkets, its anchor department store Blackwell's, and many community facilities.

Early assessments conducted by the local development trust, Enterprise North Canterbury (ENC) and the local business association, Kaiapoi Promotions Association (KPA), in 2010 revealed that up to a fifth of businesses in Kaiapoi had either closed or felt that they would close in the near future. Similarly, the 'leakage' that Kaiapoi experienced prior to the earthquakes was likely to worsen, due to a further reduction of consumer choice and the unpleasantness and safety concerns associated with damaged buildings in the town centre.

In November 2010, ENC received funding from the central government for a recovery coordinator and to support Kaiapoi businesses and promote Kaiapoi. KPA used the promotions money to launch two campaigns geared toward promoting Kaiapoi businesses to local residents, a coupon book, and the Shop Kaiapoi competition, where people received raffle entries for shopping at local businesses.

These promotions echoed the social pressure that existed prior to the earthquakes to support local businesses. This pressure was enforced through dense local networks (especially among business owners) in Kaiapoi. Interview respondents repeatedly returned to the importance of 'shopping local' and 'supporting local businesses' despite many respondents noting that it was often impractical or inconvenient to do so. Similarly, many of the business recovery coordinator's activities focused on strengthening intra-local systems of support, including coordinating networking events for local business owners and working with clusters of businesses on co-promotion.

Kaiapoi's recent history of struggle to retain industries and retail spending shaped some of the development attitudes post-earthquake. Some saw the February 2011 earthquake as an opportunity for Kaiapoi, especially after experiencing increased patronage by people displaced from the Christchurch CBD and disrupted suburbs, while others wanted to pursue the recovery within Kaiapoi's historic limitations.

A local economic development advocate discussed the great potential for office development as part of the centre redevelopment:

> "Kaiapoi will never have another opportunity to drag white collar employees out to a town like this if it hadn't been for the second earthquake."

To an extent, this was true. In the year following the February 2011 earthquake, at least 16 new businesses started in Kaiapoi, some of which were "quake-displaced companies from the city" (WDC, 2012, p.8).

Yet, discussion of Kaiapoi's economic future by respondents was often tempered by restraint:

> "At the end of the day, it's actually probably never going to compete with Rangiora, or what goes on in Christchurch … it's probably going to focus on its key values, which is a wee service town" (WDC employee).

And,

> "Things were pretty tough for Kaiapoi, so you're not going to turn it around, are you? To becoming an economic powerhouse and all the rest of it… it's not a retail destination. It's a service town" (Kaiapoi economic development advocate).

Despite these concerns, the new plan adopted in June 2011, shifted away from emphasizing Kaiapoi's historic river town past, toward promoting new development.

Along with the release of the new plan, the WDC announced a $28 million dollar recovery funding shortfall that would be met by increased rates (Vallance, 2013). Despite sounding like a setback, the rates increase that accompanied this announcement allowed the WDC to pursue community facility improvement projects that would have been improbable before the earthquakes. For example, the loss of the Kaiapoi museum and library created the opportunity to redevelop an integrated service centre, library, museum, and art gallery space paid for, in part, by increased rates. This facility is intended to be a substantial centre and "anchor for pedestrian activity" in the town centre that did not exist prior to the earthquake (WDC, 2012).

After adopting the plan, new obstacles emerged that challenged Kaiapoi's recovery. The June 2011 aftershocks caused further liquefaction and damage to the infrastructure. This event was closely followed by the residential red zone decisions for the area (Vallance, 2013). Over 1,000 homes (more than a quarter of the total) in Kaiapoi were red-zoned and

several hundred more in Kairaki and Pines Beach (considered part of Kaiapoi's residential catchment) (Vallance, 2013). Relocations in response to the red zone decisions have caused significant depopulation in Kaiapoi. The WDC responded to this disruption by implementing new processes to facilitate the rapid and concurrent approval of several residential subdivisions to the West and later North of Kaiapoi, enabled by changes under the CER Act (Vallance, 2013).

The trajectory of Kaiapoi's town centre involved both loss and renewal in the phase extending through 2012 and 2013. Overall, in 2013, Kaiapoi's town centre had 23 fewer businesses (Table 9) and over 650 fewer residents than in 2006 (a reduction of 4% and just under 9% respectively). On the other hand, damage to Kaiapoi's building stock helped the town begin to overcome previous planning challenges. The older building stock that challenged Kaiapoi's development in the past is being progressively replaced by new buildings. Similarly, the new service centre and developments around the river will likely slow the sprawl and fragmentation of the pre-earthquake centre.

Kaiapoi's post-earthquake environment was shaped by strong collaborative leadership of WDC, ENC, and the KPA who worked closely with local business owners on economic recovery. Pre-existing relationships among these actors, strengthened by the planning process initiated in 2008, facilitated these relationships post-disaster. Local trends, reframed in light of the earthquakes provided a foundation for building strategies for the future.

Lyttelton, post-earthquake

Lyttelton is a coastal town southeast of Christchurch (Figure 12). The town emerged around Lyttelton's seaport, which served as the gateway to Canterbury's colonial development. Historically, most of the other businesses and organisations in Lyttelton (Figure 12) emerged to support the port and its workers. The port continues to be important to both the Lyttelton and Canterbury economies (Rice 2004).

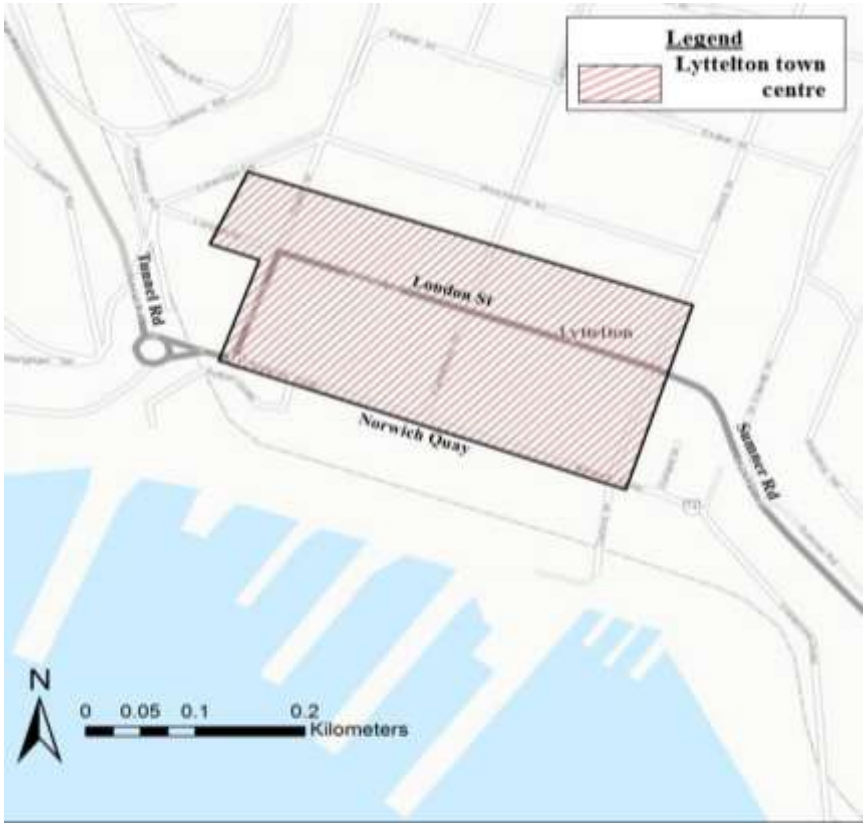
In the 1990s and 2000s, Lyttelton became an increasingly fashionable place to live for artists and young professionals attracted by relatively cheap property prices and the town's harbour setting. Along with this new population came an increasingly broad and active base of community organisations, such as the Lyttelton Harbour Business Association (LHBA) and Project Lyttelton, an active grassroots community organisation, in addition to long-established organisations like the Lions and Rotary Clubs.

In the few years prior to the 2010/2011 earthquakes, Lyttelton was also gaining popularity as a destination for visitors from Christchurch and beyond. The local farmer's market (initiated by Project Lyttelton) attracted hundreds of visitors to Lyttelton each weekend, and the 2009/2010 cruise season brought 50 ships and an estimated 100,000 passengers to Lyttelton (LPC 2010). The town centre was composed of primarily retail trade, accommodation, and food services geared toward both residents and visitors (CCC, 2012). The port company, however, was and is still by far the largest employer in the area with approximately 500 workers at the time of the earthquakes.

The September 2010 earthquake had fairly minimal direct effects on Lyttelton. Some buildings experienced shaking damage, and a few heritage buildings were seriously damaged. The port sustained an estimated $50 million of damage to wharves and other infrastructure, but was operational within 48 hours of the earthquake (LPC, 2010).

The February 2011 earthquake, however, was centred in Lyttelton at a depth of only 5 km. The earthquake seriously damaged over a third of the buildings in the town centre, including a large proportion of the heritage buildings and social hubs. Like Christchurch and Kaiapoi, Lyttelton's town centre was also temporarily cordoned for approximately a week following the earthquakes, and areas around several damaged buildings were cordoned for longer.

Figure 12: Lyttelton town centre (area designated in Lyttelton town plan 2011)



The earthquakes significantly reduced Lyttelton's connectivity to Christchurch and other nearby areas, with infrastructure damage cutting the town off from a number of economically important traffic flows. The road tunnel connecting Lyttelton to Christchurch through the Port Hills closed temporarily, and one of the rail tunnels closed longer term. Almost all cruise services to Lyttelton ceased immediately and were indefinitely rerouted to Akaroa, a relatively undamaged tourist town on Banks Peninsula. Additionally, due to rock fall, the Sumner Road closed and remained closed through 2013. This road connected Lyttelton to its nearest neighbour Sumner, a popular beach town and source of visitors to Lyttelton. The closure also meant that vehicles from the port that could not use the tunnel (e.g. trucks transporting dangerous goods) needed to use an alternate route, which was more difficult and time consuming for drivers. A local business association representative felt that the alternate route potentially made Lyttelton "less attractive" for certain kinds of shipping.

Like Kaiapoi, the Lyttelton Harbour Business Association (LHBA) received funding from the CCC to promote Lyttelton following the February earthquake. Unlike Kaiapoi, however, a significant number of businesses in Lyttelton remained closed for prolonged periods following the 2011earthquake. This made it difficult to use the funding for promotions when, according to a local business advocate:

> "We've got so little to shout about at the moment [September 2011], compared to what we did. What is that campaign going to look like? Telling people to come to Lyttelton, yeah great, but come to Lyttelton and do what when you get here?"

Although locals continued to support businesses in the township, several key informants and CSO respondents referred to the need to achieve a 'critical mass' of businesses to make Lyttelton economically viable.

At the same time, as in Christchurch and Kaiapoi, community groups and business associations played an active part in keeping local people engaged and connected to the Lyttelton town centre. For example, local community groups made a makeshift theatre and staged a play on the site of a popular bar that had been demolished, and found a way to reinstate the farmer's market in a new area to keep visitors coming into town.

To a greater extent than the Christchurch CBD and Kaiapoi, Lyttelton is contained by its physical topography (with steep hills forming a semi-circular amphitheatre around the port) in ways that limit new development and for the possibility of relocating around the periphery of the damaged centre. As a result, many local leaders' actions have focused on expediting the demolition and town planning processes.

The CCC adopted the Lyttelton town plan in June 2012. The plan reflects some of Lyttelton's fairly recent progress toward becoming a trendy, arts- and entertainment-focused centre. The introduction of the plan states "Lyttelton will be a rebuilt and prosperous niche

centre" alternately referring to "boutique businesses," "spaces for creativity," and the inclusion of "local art in public spaces" (CCC, 2012).

Lyttelton had 213 fewer residents in 2013 than in 2006 and 60 fewer businesses in 2012 than in 2010 (reductions of about 7% and 5% respectively). It is now more isolated than it was prior to the earthquakes, due to the loss of the Sumner Road and reduced traffic through the road tunnel (as a result of construction and people's perception that it is unsafe). Similarly, fewer visitors are coming by sea, as cruise ships had still not returned to the port as of late 2013. Many heritage buildings that drew tourists have been demolished. Lyttelton's recovery plan, however, builds on the strengths that were emerging in Lyttelton just prior to the earthquake, particularly the growth of the creative class, the prevalence of community groups, and the development of Lyttelton as a niche entertainment destination.

4.4 Conclusion

The impacts of the Canterbury earthquakes were unevenly distributed spatially and across sectors of the economy. Organisations across Canterbury have sought to recover in an environment defined by a sustained sequence of disruptions over a period of years. In addition to the earthquakes, institutional responses, such as the detailed engineering evaluations (DEEs) required for all commercial buildings and CERA's decision to red zone thousands of residential properties, have shaped the post-disaster environments in which organisations pursued recovery.

The three town centres in this study have had to redefine their image in light of drastically changed built environments, including the loss of historic buildings and social and cultural spaces. Planners from the Christchurch CBD and Kaiapoi are using the redevelopment opportunity to re-establish their centre's relevance as a social and economic hub for their communities. Lyttelton is emphasizing and building on its newly emerging

identity as an arts and entertainment destination. These plans, however, will take years to finish. In the interim, community members and organisations have worked to overcome the disruption of social and economic ties. They have also sought to stem the loss of engagement with the town centres and other spaces where those ties are formed and reinforced.

Prior to the earthquakes, the case-study organisations, which I analyse in-depth in Chapters 5 and 6, were located in these town centres. Although several of the case-study organisations relocated elsewhere, and a small number closed permanently, their real and perceived range of options and what constituted a good investment or a potential source of support were linked to their changing built and social environments. Organisations operating in these town centres following the earthquake were recovering in communities that for the most-part wanted them to recover, that implemented programmes to aid economic recovery and that worked to support local businesses. These interactions influenced how organisations pursued recovery. In the next chapter, I examine the ways organisations are differentially connected to their local contexts, how these connections were reshaped by the earthquakes, and how these connections influenced organisations' post-disaster outcomes.

Chapter 5: Geographic Embeddedness and Contextual Resilience

5.1 Introduction

How does an organisation's embeddedness in its local context influence its post-disaster trajectory? While organisations' embeddedness in society is understood to confer advantage during periods of business as usual, it has yet to be investigated in a post-disaster context. Using 32 longitudinal comparative case studies, I examine the various ways that organisations connected to their local contexts, and explore the implications of these connections for organisations' ability to survive and adapt in the earthquake aftermath.

The chapter is organised into four main sections. Section 5.2 introduces the case study organisations (CSOs) and their pre-earthquake trajectories. Then, Section 5.3 examines the ways that the CSOs connected to their local environments. Using the case studies, I derived a typology, or categorisation system, of local embeddedness. The typology provides a basis for comparing the nature and extent of organisations' embeddedness in their local contexts.[42]

Next, Section 5.4 considers how a CSO's embeddedness influenced the impact that the earthquakes had upon it. The degree and type of disruptions that CSOs experienced as a result of the earthquakes depended both on the extent of disruption to their local contexts and on the ways CSOs were connected to those contexts. For example, organisations with a high proportion of local customers were more severely disrupted by residential red zoning decisions than those that had a more geographically dispersed customer base.

Finally, Section 5.5 examines the relationship between organisations' embeddedness and their capacity to adapt and recover following the earthquakes. I describe the range of

[42] Local embeddedness refers to the extent that an organisation interacts with, has gained legitimacy in, and is tied to its local (town) environment.

adaptive actions that CSOs pursued as part of their recovery, and discuss the features of embeddedness that hindered or enhanced their adaptive capacity.

The results and discussion presented in chapters 5 and 6 are divided thematically to allow an exploration, respectively, of organisational embeddedness first through a place-attachment lens and then through a network-specific lens. Chapter 5 explores the nature of an organisation's connections to place and its local environment. The analysis focuses on how these connections were formed, enacted, and how they influenced an organisation's post-disaster trajectory.

Chapter 5 discusses some aspects of organisational networks as they are an central drivers of local embeddedness. However, networks also enable organisations to transcend their local boundaries. Chapter 6 explores the geographically distributed networks that organisations drew on for support following the earthquakes and what this meant for them in the earthquake aftermath.

5.2 CSOs Pre-earthquake Characteristics

I examine 32 case study organisations with a range of pre-earthquake characteristics. The CSOs were drawn from the Christchurch CBD (12 CSOs), Kaiapoi (11 CSOs), and Lyttelton (9 CSOs) areas. As seen in Table 11, on average the CSOs had just over 7 full-time equivalent employees (FTEs) and had been operating for nearly 23 years. [43] Lyttelton CSOs were on average younger and smaller than CSOs in the Christchurch CBD and Kaiapoi. CBD CSOs were the oldest and largest on average. Five CSOs were part of a broader corporate organisation, with offices in other areas. The variable 'FTE Corp' reports the FTE for the wider corporate entity (Table 11). For these organisations the average FTE for the corporation was about 137.

[43] To help protect respondents' confidentiality the duration of operation is presented as range quartiles in Table 11.

Table 11: CSO pre-earthquake (2010) attributes [44]

Pre-EQ Location	CSO Pseudonym	Industry Category	FTE (FTE Corporate)	Duration of Operation (yrs.)	2008/2009 Revenue [45]
Christchurch CBD	Bond's beverages	Manufacturing/ Retail/ Wholesale/ Hospitality	6 (190)	26.75+	0
	Cat's Cradle	Hospitality	5.5	0-3.5	+1*
	Elegance	Retail	1.5	12.25-26.5	+1
	Executive Sweets	Hospitality	2	0-3.5	0
	Gilbert's Building Supply	Wholesale	26 (98)	26.75+	0
	Health Solutions	Tech & scientific services	37.5 (45)	12.25-26.5	-1
	Kedzie & Sons	Retail	3.5	26.75+	-1
	National Service	Info. media & telecoms	15 (289)	26.75+	-1
	Tech Sense	Tech, & scientific services	9	3.75-12.0	0
	The Attic	Retail	2.5	0-3.5	0*
	Wigwam	Retail	3	0-3.5	0
	Wolverine Wares	Retail	6	26.75+	0
Christchurch CSO mean			**9.8**	**29.2**	
Kaiapoi	Amherst Retail	Retail	4.5	12.25-26.5	-1
	Figure Financial	Financial services & real estate	3	3.75-12.0	0
	Kaiapoi Arts & Recreation	Culture & recreation	0	26.75+	0
	Kaiapoi Assistance	Social services	20	12.25-26.5	0
	Kaiapoi Corner Store	Retail	1.5	3.75-12.0	0
	Kaiapoi Rental	Financial services & real estate	13 (61)	3.75-12.0	0
	Kaiapoi Shoppe	Retail	7.5	26.75+	0
	Kaiapoi Society	Culture & recreation	27.5	26.75+	0
	Suave[46]	Personal care services	3	0-3.5	NA
	Toasty's[47]	Hospitality	7	0-3.5	NA
	Timber Craft	Manufacturing	1.5	12.25-26.5	0
Kaiapoi CSO mean			**8.0**	**27.3**	

*Opened in 2009, thus number reflects a truncated trend between opening in 2009 and the first earthquake in September 2010.

[44] As discussed in Chapter 3, the organisation names used in this thesis are pseudonyms used to maintain confidentiality.
[45] The 2008/2009 revenue figure indicates whether revenue increased (+1), stayed the same or experienced steady growth (0), or decreased (-1) between the 2008 and 2009 financial years.
[46] *Suave* opened in late 2010 after the September earthquake.
[47] *Toasty's* opened in early 2010, prior to the September earthquake.

Table 11: (continued) CSO Pre-earthquake (2010) attributes

Pre-EQ Location	CSO Pseudonym	Industry Category	FTE (FTE Corporate)	Duration of Operation (yrs.)	2008/2009 Revenue
Lyttelton	Coastal Services	Financial services & real estate	6.5	12.25-26.5	0
	God Save the Queen	Retail	1	0-3.5	0
	Good Old Pub	Hospitality	10	0-3.5	-1
	McCoy's Hospitality	Hospitality	7	3.75-12.0	0
	Norwich Retail	Retail	1	12.25-26.5	0
	Port Retail & Craft	Retail/ Manufacturing	2	3.75-12.0	0
	Pretty Patty's	Personal care services	1	0-3.5	NA
	Pumpkin Community Group	Culture & recreation	1	12.25-26.5	0
	Star Creek	Retail	1	3.75-12.0	0
Lyttelton CSO mean			**3.4**	**8.8**	**0**
OVERALL CSO mean			**7.4**	**22.8**	

Most of the organisations (22) had steady revenue prior to the earthquakes. Only two experienced an upward revenue shift, and three organisations were too new to report this indicator (NA), having only opened in 2010. The CSOs reported their revenue on a categorical scale from 'very poor' to 'excellent' for each financial year (1 July-30 June) from 2008 to 2012. [48]

Table 11 shows an indicative direction of the self-reported revenue prior to the earthquakes (2008-2009), with values of either -1 (decreasing – e.g. from excellent in 2008 to good in 2009), 0 (same), or +1 (increasing). Using this rough indicator, we can see that five CSOs experienced a downward revenue trend between the 2008 and 2009 financial years.

Another organisational characteristic that I explore in this chapter is the ways the CSOs were connected to their pre-earthquake locations. For this I needed to develop a typology for assessing organisations' local embeddedness, which I describe in the next section.

[48] For some non-profit organisations, revenue was not an appropriate measure, in those cases they rated "level of financial resources available to support the mission" on the same scale.

5.3 Typology of Local Embeddedness

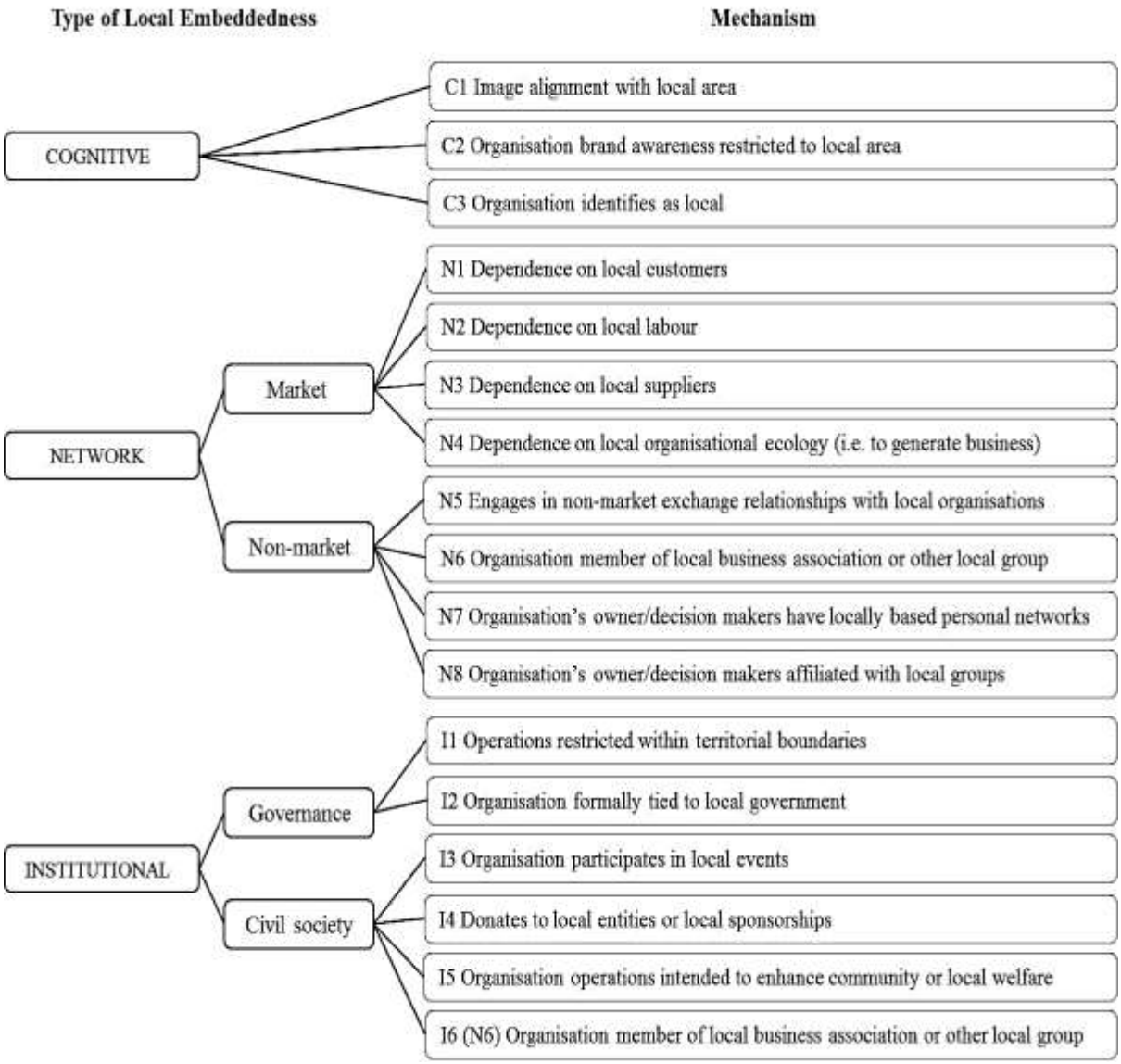
This analysis identifies the different ways organisations and organisational decision makers became embedded in their local contexts in ways that kept them from moving elsewhere, shaped organisational decisions, and constrained and enabled adaptive action. The CSOs became connected to their local contexts through a series of mechanisms of embeddedness. Using interviews with organisation leaders, surveys, and field observations, I identified these mechanisms for each CSO in this study.

The mechanisms can be placed in one of three categories of local embeddedness – cognitive, relational networks, and institutional. I derived these categories from Zukin and DiMaggio's (1990) description of the four forms of economic embeddedness (cognitive, cultural, political, and structural-network). In the typology in Figure 13, I synthesize aspects of political and cultural embeddedness into the larger category institutional embeddedness. The different categories of embeddedness in the typology serve to distinguish the distinct types of engagement that organisations have within their local environments, including, meanings that are formed and shared amongst people in those environments; exchanges that occur through formal and informal networks; and the regulations, norms, and social pressure that guide behaviour. Each category of embeddedness (cognitive, network, and institutional) was associated with several mechanisms that describe the actions or processes through which embeddedness is developed. The mechanisms, which I derived inductively from the case studies, embed the organisations in different facets of their local contexts.[49]

Each of the CSOs was connected to its local environment by at least one of these mechanisms. That said, it is important to note that the typology reflects the activities of this particular set of CSOs rather than for all organisations.

[49] Note that one of the mechanisms fell into two categories: "Organisation's owner/decision makers affiliated with local groups" (I6/N6))

Figure 13: Typology and mechanisms of local organisational embeddedness



The next sections briefly define each type of embeddedness in the typology. In these sections, I examine how the mechanisms within each embeddedness category connected the CSOs to their local contexts.

5.3.1 Cognitive mechanisms

Cognitive embeddedness has two related dimensions. First, it refers to factors that limited organisation decision makers' ability to exercise economic rationality. Such factors include uncertainty, complexity, the cost of information, and the structured regularities of thought (Zukin & Dimaggio, 1990). The second dimension refers to collective or social

cognition and the ways in which shared representations and meanings shaped people's interpretations and decisions (Bakker et al., 2011; Kalantaridis & Bika, 2006; Maskell & Malmberg, 1999). Both of these dimensions influenced the way people (e.g. an organisation's decision makers or community members) select and understand information (Dequech, 2003).

I identified three mechanisms of cognitive embeddedness (Figure 13) that shaped how CSOs connected to their local environment. These were: 'image alignment with local area' (C1), 'organisation brand awareness restricted to local area' (C2), and 'organisation identifies as local' (C3). The first two mechanisms address organisational image. Image refers to the way that organisational leaders would like others to perceive their organisation and the impressions that others actually form of the organisation (Hatch & Schultz, 2002; Whetten, 1998).

Organisational decision makers, often small businesses owners who wanted to cultivate a positive local image, appropriated aspects of the town's image for their organisation. These decision makers relied on people's common (positive) interpretations of place meanings to make certain associations between the organisation and the town. Some respondents, for example, felt that prior to the earthquakes their Christchurch CBD location gave them "status", positioned their product as "higher end," and facilitated associations with "independent" and "unique" businesses in a way that distinguished them from organisations in the suburbs and the malls. Similarly, six of the 11 CSOs in Kaiapoi included the town name in their organisation name, [50] and this contributed to the image of these CSOs as 'local' organisations that were drawing on local people's positive functional and emotional associations with Kaiapoi.

[50] This number reflects a general trend in Kaiapoi, of the 40 organisations from Kaiapoi that responded to 'Survey 1' 16 (40%) had Kaiapoi in their organisation name.

An organisation's image is represented in part through its brand (e.g. its name, symbols, narratives, and other distinguishing features). The mechanism 'Organisation brand awareness restricted to local area' (C2) refers to the extent to which the organisation's identifiers are recognised outside of its local area. If awareness of the CSO's brand was restricted to the local area, it could act as a disincentive to organisational relocation outside of that area.

The third cognitive mechanism (C3) addresses organisational identity. Identity refers to what people within the organisation understand about its values and characteristics (Gioia, Price, Hamilton, & Thomas, 2010). Some CSOs identified as a local (Kaiapoi, Lyttelton, or CBD) business, and this formed part of how they understood, experienced, and enacted their organisation. Respondents explained that being "part of the community" or being a "local business" informed the interpretation of their mission or their organisational culture. The owner of *Toasty's*, for example, stated that as a Kaiapoi business it was important to them to act as "a hub of the community." Similarly, the owner of *Figure Financial* felt that their internal culture reflected the "relaxed and cruisy" atmosphere in Kaiapoi, and this congruence was part of why the owner chose to stay in Kaiapoi after the September earthquake.

5.3.2 Network mechanisms

Relational networks are central to organisational function. For the purposes of this research, I refer specifically to the relational and structural features of a set of dyadic (one-to-one) organisational relationships. These relationships are characterised by repeated exchange between actors that are mutually acquainted (Podolny & Page, 1998; Zukin & Dimaggio, 1990).

Network embeddedness is arguably the most important form of embedding for organisations.[51] The people and organisations that composed organisations' networks shaped the kinds of information and resources that they could access. Local network embeddedness refers to the number, strength, and frequency of an organisation's connections to others in the local area (Copus et al., 2011; Maskell & Malmberg, 1999; Temple, 2009).

The CSOs enacted network embeddedness through a number of mechanisms, which I differentiate broadly into market and non-market sub-types. In this research, I use the term 'market' to refer to network relationships that have an element of formal monetary exchange.[52] Local market embeddedness then refers to the strength and frequency of interactions between the organisation and its local customers and suppliers; or the level of dependence an organisation has on local ties to generate inputs and outputs (Halinen & Törnroos, 2005; Kalantaridis & Bika, 2006). Market embeddedness includes high proportions of labour and other inputs from the local area (N2, N3) and the proportion of local customers (N1) upon which CSOs rely.

The third market mechanism refers to interactions among local organisations that generate business for organisations (i.e. the local organisational ecology (N4)). 'Ecology,' in this context, refers to an environment comprised of a community of organisations. Organisations that were embedded in the local organisational ecology, interacted with other local organisations interact with each other, often with synergistic effects, and collectively shaped their broader environment.[53] As a result of these interactions an organisation became intertwined with and dependent upon the organisations in their local ecology. In this study, I specifically refer to CSOs' reliance on a community of local organisations to generate

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[51] Zukin and DiMaggio (1990) in their seminal work *Structures of Capital: The social organization of the economy,* also emphasise the relative importance of network. They state that, what they refer to as "structural", embeddedness, is "…more important than either cognitive or cultural embeddedness" (p.18).

[52] It is important to note that embeddedness theory proposes that economic activity is embedded in society, and thus there is no such thing as a pure, rational, market relationship.

[53] C.f. Rao (2002) for more on organisational ecologies

business for the CSO, but there are other ecological interactions that may attract and bind organisations to an area.

'Non-market' network embeddedness (Figure 13) refers to exchange enacted through on-going interpersonal relations. Repeated interactions between organisational actors or between individuals (e.g. community members, other local business owners) and an organisation created ties that were reinforced through loyalty, trust, and expectations of reciprocity. As discussed in the literature, these types of ties in some ways transcend market rationality (Granovetter, 1985; Uzzi, 1996; Zukin & Dimaggio, 1990). The typology includes four non-market mechanisms. CSOs became embedded in non-market relational networks by affiliating with locally based business associations or industry groups (N5) and through non-market exchanges with other local organisations (e.g. referring customers to one another and sharing innovative ideas) (N6).

Additionally, the personal ties of organisations' leaders (captured in mechanisms N7 and N8), in some cases had an important influence on organisational decisions and actions. Personal network embeddedness was most common and influential for micro- and small-businesses in this study. For CSOs that were part of a corporate structure, decision makers' personal ties were not a significant embedding mechanism. In corporate organisations, decision making tended to occur outside of Canterbury or by owners overseeing a number of organisational locations or board members distributed throughout the country. Yet, for smaller, single-location CSOs, the leaders' personal ties were central to decisions to locate in an area in the first place, to keep the business in that location over time, and to reinvest after the earthquakes.

5.3.3 Institutional mechanisms

Organisations were also embedded in the "supra-organisational forms" that regulated organisational action, such as the state, industry groups, and at the broadest, society in general (c.f. Palmer & Biggart, 2002, p. 260). CSOs that were part of a corporation or other complex organisation experienced a form of intra-organisational institutional embeddedness (e.g. among branches or within a corporate structure), which "dictate[d] the processes, structures, and values that organisations adopt and maintain" (Elsbach, 2002, p. 41). All of these institutions guided and constrained organisational action through either formal (e.g. laws, contracts, and property rights) and informal regulatory systems (e.g. sanctions, customs, and norms) (North, 1991).[54]

The first subtype of institutional embeddedness, 'governance,' refers to governance systems that provide regulatory frameworks which guide organisational behaviour. Thus, the mechanisms under the governance category, in Figure 13, refer specifically to systems of formal regulation enforced through hierarchical power (i.e. government or supra-organisational structures like corporate bodies): 'Operations restricted within territorial boundaries' (I1) and 'Organisation formally tied to local government' (I2). In total, 10 CSOs' operations were focused within particular territories that ranged in size from the entire South Island of New Zealand to a town such as Lyttelton or Kaiapoi. Only two CSOs were formally tied to the local government. *Kaiapoi Society* was funded and managed through the Waimakariri District Council, and the Christchurch CBD based *National Service* was legally obliged to assist and coordinate with local, regional, and national authorities in emergency situations.

[54] Institutional embeddedness includes an array of interrelated forms of embeddedness that have been identified in economic sociology and geography, including 'political' (Zukin & Dimaggio, 1990), 'societal' (Hess & Coe, 2006; Hess, 2004; Jessop, 2001), and 'cultural' (Dequech, 2003; Hess, 2004; Kalantaridis & Bika, 2006; Zukin & Dimaggio, 1990) embeddedness.

‘Civil societal’ embeddedness refers to connections to the tacit rules of society and collective understandings and norms that guide appropriate action and interaction (Dequech, 2003; Pallares-Barbera et al., 2004; Zukin & Dimaggio, 1990). This form of embeddedness overlaps with cognitive embeddedness. It relies on collective identity with a group that has an element of social closure (e.g. a local community). Social collectives benefit from the cognitive dimensions of embeddedness through shared goals and trust (Dequech, 2003). Members of a collective see their fates as linked, and may forgo self-interest to act in the interest of the collective (Coleman, 1988). Unlike mechanisms in the cognitive category, however, the mechanisms in the institutional category refer specifically to the affective (or expressive) aspects of cognition, such as the time and resources that organisations invest in the social life of the town (I3, I4, and I6).

Institutional embeddedness captures some of the ways CSO’s engaged with local culture. Some CSO respondents saw their organisations as part of a common local enterprise, and part of their role as ‘enhancing community or local welfare’ (I5). Institutions of different kinds (e.g. innovation centres, local authorities, labour unions) provided a basis for trust in collective representation or belief in the benefit of co-promoting local interests (Amin & Thrift, 1994). For example, the mechanism ‘Organisational membership in a local business association or other local group’ is a type of institutional embeddedness (I6) as well as network embeddedness (N7), because organisational membership in local groups (e.g. business associations, the chamber of commerce, or marketing/promotions boards) demonstrated that organisational actors perceived the local area as a meaningful scale for collective engagement.

5.3.4 Typology conclusion

The nature of an organisation’s local embeddedness normally changes over time as the organisation grows, as it accumulates ties locally and elsewhere, and as the environment

around it changes. An organisation's adaptability was influenced in different ways depending on the nature of its local embeddedness.

Each of the sixteen mechanisms introduced in the typology can lead to spatial inertia for organisations, which in some cases may reduce adaptive capacity. Many of the mechanisms, however, also enabled organisations to better navigate their particular local environments. Local embeddedness gives organisations access to tacit knowledge and helps them to operate within the boundaries of acceptable local norms or mobilise local economic and social capital.

It is important to note that the typology introduced in this chapter reflects the activities of this particular set of CSOs rather than for all organisations. There may be other mechanisms by which a different set of organisations would connect to their local environments. Additionally, because the typology was derived inductively from the case studies, it is almost certain that I have not captured all of the mechanisms which tied the CSOs to their local environments. The typology does, however, demonstrate that not all organisations connect to their environments in the same ways. It shows that organisations' connections have a range of potential implications for organisations decisions, behaviours, and outcomes. It also facilitates the development of a standardised way of measuring and comparing local embeddedness. This is expanded upon in the next section.

5.3.5 Embeddedness measurement

To establish a scale that would allow comparisons of the different degrees to which CSOs were locally embedded, I recorded a binary score for each of the 16 mechanisms discussed in Figure 13 and summed the result to generate a local embeddedness (LE) score for each CSO.[55] The CSO LE scores ranged from 1 to 13 (out of a possible 16). Although

[55] For each of the market mechanisms (dependence on local customers, local labour, and local suppliers), the organisation received a score of 1 if they had an estimated 50 per cent or more local customers, labour, or suppliers, and a 0 if they had less than 50 per cent.

the LE scores do not account for the depth of particular connections or weight any of the mechanisms, this relative 'measure' of embeddedness enabled comparisons between organisations that were differentially embedded in their local contexts. This relative score offers insights into what kinds of organisation are more locally embedded than others and whether organisations embed in different places in different ways.

Local embeddedness varied by industry group, as seen in Table 12. The "culture, recreation, and social services" CSOs had, on average, the highest LE Scores (10.8). All of these CSOs were non-profit organisations and were geared toward providing services for their local community (i.e. mechanisms I1 and N1). In different ways their operations enhanced community or local welfare (I5). Additionally, two had formal relationships tying them to the local government (I2).

Table 12: Average local embeddedness scores by industry category

Combined Industry Categories	CSOs (N)	Mean Local Embeddedness Score
Culture, recreation, & social services	4	10.8
Hospitality	5	8.4
Retail	12	7.7
Professional & Personal Services	5	7.2
Manufacturing & Wholesale	3	3.7
Information, Communications, & Technology (ICT)	3	3.0
Total	32	7.3

CSOs in industries that deliver their products or services remotely— online, over the telephone (ICT) or offsite (manufacturing & wholesale) — had, on average, the fewest mechanisms tying them to their local environments. These CSOs were less likely to rely on local customers and were, therefore, less likely to benefit from intentionally cultivating local relationships (e.g. by sponsoring local clubs or participating in local events).

'Corporate' CSOs were tied to their local environments in fewer ways than single-location, independent CSOs. Corporate CSOs were part of a larger organisational structure and had lower average LE scores (4.2) than single location organisations (7.9). They were

less likely to depend on local customers, suppliers, or labour (N1, N2, and N3). Corporate CSOs were also less likely to pursue image alignment with the local area, to have restricted brand recognition, or to identify as local (C1, C2, and C3). They were, however, far more likely than independent CSOs to have their operations restricted within territorial boundaries (I1), which greatly restricted their ability to relocate out of damaged areas.

Local embeddedness also varied among the study areas. CSOs in Lyttelton had, on average, the most mechanisms tying them to their local environments, with an average LE score of 8.9. The Christchurch CBD CSOs averaged a score of 5.6 and Kaiapoi CSOs averaged 7.7. As shown in Table 13, some mechanisms were more prevalent in some centres than others. This suggests that some mechanisms may have been particularly advantageous in that town centre context. Organisations in Lyttelton were most likely to depend on local labour (N2) (89% of Lyttelton CSOs depended on Lyttelton residents for labour, [56] compared to 73% in Kaiapoi, and 33% in the CBD). The owner of *Good Old Pub* in Lyttelton explained that hiring locals was useful because they tended to have strong friendship networks in Lyttelton and that this attracted customers. In Kaiapoi the most common mechanism by far was organisations identifying as local (C3), but a close second was 'donations to local entities and local sponsorships' (I4). Donating was far more common in Kaiapoi than elsewhere.

Although retail and hospitality CSOs were the most likely to depend on the local organisational ecology to generate business in all towns, this was less important for CSOs in Kaiapoi. In Kaiapoi, customers were far more likely to drive to a CSO location for a specific product or service.

[56] Local labour counts owners if they work at the organisation. In Lyttelton, several of the CSOs were run by a single owner or partnership that lived in Lyttelton.

Table 13: Percent of CSOs associated with each embeddedness mechanism by location

ID	Town	Pre-earthquake Location CBD	Kaiapoi	Lyttelton	All Cases
C1	Image alignment with local area	50%	64%	78%	63%
C2	Organisation brand awareness restricted to local area	50%	45%	78%	56%
C3	Organisational identifies as local	25%	91%	56%	56%
N1	Dependence on local customers	58%	73%	67%	66%
N2	Dependence on local labour	50%	73%	89%	69%
N3	Dependence on local suppliers	8%	27%	22%	19%
N4	Dependence on organisational ecology	67%	36%	78%	59%
N5	Engages in non-market exchange relationships with local organisations	17%	9%	11%	13%
N6	Organisation membership in local business association or other local group	33%	18%	33%	28%
N7	Organisation owner/decision makers have locally based personal networks	33%	27%	56%	38%
N8	Organisation member's affiliation with local groups/organisations	17%	36%	67%	38%
I1	Operations restricted within territorial boundaries	33%	36%	22%	31%
I2	Organisation formally tied to local government	8%	9%	0%	6%
I3	Organisation participates in local events	8%	18%	33%	19%
I4	Donations to local entities or local sponsorships	17%	82%	56%	50%
I5	Organisation operations intended to enhance community or local welfare	17%	55%	44%	38%

Kaiapoi CSO respondents were, however, most likely to identify as local organisations (with 90% of the CSOs noting that their organisational identity was tied to Kaiapoi, compared to 56% in Lyttelton, and 25% in the CBD). CBD organisations relied on the local ecology and other businesses in the CBD to provide the customer base.

The typology of local embeddedness facilitated further exploration of the relationship between local connectedness and resilience in three ways. First, understanding how or why different kinds of organisations become embedded in places helped explain what motivates them to stay or reinvest after a disaster. Second, the typology facilitated explorations of how organisations were affected by disruptions in those places, and by extension, how local recovery interventions assisted organisations. For example, case study organisations were highly embedded in the Christchurch CBD's organisational ecology prior to the earthquakes. Yet due to building damage, depopulation, and the cordons most of the organisational

ecologies in the CBD were severely impacted and in many places destroyed. Thus, an important intervention in the CBD was to help create organisational communities, such as the ReStart Mall. Finally, exploring the nuances of local embeddedness enabled a richer analysis of the relationship between different kinds of local connections and organisation's adaptive capacity. In the next section, I examine the role of organisational characteristics, including local embeddedness, in determining the impact of the earthquakes on CSOs.

5.4 CSO Disruption and Vulnerability

The earthquakes and the social and institutional responses that followed affected organisations both directly and indirectly throughout the study period. Some CSOs experienced high levels of direct impacts, but were able to adapt in ways that enabled them to minimise further disruptions. Others avoided serious disruptions for months after the event but later experienced degenerative change as their contexts shifted around them. The earthquakes had direct effects on organisations caused by physical property damage and indirect effects caused by increased costs, decreased productivity, and other supply and demand side effects.

5.4.1 Direct effects

As an indicator of direct disruption from the two main earthquake events (September 2010 and February 2011), I developed a composite score of the initial impacts to the CSOs' physical premises. The 'direct impact score' is an indicative measure of the physical disruptions that would have affected the CSOs' ability to operate (Table 14). The final 'direct impact score' for each CSO is the sum of the 5 binary direct impact variables for the September 2010 and 5 for the February 2011 earthquake (1= organisation experienced this impact, 0 = organisation did not experience this impact). Lifeline disruption refers to both water and electricity disruption for September and February, so organisations can have a total

score up to 4 for this variable (Table 14). CSOs in the Christchurch CBD experienced the highest impact scores on average (8.42), as the CBD was heavily disrupted by both the September 2010 and February 2011 earthquake. In comparison, the average impact score for Kaiapoi CSOs was 3.36 and for Lyttelton 4.89 (Table 14).[57]

All but three CSOs closed for some period of time following the earthquakes. For those that did close, the length of time varied from less than a week to more than a year and a half. Table 14 also shows the total number of days that CSOs closed following earthquakes (including major aftershock events). Two organisations, *Kaiapoi Arts & Recreation* and *McCoy's Hospitality* in Lyttelton, closed immediately following the September 2010 and February 2011 earthquakes, respectively, and never reopened. In contrast, two CSOs in Kaiapoi (*Toasty's* and *Timber Craft*) were for relatively short periods of time following the earthquakes, but shut indefinitely in 2013 when detailed engineering evaluations (DEEs) revealed serious structural damage to their premises.

Organisations that experienced greater direct impacts were closed for longer (this relationship is statistically significant as shown in Table 15). However, there were substantial variations in the length of time CSOs stayed closed that cannot be explained by physical impacts alone. For example, some organisational characteristics mitigated the closure duration, including the size and age of the organisation. Larger and older CSOs were closed fewer days following the earthquakes (Table 15). Larger organisations were also better able to redistribute internal resources, whether financial or human, in the immediate earthquake aftermath and so reduced the amount of days they needed to close.

[57] Some CBD organisations reported disruptions from the December 2010 earthquake, and several Lyttelton organisations were also impacted by the June 2011 aftershocks. Disruptions from these events are not reflected in the direct impact scores.

Table 14: CSO impact, closure, and 2013 post-disaster trajectory [58]

	CSO Pseudonym	Cordon	Structural Damage	Non-Structural Damage	Lifeline disruption	Direct Impact Score (total)	Days closed	2013* Trajec.
Christchurch CBD	Bond's Beverages	1	1	2	4	8	4	0
	Cat's Cradle	2	1	2	4	9	554	0
	Elegance	2	2	2	2	8	132	-1
	Executive Sweets	2	1	2	4	9	155	+1
	Gilbert's Building Supply	2	2	2	4	10	6.5	-1
	Health Solutions	2	1	1	3	7	35	-1
	Kedzie & Sons	2	2	2	4	10	59	+1
	National Service	1	1	2	2	6	7	-1
	Tech Sense	2	2	2	4	10	11	0
	The Attic	2	2	2	2	8	220	0
	Wigwam	2	2	2	4	10	67	-1
	Wolverine Wares	2	1	2	1	6	49	-1
Kaiapoi	Amherst Retail	1	0	1	2	4	4	+1
	Figure Financial	0	1	1	3	5	51	-1
	Kaiapoi Arts & Recreation	1	1	1	2	5	NA [59]	-1
	Kaiapoi Assistance	0	0	0	0	0	0	0
	Kaiapoi Corner Store	0	0	0	0	0	0	-1
	Kaiapoi Rental	1	1	2	2	6	20	-1
	Kaiapoi Shoppe	0	0	2	2	4	0	-1
	Kaiapoi Society	0	2	2	2	6	13	+1
	Suave	0	0	1	0	1	1	+1
	Toasty's	1	1	2	2	6	13	-1
	Timber Craft	0	0	0	0	0	3	-1
Lyttelton	Coastal Services	2	0	1	0	3	3	+1
	God Save the Queen	2	2	2	2	8	130	+1
	Good Old Pub	2	1	1	2	6	605	-1
	McCoy's Hospitality	2	1	1	2	6	NA	-1
	Norwich Retail	1	1	1	2	5	157	0
	Port Retail & Craft	1	1	2	0	4	90	-1
	Pretty Patty's	0	1	1	2	4	60	+1
	Pumpkin Community Group	1	1	1	0	3	NA [60]	-1
	Star Creek	1	2	2	0	5	90	-1

*Post-disaster trajectories are: +1 = developmental change, 0 = restoration to pre-EQ trends, and -1= degenerative change

[58] As detailed in Chapter 3, the CSOs' 2013 trajectories reflect the direction of the CSOs' revenue trend between financial years 2008 and 2012 and a qualitative self-assessment of the organisation's health compared to before the earthquakes.

[59] *Kaiapoi Arts & Recreation* closed immediately following the September 2010 earthquake, and had not reopened as of 2013. *McCoy's Hospitality* closed for 7 days following the 2010 earthquake and immediately following the Feb earthquake. The owners eventually chose to close the business permanently in 2011.

[60] *Pumpkin Community Group* reduced its operations following the September 2010 earthquake, and had very limited functionality after the February 2011 earthquake.

Table 15: Correlations between CSO attributes, impact, and embeddedness score

	FTE / FTE Corp	Duration operation (years)	Days closed	LE Score	Direct Impact Score
FTE / FTE Corp	1				
Duration operation (years)	0.298/ 0.346	1			
Days closed	**-0.388*/ -0.415***	**-0.435***	1		
LE Score	-0.172 / -0.252	-0.187	0.303	1	
Direct Impact Score	0.240/ 0.279	-0.058	**0.500****	-.229	1

*Significant difference at p<0.05, ** significant difference at p<0.01

Despite their potential exposure to local disruptions, organisations with high local embeddedness (LE scores) did not close for more days.

The organisation's industry sector seemed to influence closure duration, though there are not enough organisations in each category to perform valid tests for significant differences. Of the organisations that reopened, hospitality organisations were closed the longest (267 days) and retail the second longest (83 days) (Table 16).

Table 16: Average local direct impact scores by industry category

Combined Industry Sector	***CSOs (N)***	**Direct Impact Score (μ)**	**Days closed* (μ)**
Culture, recreation, & social services	4	3.5	6.5 [61]
Hospitality	5	7.2	266.8
Retail	12	6	83.2
Professional & Personal Services	5	3.8	27.0
Manufacturing & Wholesale	3	6	4.5
Information, Communications, & Technology (ICT)	3	7.7	17.7
Total	32	5.7	84.9

*Only includes organisations that reopened during the study period.

The trajectories CSOs experienced as of 2013 (also reported in Table 14) were not predicted by their size, age, or even pre-earthquake revenue trend. [62] Overall, 18 CSOs experienced degenerative change following the earthquakes, 6 experienced restoration of pre-

[61] Two of the four culture, recreation & social services CSOs did not reopen at all during the study period, and this artificially depresses the average days closed value.

[62] I used Kruskal-Wallis tests, the non-parametric version of an analysis of variance test (ANOVA), to assess differences among independent samples (trajectory groups).

earthquake trends, and 8 experienced developmental change. An important finding of this analysis is that an organisation's pre-earthquake characteristics were not enough to guide them toward positive outcomes. Insurance status was also insufficient to predict an organisation's trajectory following the earthquakes. Insurance was a common loss mitigation resource for many organisations.[63] Although receiving insurance pay-outs helped organisations buffer the initial impacts of the earthquakes, they were unable to simply absorb the indirect effects of the earthquakes.

The degree of direct impact did influence the number of days that CSOs closed, but neither direct impact score nor days closed were also capable of predicting organisational trajectories in 2013. Effects such as population dislocation, reductions in staff productivity, and decreased demand had a significant impact on some organisations. These indirect impacts are discussed in more depth in the next section. The difference between the trajectory groups, however, only became apparent when examining the way organisations engaged with their contexts and adapted in the aftermath of the earthquakes (Section 5.5).

5.4.2 Indirect effects

The earthquakes significantly disrupted CSOs' local contexts (the Christchurch CBD, Kaiapoi, and Lyttelton). These disruptions were sometimes immediate and obvious (e.g. building damage and cordons) and on other occasions were slower to emerge. The contextual changes for each local area are summarised in Table 17 and discussed in detail in Chapter 4.

These altered contexts indirectly impacted organisations across Canterbury in several ways. For example, costs increased for many CSOs as demand for commercial real estate increased.

[63] Of the 32 CSOs, 30 had some form of insurance, and 18 had business interruption insurance specifically.

Table 17: Major post-earthquake disruptions and changes to study areas as of 2013

Area	Impact
Christchurch CBD	• Cordon (lasting up to 2.5 years in some areas) • Traffic rerouted around the city • Lost anchor attractions and damage to significant heritage buildings (e.g. the Christchurch Cathedral) • 1,600 commercial buildings to be totally or partially demolished • 2,200 (38%) fewer CBD businesses in 2013 than 2010 • 2,700 (36%) fewer CBD residents in 2013 than 2006
Kaiapoi town centre	• Significant portion of its buildings including several locally significant heritage sites severely damaged or demolished • Short-term town centre cordon • 1,000 homes in Kaiapoi's residential catchment were red zoned • 23 (4%) fewer Kaiapoi businesses in 2013 than 2010 • 650 (9%) fewer Kaiapoi residents in 2013 than 2006
Lyttelton town centre	• Significant portion of its buildings including several significant heritage sites severely damaged or demolished • Short-term town centre cordon • Road tunnel temporarily closed, perception that road tunnel unsafe • Lost access via the Sumner Rd. • Lost cruise ships that previously brought thousands of visitors each week • 22 (5%) fewer Lyttelton businesses in 2013 than 2010 • 213 (7%) fewer Lyttelton residents in 2013 than 2006

In the greater Christchurch area, the price of new rental contracts increased by 18 per cent between the end of 2010 and 2012, compared with a 7 per cent increase nationwide (Parker & Steenkamp, 2012). Similarly, the cost of quality labour increased and insurers increased their premiums in response to revised estimates of seismic risk.

The indirect effects varied depending on how organisations were connected to their disrupted contexts. If we understand an organisation's connections to its context as a series of pathways – along which things like resources, meaning, or identity are generated and exchanged – then we can see how these connections may increase the potential for disruption when that context is disrupted.

I identified categories of indirect effects that CSOs experienced as a result of their local embeddedness. These include: changes to the way people perceived and interpreted their local contexts, impacts on demand, and impacts on productivity. Each of these is elaborated below.

Image and identity impacts

The earthquakes changed the images and ideas that people associated with the study towns. These changes had the greatest impact on CSOs that aligned their image with their local area prior to the earthquakes. This type of impact was most pronounced in the Christchurch CBD. In the aftermath of the February earthquakes, CSO respondents were unsure whether the CBD even existed and, if it did, in what form. For some CSOs, the "whole heart has been ripped out"; the CBD was "broken", "gone", and "barely functioning". The respondent from *National Service* summarised the debate saying:

> "People talk about the new container mall as the CBD. People talk about Lincoln Road as the CBD, but mostly people refer to the CBD as 'that big dark hole with all those broken buildings'."

For many, the CBD was no longer associated with status and prestige, and being located in the CBD no longer produced positive meanings by association.

In Kaiapoi and Lyttelton, CSO owners were more likely to discuss the loss of heritage buildings, which had been central to the towns' characters prior to the earthquakes. In Lyttelton in 2009, large parts of the township had been awarded Category 1 Historic Area status by the New Zealand Historic Places Trust. For Lyttelton CSOs, the loss of the majority of the town's significant heritage buildings not only reduced the attractiveness of the town for visitors, but also altered an aspect of the town's character that prior to the earthquakes had been attractive to many business owners.

Demand impacts

The emergence of new and sometimes negative place images, including heightened perceptions of certain areas as dangerous, had significant impacts on customer numbers. In the CBD, customer numbers decreased following the September 2010 earthquake due to people's fear that tall and unreinforced masonry buildings were unsafe. A similar fear was

also evident in relation to the Lyttelton road tunnel and the main street in Kaiapoi, dramatically reducing customer numbers at various points following the earthquakes. The owner of *Cat's Cradle* reported significantly reduced customer numbers and revenue following the September 4th and Boxing Day 2010 earthquakes:

> "You know, we franticly put up signs saying 'we were still open' and stuff, but you know it was tough straightaway from that point. New Year's Eve's a good example, you know […] we didn't have anyone come in till half past 12 and then it sort of filled up a bit but you know. We did probably ten or 15 per cent of what we'd done the previous New Year's Eve, and it was just tough because it was such a brick building. That was so obviously a brick building. I'd see people come in to look around, feel uneasy and leave."

Predicting the flow of demand also became difficult, as people and other organisations relocated from or closed in the affected areas. Both the CBD and Lyttelton no longer had the critical mass of businesses necessary to function as a central hub with the same organisational synergies. Previously dependable patterns of interaction no longer applied. For example, before the earthquakes hospitality organisations in Lyttelton could count on the theatre and music venues to generate weekend trade, but this was no longer true after the earthquakes.

Conversely, Kaiapoi CSOs that reopened experienced a significant surge of demand following the September 2010 quake, as they were operating in an environment with fewer competitors. Some Kaiapoi CSOs also experienced short-term demand increases after the February 2011 earthquakes and following the large number of detailed engineering evaluations (DEEs) required for commercial building that closed much of the neighbouring town Rangiora's main street in May 2011. Then in late 2011 and 2012, after the residential red zoning announcement, both Kaiapoi and Lyttelton CSOs experienced a sustained

reduction in local customers. Organisations that relied on a relatively high degree of local patronage or on the local organisational ecology were more likely to be impacted by such developments than organisations that were not embedded in this way.

CSOs' with a relatively high proportion of local patronage also reported that disrupted customers and clients sometimes required additional (often unpaid) assistance, extended credit, or additional products and services in the earthquake aftermath.

Productivity Impacts

Organisations experienced impacts on their productivity as a result of both network and institutional embeddedness mechanisms. Labour productivity decreased and intra-organisational conflict and at-work error rates increased as local staff dealt with the ongoing strain of the earthquakes and disruptions to their homes and families. Managing staff wellbeing thus became one of the major challenges and priorities for CSOs following the earthquakes. Although CSO leaders recognised the importance of managing staff wellbeing, supporting staff meant giving staff more time off and increased spending (e.g. on getaways for staff, lunches, and other items thought to boost staff morale and wellbeing) which was difficult for some organisations to manage. Effects on staff productivity and wellbeing were greater for CSOs whose owners and staff lived in areas that were highly damaged, such as the study towns. CSOs also experienced reduced staff productivity due to customers consuming staff members' time discussing the earthquakes.

Disruption to local suppliers reduced organisational productivity, as organisations needed to find alternate suppliers or work around inadequate service. Ten CSOs permanently lost at least one service provider or supplier as a direct result of the earthquakes. Some suppliers, especially those with a high proportion of customers in Canterbury, were overwhelmed by increased demand (notably service suppliers, such as insurance brokers and I.T. consultants), and this caused delays for some CSOs, hindering their recovery progress.

Similarly, changes to the institutional contexts in which CSOs were embedded had ripple effects on CSOs. Local councils and intra-corporate partners were often consumed with response and recovery activities and, as a result, were less able to support organisations with which they had both formal ties and support responsibilities.

Organisations that were embedded in local social institutions often faced an increased expectation to provide support and services to local people and groups. For example, CSOs which felt that their organisation enhanced community welfare prior to the earthquake were more likely to assist with local response and recovery activities following the earthquakes. Their contributions included offering their premises as a shelter, providing resources (e.g. food and water) and information to affected community members, and doing extra unpaid work to assist disrupted clients.

5.4.3 Earthquake effects overview

If we use the LE Score as a proxy for potential impact from local disruptions we can see that some organisations were far more exposed to these disruptions in their local context than others. In the short to medium-term, these highly embedded organisations had to reconsider where their organisation fitted in a redefined context, to deal with fluctuating or declining demand, and to address additional challenges to their productivity. Despite these additional challenges, a high level of local embeddedness did not mean that organisations were closed for more days following the earthquakes, nor did it significantly influence CSOs' 2013 post-disaster trajectories. Thus, it was important to further examine the way organisations mitigated the negative effects of the earthquakes.

5.5 Adaptation and Embeddedness

Regardless of an organisation's sector, size, degree of earthquake impact or its ability to cover losses with internal resources or insurance, the ability to adapt was crucial to its

ongoing existence. Comparisons among the 32 CSOs showed that the major variables differentiating organisations' post-disaster trajectories was the capacity to (a) identify the need to adapt and (b) the ability to effectively implement those adaptations. Although an organisation's context is always changing, the earthquakes and subsequent social and institutional responses caused major shifts, often accelerating or altering local trends. As a result of these contextual shifts, organisations needed a heightened ability to monitor their environment for potential disruptions and opportunities. They then needed to implement adaptations throughout the recovery process in order to thrive in an unsettled and uncertain environment.[64] An organisation's need to adapt, however, is not always accompanied by the capacity to adapt. In different ways organisational embeddedness hindered and enabled adaptive capacity.

The trajectory groups indicate how organisations were performing as of April 2013. Table 18 displays the CSOs by pre-earthquake geographic location and trajectory group. It is important to note that CSO trajectory does not indicate recovery speed; rather it reflects the capacity of organisations to retain or regain functioning following a prolonged series of disruptions.

Cross-case analysis within and among the trajectory groups revealed important commonalities among the organisations that were doing well in 2013 versus those who were either doing poorly or no longer operating.

[64] Adaptation is prompted when an organisation detects the need to deal with a novel situation or stressor, when existing routines stop working to the benefit of the organisation, or when it becomes apparent that other modes or locations for operating will offer greater advantages (Berkhout, Hertin, & Gann, 2006; Gavetti & Levinthal, 2010).

Table 18: CSOs by location and trajectory group

	Trajectory		
	Degenerative Change	Restoration to Pre-EQ Trends	Developmental change
Christchurch CBD	Elegance Gilbert's Supplies Health Solutions National Service Wigwam Wolverine Wares	Bond's Beverages Cat's Cradle Tech Sense The Attic	Executive Sweets Kedzie & Sons
Kaiapoi	Figure Financial Kaiapoi Arts & Rec* Kaiapoi Corner Store Kaiapoi Shoppe Kaiapoi Rental Toasty's** Timber Craft*	Kaiapoi Assistance	Amherst Retail Kaiapoi Society Suave
Lyttelton	Good Old Pub McCoy's Hospitality** Port Retail & Craft Pumpkin's community group* Star Creek	Norwich Retail	Coastal Services God Save the Queen Pretty Patty's

* Still closed as of April 2013, ** Closed permanently

The key findings were that:

- Organisations experiencing developmental change each made significant operational and location changes throughout the study period (between September 2010 and April 2013).
- Organisations experiencing developmental change were opportunity seeking as opposed to restoration or survival seeking.
- Organisations experiencing degenerative change faced issues of inertia, with a series of factors slowing or hindering their ability to change in response to contextual challenges.

CSO that experienced restoration to pre-earthquake trends, like developmental CSOs, undertook significant adaptations following the earthquakes. Overall, however, they implemented fewer changes, and were generally focused on restoring and maintaining their core operations. Similarly, some of the CSOs that experienced degenerative change implemented changes but often did not evaluate other options. They neglected to develop

feedback processes to incorporate lessons for their long-term success, and sometimes struggled to understand how their organisation fitted into the changing local context.

Organisations that did well following the earthquakes also exhibited several indicators of endogenous organisational resilience (i.e. capacities originating from within the organisation). As I discuss in the next sections, however, organisations' resilience was also shaped by embeddedness in their contexts.

Section 5.5 presents an analysis of organisational post-earthquake adaptation in three stages, progressing toward understanding the linkages between organisational resilience and their local embeddedness. Section 5.5.1 provides an overview of CSOs' adaptive actions following the earthquakes. Section 5.5.2 then shows how CSOs' embeddedness in their local contexts in some cases led to inertia (inability or resistance to change), thereby limiting the range of possible adaptive actions. Finally, Section 5.5.3 presents an analysis of the forms of local embeddedness that contributed to CSOs' capacity to implement developmental change. It demonstrates how attention to embeddedness is able to enhance our assessment and interpretation of organisational resilience.

5.5.1 CSOs adaptive actions

The adaptations that CSOs employed to respond to changes in their local contexts fell into two general categories. They adapted their operations (strategy, structures, and processes) and they moved (within or outside of their local area).

Operational adaptations

CSOs adapted their structures, strategies, and processes in the aftermath of the earthquakes. The earthquakes prompted some organisations to revaluate the way they had been operating. In some cases, the quakes catalysed innovation or changes organisations had considered but not pursued, while in others their effect was to accelerate planned changes.

CSOs made many adjustments during the short-term response period (e.g. operating for longer hours and using generators), but here I focus on the longer term operational adaptations. These adjustments included: 1) restructuring, 2) combining locations, 3) dividing or expanding operations, 4) changing products or services offered, (5) technology upgrades, and (6) increasing efficiency.

Restructuring

Cooperation and alliance seeking behaviours typically become more frequent in the aftermath of disasters (De Alessi, 1975; Koria, 2009). CSOs were spurred by the earthquakes to restructure their formal business relationships through mergers, acquisitions, and buyouts. These initiatives allowed organisations to transfer and exchange resources and information, and to redistribute risk within their organisational systems. Table 19 provides examples of organisational acquisitions and mergers that occurred in the earthquake aftermath. The acquisitions had the added benefit of allowing the CSOs to move to locations that were already associated with the CSOs' business type.

Some of the other restructuring responses served the dual purpose of reducing organisational costs and increasing efficiencies. These changes allowed organisations to maintain positive cash flow despite decreased revenue and unpredictable demand. CSOs dropped parts of their businesses that were underperforming, rationalised services, and reduced costs. For example, after merging, *Bond's Beverages* decided not to reopen part of its CBD branch, which had been performing poorly prior to the earthquakes. Other organisations decided to reduce costs in other ways by moving to smaller, cheaper premises (e.g. *Coastal Properties*), renegotiating the terms of their lease (e.g. *Kaiapoi Rental*), or reviewing and reducing non-essential services (e.g. *Gilbert's Building Supplies* and *Tech Sense*).

Table 19: Post-earthquake organisational acquisitions and mergers

Type of Restructuring	CSO	Description
Acquisition	Bond's Beverages	Before the February earthquake, the national corporation had recently acquired another company. Within days of the February earthquake, the Christchurch CBD office was able to move to the suburban based office/warehouse of the newly acquired company. This move accelerated the merger process and the rationalisation of business assets.
Partial Merger	National Service	In 2013, National Service split its Christchurch operations, after realising it needed to expand but that its post-earthquake premises were too small to do so. A large department within National Service merged with the Christchurch branch of another national organisation. The similarities in their operations made it logical to combine the two organisations, while allowing the rest of National Service to relocate separately.
Acquisition & Merger	Pretty Patty's	After losing her premises in 2011, the owner of Pretty Patty's purchased another business in a suburb outside of Lyttelton. She took across the Pretty Patty's name, but acquired the client list, location, and some equipment from the previous business owner. She then merged the business with another personal services business. This expanded the range of services offered and enabled the business to operate 6 days a week.
Acquisition	Suave	After losing her premises in 2013, the owner of Suave purchased another business in Kaiapoi in a higher profile site. She retained an employee of the former business and the new employee's associated client base.

Combining locations

Some organisations temporarily shared premises, or co-located, following the earthquakes so they could continue operating while unable to access their premises. Others pursued co-location as a long-term response to reduced commercial property availability, increased lease costs, and to distribute the risk and cost borne by a single organisation. Longer-term co-locations also allowed some businesses to share customers and attracted additional customers who liked having the businesses in the same locations. For two CSOs, the process of co-location – a relatively casual arrangement between two friends – reduced costs and the amount of work for both business owners:

> "We go walking together and she's one of the friends [I mentioned earlier], and you say why don't you have the back room? Why don't you do a couple of days? So I go from working four days a week to working three, but open six days a week… Open longer and working less! So I've reached shop keeping nirvana, because of the earthquakes."

None of the CSOs had attempted or planned for co-location prior to the earthquakes, yet seven CSOs successfully operated from another organisation's premises for a period of time following the earthquakes. One CSO leased new temporary premises with another organisation, and two CSOs hosted displaced organisations on their premises. All of these arrangements were made post-earthquake (as opposed to a pre-planned mutual aid agreement), and in all but two cases the actors making the arrangements from each organisation had pre-existing relationships.

Dividing or expanding operations

In 2011, three CSOs went from operating in one premises in the Christchurch CBD, to operating two premises in different locations. The CSOs had not planned to expand to a second location prior to the earthquake and they consequently struggled to varying degrees to adjust to the increased costs and management burden brought about by this organisational change.

Second locations served different purposes for the CSOs.

- *Gilbert's Building Supplies* relocated within a week of the earthquake, signing a long-term lease for premises that could only accommodate the wholesale division of their organisation. As a result, they had to acquire a second location in another Christchurch suburb to house the retail portion of their business.

- *Wolverine Wares* and *Executive Sweets* were operating relatively successfully from permanent and long-term temporary locations, respectively, and opened a second location in the Christchurch CBD ReStart Mall.

The national administration manager for *Gilbert's Building Supplies* recalled feeling a sense of urgency to acquire commercial accommodation within a day of the February earthquake:

> "So what happened was all the buildings went instantly, and people were thinking they had a lease on one and then all of sudden somebody would come along with more money […] So on the Wednesday night I found five buildings, of which this was one of them […] So [the business owner] said I just want a lease contract through today, and I want it signed and sealed and everything. Because we knew people were coming in over the top. He got to the bank at half past four… and got the money in, and he knew once the money was in the bank they couldn't do anything about that."

Gilbert's leaders made a quick decision to lease premises that would not suit all of their business needs, in order to avoid missing out completely in an atmosphere of real (though possibly exaggerated) scarcity and heightened competition for commercial space. This decision then generated the need to acquire a second location, making coordination and management more complicated for the organisation. It did, however, ensure that *Gilbert's* was able to operate within days of the February earthquake. As *Gilbert's* business model required a physical site, acting quickly to obtain premises was sensible.

Conversely, *Wolverine Wares* and *Executive Sweets* opened their second locations with greater strategic deliberation. These business owners saw the ReStart Mall as a potential business opportunity, but also as an opportunity to be part of the recovery of the city. They were unwilling, however, to relocate their organisation completely or to commit all of their

resources to the CBD. In this case, operating two locations allowed these CSOs to hedge their investment in the CBD.

Changing products or services offered

CSOs adjusted the products and services they offered according to changing customer preferences or market circumstances in the earthquake aftermath. Some organisations, such as *Amherst Retail* and *Kedzie & Sons*, saw opportunities to capture new markets after losing local competitors. New locations and different customer demands prompted other CSOs to alter what they offered. Table 20 summarizes how organisations altered their product offerings.

Table 20: Types of post-earthquake product and service changes

Type of Change	Example
Offering fewer products and services	Tech Sense limited the range of services they offered to business clients in order to focus on their key growth areas.
Offering more products or services	Due to increased funding and interest in the organisation as a result of their part in the response Kaiapoi Support was able to fund new services that they had desired to introduce prior to the earthquakes.
Offering different products or services	Wigwam and Elegance felt that the earthquakes had changed customers' product preferences (e.g. an increased demand for colourful products), and adjusted accordingly.
Shifting industry focus	After losing their premises and a significant amount of stock, Port Retail & Craft moved from a majority retail income supported by light manufacturing to relying almost entirely on their manufacturing income.
	The owner of God Save the Queen switched from entirely retail, to entirely wholesaling her own earthquake related line of products after losing her pre-earthquake premises, and later relied on a mix of retailing and wholesaling.

Other organisations made minor changes to their ordering (i.e. *Wigwam* and *Elegance*), while others shifted their industry focus entirely. *Port Retail & Craft*, for example, shifted the emphasis of its operations to the manufacturing side of the business. Prior to the earthquakes, the owners had focused on developing the retail portion of their small business, but after losing premises and stock, and with significantly reduced foot traffic in Lyttelton, they opted to focus more on the light manufacturing side of the business.

Technology upgrades

The earthquakes accelerated the integration of new technologies into CSOs' operational systems. Organisations integrated innovative technology and techniques into their operations, including utilising social media, new IT software, new or improved cloud based backup and storage systems, satellite phones, and increased capacity for mobile working. Several specific examples are outlined in Table 21.

Table 21: Innovations and technological improvements

Organisation Type	Post-earthquake technology adoption
Figure Financial	Implemented new cloud computing system to ensure that all client records would be accessible in the event of a disruption. This has given both staff and clients greater flexibility and is projected to increase profitability.
Gilbert's Building Supplies	Integrating the digital inventory management systems for the organisation's locations throughout New Zealand. This facilitated inventory sharing, and as a result reduced the amount of stock each location needed to order and carry.
God Save the Queen	After the demolition of the retail shop, the retailer began designing and wholesaling a line of earthquake related products to stores and online distributors nationally and internationally. Using low-cost online platforms, a blog and a social networking website, the organisation marketed the new line of products and coordinated ordering, reducing overheads and greatly increasing sales compared to pre-quake.
Health Solutions	Transferred emails and a number of client services to the cloud, and digitally replicated data across multiple locations, increasing information redundancy but also increasing efficiency and improving the client experience.

CSOs used blogs and social networking sites to connect with old customers and generate interest from new customers. Two CSO owners even continued to interact with the public online during periods of extended closure. This strategy helped keep customers engaged in the organisation's story of recovery and meant that the organisation had to do less work to reconnect with customers after reopening in new locations.

Technology upgrades helped CSOs manage higher workloads, reduced costs, and increased CSOs' efficiency. For retail and IT CSOs these developments greatly enhanced their ability to reach a larger market outside of Canterbury. All of these changes improved their network resilience in the face of further local disruptions.

With varying degrees of success, CSOs adapted their operations to their post-earthquake environments. Decision makers pursued these adjustments with the intention of

improving organisational performance. Many of these adaptations, however, had the added consequence of influencing CSO's embeddedness in these environments. For example, some organisations' local embeddedness may have decreased as they connected with a larger customer base online and as technologies enabled staff to be more mobile.

Location adaptations

CSOs' also moved elsewhere within their disrupted environments or left them altogether. Many of the CSOs in this study relocated more than once to various forms of emergency, temporary, and permanent premises. They not only had to change where they were located, but how they operated and with whom. CSOs that lost their pre-earthquake premises pursued responses including: 1) operating from temporary premises, 2) operating virtually, with no central physical base, 3) operating from another organisation's permanent premises, 4) relocating to a new or restored 'permanent' location, and 5) not moving (i.e. operational hiatus during repairs to pre-earthquake premises).

Relocation was a necessary adaptive response for organisations that lost access to their premises or when contextual changes rendered their original locations unsuitable for ongoing operation. Only three of the 32 CSOs did not at any point (between September 2010 and April 2013) lose access to their premises. All of these were in Kaiapoi. As a result of the September 2010 earthquake, five CSOs' buildings were red stickered or deemed unsafe for re-entry. Following the February 2011 earthquake, 21 CSOs' buildings received red stickers, and in 2013 three Kaiapoi CSOs (whose buildings were previously unaffected) lost their premises following DEEs. In total, 22 CSOs relocated at least once (of those 13 relocated more than once).

Operating from a temporary premises

Temporary premises include any location where the employees of the organisation worked collectively without the intention of staying permanently. These premises took a range of forms, from booths or other short-term 'pop-up' shops lasting hours or days to motels and rented houses, and even included the personal residences of employees. Other CSOs operated from purpose built temporary buildings that were in place for years, for example, the retrofitted shipping containers in Figure 14 that composed the Christchurch CBD ReStart Mall.

Figure 14: Temporary Premises. Pop-up shop on porch and shipping container shops in ReStart mall

Source: left image (Rebecca Lovell-Smith), right image (Joanne R. Stevenson)

For some CSOs, 'temporariness' was a strategic adaptation to an environment characterised by uncertainty. While the normal patterns of interaction were disrupted, CSOs that depended on their organisational ecology to attract customers utilised mobile premises to 'pop up' at events that generated customers. For example, *Executive Sweets* temporarily operated their retrofitted shipping container at a multi-week festival in the CBD. *Kedzie & Sons* sold stock salvaged from their red-zoned shop at a local fair, and the owner of *God Save the Queen* ran a pop-up shop from her front porch during the Lyttelton Farmer's Market (Figure 14).

The owner of *Cat's Cradle*, a CBD bar and entertainment venue, described the mobility of their temporary premises as a 'self-insurance' strategy while Christchurch reconfigured, saying:

> "We could pack the whole thing down and shift it onto a new site in a week… I'm not committing to anything yet. I know everyone's saying 'Addington's the new spot. Sydenham's the new spot,' but I'm just hedging my bets. And I can move to wherever the new spot is."

Temporary premises also enabled organisations to return to the Christchurch CBD, prior to the finalisation of the city plan. This allowed organisations to stay connected to the CBD while the city was in a state of impermanence and unpredictability.

Operating as a virtual organisation

Two CSOs were able to operate temporarily as 'virtual' organisations, conducting the majority of their business online or over the telephone without the need for a physical base. For a period of several months following the February earthquake, *Norwich Retail*, stored stock in the owners' and neighbours' homes and used a popular auction website to sell goods while the owner waited to learn the fate of their premises in Lyttelton.

Health Solutions, a larger organisation (37.5 FTE), enabled employees to work from home for approximately six months following the February 2011 earthquake, finding spaces for collective meetings as needed. This approach allowed *Health Solution*s' management to avoid committing to a long-term lease in a suboptimal location.

Relocating to a new 'permanent' location

By April 2013, 24 of the 32 CSOs were operating from what they considered a permanent location. That said, permanence had taken on a more flexible meaning in the earthquake aftermath. Some CSOs that signed long-term leases in sub-optimal buildings or

locations considered these premises ‘permanent for now’ until better options become available. Similarly, with on-going disruptions CSOs also ended up having multiple ‘permanent’ locations. For example, Christchurch CBD retailer *Kedzie & Sons* moved to a new location in the CBD after losing its premises in the September 2010 earthquake. After losing the new premises in the February 2011 earthquake, *Kedzie & Sons* spent several months operating from temporary locations, including the owner’s home, before relocating to a third permanent location in a Christchurch suburb. Permanence was often interpreted by CSO decision makers through a new lens of uncertainty and contingency following the earthquakes.

CSOs that relocated to permanent premises outside of disrupted areas often needed to make fewer operation adaptations. They did, however, need to expend more effort making connections with new customers. For example, *The Attic* was the only organisation to relocate out of the region. The decision to relocate to a relatively stable and intact urban environment eliminated some of the feelings of uncertainty that Canterbury CSOs continued to face. Aside from disrupting their connections to their local networks in Christchurch and needing to establish new relationships in Wellington, *The Attic* was generally able to continue operating in much the same way as they had prior to the earthquakes.

Not moving – operational hiatus

Several CSOs closed for a period of months while decision makers considered their organisation’s future. However, only two CSOs completely ceased operations for the entire duration of the repair or reconstruction of their premises. This decision had different implications for the CSOs due to the nature of their business. *Kaiapoi Arts & Recreation*, a non-profit organisation, chose to cease operations indefinitely while its new council-funded building was planned and constructed. *Kaiapoi Arts & Recreation* relied, almost completely, on volunteers and the director did not feel that it was a good use of the organisation’s limited

human or financial resources to operate in a temporary capacity. By contrast, the *Good Old Pub* in Lyttelton, a for-profit business with 10 FTE, was closed for 20 months and forced to lay-off all of its employees while waiting for structural repairs on its building. The owners committed to staying in their building based on their landlord's estimates of repair times, but these were greatly prolonged due to building consent complications. Although the pub had business interruption insurance, the hiatus proved financially detrimental for the organisation.

CSOs needed to adapt to recover and to operate successfully in their altered post-disaster contexts. CSOs that were able to perceive the need for adaptation before they were negatively affected tended to fare better than others. Adaptive options, however, needed to be adequately evaluated before implementation as they set the path of the organisation going forward. For example, organisations that committed to a sub-optimal lease often needed to make further operational changes like splitting the organisation. Thus, an interesting product of the complex and uncertain environment in the earthquake was a new attitude toward temporariness. Some CSOs resisted re-embedding in a new location and implemented systems that enhanced mobility and flexibility.

5.5.2 Embeddedness and inertia

For organisations to implement change successfully, they had to overcome organisational inertia. An organisation's inertia, or a resistance to change, increases when its embeddedness in some way reduces its capacity to perceive, respond, and adapt to changes in its environment (Berkhout, 2011; Tripsas & Gavetti, 2000). An organisation has high inertia "when the speed of reorganization [adaptation] is much lower than the rate at which environmental conditions change" (Hannan & Freeman, 1984, p. 156). High inertia can lead to stagnation or degenerative change if organisations are unable to adapt to their changing contexts adequately. Some kinds of inertia, such as resistance to changes that leaders did not see as conducive to their organisation's mission or values, provided guidance and direction

for CSOs. Organisations, however, then needed the capacity to adapt to accommodate these 'immovable' aspects of their organisations.

The mechanisms that connect organisations to their environments shaped the range of adaptations that were available and acceptable to CSO decision makers. Some of the mechanisms through which CSOs connected to their local contexts restricted adaptive action more than others. For a few organisations, their embeddedness led to high levels of inertia and degenerative change. For some, however, embeddedness in local contexts actually enhanced their capacity for adaptive responses.

Challenges of cognitive inertia

Cognitive inertia, CSOs' tendency to revert to familiar processes or failure to optimise decisions post-earthquake, was often the result of uncertainty, complexity and the cost of information. Cognitive inertia was evident amongst CSOs that continued along a pre-established path even when their contexts had changed significantly. Decision makers sometimes acted on a mental model of the environment with which they were familiar.[65] This was detrimental in an environment characterised by repeated rapid-onset disruptions and ongoing, subtle changes. CSOs had to determine paths for their future in unfamiliar contexts dominated by uncertainty. Many of the normal indicators and assumptions that guided decision making prior to the earthquakes (e.g. which areas of the city were developing or declining; demand forecasts) were no longer valid. As a result, some organisational decision makers opted for the familiar or the default option when they made decisions. For example, the owners of *Good Old Pub*, recommitted to the building they had been leasing prior to February 2011:

> "Well the landlord said he could get the building fixed, in a shorter time than is now happening. In hindsight if we had known how long it was going to

[65] C.f. Hodgkinson (1997) and Porac & Thomas (1990) for more on cognitive inertia.

take…but hindsight's a wonderful thing. You can't change that. It was a unique event and nobody knew how to react or what to do. If it happened again now, I think more people would think differently."

Even if the landlord had been able to repair the building in the time allowed, *Good Old Pub* would have been closed for several months. As a result of delays caused by on-going aftershocks and issues bringing the building to the current building code, they were closed for nearly 20 months following the earthquake.

CSOs whose owners were near retirement or had planned to sell the business prior to the earthquakes also experienced cognitive inertia. All four CSOs whose owners were planning to exit their business prior to the earthquakes experienced degenerative change. *McCoy's Hospitality* in Lyttelton, lost their building, and did not reopen after the February earthquake. The other three, experienced fairly minimal impacts, but did not adapt sufficiently in their changing environments to maintain positive growth. The decision makers in these small businesses were less likely to perceive the need to adapt and did not have the desire or "energy" to implement changes once the necessity did become apparent.

CSOs were not only limited by their ability to process new information about their environments, but also by ties between their image, identity, and the town in which they were located. CSO's whose brand recognition was restricted to their local environment faced higher barriers to establishing in a new location successfully. Relocating in a new town where the organisation was unrecognised would mean losing the original investments made in establishing a local reputation.

Of the 18 CSOs that identified as a local organisation (C3), only one relocated permanently to another town after the earthquakes. For organisations that had to consider relocation, decision makers (even those that did not live in the same town as the organisation) expressed attachments to their organisation's town in a way that precluded relocating

elsewhere. For example, the owner of *Figure Financial* felt that the organisation was part of the town "I just feel attached and I feel that it [the business] is tied to Kaiapoi."

Following the earthquake, CSOs' identity as part of a local collective (C3 and I5) often translated into a sense of responsibility to reopen locally and continue serving the town. CSO respondents noted a sense of solidarity among the community members and the businesses that reopened, which in many ways deepened the embeddedness of ties that these organisations already had in these places.

Challenges of network inertia

Network inertia occurred when organisations could not successfully make changes to their networks, even when the relationships were no longer optimal or had stopped functioning.[66] As organisations become more embedded in their networks, forming multiplex ties with elements of friendship, loyalty, and trust, the barriers to disrupting these networks becomes higher. Network adaptations can include both removing and adding network members, but also changing the nature of the relationships.

Certain market ties were more adaptable than others depending on the nature of the relationships and the nature of the adaptation required. CSOs were limited (or enabled) by their suppliers' capacity to deliver more or different goods and services in response to demand changes following the earthquakes. Organisations that depended on local labour and local customers faced similar challenges. The distance that staff and customers would travel to a relocated organisation was finite and depended on the depth of their relationship with the organisation and the substitutability of either the job (in the case of staff) or the product offered (in the case of customers). For example, *Pretty Patty's* local customer base supported the business, in part because it was a Lyttelton business, and the owner recognised that she

[66] C.f. Kim, Oh, & Swaminathan (2006) for a more thorough definition of network inertia.

would lose much of that business when she relocated outside of Lyttelton. She proceeded with the move, but factored this knowledge into her relocation decision making.

Reliance on the local organisational ecology (e.g. proximity to other organisations to generate business) restricted organisations' relocation options to, for example, areas that were undamaged or new agglomerations like the ReStart Mall. The owner of *Wigwam* explained that even if they could have reopened their retail store in the CBD, without other organisations around it would not have been a wise business decision:

> "Nobody would come. It would be like a random act of business risk. It would be like I'm going to put my business in a field and closing your eyes and pointing at a map. And you would be luckier there than on [our previous site]."

Yet, the substitutability of organisational ecologies was limited. *Wolverine Wares* moved from the CBD where it had been situated near other niche independent shops to a suburban area near a shopping mall. They found that not only did mall customers not come up the street to the shop, but previous customers from the CBD did not want to "come to the suburbs."

The personal networks and affiliations for small and micro-organisation owners and decision makers were some of the strongest and least flexible mechanisms tying organisations to places. This led to spatial inertia for some organisations. Owners of five CSOs in this study expressed reluctance to relocate their business if it meant that their children would need to change schools. For two small-business owners', their desire to remain close to their extended family was the main reason that they reopened their business in town (despite significant obstacles). This again did not necessarily lead to degenerative change, but required organisations to find ways to adapt within these limitations.

Challenges of institutional inertia

Institutional inertia limited the types of adaptive responses that were possible or acceptable for some CSOs following the earthquakes. Ten CSOs were affiliated with a larger organisational entity or corporation that restricted their operations to a particular territory. These CSOs' options for relocation were restricted within their operational territory. For example, the General Manager of *Kaiapoi Society* explained that they could not consider relocating outside of Kaiapoi even if they wanted to, because:

> "There's 14 like businesses within the Christchurch area so you can't just move up and set up next to somewhere else. You're all competing for the same customer base, so no. It wouldn't work; you couldn't go poke yourself beside Papanui or someone else."

Another effect of formal institutional embeddedness was that, like network embeddedness, CSOs' resilience was limited by their institutional capacity to cope effectively with the earthquakes.

Regardless of whether the CSOs had formal ties with the local government, they were influenced by the government's effectiveness in response and recovery. There were differences in perceived institutional efficacy and helpfulness between CSOs under the jurisdiction of Christchurch City Council and those under the jurisdiction of the Waimakariri District Council (WDC). About 54 per cent of CSOs in Kaiapoi listed the WDC as an important source of post-earthquake support, compared to 19 per cent of CBD and Lyttelton CSOs that listed the CCC as an important source of post-earthquake support. CSOs under both councils reported issues with the way their council had handled the response and recovery. However, Christchurch and Lyttelton CSOs (under CCC's jurisdiction) were more likely to report council procedural failures that actually hindered their ability to operate, including delays and opaqueness in building consenting processes, "lack of decision making", and "false promises" about the timing of decisions and actions. Thus, CSOs'

adaptive speed and capacity to recover depended, in part, on the flexibility and adaptive capacity of their political institutional contexts.

Inertia summary

Organisations tend to resist relocation until it becomes absolutely necessary (Clark & Wrigley, 1995). All but one CSO relocated within Canterbury, and CSOs generally stayed as close as possible to their pre-earthquake locations. Only three CSOs' premises in 2013 were more than 5 km from their pre-earthquake premises. On average, CSOs moved less than 1.2 km (excluding one CSO that relocated out of the region).

Organisations with more connections to their local environments (i.e. higher LE scores) tended to find ways to relocate locally despite sometimes significant challenges. In the Christchurch CBD, for example, CSOs had to overcome substantial obstacles including a general lack of permanent accommodation, fragmentation, and resistance from the council to allow permanent developments while undergoing the planning process. As of April 2013, six of the 12 CBD CSOs were operating from at least one premises in the CBD.

CSOs' resilience was nested within the resilience of the cognitive, network, and institutional structures in which they were embedded. Inertia was caused by factors within the organisation and by the interaction between an organisation and its local and extra-local contexts. The increased complexity and uncertainty of the post-earthquake environment exacerbated cognitive inertia. CSOs performed poorly as a result of cognitive inertia, in cases where decision makers lacked the desire to reinvent because they were near retirement and where they reverted to familiar decision pathways. Those that reverted to familiar processes often did not adequately understand the linkages between their contexts and their organisation.

Additionally, network inertia limited the range of adaptive options that some CSOs could pursue. Personal networks of owner's and decision makers were some of the strongest

ties to a local area and had a significant influence on an organisation's decision to stay in a local area.

Finally, institutional inertia restricted some CSOs' adaptive options and access to resources. CSOs embeddedness in a corporate structure in many ways increased their capacity to absorb the negative impacts of the earthquakes, but also served to restrict the flexibility and responsiveness of some organisations. Additionally, the capacity of the local government to respond and the choices that the national government made, including cordoning and residential red zoning, had major direct and indirect impacts on the CSOs. It shaped the suite of available options they could pursue.

5.5.3 Embeddedness and resilience

Resilience allows organisations to absorb impacts, to adapt in ways that may minimise the negative impacts of a disruption, and to capture opportunities for organisational improvement that may arise. Stephenson (2010) and Lee et al. (2013) developed and refined the "New Model of Organisational Resilience" (discussed in detail in chapter 2) using empirical evidence gathered from organisations in New Zealand. The model proposes that organisational resilience consists of two factors: planning and adaptive capacity. The planning factor consists of five indicators of resilience that loosely relate to an organisation's capacity to strategize and plan for crises. The adaptive capacity factor consists of eight indicators that assess an organisation's ability to detect and respond to crises in a way that minimises their disruption. Table 22 includes the factors and indicators as specified in Lee et al. (2013, p.34). For full definitions, see Chapter 2.

The model of organisational resilience proposed by Lee et al. (2013) offers a useful guide for considering the endogenous factors that enable organisations to adapt successfully in the face of stressors.

Table 22: Factors and indicators of organisational resilience

Factor 1: Planning	Factor 2: Adaptive Capacity
Planning strategies	Minimisation of silos
	Internal resources
Participation in exercises	Staff engagement and involvement
Proactive posture	Information and knowledge
External resources	Leadership
Recovery priorities	Innovation and creativity
	Decision making
	Situation monitoring and reporting

Source: Lee et al. (2013)

However, it does not adequately consider the relationship between an organisation and its environment, or conceptualise the porous boundaries between an organisation, the people that compose it, and the wider community environment in which it operates.

The comparative case studies focus on understanding how organisations were connected to their local social environments. The findings suggest that organisations are resilient, in part, because they are embedded in resilient social contexts. Organisations that have high levels of endogenous resilience, however, are better able to employ their connections to enhance their resilience. They are also better able to avoid the disruptions that flow through these connections, and to take advantage of opportunities as they emerge. For example, organisations that had effective crisis leadership and more internal resources were able to see the opportunity created by the loss of competitors and to reopen quickly and increase their market share.

The results discussed in the next section can help move our assessment of resilience from an attribute that is solely created and maintained *within* an organisation to an attribute that is also created through *interaction with* elements outside of the organisation. Resilience is co-created through interaction between an organisation, its local context, and its relational network. The boundaries between these elements are porous and overlapping. Resilience is both potentially enhanced and hindered depending on the nature of these interactions and the

organisations' degree of embeddedness. These external or 'exogenous' sources of resilience can be conceived of in two, related ways:

First, *contextual resilience* refers to the relationship between an organisation and the resilience of its physical, social, and institutional environments. Organisational resilience is, in part, derived from interactions with various components of organisations' context. While, my investigation has focused on organisations' interactions with place at the local scale, it is important to note that contexts are produced at multiple, nested, and interacting scales, and the unit of analysis (e.g. organisation) can be embedded in and across different scales (e.g. local, regional, and national).

The concept of contextual resilience accounts for the relationship between community and place-based resilience and organisational resilience. Contextual resilience is created through the interaction between an organisation and its contexts. Through their embeddedness in various local, regional, national, and super-national contexts, organisations become infused with the contexts in which they operate. Elements of resilience that permeate the contexts in which an organisation is embedded (i.e. high degrees of social capital, strong local leadership, strong commitment to place) also permeate the organisation, depending on how bound together the organisation is with its context. In this study, for example, some CSOs captured positive externalities by being situated in a community with a strong collective identity and norms of shopping locally. Similarly, CSOs that wanted to relocate within their heavily damaged town centres benefitted from community and industry groups that implemented programmes to keep people connected with the town centres, such as Gap Filler Projects and the ReStart mall.

The second way of conceiving of and exploring external sources of resilience is by specifically focusing on organisations' networks. I refer to this as *relational resilience.* Relational resilience is derived from resilient organisational networks. Relational resilience

has three elements: 1) resilience of the networks members, 2) resilience of the connections between these network members, and 3) the capacity of organisations to establish and mobilise resources from networks (including the willingness of staff members to mobilise personal networks).

Contextual and relational aspects of organisational resilience offer different, but complementary insights into the way organisational resilience is shaped through extra-organisational interactions. Relational resilience is based on sets of discrete exchanges (as in the definition of network embeddedness). Exchange with other actors in a network of relations, however, is part of the way that an organisation engages with its context. As demonstrated in the embeddedness literature, there are a number of ways that an organisation may connect with a place that are not adequately accommodated by the network metaphor. For example, the cultural norms that regulate organisational action cannot be represented as a series of nodes and ties. Contextual resilience captures the diffuse elements of an organisation's experiences in a place that may improve its capacity for resilience, such as the meaning, feeling, and motivation that organisational actors gain from feeling like their organisation is part of a place. It is not enough, however, to be embedded in a resilient network or resilient context. The CSO must also have the capacity to locate, activate, and apply the benefits of these external sources of resilience.

In the final part of this chapter I discuss ways local embeddedness can enhance organisational resilience. I also identify certain organisational capacities that improved CSOs' ability to mobilise contextual resilience. I again frame the discussion around the three categories of embeddedness from the embeddedness typology in Figure 13. I examine CSOs' relational resilience in the post-earthquake recovery context in-depth in Chapter 6.

Cognitive embeddedness and resilience

Cognitive embeddedness enhanced CSOs' capacity to recover in three main ways. First, if an organisation's image was tied to the local area (C1), they were more likely to benefit from people's desire to support their town's recovery. Second, an organisation's local identity (C3) created a sense of purpose that motivated staff members as they pursued recovery. Third, organisations that were engaged in their communities prior to the earthquakes were better equipped to assess the responses of the local people to the actions of the business (N5-8, I3).[67]

Some of the support that organisations received from local people was a positive externality of local residents' desires to support the town. CSOs were more likely to receive the benefit of this form of social capital if their image was tied to the local area. For example, the owner of *Port Retail & Craft* reopened in Lyttelton after losing their building in the February 2011 earthquake. As they struggled to re-establish and reorient, the business was buoyed by local support:

> "I know a lot of local people deliberately tried to buy things from us once we were open, just to support local business. So that was nice, just coming to buy something local to keep you here. So there were quite a few people like that."

The regional manager of *Bond's Beverages* noted that despite having an office and part of their operations based in the Christchurch CBD the organisation did not have a well-established image as a local organisation prior to the earthquake and as a result they missed out on the surge of local support.

> "Everyone is wanting to support the local Christchurch [manufacturers], and we [manufacture] in Auckland. So that's a barrier which we need to work out ourselves. Because it doesn't make a difference to the quality of the [product]

[67] Being able to assess the "likely action of other people" comes from Dequech's (2012) interpretation of cognitive embeddedness as a function of embeddedness in cultural institutions.

with how quickly you can get stock to and fro. But everyone's really Christchurch, Canterbury focused."

The respondent felt that the loss of their building in the CBD allowed them to share the Christchurch experience in a way they had not before the earthquakes, and potentially begin to develop their local image:

"R: And now that we've got this for Christchurch, and this [new location] is actually a driver when we're trying to drum up business, is that we are local. We've got a hub. This is our training centre. And we can explain this isn't the […] training centre that we had, we were [in the CBD], as soon as you say that they're like, 'You know'.

I: People are a bit more sympathetic?

R: Yeah, it ties us back into the local community. So we're trying to drive that angle a bit."

Having a pre-established local image allowed organisations to mobilise local social capital more effectively in the earthquake aftermath.

Second, the motivating force of an organisation's local identity blended mechanisms of cognitive (i.e. 'organisation identifies as local' (C3)) and societal-institutional embeddedness (i.e. 'organisation operations intended to enhance community or local welfare' (I5)). Decision makers who had a clear vision or purpose for their recovery, regardless of what it was, performed better long-term than those that did not. For some decision makers, their identity as a local organisation and their interpretation of their place in the recovery of the town as a whole was part of this vision. For example, *Kaiapoi Society* lobbied the council to open their building quickly after the September earthquake so that displaced and disrupted people "had somewhere to go" for shelter but also hospitality and recreation. Similarly, *Kaiapoi Welfare's* identity as an organisation that services the community was instrumental

in their motivation to mobilise additional resources, increase staff workload and hours, and expand their services to assist community response and recovery following the September earthquake. The owner of *Norwich Retail* felt that her organisation and the products she offered were an important part of Lyttelton, and that motivated her to continue operating despite challenging conditions both before and after the earthquake:

> "I just think [what the store offers is] worthwhile and I have a very real sense that it puts something into the community that's somehow good and nourishing; a good thing to do. So regardless of how much money I make out of it, it sounds a bit altruistic or flaky, but that kind of thing seems like a good thing to do. And because I live in the community it seems like I'm bringing something to the table, and people like it."

Finally, CSO decision makers and staff member that were embedded in their local community had an interpretive advantage when evaluating adaptive options and anticipating local responses to changes. For example, the owner of *Amherst Retail* felt that it was important to the community to demonstrate commitment to Kaiapoi:

> "R: I wouldn't move the business, I could buy another one, but in saying that I think Kaiapoi's the sort of place that's not that easy to be an absentee owner, because everyone talks and knows and if you're not there…
>
> I: You think that makes a difference?
>
> R: Oh, hell yeah, because that's what people expect. They expect to know. Although I mean eventually, I mean, they know the girls and stuff, but you're not there and if you're here because you've gone and bought a [shop] somewhere else and you're spending all this time there…In some ways, it's a positive. I mean small towns are good because, you do good things, word gets round but you do other things …which maybe not be 'bad bad' from your point of view, but could

> be slightly negative to other people. So they're like, 'why would we support him, now he's always away?'."

This shop owner's involvement with and knowledge of the community helped him determine the kinds of adaptive actions that would work in Kaiapoi without risking damage to the organisation's reputation. An instrumental part of the adaptive process is evaluation of the organisation's adaptive space, the range of options that are available, and assessing their potential influence on organisational outcomes. Having decision makers or staff members embedded in the local community gave the organisation access to tacit understandings of local norms and expectations that might in turn influence the success of adaptive actions. In this way cognitive embeddedness could facilitate constructive, situation-specific, sense-making that helped decision makers overcome their tendency to rely on general or programmed explanations.

Network embeddedness and resilience

Organisations' external networks were critical in facilitating adaptation. Inter-organisational and inter-personal ties were an important source of physical resources and information, which increased an organisation's adaptive options and its ability to enact its plans. In Chapter 6, I discuss, in detail, the role of support networks and the way networks expanded organisation's resource base and response capacity.

Local networks increased CSOs' capacity to detect the need for change and to evaluate adaptive options. Networks increased their access to information, enhanced organisations capacity for situation monitoring, their capacity to detect the need for change, and to evaluate adaptive options. Network connections can act as environmental 'sensors.' The greater quantity and quality of these network sensors that an organisation had in the environment, the more potential access they had to information about that environment.

CSOs that proactively sought opportunities in their recovery environments utilised their networks for monitoring trends and accessing timely information. CSOs' local sensor networks included embedded inter-organisational relationships; affiliations with local business associations, customers, and owners; and staff member's personal networks. Box 5.1 presents contrasting case descriptions of two CSOs' different capacities to perceive changes in their local contexts and the potential impact of these changes on the organisation.

Box 5.1
Case Comparison: Failure and a success in perception

Amherst Retail, developmental change

Amherst Retail experienced greater damage and disruption as a direct result of the earthquakes than Kaiapoi Corner Store, but was able to implement adaptations that helped them avoid degenerative change in the earthquake aftermath. Amherst Retail's situation awareness, enabled by local networks, allowed them to perceive potential disruptions and opportunities for growth. As a result of this awareness of Kaiapoi's current and future situation the organisation was able to implement two important proactive adaptations. First, following the September earthquake, Amherst filled a gap in the retail market by adding new products that non-operational local retailers previously offered. Second, even though they did not lose their building they opted to relocate to a new development because they felt they could lose their building suddenly due to a DEE, future construction on the main street would reduce foot traffic, and new residential developments would bring customers in cars that would appreciate a parking lot. Amherst retail had a greater capacity to perceive the need for change in part because of their internal and external 'sensors' including, a high proportion of local staff that were aware of trends and issues concerning local residents. The owner also attended post-earthquake business information and networking meetings held by ENC, and participated in the local promotions campaigns.

Kaiapoi Corner Store, degenerative change

After losing a significant competitor in the September 2010 earthquake, Kaiapoi Corner Store experienced a significant increase in business through 2010 and much of 2011. They opened for longer hours and coordinated with suppliers to ensure that they could continue serving their customers. Yet in 2013 the CSO reported dropping revenue and being "worse off" than they had been prior to the earthquakes, due to the significant loss of local customers from nearby residential red zone areas. The owners had not perceived the potential impact of this change in their local context on the organisation, and therefore did not pursue adaptive action. Their lack of awareness about when and how the red zoning decision would affect their business was caused, in part, by the owner's lack of local networks in the area. Kaiapoi Corner Store was not a member of local business associations or groups. The owner's personal friendship and kin networks were located outside of Kaiapoi, and neither the business nor the owners participated in local events, attended information nights, or otherwise engaged with the community.

The cases in Box 5.1 illustrate how an organisation's local networks can deliver information about the local environment, even if the organisation is not actively seeking that information. *Amherst Retail* received information about potential shifts in Kaiapoi that might affect their business through their local staff and the owner's active engagement with local business support activities. *Kaiapoi Corner Store* took advantage of immediate opportunities

through effective business management practices, but was less able to anticipate future changes due to their relative social separation from the Kaiapoi community. Being part of a network facilitates the transfer of thick and tacit information in a way that enhances an organisation's ability to interpret and navigate their environment before and after crises.

Three of the resilience indicators identified in Lee et al.'s (2013) model enhanced CSOs' capacity to utilise their networks as sensors. These were 'situation monitoring and reporting,' 'staff engagement and involvement,' and 'proactive posture'. First, situation monitoring was exercised through organisational practices that promoted vigilance about emerging issues the organisation's internal and external systems. Second, staff engagement expanded their potential sensor networks exponentially. If CSOs had internal practices that involved staff and encouraged staff to feel like they were integral in the organisation's success, staff members were more likely to utilise their own networks not only to gain information about their environment but also mobilise resources on behalf of the organisation. Finally, CSOs that practiced proactive posture or a "strategic and behavioural readiness to respond" (Lee et al., 2013, p.34) to signs of change in the organisations' environment were more prepared to act on the signals they received from their networks.

Embeddedness in local networks also enhanced CSOs' capacity to evaluate adaptive actions. For small business owners, in particular, having discussion networks characterised by strong, trusting ties gave decision makers a place to evaluate potential adaptive moves, share ideas, and discuss problems as they arose. Organisations were faced with many complex decisions that can determine the path for their recovery going forward. Micro- and small-CSOs were more likely than medium and large-CSOs to seek external advice about business and recovery decisions following the earthquake.

Decision makers were more likely to gather information that they found useful and to heed advice if it came from a source that the decision makers knew and trusted before the

earthquakes. The perceived reliability of that advice also increased if it came from others that were also going through the recovery process. The CSOs described in Box 5.2 had very different post-disaster experiences, in part, due to their differential capacity to mobilise evaluative support from a trusted source.

Box 5.2
Case Comparison: Evaluation and adaptation

Elegance and **The Attic** both lost their retail stores in the Christchurch CBD as a result of the February earthquake, and both chose to relocate their business to the North Island in the aftermath. This decision nearly bankrupted Elegance, while The Attic successfully established in Wellington and restored to pre-earthquake levels of income and growth. There were two main differences that contributed to these divergent outcomes. The first was that The Attic had better internal resources in the form of business interruption insurance that allowed them to receive some form of income as the business decision makers took several months to assess the future of their building in the cordon and consider relocation options. Elegance's business interruption insurance had lapsed between the September 2010 earthquake and February 2011 earthquake. The businesses also differed in the way they discussed the relocation and evaluated their options. The Attic was owned by business partners with a close trusting relationship that facilitated collaborative evaluation and decision making. The owners also discussed matters with a close knit group of Christchurch business owners that they knew prior to the earthquakes, seeking advice and support as they considered their options for the future. Elegance, on the other hand, was a sole proprietorship and the owner sought advice about relocating from a mentor from Recover Canterbury. Having never met the mentor prior to the earthquake, the owner was less inclined to trust his advice not to proceed with the move to Auckland and ultimately made a series of choices without adequate evaluation which had severe and lasting negative impacts on the organisation's financial and the owner's personal wellbeing.

In the example in Box 5.2, the divergent outcomes for *The Attic* and *Elegance* were shaped both by internal resources (in the form of insurance) and the ability to mobilise external support. These organisations also differed with respect to the endogenous resilience indicator of 'leadership'. For both of the CSOs in Box 5.2, the crisis decision making was influenced by the CSO leaders' connection to a network that could or could not adequately support their evaluative process.

Relationships that are both robust (reinforced through friendship, trust, and reciprocity) and adaptable contribute significantly to relational resilience. Similarly, having resilient network members offers elements of stability in the network, speed and quality of support, and can generate a willingness to co-enable innovation and adaptation through the network. Chapter 6 covers other aspects of relational resilience in greater depth.

Institutional embeddedness and resilience

CSOs' resilience was enabled and hindered by the institutional systems in which they were embedded. The local councils' and central government departments' capacity to mitigate the impacts of a disruption, to adapt in a complex and uncertain environment, and to communicate effectively with stakeholders was critical for CSOs following the Canterbury earthquakes. This was true for organisations embedded in corporations as well. Intra-organisational institutions can uphold internal structures that normalise and reward collaboration and collective action (Kondra & Hurst, 2009). Thus, the intra-organisational institutional norms that guide support-behaviours in addition to the adaptability of the head office, board, and other elements of the corporate body enabled recovery and adaptation for the earthquake affected portion of the organisation. For example, other branches of corporate CSOs, in some cases, took on additional work to allow the Christchurch-based office to focus on recovery or otherwise altered normal operations to facilitate the reduced capacity of the earthquake affected part of the organisation.

Institutional embeddedness could also extend organisations' time frames for evaluating future options and planning a path forward for their recovery. The earthquake support subsidy (ESS), which was administered through Work and Income New Zealand, is an illustrative example. As discussed in Chapter 4, decision makers created the ESS following the earthquakes, and nothing like it had been deployed in New Zealand following a disaster. The government's capacity to perceive the need for this support and implement an innovative solution created a recovery environment in which CSOs had access to an important resource. The ESS allowed earthquake affected organisations to continue paying staff while they evaluated options for the future. The ESS, at least temporarily, relieved CSOs of some pressure to make staff redundant or to commit to recovery options immediately following the earthquakes.

Embeddedness in an institution, such as a corporation or a local government body, to differing extents also increased the absorptive capacity of some CSOs. The ability of CSOs to access the collective financial and human resources of that institution meant that some were able to absorb a higher degree of disruption. An institution's absorptive or buffering capacity is only helpful to a limited extent as "erecting barriers to protect a firm from environmental fluctuation may […] prevent the firm from obtaining the information it needs to respond effectively" (Lengnick-Hall & Beck, 2005, p. 741). Institutional insulation needed to be balanced by external sensor networks and an internal culture that was open and able to respond to those external signals of change.

Finally, CSOs that reopened in the CBD, Lyttelton, and Kaiapoi experienced positive externalities of functional and supportive societal institutions. In Lyttelton and Kaiapoi especially, relatively high degrees of local social capital had positive externalities for CSOs reopening in otherwise challenging environments. As discussed earlier, social capital promoted civic engagement, positively reinforcing people's support for local businesses.

CSOs in Lyttelton and Kaiapoi benefitted from strong social pressure to shop local and support local businesses. Local business associations and economic development agencies worked to promote community solidarity and to reward those that supported local businesses through promotions campaigns and local events. Similarly, local groups created community spaces in damaged urban areas, giving people reasons to stay in contact with the CBDs and town centres even when these centres lacked the business 'critical mass' to serve as a functioning economic hub.

The sense of community in these places meant that people were more likely to form personal connections with the CSOs and CSOs' staff members, which made these ties more resilient in the earthquake aftermath. When asked about the benefits of operating a business in Kaiapoi, the owner of *Kaiapoi Shoppe* answered:

"R: The sense of community. I mean you see the same people, you know what's happening in their lives; you know that maybe their husband's been diagnosed with cancer or they've just had a baby, or grandma's moved in with them. So you can have that ongoing, sense of knowing. You know people and they know you. Our daughter's just got married not long ago and about half a dozen customers have been in asking can I look at the wedding photos? That sort of thing.

I: Has that changed at all because of the earthquakes?

R: No. I think in actual fact it's got stronger. That's one good thing that has come out of it – the sense of community is a lot stronger."

Similarly, the owners of *McCoy's Hospitality*, a hospitality organisation that ultimately never reopened after the February earthquake, were supported by locals prior to the earthquake and they continued to receive support and encouragement during their prolonged closure:

"Well, it is very community driven. It doesn't matter how you look at Lyttelton. They have some good organisations, and even at Christmas time, a lot of those organisations utilise you and stay in their own community to have their Christmas parties. And that's fantastic, you know, you'd think that some people would go further afield, but we have something unique in Lyttelton and they do use that […] As I said before, the [supportive voicemail] messages from customers [after the earthquake. […] Just last week we were at The Brewery for lunch and there was probably 4 or 5 of our customers in the room, that all recognised who we were and said how long 'till we were opening. And that type of thing does make you motivated, and it felt good to want to get back and do what we were doing before."

Organisational resilience in these places was buoyed by local social capital. In these communities, social capital included the norms of collective support and civic engagement reinforced through reputation and reciprocity (e.g. if local businesses supported the community prior to the earthquake, the community tended to support the businesses after the earthquake). The adaptive capacity of CSOs reopening in these towns was enhance by these social-institutional features.

Endogenous resilience and embeddedness

Extra-organisational sources of resilience improved CSOs' capacity to adapt in the aftermath of the earthquakes. Yet, in order to successfully process information being received about the environment, implement changes, and feed lessons learned back into the organisation, CSOs required many of the endogenous indicators of resilience captured in Lee et al.'s (2013) New Model of Organisational Resilience. I identified some of these indicators in the discussion above, including situation monitoring and reporting, proactive posture, staff engagement, and internal and external resources. Organisations' recovery trajectories cannot be fully understood without considering how these endogenous, contextual, and relational components of resilience fit together.

Table 23 through Table 25 summarize the adaptations CSOs implemented and the factors that enabled or hindered their resilience. The tables provide succinct comparative analyses of seven CSOs (three that experienced developmental change, and four that experienced degenerative change). The tables capture aspects of the in-depth narrative constructed through the longitudinal case studies, while distilling points that illustrate the processes that shaped post-disaster outcomes. These cases illustrate the important relationship between endogenous, contextual, and relational sources of resilience. These CSOs needed adequate endogenous resilience to mobilise exogenous sources of resilience effectively. Interestingly, however, some CSOs that had relatively high endogenous

resilience were unable to thrive in contexts that hindered adaptation, while some that had relatively low levels of endogenous resilience could be propped up by high levels of contextual and relational resilience.

The three CSOs described in Table 23 had positive recovery trajectories as of 2013, despite having some of the highest direct impact scores out of any of the CSOs. These CSOs had relatively flexible approaches to their operations, and implemented multiple operational and locational changes in the post-disaster period. Each of these CSOs moved their organisations a minimum of three times during the recovery period. These organisations had several qualities in common that facilitated successful recoveries.

First, although each of the owners was personally embedded in their local area and unwilling to relocate far from these areas, the CSOs were highly mobile within these environments. Each of these organisations depended to some extent on the local organisational ecology to generate business. They were each aware that in the shifting post-disaster context they needed to move to ecologies that were intact or newly emerging.

Second, these CSOs were all willing and ready to change (proactive posture). Sometimes CSOs were responding to direct disruptions like the loss of a building. More often, however, they needed to respond to disruptions that were less easy to observe, such as gradual population loss. In these cases the CSOs that coped well were able to recognise the need to adapt *before* experiencing the negative effects of the disruption. It is important to note that proactive posture is not synonymous with response speed. *Executive Sweets* was closed for several months following the February earthquake as was *God Save the Queen*. These organisations were prepared to change, but also took the time to evaluate properly and find ways to resource their adaptive actions before committing to them.

Finally, each of these CSOs was able to tap into strong organisational networks and positive aspects of their local contexts to access support that aided their recovery processes.

God Save the Queen provides an illustrative case of an organisation with relatively limited endogenous resources, but an exceptional capacity to utilise the owner's networks to recover and forge new avenues for the business following the earthquakes.

In order to continue operating in these challenging environments, all of the CSOs discussed in Table 23 needed to implement innovative solutions. These included operating from temporary premises but also connecting with customers in new ways and introducing new products. In each of these cases, innovation was enabled by the effective use of the organisations' and owners' networks. Similarly, each of these organisations mobilised some support from institutions that were able to adapt and provide specialised assistance to businesses in the earthquake aftermath, including WINZ and local business associations.

As *Executive Sweets* only had one staff member in addition to the owner, and *God Save the Queen* had none, staff relationships only played a role in *Kedzie &Sons'* resilience. *Kedzie & Sons'* internal culture was characterised by good staff engagement without silos separating aspects of the business. The owner attributed this culture to the fact that it was a family business, owned by a father and son, explaining that for all employees:

> "It's not so much you're just an employee, it's like you're a part of the business. At the end of the day we're only making money if they're doing their job, and doing it well."

As a result, staff stayed with the business through its many transitions, and helped with the recovery in ways that extended beyond their usual job descriptions. The owners rewarded this loyalty by retaining their employees even after an insurance adjuster recommended that they lay people off to reduce operating costs, finding ways to manage without sacrificing these relationships. Thus, as with external networks, internal networks were strengthened and reinforced through trust and reciprocity in ways that created resilience for the organisation as a whole.

Table 23: Cases of highly adaptive and flexible organisations, adaptations and factors of resilience

Developmental CSO	CSO overview	Factors enabling resilient post-disaster response	Post-disaster adaptive responses
Executive Sweets	Small hospitality organisation, run by the owner and one employee. Prior to the earthquake, relied primarily on weekday trade from 'white collar workers' in the Christchurch CBD. Had business interruption insurance and was experiencing a steady revenue trend prior to the earthquake. Lost their building in the CBD as a result of the February earthquake.	• Internal resources (good insurance, low debt) • Effective partnerships, owner strong local personal/professional relationships (external resources) • Innovation and creativity, situation monitoring, proactive posture • Strong but flexible leadership • Owner's excellent knowledge of the area and local customers' responses of changes; strong local customer support	• Collaborative agreement with a local retailer to operate on part of their property in the CBD. • Operated from two mobile temporary premises, coordinating with CBD events • Increased public profile – due to new temporary locations and local media interest in their innovative approach to mobile premises.
Kedzie & Sons	Family owned and operated retailer based in the CBD for nearly four decades prior to the earthquake. Cash flow steady between average and slightly above average from 2007-2010. They had business interruption insurance prior to the earthquakes. Lost their building following both the September and February earthquakes.	• Good internal culture - breaking silos, staff engagement • Proactive posture, opportunity seeking, and constantly revaluating their options. • Situation monitoring, and processes for feeding lesson back and adapting organisation • Innovation and creativity • Effective partnerships, owner strong local personal/professional relationships (external resources) • Able to relocate to intact organisational ecology in quickly recovered part of Christchurch	• Operated from temporary locations while seeking an appropriate long-term premises • Introduced improved "customer relationship management system," contacting customers by email • Added new product lines to modernise their image • Ceased operating a time-consuming, lower-profit service their organisation used to offer prior to the earthquakes • Updated and improved website to better facilitate online sales
God Save the Queen	Small retail organisation (sole proprietor, no employees). Opened in Lyttelton a month prior to September earthquake. Experienced some growth between September 2010 and February 2011. Lost building as a result of February earthquake. No insurance.	• Innovation and creativity • Effective partnerships, owner strong local personal/professional relationships (external resources) • Proactive posture • Community support of local businesses and ability to coordinate with community events	• Operated from a pop-up shop and co-located in new premises with another displaced organisation • Switched from retail to wholesaling a line of earthquake related goods designed by the owner. • Introduced online marketing and sales • Expanded supportive relational network of like-business

Organisations that experienced degenerative change generally did so because of a failure to adapt adequately in the earthquake aftermath rather than as a result of the degree of impact or preparation. In Table 24, I summarise two case studies that experienced cognitive and network inertia that hindered their recovery. Both *Wigwam* and *Toasty's* owners were anchored in their local contexts through kinship ties, but struggled to implement adaptations that would allow them to operate successfully in the dynamic post-earthquake environment. For example, both of *Wigwam*'s temporary relocations had limited success because they did not situate the CSO within an organisational ecology that could generate business in the same way it had prior to the earthquakes.

Toasty's recovery was also hindered by the owner's lack of proactive posture or planning strategies for the impending DEE, which ultimately led to the loss of their building, and by the lack of situational awareness of an important network member. According to the owner of *Toasty's,* the landlord misinterpreted their insurance policy, stating that *Toasty's* had comprehensive insurance including loss of earning. The landlord had not put the business owners' names on the policy, meaning that *Toasty's* actually had no coverage following the earthquake. The owners of *Toasty's* chose to stay with the lease despite this issue, in part because of a personal friendship with the landlord who was suffering serious health problems. This demonstrates the dangers of network inertia.

Table 24: Cases of cognitive and network inertia, adaptations and factors hindering resilience

Degenerative change CSO	CSO overview	Factors disabling resilient post-disaster response	Post-disaster adaptive responses
Wigwam	Retail shop with two locations in Christchurch (one CBD and one in a near suburb). Experienced declining profits as a result of the recession 2009-2010). Did not have business interruption insurance	• Owners highly personally embedded, did not want to relocate the business outside of Christchurch • Inadequate internal resources — relatively high level of debt prior to the earthquake, which increased following the earthquake • Good 'innovation and creativity' in establishing the temporary shop, but relatively poor organisation-environment fit in new location • Poor 'situation awareness' – the owners ignored clear signals that the recession would limit their business before determining to open the CBD shop (pre-EQ). • Survival seeking in their temporary location	• Reopened in a novel temporary location – as a result attracted media attention and initially some curious customers • Operated from another organisation's shop for 3 months • Purchasing different products due to changed customer preferences
Toasty's	Small hospitality organisation, run as a family business. Opened a few months before the September 2010 earthquake. Did not have any insurance (due to miscommunication with the landlord). Experienced greatly increased business and profile after losing most competitors in Kaiapoi became 'community hub' in earthquake aftermath. Lost building in 2013 following DEE, and permanently closed.	• Owners highly personally embedded in Kaiapoi area, did not want to relocate the business • No planning strategies for building closure, poor situation awareness, and proactive posture • Inadequate internal resources (lack of insurance, and lack of energy), did not mobilise external network of support despite high degree of community social capital and strong (trust, reciprocity based) relationships • Restoration seeking	• In anticipation of losing the building the owners stopped updating the menu or investing money in the business to minimise their potential losses.

Finally, the two organisations described next, in Table 25, were hindered, in part, by institutional inertia. This inertia stopped these organisations from relocating outside of their territorial boundary despite serious losses to their clientele and barriers to relocating successfully within their respective towns. *Pumpkin's Community Group* was part of a larger national organisation, and offered services to the Lyttelton community. Similarly, *Kaiapoi Rental* was part of a larger corporate body and restricted to the Kaiapoi and near residential market. *Pumpkin's* faced an additional relocation challenge because they required specialised facilities to accommodate some of their clientele.

Kaiapoi Rental is an excellent example of an organisation that had a high level of endogenous resilience and yet still experienced degenerative change. The business' leaders implemented significant adaptations, maintained good relationships with its staff, and adjusted its internal processes to meet greatly increased customer needs. They also contributed significantly to community efforts, with staff volunteering to shovel silt from liquefied properties and engaging in local events and recovery initiatives. Yet, due to the disrupted nature of the local real estate market caused in large part by the widespread red zoning of residential property, as of 2013, *Kaiapoi Rental* was worse off than it had been prior to the earthquake.

Pumpkin's Community Group had relatively low endogenous resilience, and their recovery was further disabled by contextual challenges and poor relational resilience. They were unable to implement adaptive actions successfully while the societal and political institutions in which it was embedded struggled to recover. They had lost community support as local volunteers and clients moved away or dealt with their own recovery, and they struggled to mobilise adequate support from local authorities that were also resource limited and focused on other priorities.

Table 25: Cases of institutional inertia, adaptations and factors hindering resilience

Degenerative change CSO	CSO overview	Factors disabling resilient post-disaster response	Post-disaster adaptive responses
Pumpkin's community group	Local Lyttelton branch of a national not-for-profit community group. One part time employee, but major decisions made by committee of volunteers. No insurance, rely on grants and funding from their central organisation. Building damaged following September 2010 earthquake, reopened for a short time before February 2011 earthquake, lost building again, operated in very limited capacity (essentially closed) through 2013.	• Not supported by resilient internal or external networks • No help mobilised from their central organisation • Relied on CCC for access to space – delays and poor communication from council • Poor internal resources - Volunteer members all local and dealing with their own disruptions • Restricted to territorial boundaries and restricted capacity to relocate or operate in some temporary spaces - need additional amenities due to the nature of their clientele. • Survival seeking, did not try to implement innovative/creative solutions	• After September they upgraded computer system for inventory management • Operated shortly from a substandard temporary location provided by another local organisation.
Kaiapoi Rental	Small real estate business part of a larger corporate entity. Negatively affected by recession but steady 2008/09 revenue trend. Temporarily lost building as a result of the September 2010 earthquake. Had business interruption insurance.	• Restricted to territorial boundaries • Clientele and operating territory heavily affected by Red Zoning • Houses that were not damaged were near areas with "weeds, broken roads still not fixed, messy sites" • Rely in part on foot traffic, main street fenced off, council's pedestrian solutions made it difficult to walk down the main street	• Temporarily collocated with like organisation • Reduced the cost of the lease • Increase workload to meet increased client demands (more work for less money) • Adjusting processes to continue working in market affected by legal, insurance, and financial complexities • Relocated in 2013 to new development

This CSO lacked the internal resources (both in terms of finances and volunteer energy) and external resources to aid adaptations or to identify and potential solutions.

Due to *Pumpkin's* spatial and institutional inertia and limited resources, their primary strategy was to enter a state of hibernation to conserve resources while the institutions in which they were embedded recovered. *Kaiapoi Rental,* on the other hand, a for-profit business implemented a number of adaptations to ensure its survival and to position it to improve as the local market improves in the years to come. The organisation worked to maintain its relationship with the local customer base, and due to the norms of reciprocity and rewarding local loyalty that characterise many of the exchanges in Kaiapoi, these actions might be interpreted as an investment in social capital.

The resilience of an organisation is contingent upon the resilience of its context. Organisations experiencing inertia were unable to adapt even if the contexts were no longer conducive to their success or were actively hindering organisational recovery. While some organisations found ways to adapt within certain constraints, some organisations, such as Kaiapoi Rental, were unable to compensate fully for a lack of contextual resilience with high degrees of endogenous resilience.

5.6 Conclusion

The analyses presented in this chapter have addressed the question: 'How do an organisation's connections to its local context affect its recovery trajectory?' I began this analysis by first identifying the ways the case study organisations connected to their local contexts. I identified 16 unique mechanisms through which CSOs became embedded in the various social structures that composed their local contexts. I used these mechanisms to calculate a 'local embeddedness' score.

I then examined CSOs' local embeddedness through three different lenses: embeddedness as a conduit for impact, embeddedness as the cause of organisational inertia,

and embeddedness as a source of organisational resilience. The findings indicate that although organisations with higher degrees of local embeddedness were potentially exposed to more impacts from local disruptions, they were not closed for more days nor did LE score relate to the organisations' post-disaster trajectory.

Local embeddedness influenced organisations adaptive capacity in a number of ways. The nature and degree of their embeddedness influenced whether an organisation relocated within its pre-earthquake local context. Local embeddedness enhanced a CSO's capacity for monitoring its local environment. Embeddedness in relational networks enhanced CSOs' capacity to discuss and evaluate their adaptive options in their local contexts. Finally, embeddedness in resilient networks and an organisation's capacity to access local social capital improved its access to mobilise resources and support in the earthquake aftermath. The most difficult forms of inertia for CSOs to overcome were institutional inertia and personal network inertia. CSOs were less able or willing to relocate if they had high levels of embeddedness in governing institutions or if leaders had strong personal ties to the area.

Findings from the case studies led to the development of two resilience concepts that expand our current understanding of where resilience originates in organisations' systems. Contextual resilience, which was ultimately the result of findings presented in this chapter, refers to the relationship between the resilience of place and organisational resilience. Relational resilience, which I explore in more depth in the next chapter, refers to the relationship between relational networks and organisational resilience. Both concepts introduce aspects of organisational resilience that are constituted, in part, by engagement with various elements of geographic contexts and a wider network of social relations. Further, elements of an organisation's endogenous resilience enhance its ability to recognise and utilise these collectively held sources of resilience.

So how might organisations use this information to enhance their resilience? There are at least three strategies that organisations could adopt to reduce the negative elements of embeddedness and enhance the elements of embeddedness that facilitate resilience. First, organisations could buffer themselves (i.e. introduce a degree of separation or protection) from potential disruptions to their local environments, by, for example, having ICT systems, such as cloud based storage in case of physical disruptions. They could also buffer against local disruptions by developing networks that extend beyond their local area and allow them to bring in support from unaffected actors. For CSOs, however, buffering had mostly short term benefits and a limited capacity to alter medium-term recovery outcomes. Additionally, buffering the organisation too much from the local environment meant missing out on important signals of change and reducing organisational capacity to capitalise on local loyalties and to capture the positive externalities of local social capital.

The second strategy is ensuring that the organisation is situated in a resilient context and connects to others with a high degree of resilience. For example, there are potentially negative implications for an organisation that locates in an area with a poorly functioning local government, and this risk is likely to be exacerbated following a disaster. Similarly, an organisation may benefit by locating and embedding in an area that has a high degree of social capital (e.g. a large number of active community organisations and business associations).

Finally, organisations can invest in their community before a crisis, so as to enhance local resilience. This is an especially important strategy for organisations embedded in a way that precludes relocation in the event of local disruptions. These organisations may benefit from considering their local area as part of their operations, investing in the resilience of that area or building resilient connections that will enable them to continue functioning even if the area is disrupted. For example, organisations may want to focus on building connections in

their location that promote and allow them to access local social capital. They may want to develop local networks that help identify emerging issues and evaluate adaptive options informed by context-specific input. They can continue to reinforce these networks with transparent communication and reciprocity. Additionally, as discussed in the results, developing a local identity and image can also help organisations mobilise support and give staff members a sense of purpose and motivation to continue operating in these environments in the disaster aftermath.

Explorations of the relationship between organisations and their contexts in this chapter are by no means exhaustive. Rather, this analysis serves as an entry point for further investigation of the relationship between organisational connectivity and resilience. I focused specifically on the local environments, but organisations are subject to other fluid, multi-scalar influences (e.g. global economic trends, national regulatory environments) that shape organisations to different degrees. Further explorations into the relevance of organisational embeddedness are important for the advancement of organisational resilience studies.

Chapter 6: Post-Earthquake Support Networks

6.1 Introduction

When disasters disrupt or overwhelm an organisation's capacity to function effectively, its external networks can provide access to resources and information that help it to absorb the impact and adapt in the aftermath. Networks allow organisations to make investments in relationships, which they can later 'redeem' to avoid bearing the costs of a disaster completely on their own. Network connections can also be formed briefly or spontaneously to fill emergent needs that had not been anticipated prior to a disruption.

This chapter analyses the post-earthquake support networks of the 32 case study organisations (CSOs) introduced in the previous chapter. I address two key research questions: What is the nature of organisational post-disaster support networks? And, what is the relationship, if any, between the organisations' post-disaster trajectories and the nature of these support networks? To address these questions, I examine the nature of CSO support networks (i.e. the kinds of relationships which comprised them), how organisations utilised external support following the earthquakes, and the features of CSO networks and network management practices that enhanced their ability to respond and adapt after the earthquakes.

The chapter layout differs slightly from the thematic structure of the previous chapter. Due to the relatively large amount of quantitative data and analyses, I present the descriptive and statistical quantitative results first, and then draw out the nuances of this data through integrated analyses and discussion of the qualitative case study information. The three main sections are as follows: Section 6.2 provides a general overview of the CSO support networks, including who provided support, where supporters were located, and the overall network characteristics. In Section 6.3, I examine the relationships between the organisational characteristics, support content, and network characteristics. I then

systematically compare the support networks of organisations with different post-disaster trajectories. In Section 6.4, I integrate the network analysis findings with qualitative data from the CSO respondent interviews. I discuss how network features and organisational practices influenced support exchanges and organisational outcomes.

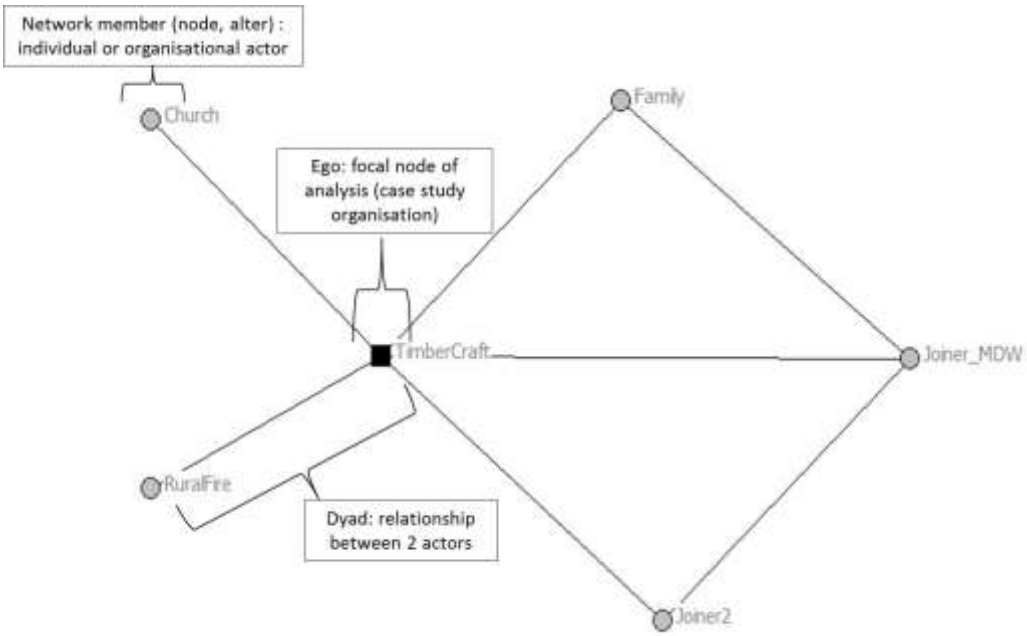
6.2 Support network overview

Every CSO in this study mobilised some support from extra-organisational actors following the earthquakes. CSO respondents provided information about their organisational support networks through participant aided sociograms (PAS). PAS formed part of the in-depth interview process with CSO leaders. Respondents started the PAS exercise by reporting all of the people, organisations, or institutions that they recalled supporting their organisation's recovery following the earthquakes beginning in September 2010.

The focal node (or ego, as shown in Figure 15) within each network is the case-study organisation. For CSOs that were part of a corporation or affiliated group, the office based in the Christchurch CBD, Lyttelton or Kaiapoi is the 'ego.' Thus, in this study intra-corporate networks were included in the analysis of organisational support networks.

Respondents from the 32 CSOs listed a total of 457 network members, alternately referred to as supporters. These network members included individual or organisational actors that provided some kind of support to the CSO following the earthquakes. In the PAS exercise, CSO respondents provided information about each network member. The information included their role relative to the CSO (e.g. supplier, customer, or friend of an employee) and the importance of the supporter to the organisation's recovery for all 457 network members. Respondents then provided additional information about the dyad (i.e. the relationship between the CSO and the supporter, also depicted in Figure 15) and the support exchanged for up to 15 supporters in their network.

Figure 15: Network components

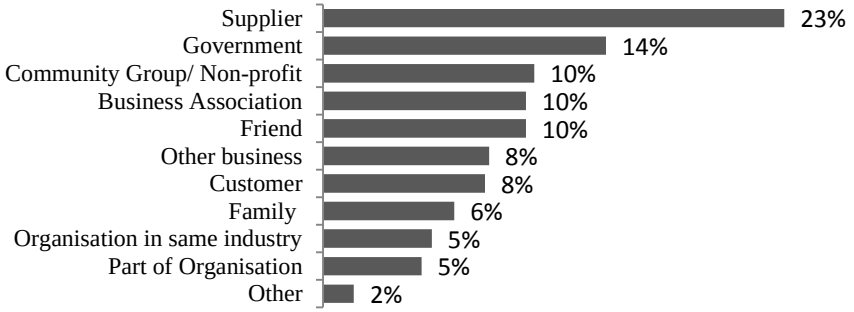
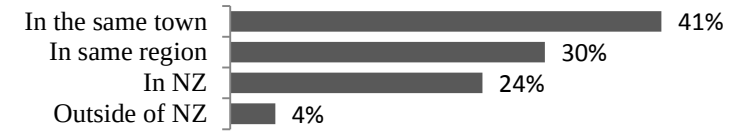
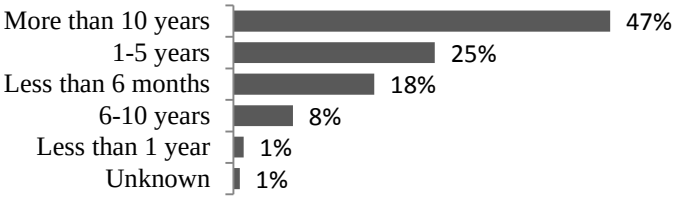


Before I explore the relationship between organisational networks and their post-disaster trajectories, I present the general characteristics of the CSOs' support networks. First, Table 26 presents the aggregate characteristics of the CSOs' networks. Suppliers were by far the most common source of support reported by CSOs following the earthquakes. Supplier is a broad category that includes suppliers of material goods as well as suppliers of services including accountants, insurers, and contractors. CSOs also frequently received support from other formal relationships including government and community groups or non-profit organisations.

CSOs sourced most of their support from people or organisations in Canterbury and with whom they had long-term relationships. About 70 per cent of supporters were located within Canterbury, and CSOs had a relationship for a year or longer with 80 per cent of supporters.

Support networks also included a substantial amount of relationships formed in the earthquake aftermath (nearly all of the 17 per cent of relationships with a duration of 6 months or less were formed post-earthqake).

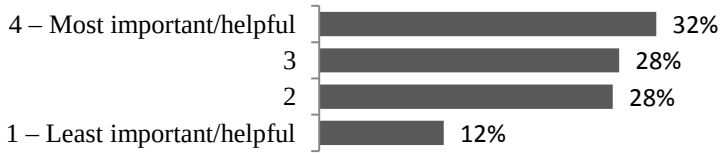
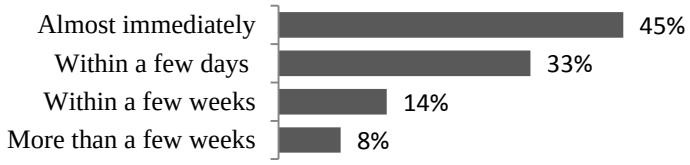
Table 26: CSO support network characteristics

Supporter/Relationship Attribute	**% of Supporters**
Role of Supporter (*N=457)*	
Location of Supporter (*N=372)*	
Duration of Relationship with Supporter (*N=372)*	

Some of these include relationships with groups that did not exist prior to the earthquake, such as CERA and Recover Canterbury, or were connections made to fill needs that did not exist prior to the earthquake (e.g. accessing the CBD cordon).

The timing of initial contact with supporters differed following the two major earthquakes in September 2010 and February 2011 (‘Sep 2010 Timing’ and ‘Feb 2011 Timing’ in Table 26). The support accessed following the September earthquake tended to be front-loaded, with nearly 80 per cent of initial contact with supporters made within a few days of the earthquake.

Table 26: CSOs' support network characteristics (continued)

Supporter/Relationship Attribute	% of Supporters
Importance (*N=457*)	
Sept 2010 Timing (*N = 149*)	
Feb 2011 Timing (*N = 297*)	

In contrast, support following the February earthquake was distributed over a longer period. This in part reflects the additional time organisation leaders needed after the more disruptive February earthquake to address family and personal disruptions and to determine recovery priorities before mobilising support.

Support came in a number of different forms. Respondents also provided open descriptions of the various kinds of support each network member provided. The only restriction imposed on the type of support that respondents described was that the support had to, in the respondent's opinion, aided the organisation's response and recovery. The final coding of these open responses contains six mutually exclusive categories of organisational support (Table 27). These categories capture all forms of support that CSOs mobilised from

their networks throughout the recovery period.[68] CSOs received everything from supplies and accomodation to administrative assistance and emotional support from their post-earthquake networks.

Table 27: Types of organisational support

Type	Description
Advice & information	Advice or information offered to the CSO whether general or specific (e.g. business mentoring; legal and financial advice; information about where to apply for aid).
Assistance & services	Services, assistance, and labour provided to the CSO (e.g. retail shop assistance, construction work, doing taxes, physically assisting with relocation, cleaning)
Bridging & advocacy	Social influence exerted by the tie. Includes bridging (socially 'horizontal') or linking (socially 'vertical') CSO to a wider range of people and/or organisations. Also includes advocacy on behalf of the respondent organisation.
Emotional support	Support given with the intent of aiding the emotional coping of people within the CSO (e.g. "checking in," offering sympathy, sending supportive emails or calls).
Financial support	Monetary and financial related support given to the CSO or staff (e.g. loans, donations, and grants, purchasing from the respondent organisation, insurance pay-out, employee wage subsidy, bank overdraft, debt forgiveness, extended credit or discounts).
Physical resources	Non-monetary physical (tangible, material) resources (e.g. location to operate from - includes co-locating, storage space, transportation, equipment, furnishings, and office supplies, food and drinks, housing for staff).

Supporters could provide any combination of these support types. Some of the exchanges were simple one-off transactions, while other interactions were multi-layered and repetitive, with supporters offering different kinds of support at different periods throughout the recovery process. 'Assistance and services' was the most common support type, while 'bridging and advocacy' was the least common. Approximately 37 per cent of supporters provided some form of assistance or services, 31 per cent provided emotional support, and 30

[68] This period includes any time between the September 2010 earthquake and when the data was collected in mid-2012.

per cent provided financial assistance. Slightly less common were physical resources (25%), advice and information (23%), and bridging and advocacy (10%).[69]

Finally, respondents indicated whether support was bi-directional (i.e. whether support was in some way reciprocated during the study period) and which network members interacted with each other. This information provided insights into the structure of the ego-networks.

CSO networks also had various sizes and structures. Table 28 presents the average characteristics of the CSOs networks: network size (the number of supporters with whom the CSO connected), network density (proportion of supporters that know each other), and reciprocity (proportion of supporters to whom the CSO provided support post-earthquake). The external-internal (E-I) index calculates the degree of network heterogeneity, which, in this instance, refers to the proportion of the network that consists of supporters from outside of the CSO's industry sector. [70] E-I index ranges from 1 (all of the support came from outside of the CSO's industry sector) to -1 (all of the support came from inside the CSO's industry sector). So the CSOs in this study tended to get a majority of their support from others outside of their industry.

Table 28: Structural network attributes (N=32)

Variable	Mean	Standard deviation
Network size	14.3	8.3
Network Density	0.2	0.1
Reciprocity (%)	35.4	19.7
E-I index	0.7	0.4
Supporters outside of Canterbury (%)	26.7	20.9

[69] Bridging and advocacy was likely under-reported as it was not always perceived by respondents as support. Instead CSOs likely saw it as an interim step in connecting with others from whom they could access support.
[70] E-I Index is calculated as (((Network Size – (∑Homophilous Ties))-((∑Homophilous Ties))/Network Size) or in other words ((E-I)/(E+I)). Homophilous ties in this study refer to organisations in the same industry sector as the CSO). So 'E' refers to group-'external' ties, and 'I' refers to group-'internal' ties (Hanneman & Riddle, 2005).

CSOs received support from an average of 14 network members (ranging from a minimum of 4 to a maximum of 43). Network density ranged from a minimum of 0 (i.e. none of the supporters in the network knew each other) to a maximum of 0.6 (60% of the supporters knew each other). Density, or the connectedness of the ego's network, can affect what is exchanged and how (Borgatti, Mehra, Brass, & Labianca, 2009). For example, having network members that do not know each other (i.e. structural holes) can mean that an organisation is in a better strategic position to negotiate with some network members and is able to access unique resources (Burt, 1992).

Finally, reciprocity indicates how much the CSO was involved in 'giving back' to their network during the study period. CSOs returned some form of support to over a third of their network members following the earthquakes. Ritchie and Gill (2007) refer to 'specific' and 'generalised' forms of reciprocity — where "specific reciprocity involves an arrangement in which an individual or group agrees to do something for another individual or group in return for something predetermined," and "generalised reciprocity is based on a high level of trust …where frequent social interaction has laid a foundation for mutual obligation and responsibility for action" (p.107). In this study, reciprocity includes both of these types, but excludes any monetary payments for goods or services.

Section 6.3 presents the results of the statistical social network analysis (SNA), which was used to explore the relationships among organisational characteristics, support content, and network characteristics. These analyses begin by answering the fundamental social support question, 'who gives what to whom?' The analysis then explores what kinds of networks give what to whom. And finally, 'Are CSOs' post-earthquake trajectories associated with certain network attributes?'

6.3 SNA Results

The analyses in this section examine the relationship between the supporter's characteristics and the nature of the support (e.g. what kinds of support and how it was delivered). I also explore whether and how the support network influenced an organisation's post-disaster trajectory. Along with the descriptive statistics in the previous section, the results in this section address the question, "What is the nature of organisational post-disaster support networks?" In the latter half of the section I examine whether organisation's post-disaster trajectory was influenced by the nature of the support network.

Through the analyses of the network data (the results of which are presented in Table 29 and Table 30),[71] I wanted to explore the support implications of different kinds of network relationships. I examined who was providing the support, their location, when the CSO was first in touch with the supporter, whether the support was reciprocated, and the relative importance the CSO placed on the supporter. '

6.3.1 Who delivered which kinds of support?

Nearly every support type was significantly associated with a particular kind of supporter (Table 29).[72] Unsurprisingly, emotional support was more likely to come from family and less likely to come from suppliers and other businesses. Friends and family were less likely than expected, however, to act as sources of information and advice. This support instead came from business associations and other businesses. These supporters were more likely to have access to relevant and timely information or advice. Physical resources were

[71] The chi-squared statistic is calculated by subtracting the expected count from the observed count. Then the differences are squared for each cell, and the squares are divided by the expected number $[(O-E)^2/E]$. The sum of all the values of $[(O-E)^2/E]$ for the variables of interest is the chi-square statistic. The chi-square statistic is used to determine whether the relationship is significant. Chapter 3 provides descriptions and justifications for the statistical tests applied in this section including Pearson's chi-squared statistic, Pearson's correlations, and the Kruskal-Wallis non-parametric analysis of variance (ANOVA).

[72] Each network member could provide from one to all six support types. Thus, when I ran the cross-tabulation and chi-squared analysis I ran each support type separately, resulting in a chi-squared value for each support type. This differs from the results in Table 30, as each network member could only be associated with one category. I therefore created a cross-tabulation table for all categories of the variables of interest.

most likely to come from suppliers. Assistance and services, such as administrative support and help moving premises, were most likely to be provided by those with whom the CSO decision makers had a close relationship – primarily friends and family of staff and other parts of the organisation (i.e. others in the intra-corporate network).

Although too few CSOs reported receiving bridging and advocacy support for the results to be statistically valid, Table 29 does show that this support most frequently came from business associations and government agencies or personnel. These were the type of supporters that likely had the greatest access to broad and potentially powerful networks to which the CSO was not directly connected. The relevance of arms-length ties for connecting egos to other networks is firmly established in Mark Granovetter's much-cited 1973 article *The Strength of Weak Ties*. Relationships with business associations or government agencies were, in most cases, 'weak ties', as CSOs generally interacted with them formally and relatively infrequently. Nevertheless, these types of ties were excellent avenues for accessing information and expanding organisational network reach (i.e. through bridging and advocacy).

Customers, community groups/non-profits, and competitors were not associated with a particular type of support, but rather supplied a wide range of support depending on CSOs' needs. These types of supporters might not have had access to the range of resources available to more influential supporters (e.g. government personnel), but they were often more flexible. Ties that were flexible and adaptable, as discussed later, were instrumental in filling emergent needs quickly.

Similarly, financial support was not significantly associated with a particular role type. Financial support most frequently came from suppliers, in the form of discounts and extended credit, from government actors in the form of the Earthquake Support Subsidy and tax deferments, and business associations or industry groups (primarily Recover Canterbury)

in the form of grants. CSOs, however, also received financial support from every other type of supporter in different forms.

The nature of the relationship also varied depending on the network member's role. CSOs were more likely to return support (reciprocate) to those with whom they had close relationships, friends and family, as well as other organisations in the same industry (Table 30). Support was more likely to flow one-way, without reciprocation, from organisations with which the CSO had more formal relationships: government agencies, suppliers, and business associations.

Table 29: Role types and support types, Pearson's chi-squared results[73]

		Family	Friends	Supplier	Customer	Part of Org	Org in Industry	Business Assn.	Community Group/ NPO	Other Busin.	Govt.	Total	X^2	df	Asym Sig.
Support Type															
Emotional	Obs.	21	10	14	11	6	11	10	8	11	13	114	41.02	10	0.00**
	Exp.	*8.6*	*10.7*	*27.9*	*7.7*	*6.7*	*6.4*	*12.9*	*9.5*	*18.1*	*15*	*114*			
Bridging	Obs.	1	1	4	1	0	1	13	1	4	10	38	35.41	10	0.00**
	Exp.[74]	*2.9*	*3.6*	*6*	*2.6*	*2.2*	*2.1*	*4.3*	*3.2*	*2.8*	*5*	*38*			
Advice	Obs.	4	4	16	0	4	5	24	8	11	10	86	47.79	10	0.00**
	Exp.	*6.5*	*8.1*	*21*	*5.8*	*5.1*	*4.9*	*9.7*	*7.2*	*6.2*	*11.3*	*86*			
Physical	Obs.	6	10	31	7	7	6	2	7	7	9	93	39.7	10	0.00**
	Exp.	*7*	*8.8*	*22.8*	*6.3*	*5.5*	*5.3*	*10.5*	*7.8*	*6.8*	*12.3*	*93*			
Financial	Obs.	4	4	34	9	4	5	13	11	6	20	110	18.18	10	0.052
	Exp.	*8.3*	*10.3*	*26.9*	*7.4*	*6.5*	*6.2*	*12.4*	*9.2*	*8.0*	*14.5*	*110*			
Assistance	Obs.	15	25	32	8	18	6	5	12	6	10	138	62.43	10	0.00**
	Exp.	*10.4*	*13*	*33.8*	*9.3*	*8.2*	*7.8*	*15.6*	*11.5*	*10.0*	*18.2*	*138*			

*Significant difference at $p<0.05$, **significant difference at $p<0.01$

[73] Table 29 shows the expected value (Exp), calculated based on the null hypothesis that there is no relationship between role type and support type, and the observed value (Obs), the actual count of support instances from network members in different role categories. If the relationship is significant it means that we can reject the null hypothesis that there is no relationship between the supporter's role and the support delivered.

[74] Chi-squared results need a minimum of 5 responses in the expected cell to be statistically valid.

6.3.2 Where was support coming from?

Overall the great majority of supporters (~70%) were located within Canterbury. That said, suppliers and other parts of the business were more likely than other types of supporters to be based outside of Canterbury (Table 30 shows the counts by role type of which supporters were located outside of Canterbury). Of the types of support, only financial support was more likely than expected to come from outside of Canterbury (χ^2 (4, N=372) = 14.0, $p < 0.05$).[75] This difference in the location of financial and non-financial support is in part due to the relative ease of giving monetary resources, discounts, or credit from a distance, as opposed to delivering services or physical resources. Suppliers and other parts of the business (both often located outside of Canterbury as indicated in Table 30) were common sources of financial support.

Financial support from outside of Canterbury may also reflect a greater sense of financial security for organisations operating outside of earthquake affected areas, compared to organisations dealing with the uncertain recovery environment in Canterbury. Thus, connecting with supporters outside of Canterbury was often a useful approach for organisations that needed to access financial support.

[75] I conducted some additional chi-square analyses that are not included in Tables 6.4 or 6.5. All chi-squared tests referred to in the text that are not presented in the tables are reported fully in the text, including, in order: the degrees of freedom, the sample size for the test, the chi-squared statistic, and the significance.

Table 30: Role type and support characteristics, Pearson's chi-squared [76]

		Family	Friends	Supplier	Customer	Part of Org	Org in Industry	Business Assn.	Comm. Group/ NPO	Other Busin.	Govt.	Total	X^2	df	Asym Sig.
Sep Support Timing	Value	/	/	/	/	/	/	/	/	/	/	149	30.45	11	0.00**
Almost immediately	Obs	14	2	16	4	9	3	6	7	7	2	67			
Within days, weeks, months	Obs	1	6	17	5	7	2	12	7	7	17	82			
Feb Support Timing	Value	/	/	/	/	/	/	/	/	/	/	293	55.01	20	0.00**
Almost immediately	Obs	17	5	19	7	10	2	6	8	2	2	81			
Within days or weeks	Obs	5	19	35	7	7	8	14	7	9	9	134			
More than a few weeks	Obs	2	8	25	5	0	5	10	8	6	6	78			
Importance	Value	/	/	/	/	/	/	/	/	/	/	457	75.80	33	0.00**
Less (1,2)	Obs	5	24	43	10	6	13	24	14	21	21	181			
More (3,4)	Obs	20	25	60	26	16	11	21	33	16	41	276			
Reciprocity	Value	/	/	/	/	/	/	/	/	/	/	365	89.00	11	0.00**
No	Obs	9	14	81	13	12	4	37	16	13	39	239			
Yes	Obs	19	20	9	11	10	17	5	13	13	9	126			
Out of Canterbury	Value	/	/	/	/	/	/	/	/	/	/	372	30.10	11	0.00**
No	Obs	21	26	64	17	8	19	28	29	22	32	267			
Yes	Obs	7	9	27	8	14	2	14	2	5	17	105			

*Significant difference at $p<0.05$, **significant difference at $p<0.01$

[76] A number of categories were combined to try to ensure that there were high enough values in each cell. Expected values were calculated as part of the chi-squared analysis, but only the observed values are reported in order to keep the table relatively readable.

6.3.3 When did organisations begin mobilising support?

Supporters with whom CSOs and their employees had close relationships (family and other parts of the organisation) provided support most quickly. Those with a duty of care (i.e. local government actors) were next, followed by those with whom organisations had more formal market relationships (Table 30). In September 2010, significantly more family delivered support immediately after the earthquake than expected, while government sources and business associations were significantly more likely than expected to deliver support later. Similarly, after February 2011 it was family and other parts of the organisation that were in contact almost immediately after the earthquake. Government actors were significantly more likely than expected to offer support within a few days or within a few weeks, and suppliers were more likely than expected to offer support more than a few weeks after the disaster.

There was a significant relationship between support timing and emotional support (χ^2 (5, N=356) = 27.6, $p < 0.001$), physical resources (χ^2 (5, N=356) = 8.25, $p<0.05$), and financial support (χ^2 (5, N=356) = 19.1, $p<0.001$). Supporters were more likely to deliver emotional support and physical resources almost immediately after or within days of an event, whereas CSOs received financial support later (within weeks and more than a few weeks after the earthquake) more often than statistically expected. There were few, if any, logistical barriers for emotional support, while early instances of physical resource support (e.g. emergency accommodation, replacement stock) required rapid adjustments to normal exchange protocols. These rapid transactions required informal and flexible responses predicated on trust. Conversely, acquiring financial support often required a greater time investment to for example, fill out forms (in the case of grants and loans) and lodge insurance claims.

6.3.4 How important was the support?

The perceived importance of support was also significantly associated with who delivered the support (Table 30) and when (Importance*Support Timing χ^2 (9, N=356) = 35.5, $p<0.001$). Family members tended to be ranked as 'most important' more often than statistically expected, while business associations were ranked as less important. While the importance rankings may, in part, reflect the degree of closeness that the respondent felt to the network supporter (privileging family members), family supporters were actually more likely to provide support earlier and, on average, to provide more types of support.

Overall, the results in Table 29 and 30 show how segments of an organisation's network provide support in different ways. Close ties with family and other parts of the organisation were more likely to provide more types of support, faster, and therefore CSOs tended to see these supporters as more important. Ties that were more formal or market based, however, were critical sources of advice and information and bridging and advocacy support. Similarly, suppliers were a major feature in CSOs' support networks. They were the most common sources of support overall and the most common sources of financial support in particular. Suppliers were also less likely to require reciprocated support, in part because they received payments more often for their goods and service, but also because they were more likely to be located outside of the affected areas.

6.3.5 Which organisations had what kinds of networks?

Organisational characteristics influenced the form of CSOs' support networks. The results shown in Table 31 indicate that larger and older organisations were more likely to have a low E-I score (i.e. were more likely to get support from other organisations in their industry sector) and to have more supporters outside of Canterbury. Larger organisations did

not necessarily have larger support networks, despite the organisation presumably having more access to more connections through their employees. [77]

Network size was not correlated significantly with any of the variables, including direct impact score or days closed. In other words, organisations that may have suffered more impact did not necessarily recall accessing support from more network members.

Table 31: Correlations among organisation and structural network variables, Pearson's correlations

N=32	FTE (FTE Corp)	Duration operation (yrs.)	Days closed	Direct Impact Score	Net Size	Net Density	Reciprocity (%)	E-I Index	Ties Out Cantb. (%)
FTE (FTE Corp)	1								
Duration operation (yrs.)	.120 (**.758****)	1							
Days closed	-.131 (-.210)	-.309	1						
Direct Impact Score	.070 (.171)	.079	.282	1					
Net Size	.093 (-.010)	.025	-.037	-.007	1				
Net Density	.187 (.300)	.345	-.071	-.009	-.283	1			
Reciprocity (%)	-.090 (-.094)	-.173	-.102	-.101	-.180	.271	1		
E-I Index	-.275 (**-.467****)	**-.478****	.195	-.007	.124	**-.706****	-.034	1	
Ties Outside Canterbury (%)	.064 (**.512****)	**.676****	-.185	.185	.057	.342	-.338	**-.418***	1

*Significant difference at p<0.05, **significant difference at p<0.01

E-I index and support network density correlate significantly and negatively. The direction of the correlation indicates that as networks become more homogenous (-1) (i.e. the CSO had more ties to organisations in the same industry) the more densely connected the networks become[78]. Additionally, the more homogenous the networks were in this study, the

[77] It is possible that this is because only one respondent from each organisation completed the PAS exercise for each CSO. When network data is gathered using qualitative methods, network size is relatively unreliable and needs to be considered an indicative estimate, rather than a reflection of 'reality.'

[78] This corresponds with Granovetter's (1973) finding that network members with more in common (shared attributes) are more likely to know one another.

greater proportion of ties the CSO had outside of Canterbury. This is in part because much of the support that came from outside of Canterbury came from other parts of the intra-corporate network, which tended to interact with each other.

Organisation attributes and support application

Allowing CSO respondents to self-define support produced a broad interpretation of what organisations needed to help them cope following the earthquakes. Many needs emerged in the earthquake aftermath that CSOs had not anticipated or planned for, such as the need to access the CBD cordon or the emotional strain of prolonged disruption on employees. Thus, it was important to have relationships with others that were able and willing to adapt along with the CSO in the earthquake aftermath.

As discussed in the previous section organisational attributes, particularly age and size, influenced the forms their networks took and the CSOs' approaches to applying external support to their problems. Older CSOs were more likely to be part of a corporation or formally affiliated with a larger organisation (the average age of corporate or affiliated CSOs was 45 years old, compared to non-corporate at 13 years old). CSOs that were part of a larger organisation mobilised a relatively high proportion of support from within their wider intra-organisational networks in the earthquake aftermath. Similarly, the older and larger the CSOs were, the lower their E-I index scores tended to be (Table 31). This reflected the high degrees of support received from others within their industry, and the more ties they had outside of Canterbury (Table 31). Again, these ties largely consisted of intra-corporate network members or connections made through those members.

In contrast, organisation age correlated significantly and negatively with the proportion of family or kin ties in the network ($r= -0.364$, $p=0.05$). In other words, younger organisations tended to mobilise a greater proportion of their support from family. Conversely, older CSOs were more likely to have established relationships with other

organisations in their industry and corporate support mechanisms that reduced the need to blur the boundaries between organisational and personal networks.

Depending on their age and size, CSOs utilised support in different ways to address problems following the earthquake. For example, if we examine two particularly prominent issues, accommodation shortages and managing workforce strain, there were distinct differences in the approaches of relatively older, larger CSOs and those of younger, smaller CSOs.

Relatively older and larger CSOs (i.e. those in the upper quartile of age, older than 27.25 years, and size, more than 9.25 FTE) mobilised intra-organisational networks and bridging support to access commercial accommodation. For example, the Wellington office of *National Service*, a national public service organisation with nearly 290 employees in New Zealand (15 in Christchurch), coordinated the post-earthquake relocation process for their Christchurch counterparts. Similarly, *Kaiapoi Rental*, part of a company with three branches in Canterbury (13 employees in Kaiapoi and 48 elsewhere in Canterbury) temporarily moved in with another Canterbury-based branch while their building was repaired following the September earthquake. These two larger organisations were also able to use their employees to expand their ability to search for alternate accommodation.

Conversely, smaller organisations (i.e. those with fewer than 9.25 FTE) relied far more on friends and other local businesses to help them secure alternate commercial accommodation in the earthquake aftermath. Help from these supporters came in the form of information sharing including, for example, where rental vacancies had become available, and informal co-location arrangements.

Workforce support was one of the most important types of assistance CSOs mobilised following the earthquakes. Organisations simultaneously experienced increased demands on their workforce and challenges to their workforce's ability to perform in their roles. For

example, earthquake-affected organisations faced higher logistical and coordination demands due to disrupted infrastructure and supply chains. They also faced increased administrative burden from insurance claims and relocation requirements. At the same time, local labour productivity often decreased as employees dealt with damage to their homes, disrupted families, and other personal stressors. Therefore, CSOs needed to find ways either, to reduce workloads, supplement the workforce, or to improve their capacity to cope with the additional strains in challenging circumstances.

Both large and small CSOs used their networks to expand their workforce capacity after the earthquakes. Smaller CSOs mobilised additional labour from family members and friends who assisted with administrative work, relocation management, and related tasks. Larger organisations redistributed work to out-of-town branches or brought in additional staff members from offices in unaffected branches.

Smaller CSOs were also more likely to access financial support overall, and they often applied this financial support to help retain or enhance their workforce. The Earthquake Support Subsidy (ESS), for example, was only available for small and medium enterprises (SMEs).

Additionally, staff fatigue and strain reduced workforce productivity, increased intra-organisational conflict, and stressed relations with customers and clients. To address these issues, medium and larger CSOs provided employees with personal counselling, remote working options for staff, opportunities to rotate to non-earthquake-related jobs or offices outside of damaged areas, holiday packages, and flexible working options. Small businesses (especially micro-businesses, with five or fewer employees), however, were generally unable to provide the same level of support. They tended to mobilise support instead through extra-organisational networks, with family members and friends providing a significant amount of emotional support and supplemental labour to cover for or assist fatigued employees. Several

small business owners in this study discussed the importance of community members 'checking in' on staff and receiving encouragement, empathy, and a sense of solidarity from members of their network.

Despite some of the potential network advantages of larger organisations, smaller organisations overall did not have worse medium-term recovery outcomes, nor did they mobilise less support. In part because their operations were often simpler than larger organisations, they were able to use informal sources of support including enlisting family and friends as movers, shop assistants, construction workers, and financial backers to fill needs where larger CSOs were able to use their intra-organisational networks and internal resources.

6.3.6 Does post-disaster trajectory relate to network characteristics?

Although there were notable differences among the network characteristics for organisations of different sizes, and support differed depending on the relationship characteristics, there were very few differences among the networks of organisations in different trajectory groups. I used non-parametric ANOVA (Kruskal-Wallis) tests to examine the differences among the trajectory groups across the organisational, network structure, and support content variables.

A significant Kruskal-Wallis result indicates that there is a significant difference between the rank means of highest and lowest ranked groups. For this test, the data points are ranked from lowest to highest. The test then examines the ranked positions of the scores in different groups (i.e. the trajectory groups). Thus, mean ranks reflect an average of the ranks within the comparison group presents the results for the network structure and support content by trajectory group. Table 32 presents the results for the network structure and support content by trajectory group.

This analysis begins to address the question, ‘What is the relationship, if any, between the nature of the support network and the organisations’ post-disaster trajectories?’ So, for example, Table 32 shows that organisations that had developmental trajectories on average had the largest network sizes, but that the difference between the trajectory groups is not statistically significant.

In fact, the results in Table 32 show that none of the relational characteristics or network variables consistently varies among the trajectory groups. Thus, at a general level, there is no obvious relationship between the nature of the support network and the organisations’ post-disaster trajectories. For example, organisations that had positive (developmental) trajectories did not necessarily have less dense networks or more or less homogenous networks, even though these have been associated with organisational advantage in previous studies. Neither did organisations experiencing a certain trajectory draw on significantly different kinds of support or access support from a particular kind of actor.

Although the network and support characteristics do not significantly differ among the trajectory groups, some of the mean ranks show distributions among the trajectory groups that might indicate potential relationships given a larger sample of organisations. For example, organisations that did well (experienced developmental change) mobilised relatively more emotional support from their networks. Similarly, developmental CSOs also had the highest mean rank for the proportion of the network that was composed of friends, family, and business associations. Additionally, these developmental organisations also had the highest mean reciprocity.

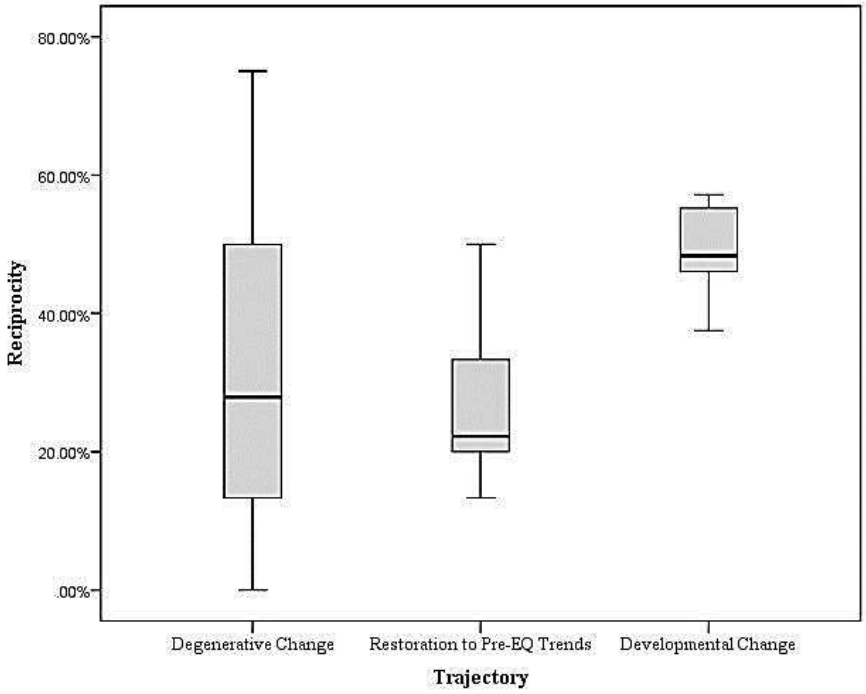
Table 32: Network structure and content by trajectory group, non-parametric ANOVA (Kruskal Wallis test)

	Mean Rank			Kruskal Wallis Statistics		
	Trajectory					
Factors	**Degenerative Change**	**Restoration to Pre-EQ Trends**	**Developmental Change**	X^2	**df**	**Asym Sig.**
Net size	16.78	12.83	18.63	1.349	2	0.51
Net density	16.33	17.50	16.13	0.087	2	0.96
Reciprocity (%)	15.11	12.00	23.00	5.636	2	0.06
E-I Index	17.25	14.25	16.50	.475	2	0.79
Emotional (%)	15.33	15.83	19.63	1.205	2	0.55
Bridging & Advocacy (%)	16.75	12.25	19.13	1.975	2	0.37
Advice Info (%)	16.78	16.25	16.06	0.038	2	0.98
Physical Resources (%)	17.61	18.67	12.38	2.123	2	0.35
Financial (%)	14.36	17.67	20.44	2.450	2	0.30
Assistance Services (%)	19.19	15.50	11.19	4.124	2	0.13
Family (%)	16.06	14.25	19.19	1.118	2	0.57
Friends (%)	14.22	18.58	20.06	2.742	2	0.25
Suppliers (%)	18.58	13.67	13.94	20.97	2	0.35
Customer (%)	17.19	15.17	15.94	0.314	2	0.86
Part of Organisation (%)	16.97	17.67	14.56	0.829	2	0.66
Org. in Industry (%)	17.03	12.92	18.00	1.383	2	0.50
Business Assn. (%)	14.06	18.17	20.75	3.125	2	0.21
Commun.Group/NPO (%)	15.97	16.00	18.06	0.374	2	0.83
Other Business (%)	14.97	17.67	19.06	1.274	2	0.53
Government (%)	19.11	13.50	12.88	3.240	2	0.20

CSOs with developmental trajectories in some way reciprocated the support of nearly 50 per cent of network members on average, compared to the overall average of 35 per cent. The amount of reciprocated support provided by CSOs with degenerative trajectories, however, was bi-modal with the bottom quartile providing an average of just below seven per

cent and the upper quartile just over 60 per cent. Figure 16 illustrates the wide distribution of reciprocity provided by CSOs that experienced degenerative change compared to the concentration of moderately high levels of reciprocity among CSOs that experienced developmental change.

Figure 16: Percent of support reciprocated by trajectory group



The average network reciprocity was lowest for CSOs that experienced restoration to pre-earthquake trends, but overall far fewer organisations had levels of reciprocity less than 20 per cent compared to CSOs that experienced degenerative change and none had reciprocity levels over 50 per cent. Interviews with respondents that had unusually high levels of reciprocity show that these CSOs tended to accept relatively high levels of support that was not directly relevant to organisational response and recovery activities. Most of this support came from supporters with whom organisational leaders had close personal relationships. They then responded with reciprocal support to these close supporters. Conversely, CSOs with very low levels of reciprocity received a relatively high proportion of their support through formal and market relationships (i.e. suppliers, government agencies,

and business associations). These exchanges tended to be relatively simple and inflexible, meaning that CSOs could not easily adapt the support relationships to suit their unique or emergent needs.

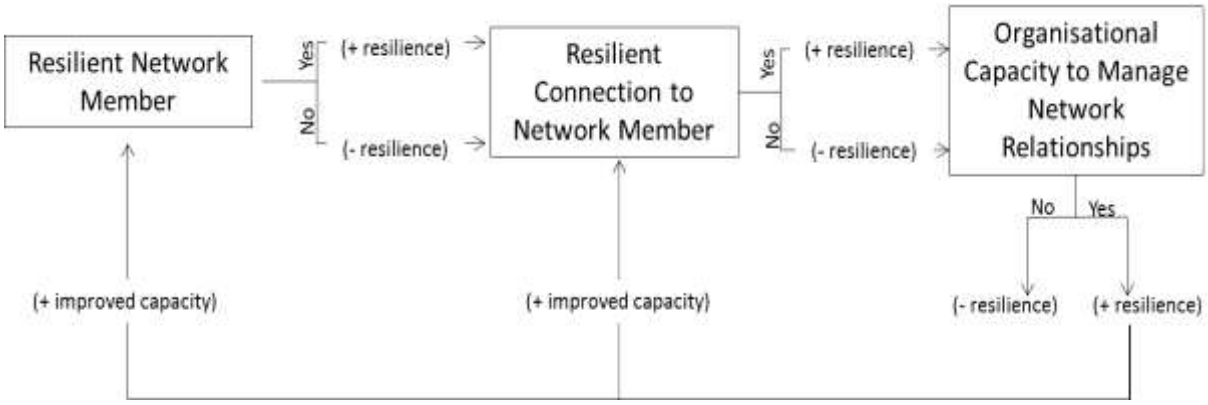
Although the network variables did not significantly influence the post-disaster trajectories, there are differences between the networks of different kinds of organisations (e.g. large and small organisations). Similarly, the analysis of the various ways reciprocity was handled by organisations with different trajectories demonstrates that more needs to be understood about the way CSOs manage and maintain relationships. This is covered in Sections 6.4 and 6.5.

6.4 Theorising Relational Resilience

The analyses in this section provide insights into the way different CSOs approached network creation and management prior to the earthquakes. In this section, I draw comparisons among the different CSOs' networks and networking practices to understand the variety of network forms and functions that contributed to or detracted from CSOs' relational resilience.

Relational resilience has three interacting elements. Figure 17 depicts these elements and the development of relational resilience as an organisational process. First, an organisation's access to resilient network members contributes to the organisation's resilience. Second, they need resilient relationships with those network members, and finally, they need the intra-organisational capacity to continue to maintain and manage the relationships. This capacity is self-reinforcing, as an organisation's ability to manage their network also means that they are better able to connect with resilient network members and to establish resilient (robust and adaptable) connections.

Figure 17: The organisational process of creating relational resilience



Network creation is a path-dependent process. CSOs' pre-earthquake connections tended to form the basis of their post-disaster support network and often served as bridges to new network connections formed in the earthquake aftermath. The majority of support came from local actors with whom the CSO or CSO employees had multi-year relationships. It may, therefore, be possible to assess and develop relational resilience prior to a disruption by examining the nature of the nodes, ties, and the organisation's capacity to manage nodes and ties. The following sections use the case studies to explore the different elements of relational resilience.

6.4.1 Resilient network members

Resilient network members facilitated organisational resilience. Being able to access support quickly and effectively from pre-existing ties enhanced CSOs' capacity to meet their post-earthquake needs. Network members needed to survive the earthquakes and to be left with adequate resources and adaptive capacity so that they were able to provide support to CSOs in the changed post-disaster environment.

The importance of network member resilience can be clearly demonstrated by examining instances of network failure and support gaps.[79] The temporary or permanent loss of key suppliers or customers disrupted CSOs to different extents depending on their degree of dependence on that network member. Ten CSOs permanently lost at least one service provider or supplier as a direct result of the earthquakes, and these losses in some cases directly impeded organisations' ability to pursue recovery. Following the February earthquake, for example, *Coastal Retail & Craft's* accountant closed its firm for an extended period of time and later relocated out of the region. This loss left a gap in the CSO's potential support network and hindered its ability to apply for financial aid from Recover Canterbury:

> "The trouble was, I'm a one-man-band pretty much, but they wanted all the stuff from your accountant, from projections of how much you earn which is fine if you've got a company accountant, you can just tell them to go do that. But it was just hopeless; screeds and screeds of paperwork trying to predict what we were going to do next year. Our accountant was across the road and he's gone, so we had to find a new one. It was just too much, we gave up."

The owner of *Coastal Retail & Craft* had no additional internal capacity to meet the emergent administrative needs of applying for grants in the earthquake aftermath, and due to the loss of a service supplier, the business also lacked the external support to assist with making such applications. Conversely, the owners of *The Attic* described rapid access to their accountant as "critical" to their recovery, in part because the accountant's file backup system enabled them to access copies of important records that had been lost in their building in the

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[79] Although I did not capture systematic data comparing organisations' pre-earthquake 'routine' networks and post-disaster support networks, at the end of the network exercise I asked questions about support that the CSO did not obtain, asked respondents to list network members that they normally would have sought support from but were unable to after the earthquake, and to list people or organisations that hindered their organisation's ability to recover.

CBD. In this case, the network member not only survived but had resilient systems in place that greatly enhanced *The Attic's* ability to resume operating, despite having no data backup systems themselves.

Over time relationships often accumulate trust, obligations and expectations of support, and foster norms of interaction. For CSOs, these features of longer term relationships reduced transaction costs and made the network members more receptive to adapting their routine transactions to meet post-earthquake needs. Supporters with whom CSOs had the longest relationships (10 years or more) tended to provide the most forms of support. Long-standing supporters also provided assistance more quickly and more times following the earthquakes.

Losing long-standing supporters was costly for organisations. Investments in these kinds of relationships are often 'sunk' and so cannot be adequately recouped, transferred, or substituted if that network member is lost. For example, a supplier, with whom *Timber Craft's* owner had a multi-year relationship, went out of business following the earthquake:

> "One of the transport companies that used to bring stuff out to me […] closed down. […] So that broke the camel's back for me. You sort of get to know contractors […] and the trucking firms are no different. You ring someone up and if you're in a hurry they'll get it for you and if you don't that's fine you know?"

Establishing a relationship with a new supplier was both time consuming and meant losing the tacit understandings and flexibility established over time with the previous supplier. Thus, even if organisations are adept at making new connections and filling gaps as needed, being connected to resilient others reduces the risk of losing sunk relationship investments.

Network members that survived the earthquakes but were unable to cope with additional demands following the earthquake became bottle necks in the flow of resources

and information. For example, three CSOs' had issues with insurance brokers that effectively ceased functioning under the increased workload following the earthquakes, making it difficult for CSOs to progress insurance claims. CSOs faced similar bottle necks with telecommunications companies. Some responded quickly, making flexible arrangements to enable CSOs to implement rapid changes, such as call diversions and mobile services for electronic transactions. Others were unable or unwilling to make even minor adjustments to their routine transactions. CSOs that were connected to resilient network members maintained or quickly regained access to support that facilitated their recovery following the earthquakes.

6.4.2 Resilient connections

From the case studies, I identified two features of relationships established before the earthquakes that improved the resilience of the ties between the network member and the CSO. These included: 1) the technical capacity to maintain or regain contact with existing ties and 2) trust and reciprocity.

Technical capacity to connect

At the most basic level tie resilience depended on organisations' ability to get in touch with their network members in the earthquake aftermath. Robust and redundant communication and information technology systems greatly enhanced this process. Organisations that had off-site or cloud based servers were able to access email data and client and supplier information even if they lost access to their building and primary computers. Some CSOs had pre-established systems or quickly acquired the ability to reroute calls to other offices or to organisation members' personal or work cell phones. Similarly, if the CSOs and their suppliers, customers, or other parts of the organisation had multiple

modes of contacting one another (e.g. cell phones, social media sites, email, and fax) they were better equipped to reconnect quickly after the earthquakes.

Five CSOs reported significant and prolonged communication disruptions with network members. Communication disruptions, especially with suppliers and other parts of the organisation, caused lasting damage to relationships and slowed the progress of recovery for these organisations. For example, after losing their computers and server in the CBD, *Gilbert's Building Supplies* was unable to process payments for branches in other parts of the country and had no technical capacity to shift this responsibility to another office. Due to cumulative delays, at the time of the interview in mid-2012 the regional manager estimated that the CSO was approximately six months behind on their accounts and facing chronic cash flow problems. Similarly, immediately following the February earthquake the owner of *Elegance* evacuated to the North Island, and was unable to get in touch with one of the business's key suppliers via telephone and had no alternate contact information for the supplier. As a result, the supplier contracted with another organisation and would not re-enter a business relationship with *Elegance* when the owner returned to Christchurch.

Trust and reciprocity

Trust and the obligation and expectation of reciprocity increased tie durability, and both eased and encouraged the exchange of resources and information. Where trust exists in relationships the probability of opportunism is lower, and, as a result, trust increases the willingness of actors to engage in informal social exchange and the willingness to increase potential vulnerability to the another actor by, for example, loaning them money or sharing tacit information.[80]

Trust in CSOs' support networks was especially important when exchanging information and advice, outsourcing work, and receiving certain kinds of financial support.

[80] C.f. Nahapiet & Ghoshal (1998) and De Wever et al. (2005)

CSO decision makers often corroborated or discussed information and advice they received from official sources with network members they trusted. Similarly, CSOs that had others in their network that they could trust to take on core organisational tasks or to assist with the additional workload generated by the earthquakes reduced the risk of staff burnout. When taking on new network members to reduce the workload burden, trust could also be appropriated through referrals. CSOs gave new supporters more responsibility if they were recommended or introduced by a source that the CSO trusted. For example, in order to source a greatly expanded volunteer workforce, the director of *Kaiapoi Society* recruited volunteers that had an established relationship with organisations they trusted:

> "A lot of work had to be done in a very short amount of time to organise all of that. It was this huge stretch of resources and making sure you didn't just have any old Joe Blogs coming in and volunteering either. They had to be reputable kind of people. So, we enlisted help from the local Lions Club in Rangiora. Lions and Rotary played a huge part in that."

As a result of this appropriated trust, *Kaiapoi Society* acquired dozens of additional volunteers to meet its urgent needs without having to expend resources on a cumbersome vetting and monitoring process.

Equally, when network members trusted CSOs the need for contracts and formal repayment arrangements was reduced. Support could be transferred more quickly with the belief that the CSO would utilise the support appropriately and would compensate or reciprocate at some unspecified time in the future. For example, many suppliers offered extended credit or offered supplies at no cost, trusting that the CSO would make payments in good faith when they were able. Similarly, the ease with which CSOs were able to access the earthquake support subsidy (ESS) through WINZ represented a relatively high degree of generalised civic trust. The ESS had low entry barriers and, as a result, CSOs mobilised this

support relatively quickly and easily following the earthquakes. Despite the risk of distributing public money without a proper evaluation process, early appraisals indicate that the ESS ultimately saved the government money due the efficiency of its deployment and its timeliness in buoying disrupted small businesses (Fischer-Smith, 2013).

Trust in networks is, in part, governed by the norm of reciprocity. Reciprocity is the informal credit system in social networks, where the actor providing support creates the expectation of future support which the recipient feels obliged to repay at some point. CSOs that had accumulated a lot of "credit slips" (to use Coleman's (1988) term) prior to the earthquake were in a better position to mobilise support after the earthquake. For example, *Figure Financial's* clients showed up in force to help the business relocate because the owner had helped many of these clients in the past. *Figure Financial*, therefore, held a number of credit slips, which the clients were eager to repay when the opportunity arose.

The prospect for network members to accumulate new credit slips, at least indirectly, incentivised cooperation and coordination in the earthquake aftermath. In several cases where local actors provided support to a CSO, the CSO later responded in kind. Due to the number of disruptions between 2010 and 2013, CSOs indirectly benefited local network members by accepting help, because it created an implied obligation that the CSO would reciprocate when the network member needed help. When CSOs mobilised support from their network, they created an expectation of future support on behalf of that network member, which many supporters later cashed-in when they were disrupted. Thus, receiving support from a network member created further expectations for reciprocity in the future. This cycle of reciprocity presumably increased the durability and resilience of the ties.

As the results presented in the previous section suggest, however, both too little and too much reciprocity may have detrimental effects. It may be prudent for organisations to manage reciprocity like cash flow, monitoring how much support is coming in and going out,

and, possibly more importantly, *when* it will come in and out. For example, 90 per cent of network members that received reciprocated support during the study period were based in Canterbury. By accepting help from others who were disrupted, the expectation was often that CSOs would be open to reciprocating immediately or in the near future, so as to aid the supporter. In some instances the clarity of formal or market transactions meant that all of the exchange took place up-front, and CSOs did not have to worry about a supporter calling in a credit slip at a less than optimal time later. Thus as previously discussed, the amount of reciprocity and outstanding network credit needed to be effectively managed to enhance positive organisational outcomes.

6.4.3 Network management and resilience

The structure of CSOs' networks influenced the way they accessed support. Two features in particular, homogeneity and density, had implications for the way organisations approached their networks. Although neither of these attributes differed substantially among the trajectory groups, they each had implications for how CSOs managed and mobilised their network. Homogeneity – or the proportion of the CSOs' network that was composed of similar others, can be assessed along two dimensions: within industry and geographically. In this section, I also discuss three ways in which organisations approached their networks to manage and access support better following the earthquakes: using network coordinators, pre-crisis network engagement, and managing the network as a resource.

Network homogeneity

Network homogeneity has many potential benefits for an organisation. Overall, CSOs that were part of a larger corporate body drew more heavily on support from organisations in their industry. CSOs that were part of a corporate entity had an average E-I index of 0.23

(relatively few ties with others outside of their industry group) compared to non-corporate CSOs with an average E-I index of 0.80 (most ties were outside of their industry group).

While homogeneity can mean that CSOs are exposed to fewer unique resources, intra-corporate and intra-industry (Table 33) homogeneity were linked to a sense of membership in a social collective. This collective identity motivated network members to transfer support to other members of that collective in the earthquake aftermath.[81] Organisations within the same industry, including competitors, were often best positioned to provide each other with support tailored to the CSOs' needs (outlines several examples of the bespoke support provided by organisations with close market overlap).

Table 33: Support received by CSOs from organisations with close industry overlap

Relationship Description	Post-earthquake Support
Competing retailers located within a few blocks of each other	Following the September earthquake, Amherst Retail and Kaiapoi Shoppe temporarily shared premises due to Amherst suffering building damage. Following the February earthquake, Kaiapoi Shoppe lost a supplier and was able to make orders through Amherst's supplier.
Competing building supply companies in central Christchurch	Gilbert's building supplies and another local competitor assisted with each other's workload and deliveries during a period of increased demand.
IT organisations operating in Christchurch prior to the February earthquake	Health Solutions joined an informal group of related IT businesses to regularly exchange tips on marketing, development, and other post-earthquake business strategies.
Historic archiving organisation based in Wellington (outside of affected region) and the Christchurch-based archiving branch of National Service	The Wellington based archiving organisation stored materials for the Christchurch based National Service, organised meetings with the local sector, offered conservation material and arranged specialised storage and relocation assistance.

In each of the examples in Table 33, network members provided support that was specific to the needs of the affected organisation. Receiving support specific to the organisation's needs reduces redundant communications or support, and was preferable to receiving less relevant information and resources from actors less familiar with the needs of the organisation.

[81] In early conceptualisations of social capital, Coleman (1988) claimed that certain forms of social capital required closed social structures. Closure facilitates the development of effective norms, which can be enforced with sanctions that can guide behaviour. Nahapiet and Ghoshal (1998) later argued that identification with a closed social structure (group, organisation, sector) allowed "individuals [to] see themselves as one with another person or group of people," which "may not only increase the perceived opportunities for exchange but also may enhance the actual frequency of cooperation" (p.256).

While intra-industry homogeneity was, for the most-part, beneficial, geographic homogeneity's potential advantages were balanced by risk. Overall, 88 per cent (28 out of 32) of CSOs had 50 per cent or more of their support network members based in Canterbury. Canterbury-based supporters, including, clients, suppliers, and creditors, were often far more willing to readjust routines and accommodate earthquake disruptions than those in other parts of the country or internationally. Perhaps because local, Canterbury-based clients and suppliers had also directly experienced the disaster, CSOs viewed these supporters as more likely to grasp the magnitude of the disruptions and understand the difficulties they experienced.

An over-reliance on local supporters, however, had some potential drawbacks. For example, local supporters were more likely to draw on the CSO for support as well (i.e. to require reciprocity). If not well managed, this expectation could be experienced as a drain on the affected CSOs' resources.'

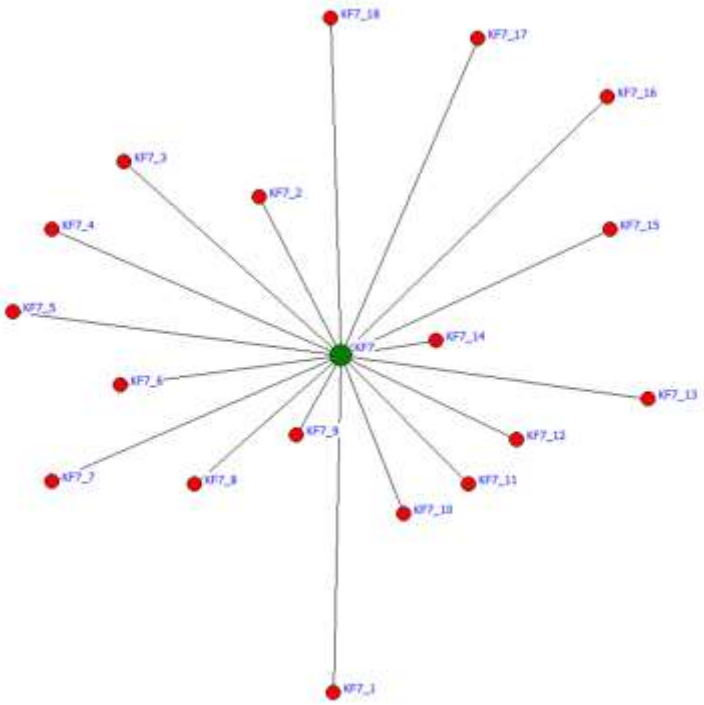
Supporters based outside of Canterbury helped some CSOs obtain resources, including workforce support, when local supplies were compromised. Additionally, supporters outside of Canterbury were more likely than expected to be sources of financial support. CSOs that relied heavily local supporters did not consistently perform worse than those that had more supporters in other parts of the country, however, an over-reliance on local support did present additional challenges for some CSOs.

Density

Like homogeneity, very dense support networks can potentially limit access to unique resources and information. In this study, however, very low density networks were associated with CSOs that were not particularly effective at utilising external sources of support.

Four CSOs had completely unconnected networks (i.e. density of 0.0, as shown in Figure 18). Three of these CSOs experienced degenerative change and one experienced restoration. Each of these organisations also exhibited low levels of engagement with their network including relatively low levels of reciprocity in their networks (19% on average), and did not affiliate with groups, such as business associations, that could potentially bridge to further networks.

Figure 18: Kaiapoi Corner Store at the centre of an unconnected network [82]



The network in Figure 18 is perfectly 'efficient' in technical terms,[83] which assumes that supporters that do not interact tend to provide unique resources and information. Completely unconnected networks, however, required a greater amount of input from the CSO. In this study, unconnected networks also tended to reflect the respondent's lack of

[82]The nodes were numbered in the order that the CSO respondent wrote them down during the name generation exercise. The distance of the node from the ego (KF7) indicates their perceived level of importance to the organisation, with important nodes closer to the centre.

[83] The calculation for network efficiency norms the effective size of the ego's network by its actual size. Effective size is calculated as the number of network members that ego has, minus the average number of ties that each network member has to other network members (Hanneman & Riddle, 2005).

awareness about who was connected to whom, and how they might utilise their networks to reach others to whom the CSO was not connected. These CSOs' leaders were particularly ineffective at managing and mobilising support from their networks, and struggled to supplement their internal capacity adequately with relational resilience.

Unconnected networks, as described in Table 34, had several features in common, including a tendency to rely on arms-length, formal, or market ties; a lack of engagement with business associations or other groups that had important bridging and bonding roles; and relatively low levels of reciprocity.

Table 34: CSOs with unconnected networks

CSO	Network size[84]	Trajectory	Network description
Gilbert's Building Supplies	11	Degenerative	The majority of this CSO's network was composed of arms-length, formal, or market-based ties to suppliers (50%) and government agencies (20%). They reciprocated support to 27% of ties. The organisation leaders sought support as needs became apparent, rather than proactively assessing problems and managing relationships before problems became apparent. They did not belong to any business associations, industry groups, or similar.
Kaiapoi Corner Store	18	Degenerative	Over 80 per cent of support came through market relationships with suppliers (72% of support consisted of physical resources from suppliers, replacing stock and delivering extra supplies due to increased demand). They did not belong to any business associations, industry groups, or similar. Organisational leaders were resistant to engaging support to aid the organisation beyond its immediate operational needs. They had 0 per cent reciprocity.
Norwich Retail	5	Restoration	This CSO had few long-term supply relationships. They tended not to engage in community activities. Their support network had only five supporters, only two of which the CSO associated with prior to the earthquake. They only reciprocated support to one network member. Did not belong to any business associations, industry groups, or similar.
Toasty's	7	Degenerative	The majority of this CSO's network was composed of arms-length formal or market-based ties to suppliers (43%) and government agencies (29%). Survival seeking, so only tended to accept help as it came, rather than mobilising support to reduce or avoid potential impacts. They reciprocated to approximately 30 per cent of their network. They did not belong to any business associations, industry groups, or similar.

The CSOs in Table 34 also tended to wait passively to receive support or only mobilise support in reaction to problems as they emerged, rather than seeking support to help the organisation avoid problems. For example, both *Toasty's* and *Kaiapoi Corner Store* were

[84] Network size is a count of the number of network members (alters) in a CSO's network.

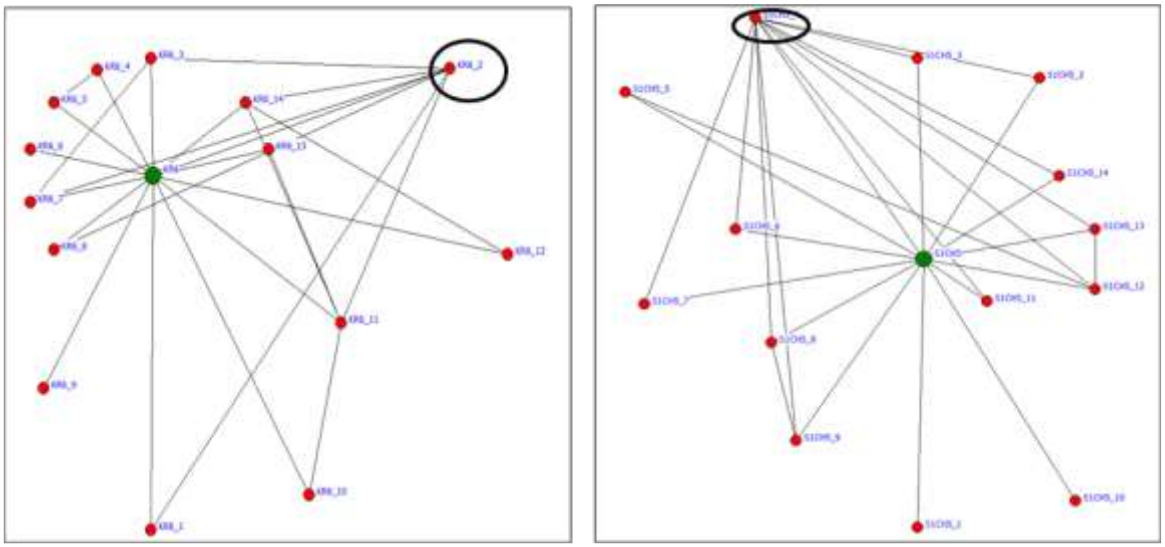
relatively unaffected by earthquake damage, and received a significant boost in patronage after losing competitors. They only began to experience degenerative change more than a year after the September 2010 earthquake as their contexts began to shift.

Network coordinators

CSOs could use structures within their network (i.e. the connections between the network members) to reduce the burden of network coordination. Some CSO leaders informally assigned a particularly well-connected network member the role of 'support coordinator' as a way of reducing the burden of distributing and taking in support.

Support coordinators reduced the frequency with which the CSO needed to interact with network members to whom they were both connected. The coordinators, indicated with a black circle in Figure 19, tended to have a high degree of connectivity in the network prior to the earthquake, but also coordinated with new network members.

Figure 19: Support coordinators in Kaiapoi Shoppe's (left) and Executive Sweets' (right) networks

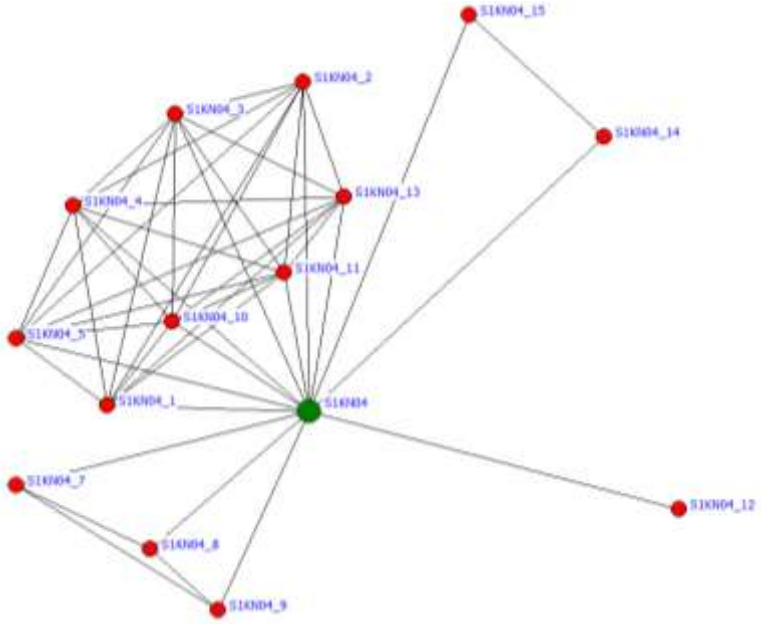


Coordinators took a range of forms within CSOs' networks, but always served to reduce network complexity for the CSO. The coordinator in *Kaiapoi Shoppe*'s network (on the left in Figure 19) was a particularly active industry group that engaged in information gathering and distribution for all of the associated organisations affected by the earthquake.

The coordinator also reported the status of suppliers and provided information about support offered by industry members and the government. A family member of the owner in *Executive Sweets'* network played a much different coordination role. This person coordinated contact with agencies offering formal support (e.g. the Internal Revenue Department and Recover Canterbury) and communicated with mutual friends who wanted to assist this disrupted business. In both of these cases, the role of the coordinator was to give the CSO a single point of contact to connect with support and information in a much broader support network.

Other CSOs did not have a support coordinator but reduced the complexity of their network by collectively coordinating with cliques in their network. A clique is a subset of a network in which the members are all relatively closely tied. In the example depicted in Figure 20, the clique in *Kaiapoi Society's* support network was a formally affiliated group of organisations to which *Kaiapoi Society* also belonged.

Figure 20: Kaiapoi Society's ego network support clique



Kaiapoi Society tended to communicate in a group setting (group emails, conference calls, and meetings) with these supporters, again reducing the need for redundant communications

and ensuring that information was appropriately distributed. Network coordinators reduced the number of individual engagements they need to have minimising the demand on the CSO's resources, but retained the access to resources and information from a large number of supporters.

Pre-crisis network engagement

CSOs tended to draw on their pre-existing support network for resources and information soon after the earthquake events. They then often expanded this network through their pre-existing ties (e.g. through bridging support). Organisations that engaged with a larger network or actively associated with affiliation groups (e.g. business associations) prior to the earthquake were able to access resources and information from a wider base of support following the earthquake. For example, *Health Solutions* was part of a larger corporate structure and had regular exchanges with other offices and corporate governing bodies in other parts of the country and abroad. It was also an active member of several industry groups. After the earthquakes, *Health Solutions'* network was relatively large with approximately 20 supporters, including a business collective through which *Health Solutions* was able to interact with several other earthquake affected IT companies to exchange information and advice. In contrast, the owners of *Coastal Retail and Craft* and *Norwich Retail*, both independent businesses, did not belong to any business associations or other support groups. They mobilised support from four and five supporters, respectively. Having a broad pre-existing network, with which the organisation was already used to engaging, provided CSOs with a platform on which to build their post-disaster support network.

Similarly, organisational attitudes and practices that shaped pre-earthquake support relationships created pathways and built capacities for managing post-earthquake support relationships. The director of *Kaiapoi Support*, for example, noted that due to limited budgets the organisation was already accustomed to sharing resources and collaborating with

other groups. This openness and capacity for accepting donations, new volunteers, and engaging in mutual support facilitated rapid uptake of available support following the earthquakes. Similarly, the owner of *Figure Financial* sought support and reaped the benefits of a supportive community cultivated prior to the earthquake. The respondent illustrated this point describing part of the CSO's relocation process after losing their premises in the September 2010 earthquake:

> "We had to move, and I had to let clients know that we were moving and if possible any trailers would be great. [On moving day], the whole car park was filled with clients. I just cried. I'm just your accountant. And they're going, 'No you're not just our accountant'."

This CSO owner had established a community of support through previous interactions with her clients and had, without explicitly intending to, accumulated obligations from these clients. So although the direction of the support flow changed in the earthquake aftermath, the patterns of support connections often created a template for post-disaster support patterns.

Managing the network as a resource

The most notable difference between organisations that effectively mobilised relational resilience and those that did not was CSO decision makers' capacity to recognise and manage their network as a resource rather than as a series of individual interactions. Network management required CSOs to draw on elements of endogenous organisational resilience, including staff engagement and involvement, situational awareness, and proactive posture to activate and manage relational resilience.

I identified five approaches, enabled by indicators of endogenous organisational resilience that helped CSOs to benefit from their support networks. First, CSOs needed the capacity for 'situation monitoring' so as to recognise current or potential gaps in their organisation's internal capacity. For example, several CSOs did not recognise the potential

for staff burnout and, therefore, turned down early offers of workforce or administrative support that could have eased demands on stressed staff members and owners. CSOs were also better off if they were aware of their network potential, including where support was available, both within and outside of their routine network, and how to mobilise it best. CSOs often had more success obtaining information about the future of their building through frequent communication with their landlord, for example, than by directly trying to contact the city council.

Second, CSOs could expand their network reach by involving staff in the organisation's decisions before and after the earthquakes.[85] Staff members whose support and opinions were valued and who were personally invested in the recovery of the organisation were more likely to mobilise social capital from outside the organisation to aid the CSO's recovery.

These kinds of action have been referred to as appropriable organisation, in that networks created for one purpose may be used for another (Coleman, 1988). They are also an example of social capital aggregation. If employees are willing to appropriate their external networks to aid the organisation, then the total amount of social capital available to the organisation increases markedly. Some CSOs' employees accessed networks formed in other contexts, such as church groups, families, and previous workplace, to aid their organisations' recovery. These ties helped CSOs acquire new accommodation, provide additional labour, obtain financial assistance, and, in one particularly dramatic instance, halt the demolition of a building the day it was supposed to come down. An additional benefit of accessing support from employees' personal networks is that in most cases the employee acted as a coordinator, bridging the interaction between their network and the CSO.

[85] C.f. Lee et al.'s (2013) definition of "staff engagement and involvement" in the New Model of Organizational Resilience.

Third, CSO leaders that assumed a more ‘proactive posture’ toward seeking and activating support mobilised higher quality (i.e. more directly applicable to the organisation’s needs) and more timely support. Actively managing support transfers included asking for support rather than passively waiting to receive it, but also managing when and how support transfers occurred.

Most CSOs experienced a surge in offers of support in the immediate aftermath of the major earthquakes. They were often, however, unable to utilise the support at the time and the support was not always relevant to the organisation’s needs. The regional manager of *National Service* found that offers of support were often poorly timed, and that those not dealing with the direct effects of the earthquake were unaware of the need for delayed or prolonged support. Despite these frustrations, *National Service* was able to *re*mobilise support from some network members once the CSO was able to properly assess its needs and create a recovery strategy. Support remobilisation was an active process and was more practical and effective for CSOs than passively taking in support as it was offered (or not offered).

Organisations that successfully remobilised support tended to:

1. Acknowledge the offer of support.
2. Communicate the organisation’s current position, and explain why they could not use the support offered at the time.
3. Where possible and manageable, maintain communications with the potential supporter.
4. If and when the CSO subsequently required assistance or other resources from a supporter, the CSO would approach the supporter and directly request assistance from them (instead of waiting passively for the supporter to offer again).

Supporters often did not offer support several times, and CSOs that did not actively re-engage with the supporter effectively allowed the offer to 'expire'. CSO leaders that maintained contact with supporters and actively engaged support when it was optimal for the organisation successfully accessed useful support.

The fourth approach refers to organisations adding new network members. Even CSOs with excellent pre-earthquake connections could not always mobilise appropriate support from their existing networks. CSO decision makers also needed to be proactive about initiating contact with new sources of support. Financial support was the most common form of support received from new (post-earthquake) network supporters, followed by specialist consulting advice (e.g. mentors from Recover Canterbury or conservation specialist that helped organisations with complicated relocation demands), and professional services (e.g. building checks by engineers). In almost all cases, these forms of support were addressing new needs generated by the earthquakes.

Finally, CSOs benefited from proactive engagement to maintain their relationships with existing network members throughout the recovery process. Regular and transparent communication was helpful for maintaining, renegotiating, and mobilising network connections. Organisations that reached out to customers (e.g. through social media as discussed in Chapter 5), suppliers, and other organisational stakeholders to alert them to the organisation's situation were better able to maintain these connections following the earthquake. For example, *Kedzie and Sons* mailed a survey to customers on their database asking "Where do we go from here?" with multiple choice options of areas they were considering for relocation. This survey helped re-engage the clientele, informing customers that the business was still operating in a limited capacity and providing updated contact information. Similarly, *Wigwam* pursued a line of forward, transparent communication with suppliers so as to avoid making their precarious financial position worse:

> "I've spent the last year avoiding bankruptcy. And how I've done that is by being in religious [regular] communication with all of my creditors, because I have seventy creditors. Every month on the twentieth, the money is in the kitty that I've got revenue… And a year's gone past and I've paid out heaps and I'm making progress, but it will be another year of paying people and I'll be debt-free, that's what I estimate… And they are all more than happy with that, because I guess they understand what the alternatives might have been, if one had rolled over and said I'm not going to do that, it's too hard, wah, wah."

Because *Wigwam* communicated its situation and repayment strategy to suppliers, it was able to renegotiate terms of payment successfully and maintain constructive relationships. Overall *Wigwam* was worse off following the earthquakes, but they were able to maintain their operations, clear their debt, and reopen fully in 2013.

CSOs could increase their potential resilience by engaging in relationships with resilient network members and ensuring a sufficient amount of heterogeneity in the network (so as to avoid losing high concentrations of important support nodes in a single event). CSOs also build their relational resilience by engaging in durable relationships reinforced through reciprocal, trust-based exchanges, and by establishing robust and transparent communication processes. CSOs that could find ways to manage their network to reduce the burden of coordination increased the relevance of support and improved their control over the timing and quantity of support through situation awareness and proactive posture.

6.5 Networks and Resilience Conclusions

The findings in this chapter contribute to the development of the concept of *relational resilience,* introduced in Chapter 5. Relational resilience is a dimension of organisational resilience mobilised through exchanges with other actors in an organisation's support network. It requires three elements: resilient network members, resilient connections with

those network members, and the capacity of organisations to effectively manage their network.

Relational resilience blends the concepts of social capital and organisational capacity, as resilience is collectively created and regulated through structures and norms of interaction, and mobilised through a network of ties. Yet, it also depends upon the capacity of the organisation to establish, maintain, and mobilise this social capital. Thus, access to a resilient network is a necessary but insufficient condition for relational resilience. The effective mobilisation and application of support depends upon internal organisational capacities.

The results from the case studies help illustrate how relational resilience might be activated in a post-disaster environment and how it might differ among organisations. Beyond simply connecting with others who are resilient, organisations can significantly contribute to their relational resilience by managing and developing the relationships that are the conduits for potential resources. Some of the most critical support came as a result of pre-existing relationships that organisations renegotiated in various ways to suit their post-earthquake needs. Renegotiation and support transfer were eased by trust and reinforced by the informal credit system of reciprocity. Additionally, positive intra-organisational relationships with staff had a multiplier effect on network size (as staff became more willing to appropriate social capital formed in other contexts for the benefit of the CSO).

Organisations that established resilient networking practices prior to the earthquakes performed better following the earthquakes than organisations with poor networking practices. Organisations that performed best were also aware of their support needs and how to fill gaps in their organisational processes with external support. They tended to approach support actively rather than passively, engaged with their networks to ensure that they received the right support at the right time, and successfully adapted (and continued to adapt) their organisation and their network in the dynamic recovery environment.

Lee et al.'s (2013) depiction of the external resource factor as "an understanding of the relationships and resources the organisation might need from other organisations in a crisis, and planning and management to ensure this access" (p.34) is quite relevant to the theory of relational resilience. The results presented here provide a more thorough understanding of what those planning and management processes might look like before and after a crisis. The theory of relational resilience proposed here integrates the concepts of endogenous resilience and external resource management with theories of network embeddedness and social capital. Thus, relational resilience facilitates the connection between the resilience of a network, the social capital created in the network, and the endogenous capacities of an organisation participating in that network.

Chapter 7: Synthesis, Contributions, and Future Research

The Integrated Research on Disaster Risk (IRDR) programme's 2013-2017 strategic plan highlighted the need to understand the "structural and institutional forces better, and social and cultural practices, beliefs and perceptions that shape…resilience and vulnerability" (2013, p. 7). Increasingly disaster researchers are adopting integrated rather than atomised perspectives of systems in order to understand the emergence of resilience and vulnerability better through complex interactions.

Researchers and practitioners across a number of disciplines have contributed toward assessing and developing organisational resilience (the capacities that allow organisations to survive a crisis and thrive in the aftermath). While this body of literature acknowledges interactions between organisations and their environment, current approaches to organisational resilience tend to be under-spatialised and under-socialised. Resilience is seen as emerging almost exclusively through the endogenous properties and capacities of the organisation, and the environment tends to be characterised either as a source of threat or a pool of resources. The results of the 32 organisational case studies presented in this thesis suggest that a contextual approach to resilience, similar to that proposed by the IRDR, can offer important insights into organisational processes and post-disaster outcomes.

The concept of embeddedness contests the neoclassical assumption that economic action is motivated by self-interest and utility maximisation. Embeddedness perspectives create room for the consideration of "structural and institutional forces" and "social and cultural practices" (IRDR, 2013) when examining organisational processes. By taking into account organisational embeddedness, the research presented in this thesis can improve our understanding of organisational resilience and variability in organisational post-disaster outcomes.

Using in-depth longitudinal case studies of organisations located in the Christchurch CBD, Kaiapoi, and Lyttelton – among three of the worst affected commercial centres following the 2010/2011 Canterbury earthquake series – I examined how connection to context and support networks shaped organisational resilience and thus organisations' post-disaster trajectories. I integrated approaches from community resilience and embeddedness theory to sharpen the way we conceptualise organisational connections to contexts and to examine the implications of these connections for organisations before and after disasters. I framed my discussion around three research questions, and in this conclusion I discuss the key findings for each question in sections 7.1, 7.2, and 7.3. Finally, in section 7.4, I explore how these findings and the concepts developed in the thesis could be expanded through future research and practice.

7.1 RQ1: How does an organisation's embeddedness in its local context influence its post-disaster trajectory?

Organisations become embedded in their contexts in different ways. In this study I focused on organisational embeddedness in local (town) contexts and in networks of support. I identified 16 mechanisms through which the case study organisations (CSOs) had become tied to their local environments prior to the earthquakes. The findings indicated that embeddedness differed among organisations in different industry sectors, between the CSOs in the three town centres, and between single-location independent businesses and complex or corporate organisations. Overall, CSOs providing community services (i.e. the culture, recreation, and social service organisations) were most embedded, while CSOs in industries that delivered their products or services remotely or offsite were least embedded. Additionally, CSOs in the tight knit small town of Lyttelton had the highest average embeddedness, while those in the Christchurch CBD were least embedded. Finally, small, single-location organisations tended to have higher degrees of local embeddedness than

complex and corporate organisations. Organisations with higher levels of local embeddedness were more likely to relocate within their town after the earthquakes. Town centres need a 'critical mass' of organisations to be viable as commercial and social hubs. Thus, organisations committed to recovering in a place following a disaster can have positive implications for the recovery of those centres. By exploring the ways different organisations become embedded in places, we can begin to understand what kinds of organisations might stay or return to disaster affected places and for what reasons.

The degree of embeddedness did not differ significantly between CSOs that experienced positive (i.e. developmental and restorative) post-disaster trajectories and those that experienced negative (i.e. degenerative) post-disaster trajectories. In itself embeddedness was neither a universal good nor a universal bad. What made embeddedness 'good' or 'bad' depended on how the organisations' contexts changed in the earthquake aftermath, and the ways in which their connections to those contexts influenced their capacity to recover. Embeddedness in local environments can increase organisational exposure to local disruptions. It can anchor organisations in places or relationships that may no longer be conducive to organisational health, and can constrain organisation's adaptive options. At the same time, local embeddedness can facilitate adaptation by improving situation-specific sense-making in complex environments. It can help organisations to create meaning and collective purpose (cognitive embeddedness) and it can increase access to social capital (network embeddedness). Additionally, healthy and adaptive institutions can create recovery enabling environments for organisations (institutional embeddedness). Organisations are resilient, in part, because they are embedded in resilient contexts.

Organisations with positive (developmental and restorative) post-disaster trajectories shared a number of endogenous capacities, including proactive posture, situation awareness, and good intra-organisational communication and leadership. These attributes allowed them

to understand their connections, recognise emerging problems and opportunities, and to expand their access to resources, information, and decision making support through interaction with their contexts. For example, CSOs that recognised their dependence on a healthy organisational ecology to generate business usually sought to move to intact ecologies in recovered or unaffected areas or used mobile and temporary premises to take advantage of temporary organisational ecologies that emerged after the earthquakes. Those organisations that were not aware of their relationship to their organisational ecology sometimes stayed in areas that were no longer conducive to their organisational health or moved to areas that also proved detrimental in some respect. CSOs that performed best following the earthquakes demonstrated a good understanding of their connections to their altered contexts, made ongoing adjustments within their constrained adaptive space, and developed and utilised connections to their local contexts to recover following the earthquakes.

Through the investigation of the first research question, I developed the concept of *contextual resilience*. Contextual resilience combines the ideas of the resilience of social, economic, and institutional contexts in which organisations are embedded and the organisational capacity to navigate and interact with these contexts in ways that increase organisational advantage. Embeddedness in resilient places, resilient institutions, and resilient networks increases organisations' ability to survive and thrive after a disaster. Resilient contexts can supplement weaknesses in an organisation's endogenous capacities. For example, *Port Retail and Craft* had inadequate internal resources to fully recovery and did not pursue many adaptations in the earthquake aftermath. Yet it was partially buoyed by social capital in Lyttelton which reinforced the norm of supporting local businesses, and indirectly helped by community organisations that worked to keep visitors coming to the town. Conversely, embeddedness in contexts that are not resilient can hinder an

organisation's capacity to recover even if it has a relatively high degree of endogenous resilience. *Kaiapoi Rental*, for example, implemented innovative and proactive adaptations throughout the recovery period, but still experienced degenerative change because it was highly embedded in a challenging local housing and rental market and constrained by institutions that limited where it could operate.

The embeddedness approach developed in this thesis contests the fiction that organisations and their contexts are at the same time bound together and yet recover and adapt independent of each other (Iversen and Armstrong, 2008). Although organisations have endogenous capacities that may enable post-disaster recovery, they are also always embedded within structures that influence their processes and outcomes in numerous obvious and subtle ways. Resilience is produced through interaction, and can become part of a positively reinforced feedback loop. Resilient organisations improve community and place-based resilience (e.g. Cutter et al. 2010; Norris et al. 2009; Tierney and Bruneau 2007), and resilient contexts (e.g. communities and places) in turn increased organisational resilience. Resilient organisations were then better able to capture and apply the benefits of resilient contexts, which allowed them to contribute to contextual resilience.

7.2 RQ2: What is the nature of organisational post-disaster support networks?

One of the richest and most fruitful areas of research in the embeddedness literature is the examination of relational networks. Although a large and growing number of studies have examined the ways networks shape organisational action and can improve organisational advantage during routine times, only a small handful of studies have investigated the nature of the networks organisations use to help them cope and recover following disasters (e.g. Chewning (2009); Doerfel et al.(2010); Graham (2007)). Thus, my investigation of the CSOs' network embeddedness began by exploring the nature of the

networks themselves, or ‘which supporters provided what to which organisations’ and ‘what kinds of networks provided what to which organisations’.

Every CSO in this study accessed support in some form through a network comprised of formal and informal ties. Support tended to come from local supporters and from those with whom organisations had a long-term relationship. CSOs mobilised support to aid every aspect of organisational functioning, from supporting employees’ emotional wellbeing, advocacy, and advertising to obtaining supplies and constructing temporary premises. Support most frequently came from other organisations with which the CSO had some degree of formal relationship (suppliers, government agencies, and business associations). Post-earthquake support networks, however, often blurred the boundaries between personal and organisational networks, with CSOs using employees’ friends, family, and other extra-organisational social capital to meet organisational needs.

The characteristics of the relationship between CSOs and their network members influenced how and what kinds of support were exchanged. Close and informal relationships with friends and other parts of the intra-corporate network were the quickest to provide support, provided more kinds of support, and were more adaptable to emergent post-earthquake needs. Other relationships delivered specialised support. For example, organisations in the same industry as the CSO were often best-positioned to provide specialist supplies, labour support, advice, and locations from which to operate. Additionally, relationships with local actors were more likely to be adaptable to emergent post-earthquake needs than those outside of Canterbury (e.g. Canterbury-based suppliers were often more flexible with deliveries and more willing to offer extended credit), in part, because of heightened collective identity developed through the common experience of the earthquakes. Close and local supporters, however, were also more likely to require reciprocated support, which, without careful management, could become taxing on CSOs’ already stretched

resources. Conversely, ‘arms-length’ or more formal ties (e.g. government agencies and business associations) were often less flexible and tended to be considered less important by CSOs, but also did not come with the implied obligation of reciprocity. Organisations benefited from having a mix of formal and informal ties in their support networks.

This examination of the nature of organisations’ support networks was important for two reasons. First, the results call into question the almost exclusive focus on formal organisational networks (e.g. relationships based on contractual, market, and governance agreements) that are common when extra-organisational relationships are factored into studies of organisational resilience. For small businesses especially, informal and inter-personal relationships were instrumental for mobilising support following the earthquakes, and these relationships were often the earliest and most flexible sources of support. Second, these results illustrate the importance of organisational and employee participation in extra-organisational networks prior to disasters. Pre-existing relationships formed the basis of post-disaster support networks, and often new network members were added with bridging help from existing network members. The results demonstrate the path-dependent process of network formation, which supports the need for careful cultivation and management of a range of formal and informal ties and local social capital, prior to a crisis.

The concept of *relational resilience*, which may be considered the network form of contextual resilience, emerged from my analysis of the CSOs’ interactions with their support networks. Relational resilience refers to the organisational adaptive capacity that emerges through interaction with a relational network. Relational resilience requires three interacting components: resilient network members, resilient ties to those members, and the organisational capacity to initiate, manage, and maintain those relationships. Relational resilience, like contextual resilience, places some of the organisation’s resilience potential outside of the organisation. The network members have their own endogenous resilience, but

organisational networks can enhance their capacity for a resilient response following a crisis. Similarly, resilience can be created through interaction between organisations and their network members. Again, as with contextual resilience, organisations need the endogenous capacity to recognise, mobilise, manage and form new supportive relationships in their networks.

7.3 RQ3: What is the relationship, if any, between the organisations' post-disaster trajectories and the nature of these support networks?

The final research question addressed the relationship between CSOs' support networks and post-disaster trajectories. Ultimately, the variation in CSOs' post-disaster trajectories had less to do with the general characteristics of the networks (e.g. network size or the proportions of different kinds of supporters) and far more to do with the nature of the relationships with their supporters and the organisations' capacity to maintain those relationships. The analysis demonstrated that attention needs to be paid not only to which ties are activated for what purposes, but also to how the ties are cultivated in the social environment over time and how organisations adapt, maintain, and renegotiate their ties for different purposes.

If an organisation's network members did not survive and adapt in the earthquake aftermath, it hindered organisational capacity to respond and implement adaptations. For example, organisations that lost critical suppliers faced greater challenges to their recovery than those that did not. Similarly, organisations whose connections were both strong and flexible, reinforced through trust and reciprocity and supported by resilient technologies that allowed them to connect, were better able to maintain these relationships and adjust them to suit their post-disaster needs. Additionally, CSOs' ability to connect to new network members was eased in cases where they could link to others through trusted network members. Finally, the ability to form and manage the network meant that organisations could

access the right kinds of support when they needed it, reduce the burden of coordinating communications, and maintain positive relationships with those they might need or want to work with in the future. This analysis further demonstrated the need to consider resilience as a capacity developed through interaction, and hindered by an exclusive focus on the internal organisational environment.

7.4 Furthering Organisational Resilience through Embeddedness Perspectives

This thesis is intended to contribute to a more sophisticated understanding of organisational resilience, and the findings have both conceptual and practical applications. There are many potential directions for future exploration for both researchers and practitioners.

With respect to research and conceptual development, more needs to be understood about how to orient organisations toward resilience thinking and incentivise actions that build resilience prior to a disaster. The way extra-organisational relations motivate and influence adaptive action and resilience building is a potential rich area for exploration. There are indications that the character of social networks and interconnectedness have a greater influence on environmental perceptions and behaviour than personal characteristics such as age, gender, or the quality and quantity of information provided (Rayner & Malone, 1998). Thus, it is possible that an inter-organisational network that promotes awareness of potential environmental changes (e.g. disasters, climate change, and economic crises) and resilience building activities may be even more effective than building a strong business case for resilience.

The research presented in this thesis can also be developed to provide measurable and comparable indicators of contextual and relational resilience. Such indicators could be incorporated into existing measures of organisational resilience, like the New Model of

Organizational Resilience. An enhanced version of this model may help organisations, like the 32 CSOs in this study, to identify aspects of their connectivity that can help them establish resilience in their everyday operations. It may also help them improve their capacity to operate and adapt within dynamic contexts. Understanding how embeddedness can co-create resilience may also incentivise collaborative resilience building between organisations and the social contexts they inhabit.

Another interesting avenue for future work would be to examine the different scales at which organisations become embedded and the implications of this for their resilience. Future research could valuably explore the relevance of embeddedness and network concepts to the resilience of a wider range of organisational types and sizes, and in different cultural contexts than were examined in this study. New research in these (and other) areas should help us to build an integrated and inclusive understanding of the "structural and institutional forces, and social and cultural practices, beliefs and perceptions that shape…resilience and vulnerability" (IRDR, 2013, p. 7), both for organisations and society more generally.

The ideas introduced in this thesis can also be advanced by practitioners interested in enhancing organisational resilience. By actively considering organisations' contexts and networks practitioners can develop proactive interventions to enhance organisations' contextual resilience. This can occur at a number of levels, including within organisations, networks, places, and formal institutions (government and policy).

Cultivating contextual resilience at the organisational level would require organisations to develop systems for monitoring and evaluating their connections to their external contexts in order to identify potential sources of inertia and potential sources of resilience. If organisations recognise sources of inertia that may restrict their adaptive options in the future, such as territorial restrictions and critical or irreplaceable network ties, they can explore ways to reduce the inertia or to adapt around these organisational

‘immovables.’ If an organisation does have certain ‘immovable’ connections, it may also want to consider ways that it can contribute to the resilience of the entity to which it is connected. For example if an organisation cannot relocate it may want to contribute to social capital by supporting social activities and connectivity in the territory where the organisation must operate.

Resilience interventions can also be implemented at the network level. Groups of organisations that interact, through a business association, for example, can develop methods of engagement that enhance the resilience of the network as a whole. Actions might include developing a culture of transparent communication, identifying ways to enhance the efficiency of coordination if group action is needed, or finding ways to incentivise specific and generalised reciprocity among network members.

Place-based communities can also interact with organisations in ways that build resilience for the place and the organisations that inhabit it. For example, local cultures that reward the norm of supporting local businesses contribute to the health of the business and increase the organisations’ local embeddedness which may incentivise reinvestment in the area after a disruption.

At the formal institutional level, the government can consider policies that support organisations following disasters. In New Zealand, prior to the Canterbury earthquakes, there was no precedent of providing support to businesses affected by disasters. In the earthquake aftermath the government implemented the earthquake support subsidy (ESS). The ESS provided critical support for thousands of small and medium sized enterprises in the Canterbury region. According to early evaluations, the ESS saved businesses and jobs, enhanced economic confidence, and contributed to positive relations between businesses and the government (Fischer-Smith, 2013). This action, small as it might seem, had a positive impact on the progress of Canterbury recovery as a whole. Thus, as with all of these multi-

level interactions, recognising that resilience is co-created can enhance the efficacy of resilience interventions.

8: References

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9: Appendices Overview

The complete appendices are included in a separate accompanying document with this thesis.

Appendix A: Human Ethics Committee Approvals

Appendix B: Research Participant Informed Consent Form

Appendix C: Key Informant Interview Guide

Appendix D: Survey 1

Appendix E: Survey 2

Appendix F: Survey 3

Appendix G: Case Study Interview Guide and Name Generator and Interpreter Questions

Appendix H: Participant Aided Sociogram, Print Template

Appendix I: Organisational Health Structured Interview Guide