

Acknowledging local sociality in disaster recovery: a longitudinal, qualitative study

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Candidate's Statement

I, Tetsuya Okada, declare that the work presented in this thesis is my original research and that the ideas of others have been cited and acknowledged in the text. This thesis is submitted in fulfillment of the requirements for the degree of Doctor of Philosophy and has not been submitted previously, in whole or in part, for a higher degree to this or any other university or institution. Ethics approval for this research was obtained from the Macquarie University Human Research Ethics Committee (5201300144).

Tetsuya Okada
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Abstract

Formal recovery, reconstruction and risk reduction efforts put in place in response to major disaster events are designed to redevelop infrastructure and services for, and improve the longer-term safety of, the affected populations. However, these efforts often rely on top-down approaches that neglect the impact on and the presence of local people's everyday lives in and with their communities (local sociality). As a result, top-down recovery and reconstruction approaches may misjudge engagement with disaster-impacted communities. Existing and emerging power-relations tend to influence the aims and processes of the recovery and marginalise the voices of the affected populations, particularly the most vulnerable.

This thesis explores these issues in four case studies: the towns of St George and Grantham, in Queensland, Australia, both of which were severely impacted by flooding events between 2010 and 2012, and the Japanese towns of Koizumi and Namie, which sustained devastating damage from the Tohoku earthquake and tsunami and in the case of Namie, contamination from the Fukushima nuclear reactor in 2011. This study identifies a critical coherence in the human, social and political issues and challenges across all study areas, despite differences in the country, physical attributes of the hazards, types of damage and responses. In particular, the commonality identified across four different cases illuminate the importance of local sociality that is highly valued by the disaster-impacted people but often overlooked or downplayed by others.

The adopted qualitative, longitudinal research approach using semi-structured interviews through multiple site visits captured and identified long-term impacts and transitions in each study area involving individuals, households, local community groups, support persons and organisations and government officials.

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Acronyms and Abbreviations

BSC: Balonne Shire Council

LVRC: Lockyer Valley Regional Council

KTG: Koizumi Chiku no Asu wo Kangaeru Kai (Koizumi Tomorrow Group)

TEPCO: Tokyo Electric Power Company

Section I

Introduction

Chapter 1: Introduction

Chapter 2: Literature Review

Chapter 3: Methodology and Methods

1. Introduction

Disasters caused by natural hazards continue to occur in many places throughout the world. Wisner et al. (2004) consider disasters occur when vulnerable populations are severely impacted by hazardous events. The list of such trigger events, even in 2016 alone, includes a series of earthquakes in Kumamoto, Japan, extensive floods in Western Europe, another set of earthquakes in central Italy and Hurricane Matthew in America. In all of these events, vulnerable local populations particularly suffered.

Publicly available reports about disasters are often either based on 'macro' or 'localised but sensationalised' points of view with agendas driven by those who are beyond the impacted area including media and governments. Public attention is more focused on immediate impacts and responses rather than the longer-term recovery (Schneider, 2002), and authorities often prioritise providing physical, structural short-term recovery efforts over social, long-term recovery supports (Ingram et al., 2006).

Such unbalanced attention tends to overlook the local aspects that the disaster-impacted people are going through on the ground. For example, after the devastating earthquake, tsunami and nuclear power plant accidents in Japan in 2011, it was often reported with a positive tone how politely and orderly the disaster-impacted people were behaving (Daily Mail, 2011, ABC News, 2011). Although such reports may have represented some aspects of the behaviour of community members, the label 'well-behaved' was created by *outsiders*¹ possibly without sufficient understanding of the affected communities, and potentially stereotyping the way these communities and the people were seen (Haalboom and Natcher, 2012). As a result, many real stories that lay behind the superficial narrative of recovery attracted little attention. An interviewee of this study confessed a critical gap between the superficial and behind-the-scenes stories of disaster-impacted community members' experiences as follows.

¹ In this thesis, the word 'outsiders' refers to the people other than disaster-impacted community members.

Shortly after the disaster, I was often told [by outsiders] that they were relieved because I was smiling. They were relieved that I responded to them saying “Thank you” with a smile, although it was the time when things easily got sad and negative. But, I never interact with my guests with tears. I’m also used to it because of my job [that involves client communication]... I was often told [by outsiders] to hold on... [But] I thought “What more can we hold on?”... ‘Hold on’ burdens us. [Resident of Koizumi (2015)]

Lack of understanding of local insights may also overlook the needs of impacted community members. The *macro-ness* of the outsiders’ perspectives on recovery relates to the idea that service providers control *what receivers get* in a top-down manner (Browne, 2013, Cannon, 2015). This situation was clearly represented in the comment provided by an interviewee of this study, who claimed that impacts of the hazard could be handled, but the aftermath was worse than the hazard impacts.

[I]t’s an experience I’ll never forget ... The water coming through, we could handle. Quite frankly, and please excuse my language, it’s the bullshit after that we had problems with. We had so much trouble with. [Resident of Grantham, who did not participate in the land-swap (2013)]

Wisner et al. (2004) note that underlying vulnerabilities set the scene for a disaster and also greatly impact, and are impacted by, the recovery process. Recovery of a disaster-impacted community and its members should bring improved resilience to the next extreme event (Wisner et al., 2004). This includes both attaining better resilience through addressing the dynamic root causes of disaster and mitigating against future hazards (trigger events) including relocation of houses (Wisner et al., 2004). This is because both structural safety and quality of life are essential for a community to continue its development in a sustainable way (Shaw, 2014, Geis, 2000, Ahrens and Rudolph, 2006) (This issue will be further addressed in Chapter 2 in Section 2.2).

Along with addressing the root causes of disasters, this study acknowledges implementation of structural measures to mitigate future hazards in the recovery phase. Such structural

measures are often needed to reduce exposure to hazardous events in respect of three major components of social vulnerability: exposure, resilience and sensitivity/resistance to hazards (Ingram et al., 2006, Turner et al., 2003). However, this study also recognises that structural measures alone cannot encompass the larger narratives of recovery at a micro-local community scale that involve both aspects of structural safety and non-structural quality of life² (Ahrens and Rudolph, 2006, Shaw, 2014).

In light of the above, this study investigates disaster recovery at a community scale to better understand how a community and its members live through disaster recovery. This is not only to identify issues and advantages experienced in the past but also to explore opportunities in order to apply these as lessons to effective risk reduction before the disaster (or the next disaster at the already-impacted places). Better understanding of what is important to a community should also be central to risk reduction efforts. In addition, addressing such core component encourages community members to think about *their* community development. Therefore, studies that increase understanding of how community scale responses are framed by the relationships and processes that influence vulnerability and resilience across scales are needed to address disaster recovery and risk reduction.

In Japan the ongoing process of community development is conceptualised as *Machizukuri*, a planning term elaborated in Chapter 2 in Section 2.6. This Machizukuri contributes to a system that encompasses local interconnections and interplays between and across a community and its members, which this thesis calls *local sociality*. The process of disaster recovery including establishment and implementation of recovery and risk reduction measures represents Machizukuri in disaster settings. This process closely interacts with the entire system of a community – local sociality of the past, present and future. As stated earlier in this Chapter, the ways in which a disaster-impacted community and the voices of its members are addressed, captured and/or reflected in Machizukuri greatly affect the local sociality of the community. Therefore, focusing on and examining these relationships are vital to reframe disaster response and recovery, where a tailored, balanced management is essential.

² This thesis hereafter uses the word 'material' to represent geo-environmental, physical and structural objects and matters including damages, actions and effects to avoid terminological confusion.

This study looks into four case study areas: St George and Grantham, Queensland, Australia, and the towns of Koizumi and Namie, in the Tohoku and Fukushima regions, Japan (Figure 1). I selected these case study areas in consideration of applying my essential skill sets such as language and cultural understanding to conduct solo fieldwork and learning from local people impacted by major disaster events on a semi-real-time basis. Therefore, the selection of these study areas is, in a way, opportunistic. However, this very opportunism is a vital element for this qualitative study, which is largely based on a constructivist grounded theory approach to investigate the field inductively (see Chapter 3 in Section 3.2 Framework of the research). This study explored each study area, that were commonly in a similar timing of disaster recovery, analysed the data sets collected through deep engagement with local community recovery processes, and examined the localness of disaster recovery across the study areas, applying the specific lens of Machizukuri to discuss local sociality.

I was born and raised in Japan for more than 30 years. I have lived in Australia more than 10 years since I moved to the country in 2006. This combination of my backgrounds, supported by the official accreditation as a professional translator (see Chapter 3 in Section 3.5 Fieldwork: Phase 1), enabled me to understand, consider and transcend social, cultural and political differences and/or similarities presented between four study areas in Australia and Japan. These differences and similarities are refined and discussed in an integrated manner in Chapter 6. In particular, the commonality identified across four different cases illuminate the importance of local sociality.

The Queensland study areas were impacted by extensive flood events between 2010 and 2012. The Japanese study areas were severely damaged by the Great East Japan Earthquake and associated tsunami as well as the Fukushima Daiichi nuclear power plant's accident in March 2011. The extent and degree of damage sustained in each area is different. For example, St George experienced slow-onset riverine floods with no fatalities, while Grantham was hit by rapid-onset flash flooding with 12 fatalities. The Japanese cases, in general, sustained greater damage than the Australian towns. Moreover, the social contexts in these areas are very different. Despite these differences, this study explores these towns as case studies as they all

experienced disasters caused by natural hazards in recent years and were all in recovery mode. In addition, examining multiple case studies in different countries provides opportunities to identify socio-economic-political differences and similarities within and between the different study cases.

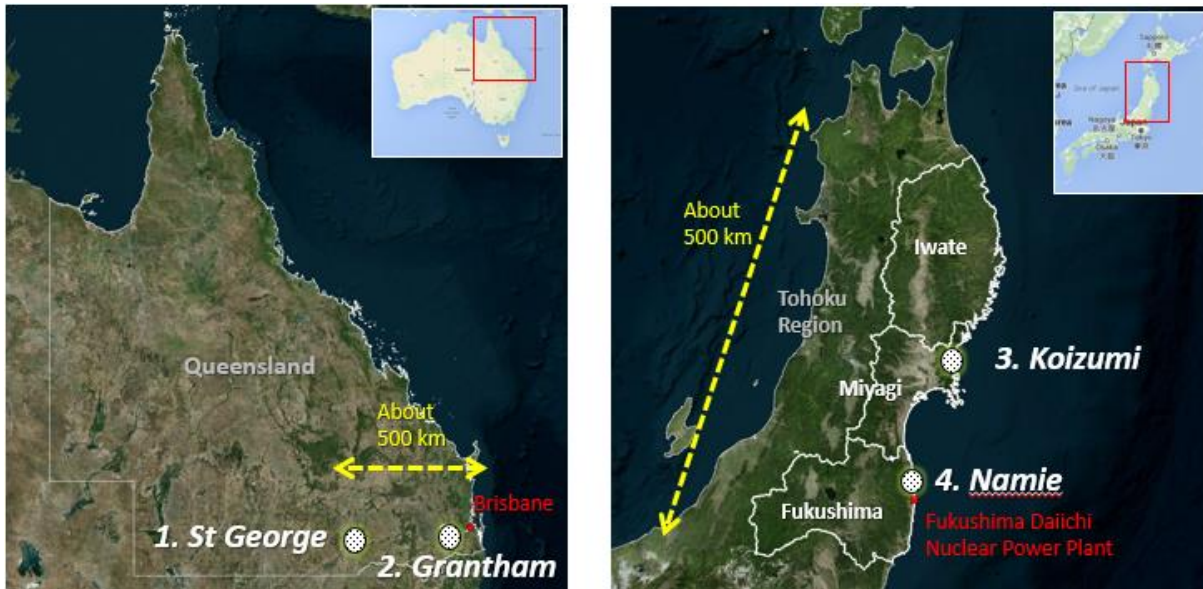


Figure 1: Case study locations

The map on the left shows location of the two case study areas in Queensland, Australia. The map on the right shows location of two study areas in Japan.

1.1 Summaries of case study areas and hazard events³

St George

The Balonne Shire is located in Queensland on the New South Wales border. It is approximately 500 kilometres west from the east coast of Australia and has an area of 31,119 m². Balonne Shire has approximately 5,000 residents and St George is the largest of town in the Shire with a population of 3,292, including 578 indigenous residents (Australian Bureau of Statistics, 2012).

³ Case study material drafted for this PhD thesis was included in several reports produced by Macquarie University's Risk Frontiers where the PhD project was supervised and for whom I worked as a Risk Analyst during the PhD research. One report for the consultancy company DC Solutions included a series of case studies for Blackall Council and was delivered in 2013. Material from the St George case study written for thesis was included in that report (King et al. 2013) and has been retained in the thesis as it was originally written for the thesis and incorporated into the report verbatim. Material drawing on my research on the Lockyer Valley case study was included in a paper (Okada et al. 2014) published in *International Journal of Disaster Risk Reduction*. As with the consultancy report, the thesis draft material was directly included in the paper and is retained in the thesis as it was originally written for the thesis and incorporated into the paper verbatim.

This region has repeatedly experienced droughts and flood. St George is particularly prone to flooding as it is located immediately adjacent to the Balonne River, which has a large catchment upstream. The 10-year drought ended with the flood in March 2010, followed by other floods in January 2011 and yet again in February 2012. In March 2010, the Balonne River's water level reached a river height of 13.39 m. It is unofficially estimated to have had a 1% AEP (Annual Exceedance Probability) flood event (Balonne Shire Council, 2013f). The 2011 January flood peaked at 13.2 m. The February 2012 flood level exceeded the March 2010 event reaching 13.95 m. Temporary flood levees were also installed during the 2011 and 2012 flood in the town (Queensland Floods Commission of Inquiry, 2011a, ABC News, 2012b). Although the construction of a temporary levee prior to the flood peak prevented further damage to the town, approximately 50 homes and an aged care facility were inundated (Balonne Shire Council, 2013f, Balonne Shire Council, 2013e). Mandatory evacuations were declared for the entire town of St George on 5 February 2012 at 15:00 (Queensland Police, 2012).

Grantham

In 2012, Queensland's Lockyer Valley had a population of 34,954, with 492 residents living within the township of Grantham (Australian Bureau of Statistics, 2012). The Lockyer Valley is an important region for agricultural production in South East Queensland (Galbraith, 2009) providing employment to 20% of Grantham's population (Australian Bureau of Statistics, 2012).

The upper Lockyer Creek Catchment has a catchment area of 710 km² in a bowl shape that funnels floodwater 15-25 km down to Grantham (Rogencamp and Barton, 2012). The Great Dividing Range, where the large regional city of Toowoomba (population: 151,189) (Australian Bureau of Statistics, 2012) is located, is the western boundary of the catchment. The Lockyer Valley region lies immediately east of the Great Dividing Range and includes the townships of Murphys Creek, Laidley, Helidon, Withcott, Grantham and Gatton. This land configuration of steep slopes with a number of tributaries contributed to the rapid onset of the series of 2010 and 2011 flash flooding events in the region.

Severe flash flooding occurred in Toowoomba and the Lockyer Valley region of Queensland on January 10, 2011 caused by a combination of factors: intense rainfall, a ground already saturated and steep topography. In the Lockyer Valley, 19 people lost their lives (12 of them in Grantham), 119 houses were destroyed and a further 2,798 houses inundated. The local infrastructure was also damaged significantly, including 77% of its road infrastructure and 40 bridges (Lockyer Valley Regional Council, 2012a). Little or no public warnings were issued due to the suddenness of the flood and the absence of alarm-activating water gauges in many of the state's flood-prone areas (Queensland Floods Commission of Inquiry, 2011c). The Lockyer Valley has experienced many river floods for which the communities are prepared. However, this event was without precedent.

*The 2013 flood was the usual flood with slow onset. You can cope with it, because I used to live down there. I'd seen many floods and knew what to do.
[Resident of Grantham who was not flooded (2013)]*

Koizumi

Koizumi district, Kesenuma City, Miyagi Prefecture, is a coastal village located 110 km northeast of Sendai (the largest city in Tohoku region located 360 km north of Tokyo). The coastal area of Kesenuma City, including Koizumi, comprises complex ria shorelines (Kesenuma City, 2016b). Fishery is one of iconic industry of Kesenuma City. While the City holds larger workforce in fishery over agriculture and forestry by approximately 30% (1,811 over 1,317), Koizumi has an opposite trend: 46 in fishery and 86 in agriculture and forestry among a variety of other industries (Kesenuma City, 2016a).

A Magnitude 9.0 earthquake occurred off the Pacific coast of the Tohoku region, Japan, on 11 March 2011 (Kesenuma City, 2016c). Less than 40 minutes after the earthquake, the subsequent tsunami with the maximum inundation depth of approximately 20 m destroyed most of the low-lying coastal and adjacent inland areas and killed 40 residents (out of a population of 1809 as at February 2011) in the district (Koizumi Chiku no Asu wo Kangaeru Kai, 2013). Despite the tsunami's destructive force, many Koizumi residents survived, because they had practiced an evacuation drill about a week before the event. Significantly, deliberations

during this drill decided upon the newly designated Primary School as the evacuation assembly point rather than the local community hall, which was considered to be vulnerable to large tsunamis and was in fact washed away (Mori, 2011b).

Namie

Namie Town, Fukushima Prefecture, is located 270 km northeast of Tokyo. On 11 March 2011, the earthquake-derived tsunami caused 175 deaths with 7 missing (The Japan Agency for Local Authority Information Systems, 2011) and destroyed approximately 600 buildings in the coastal areas of the town (Namie Town, 2015a).

The tsunami also triggered the accident at the nearby Fukushima Daiichi Nuclear Power Plant located 4 km south of the town's boundary (Namie Town, 2016b). Residents of Namie are still under an evacuation order and scattered across Japan and overseas. As at May 2015, approximately 70% of the town's population of 21,000 were temporarily living in other parts of Fukushima Prefecture, mainly in Fukushima, Koriyama, Nihonmatsu, Minami-Soma and Iwaki Cities (Namie Town, 2015b). The Town's population has declined to about 18,600 (as of November 2016) (Namie Town, 2016b).

Namie's Town Office also moved several times before setting up a building in Nihonmatsu in October 2012 but also restarted some services in Namie such as repairing infrastructure and processing debris since April 2013 (Namie Town, 2016c). As radiation levels in the three-tiered warning zones decreased, some sections of Namie Town gradually became accessible for temporary visits and daytime jobs subject to government approval.

1.2 Key elements from the literature related to the current study

As demonstrated in Chapter 2, the research literature on local scale disaster recovery shows that disasters impact communities' and their members' vulnerabilities and resilience develops over time along with the interplay of social, economic and political factors and contexts created by historical, cultural and material circumstances. The challenge that emerges from

the existing literature therefore, is how to better understand this mechanism operating at local scales in post-disaster settings that shape people's vulnerability and resilience.

As will be concluded in Chapter 2, the perspectives of all stakeholders involved and impacted by disaster risk reduction and recovery must be acknowledged in decision-making and recovery implementation. Although all actors commonly aim at the same goal of *recovery*, different actors or groups have different values, attitudes and issues that will influence the direction and process of disaster recovery. The conditions that make individuals vulnerable and/or resilient cannot simply be aggregated and considered as those of a community and vice versa. This is because the link between different scales is also an important factor to identify the drivers, interplay and effects of socio-economic-political issues in and around a local society. The issues are often cross-boundary. Thus, this complex and fluid system of disaster recovery has to be deconstructed to address the causal factors that exist in human-relations and develop through power-relations.

Human-relations contribute to the development of vulnerability and/or resilience at a local scale. Then, human-relations through power-relations often influence vulnerability and/or resilience that is generated over time. While the literature acknowledges that all these factors affect disaster recovery in complex, contextual and dynamic ways, the risk is that this excuses less than optimal engagement with these issues and privileges non-local priorities and values in recovery. The challenge from the literature, therefore, is to both recognise that different forms and levels of human- and power-relations, particularly the structure and functionality of them, are critical to better understanding of disaster recovery at a local scale and provide a means of securing that better understanding in practice.

In light of the above this study specifically aims to:

1. *Investigate what material, socio-cultural, political-economic and contextual factors as well as their interrelationships facilitate and/or impede disaster recovery at a local scale along with the similarities and/or differences between the case studies;*
2. *Better understand the structure and functionality of human- and power-relations in each case study area and identify the associated vulnerability and resilience; and*

3. Explore wider relevance of insights from the case studies and integrative discussions.

The thesis pursues these aims first by means of a literature review in Chapter 2, with Chapter 3 elaborating the methodological frameworks and approaches adopted in this study. Chapter 4 and 5 present results: Chapter 4 investigates two Australian case studies of the townships of St George and Grantham in Queensland while Chapter 5 examines two Japanese case studies of Koizumi in the Tohoku region and Namie in the Fukushima region respectively. Chapter 6 then discusses the results from the four case study areas in an integrative manner seeking to identify the differences and the similarities between the case study findings and then exploring the wider relevance of this study. Chapter 7 concludes this thesis with suggestions for further research.

2. Literature Review

2.1 Introduction

A wide literature addresses the key ideas that inform this study. It includes not only conventional disaster recovery themes, but also the broader questions of social capital, community, scale and the methods available for drawing these concerns into rigorous research. This review first discusses vulnerability and resilience, highlighting the importance of understanding the interconnectedness, fluidity and structure of these two key concepts. This is followed by a discussion of communities and their interactive relationships with individuals as a way to frame how vulnerability and resilience are addressed in practice. Next is an elaboration of the dynamic and interconnected nature of social capital and networks in a community. This chapter then explores questions of cultural conflicts and the influence of power-balance and governance at the scales of a community and beyond, focusing on the importance of community involvement as active players. This is followed by an example of active community involvement, the Japanese concept of *Machizukuri* and the introduction of a critical concept of local sociality that connects and defines all the above notions. The review then discusses the dynamic and contextual nature of disaster recovery in relation to local sociality.

2.2 Vulnerability and resilience

Vulnerability and resilience need to be addressed together

Vulnerability and resilience are clearly contested but also highly intertwined concepts in social science discourses about disaster, disaster recovery and disaster risk reduction (Jordan and Javernick-Will, 2012, Miller et al., 2010). Cutter et al. (2008) consider that vulnerability and resilience overlap partially – some factors affect either vulnerability or resilience, while others affect both of them. At the same time, vulnerability and resilience are often discussed as two sides of one coin, but are simultaneously considered as an integrated whole (Handmer, 2003, Jordan and Javernick-Will, 2012, Norris et al., 2008). Miller et al. (2010) warn that developing these concepts separately despite the close relevance of these concepts leads to disconnect between theory and practice. The tension between treating them as binary opposites

(either/or) and a holistic singular (both/and) has influenced the ways these key ideas have been discussed in the relevant literature.

Wisner et al. (2004) highlight the significance of vulnerability in disasters, arguing that interaction between hazards and vulnerability creates disasters. Wisner et al.'s (2004) Pressure and Release (PAR) model addresses the mechanism of a disaster, in which a disaster consists of the intersection of a hazard that triggers the disaster event and an underlying pre-event development of affected population's vulnerability (Wisner et al., 2004). Yet, as Haalboom and Natcher (2012) argue, there is also a risk that the academic and policy discourses themselves construct vulnerability for some groups (see also Handmer, 2003). Resilience is defined as the ability to withstand, cope and recover from disaster impacts (Jordan and Javernick-Will, 2012), and implicates a wide range of analysis of social change and adaptation not only from disaster studies, but also from climate change adaptation and wider social change disciplines (Downes et al., 2013, Manyena, 2006). A general reference point for reviewing these important concepts is the UNISDR (2009), which provides the following definitions of vulnerability and resilience in disaster:

Vulnerability: *The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard;*

Resilience: *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.*

The important point to emphasise here is that resilience should not only represent people's capacity to return to the pre-disaster conditions but also the capability to mitigate future disasters through adaptation (Manyena, 2006). This is because either disaster or subsequent situations requires the disaster-impacted to adapt to the reality that is inevitably different from the pre-disaster conditions (Paton and Johnston, 2006, Mooney et al., 2011). Regardless the difference in how they are conceptualised, vulnerability and resilience need to be addressed together as their complementary potentials to each other are essential to understanding systems of disaster recovery (Jordan and Javernick-Will, 2012, Miller et al.,

2010). This is very important to develop knowledge and strengths from different concepts (Miller et al., 2010).

Vulnerability and resilience are dynamic and continuous

Vulnerability (Wisner et al., 2004) and resilience (Norris et al., 2008) are dynamic processes that shape the characteristics of social groups, including their exposure to, and their capacity to prepare and respond to hazards when they occur. Both are influenced by the interplay of social, economic and political factors and the contexts created by historical, cultural and geographical circumstances. Both also highlight the need for research that is able to capture, in addition to hazard impacts and responses, the reasons behind and prospective development of changes as continuous, dynamic and holistic phenomena that may deliver critical influence on the society (Birkmann et al., 2010). Debates over how to classify and measure vulnerability and resilience have been influential in discussing the meaning and value of these concepts in disaster recovery and disaster risk reduction settings. Many observers, however, consider measurement tools for these concepts as limited, because they conceptualise them as static situations (Handmer, 2003, Pelling, 2012, Wisner et al., 2004). Quantitative approaches are useful for decision makers because of their simplicity and clarity in providing a guideline for action by authorities (Cutter et al., 2008). This very simplicity, however, impedes the capacity of authorities to understand complex, implicit but critical causes and processes of vulnerability (Pelling, 2012, Wisner et al., 2004) and resilience (Handmer, 2003). Paton and Johnston (2001) note that a same factor of vulnerability or resilience can increase and decrease the levels of those depending on the context. Understanding vulnerable situations and how resilience to them is nurtured is essential in addition to identifying vulnerable groups, or characteristics of resilient groups, because vulnerability and resilience are dynamic and context-dependent (Handmer, 2003, Wisner et al., 2004).

Vulnerability and resilience vary at different scales

Individuals' vulnerability (Eakin and Wehbe, 2009, Miller et al., 2010) and resilience (Maguire and Hagan, 2007, Norris et al., 2008, Pfefferbaum et al., 2007, Rose, 2004) does not aggregate simply to create vulnerable or resilient communities respectively nor vice versa (see also Manyena, 2006). However, both vulnerability and resilience studies tend to only adopt a micro

or a macroscopic view (Downes et al., 2013, Miller et al., 2010) rather than integrating analyses across the scales at which vulnerability and resilience are implicated in disaster settings. In addition, the decision whether to focus on vulnerability and/or resilience at an individual or a collective level is often influenced by the objective of a study and whether the task is conceptualised as a 'top-down' or a 'bottom-up' approach (Miller et al., 2010). Eakin and Wehbe (2009) emphasise the importance of disaggregating effects of such dynamic processes in social and ecological systems to understand the links of the effects between individual and collective levels. Investigating these fluid and complex processes of vulnerability and resilience at multi scales is essential to better understand the fluctuation and interplay of the processes at different levels (Downes et al., 2013, Miller et al., 2010). Therefore, vulnerability and resilience, identified through both detailed and broad objectives, need to be integrated holistically across scales in the design of research projects in order to better understand the dynamic and interconnected processes in a system (Handmer, 2003, Miller et al., 2010).

Addressing vulnerability and resilience across scales is needed

This research is framed at the scale of whole communities, with case studies in Queensland, Australia and Tohoku, Japan. Factors affecting community scale vulnerability and resilience in any particular setting include a wide range of material, social, environmental, economic and political processes (UNISDR, 2009, Wisner et al., 2004). Turner et al. (2003) identify exposure, resilience and sensitivity to hazards as key factors of vulnerability. Ingram et al. (2006) use resistance instead of sensitivity, but concur that the interplay of these factors is important in shaping community scale vulnerability. Their work points to the need for contextual and nuanced ways to conceptualise vulnerability (or resilience) in particular community settings rather than framing the research task in terms of a singular, definition-based approach or measure. For Downes et al. (2013) resilience needs to be considered in terms of the relationships between individuals and larger groups such as communities as well as the link between resilience and recovery processes (Jordan and Javernick-Will, 2012, Norris et al., 2008). We know that in vulnerable communities there are resilient individuals and households (and vice versa). Therefore, studies that increase our understanding of how community scale responses are framed by the relationships and processes that influence vulnerability and resilience across scales are needed to address disaster recovery and risk reduction. This literature review therefore focuses attention on the body of work that addresses this need.

2.3 Communities

Both communities and individuals should be addressed

Sharing socio-cultural, political and economic characteristics and geographic boundaries are commonly used definitions and perceptions of what constitutes a *community* (Norris et al., 2008). However, in disaster recovery, a community should not be identified simply as a sum of individuals categorised by various characteristics for the *outsiders'* activities, such as providing support and conducting research, to identify/define the target conveniently (Cannon, 2008). Particularly in consideration of vulnerability and resilience, components and totals of these across different scales, for example from an individual to a certain collective scale, are not necessarily proportional as stated in the previous section of this chapter (Downes et al., 2013, Eakin and Wehbe, 2009, Miller et al., 2010). Focusing on individual, household and community levels and the relationship between them is essential to better understand disaster recovery and risk reduction at a community scale (Cannon, 2008).

Each community is multi-faceted and functions dynamically

Each community uniquely and contextually consists of built, natural, social, and economic environments that are interconnected (Norris et al., 2008, Patterson et al., 2010). Communities are equipped with local knowledge, with awareness of their collective interests balancing out individual preferences in an effort of striving for a common good (Patterson et al., 2010). These environments and components jointly form a community's capacity in disaster recovery enabling community members to work together and solve problems leading to collective actions and decision-making (Norris et al., 2008). However, despite the potential effectiveness of this capacity (Norris et al., 2008), the multi-faceted nature of a community may demonstrate strength in one aspect that is simultaneously a weakness in another; their strong solidarity, for example, might encourage residents to remain in hazardous locations (Patterson et al., 2010).

Such features and conditions of a community that can be *inextricable* such as strong local bonds that affect resilience and/or vulnerability at a micro-local scale often exist at any point of time, even before the disaster onset (e.g. Cannon, 2008, Nakagawa and Shaw, 2004, Patterson et al., 2010, Wisner et al., 2004). These pre-disaster conditions often influence as

the elements of disaster recovery that constrain and/or enable the processes and outcomes of recovery (further addressed in Sections 2.4 and 2.7 – Hsu, 2016a, Jordan and Javernick-Will, 2012, Wisner et al., 2004). In addition, the embeddedness of these influential conditions in people’s community life is often represented as local culture that is closely related to each community (further addressed in Section 2.5 – Bankoff et al., 2015, Cannon, 2015).

Cannon (2008) also warns that unconditionally assuming that communities are benign entities based on the convenient abuse of the term ‘communities’ is dangerous, pointing out that negative aspects such as inequity and exploitation often exist in a community regardless of the presence of a disaster situation (see also Oliver-Smith, 2015, Woolcock and Narayan, 2000). Opportunistic exploitation of people is common in disaster settings and is often perpetrated by members of victims’ own communities (Cannon, 2008). These vulnerable and/or resilient conditions in a community may be present at any given point in time (Birkmann et al., 2010). Capturing these fluid and multi-faceted processes is critical to better understand the dynamic nature of vulnerability and resilience in a community (Birkmann et al., 2010, Schneider, 2002). Considering these, this study adopts Cannon’s (2008, pp. 11-12) concept of a community that is:

A group of people who share this place by living and working there together are somehow connected with each other in a more meaningful way than they are with others; as well as

A place[s] where normal everyday inequity, exploitation, oppression and maliciousness are woven into the fabric of relationships.

Consensus and participation have to be made inclusively and evenly at micro-local scales
Ideally a community centred risk reduction process needs to exist prior to a disaster, in order to minimise risks and ensure partnership in the process and the incorporation of local knowledge (Hayashi, 2007, Ingram et al., 2006, Pandey and Okazaki, 2005, Patterson et al., 2010). To facilitate community participation, Cannon (2008) emphasises the importance of understanding members’ motivations, suggesting an integration of individual and collective views and the development of shared actions that enhance safety and livelihoods. Community participation enables the members to share and tackle issues and actions, which helps local resilience increase (Johnston et al., 2012). Community members should also play an active

role in the entire process of recovery and risk reduction for its successful progress as key drivers, instead of remaining as passive receivers of information provided by authorities (Pearce, 2003, Usamah and Haynes, 2012, Bird et al., 2011, Haynes et al., 2008a). Striving for consensus within and between community members and actors involved is critical to recognise and incorporate community participation in the processes (Pearce, 2003). Furthermore, this engagement may prevent conflicts between members over preferred outcomes of the recovery and risk reduction to achieve individual interests (Lindell and Prater, 2003, Pearce, 2003).

Disaster recovery and risk reduction need to be managed with a set of engineering, administration and human interfacing skills (Lawther, 2009, Pearce, 2003). This minimises a risk of domination, complication and/or manipulation that uneven consensus formation and involvement of community members allow some of them to unevenly achieve their unrelated agenda or benefits of recovery and risk reduction efforts (Berke et al., 1993, Lawther, 2009, Pearce, 2003). Clear positioning of responsibilities for different decisions also helps the key actors who play management roles to promote locally self-sustained recovery and risk reduction (Ahrens and Rudolph, 2006). Stable community participation in disaster management helps greater understanding among community members with respect to their responsibility in recovery and risk reduction processes (Aguirre, 1994, Pearce, 2003), while also facilitating a suitable balance in the interrelationship between all actors involved (Berke et al., 1993, Davidson et al., 2007).

2.4 Social capital and social networks

Social Capital and social network are interconnected and dynamic

Social capital and social networks are another set of interconnected concepts; they strongly affect processes and outcomes of disaster recovery at a local scale (Akama et al., 2014, Nakagawa and Shaw, 2004). Social capital is a collective resource of function that facilitates actions, consisting of various social aspects that exist in human relations (Coleman, 1988, Woolcock and Narayan, 2000). For example, the close neighbourhood, human relations of Mano and Soni communities, in Kobe and Gujarat respectively, facilitated proactive public participation in and leading of their successful post-disaster recovery activities (Nakagawa and Shaw, 2004). Social networks are the most significant component that allows access to and

helps the development of social capital (Bebbington and Perreault, 1999, Wisner et al., 2004)⁴. Social networks, in short, have three types: 1) bonding as individual's identity-shared relationships; 2) bridging as group associations that share common interests and/or goals; 3) linking as connections for inter-group relationships; the quality of each network type is dynamic (Pelling and High, 2005).

In addition, policies may enable social networks to act as a facilitator of social capital (Dale and Newman, 2010). For example, government policies in Canada assisted a citizen-based community development project to achieve enhanced outcomes providing citizens with improved access to social and financial resources (Dale and Newman, 2010).

Social challenges are likely to exist cross-boundary and/or beyond a single community (Dale and Newman, 2010, Trist, 1983). Therefore, developing and maintaining social networks are critical within and between individual, neighbourhood and intra-community levels as well as inter-community scales to better access and enhance the functionality of social capital and networks (Akama et al., 2014, Dale and Newman, 2010).

The efficacy of the combination of social capital and networks changes over time (Wisner et al., 2004, Woolcock and Narayan, 2000). This dynamic nature is critical to understand essential factors of a community (Akama et al., 2014, Nakagawa and Shaw, 2004). Moreover, Onyx and Bullen (2000) demonstrate that the factors and levels of social capital at a local scale are highly area-specific and contextualised (see also Dale and Newman, 2010). Therefore, external intervention including financial measures and policies, if required, needs to be implemented in suitable and timely manners at a local scale to maximise the potential of the social capital for the local community development (Dale and Newman, 2010).

Drivers to build and use social capital and networks are community members

Conditions for different levels of network accessibility to social capital often already exist in pre-disaster times; these conditions significantly affect vulnerability and resilience, thus

⁴ This study interprets *access* and *resources* defined by Wisner et al. (2004) as the set of social capital and networks.

disaster recovery at a micro-local scale (Wisner et al., 2004). Akama et al. (2014) maintain that active community participation through well-developed social capital and networks helps the community build resilience at a local scale (see also Nakagawa and Shaw, 2004). Woolcock and Narayan (2000), however, warn that the strength of social networks may not only facilitate but also limit efficacy of social capital. For example, existing inequality and exploitation are often embedded in a community and human relationships (Cannon, 2008). Moreover, motivation for being part of a social network may not necessarily be based on high-levels of trust but a collective status to achieve goals of individual members (Dale and Newman, 2010).

Long-lasting and largely self-sufficient community development needs an appropriate combination and ownership of both formal and informal arrangements of common interests between local people and institutions (Bankoff et al., 2015, Dale and Newman, 2010). Community members and other actors involved in disaster management processes can better understand their needs as well as responsibilities through their participation as an active driver (further addressed Section 2.5 – Aguirre, 1994, Ahrens and Rudolph, 2006, Berke et al., 1993, Howitt et al., 2012, Norris et al., 2008, Pearce, 2003, Rich et al., 1995, Tompkins and Adger, 2004). These arrangements enable local communities to develop formal and informal responses to changes that may affect community disaster recovery significantly (Birkmann et al., 2010).

Leadership and trust are important but have to work with other elements

Robust social capital, networks and leadership effectively enhance collective decision-making and actions (Nakagawa and Shaw, 2004) as well as sustainable community development (Dale and Newman, 2010) in disaster recovery at a local scale. Akama et al. (2014), however, emphasise that simply distinguishing leaders and followers or identifying characteristics of the vulnerable may overlook the opportunity to address the dynamic process of social systems as a whole (i.e. social capital including networks) that build resilience as a collective action at a local scale (Handmer, 2003, Rubin, 1985, Wisner et al., 2004). In recovery, effective community groups require not only the presence of leaders but also sufficient capabilities of the communities (Paton et al., 2014). Dale and Newman (2010) identify that successful community development requires strong leadership not only *in* a community but also *with*

external resources, such as governments and supporting groups, through timely collaboration to enhance effectiveness. In addition, Possekel (1999) highlights that such *inclusive capacity* in leadership is highly necessary in disaster recovery.

Trust and reciprocity also contribute to social capital (Pelling and High, 2005), because social capital exists in human relations (Coleman, 1988, Woolcock and Narayan, 2000). While one of the directions of relevant studies considers that trust forms social capital, the other maintains that trust develops and sustains social capital (Dale and Newman, 2010). Reciprocity, which is a way to express mutual trust at a community/society level can be represented by the levels of reputation and networks (Pelling and High, 2005). This often leads to the situation that the greater reciprocity one has, the more access to social capital (Pelling and High, 2005).

Trust and reciprocity, however, may not always increase social capital at a collective scale (Pelling and High, 2005). For example, joining networks does not necessarily require people to trust them (Dale and Newman, 2010); some members of a network exclude others taking advantage of their strong social connections (Pelling, 1998); and/or, the tight bonding connection in a community may reduce collaborative opportunities with external actors (Newman and Dale, 2007). Pelling and High (2005) demonstrate the importance of investigating these complex interplays of social capital networks, trust and reciprocity to better understand contextual power-relations that affect the community/society as a whole (further addressed in Section 2.5 – Cannon, 2015, World Bank, 1992).

2.5 Human- and power-relations and governance

Interplay of culture and broader changes should be addressed holistically

People's various actions, experiences and arrangements in relation to the natural environment, human-relations and identities, dynamically and collectively interact with communities and societies (Bankoff et al., 2015, Cannon, 2015, International Federation of Red Cross and Red Crescent Societies, 2014, Wisner et al., 2004). Bankoff et al. (2015) exemplify that such continuous, dynamic and multi-scale interactions represent and are represented in culture. Local culture may face large-scale, societally encompassing changes that are triggered or even facilitated by various impacts of disasters on social and community

systems during and/or in the aftermath of disasters; this can be a key to addressing long-standing socio-cultural issues such as lack of communication and collaboration between all actors involved (Bankoff et al., 2015, Berke et al., 1993, Ingram et al., 2006). Birkmann et al. (2010) state that the devastating damage caused by the 2004 tsunami in Indonesia and the subsequent large-scale international recovery effort jointly facilitated a major societal change – the peace process in Aceh after a 30-year violent, political conflict, particularly in the short-term (Gaillard et al., 2008). It is critical to co-address these changes and recovery from disaster impacts and to strengthen community capacities in disaster recovery (further addressed in Section 2.7 – Berke et al., 1993, Birkmann et al., 2010, Ingram et al., 2006, Wisner et al., 2004).

However, differences between cultures such as histories, embeddedness and cross-sections to and/or with others (Bankoff et al., 2015), when they exist simultaneously in the same place, may cause the clash of cultures aiming for different goals and/or processes. For example, organisational cultures of authorities in disaster management outside a community often follow a top-down manner and downplay or even ignore local cultures in disaster management including recovery and risk reduction (further addressed in Section 2.7 – Cannon, 2015, Gaillard, 2008, Manyena, 2006, McEntire et al., 2002). Browne (2013) claims that, after the 2005 Hurricane Katrina, authorities' imposition of their own institutional culture meant that they failed to communicate effectively with the impacted African American communities. This disagreement is also often present between community members when one culture has more/less power than the other(s) within a community; socio-cultural inequities such as class divisions and discrimination result in increasing disadvantaged people's vulnerability (Bankoff et al., 2015, Browne, 2013, Cannon, 2015).

Power-balance and governance should be managed and maintained evenly

The power relations to manage economic and social resources are defined as governance (Cannon, 2015, World Bank, 1992). Tierney (2012) states that governance in the disaster context is commonly considered as a collaborative arrangement that:

the processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic

spheres in order to carry out a public purpose that could not otherwise be accomplished (Emerson et al., 2012).

Governance here includes not only government authorities but also all other actors that participate in and play key roles in disaster management (Cannon, 2015). To reduce vulnerability, governance has to balance the societal system including relationships within and between all actors in disaster management with cultural, political, social and economic attentions (Wisner et al., 2004).

Flexible management is required in complex disaster settings

Disaster risk reduction involves many closely linked and intertwined phases including, vulnerability reduction, resilience building, hazard mitigation, disaster preparedness, response and recovery (e.g. Asian Disaster Reduction Center, 2005, Maguire and Hagan, 2007, Waugh and Streib, 2006, Queensland Government, 2016). Moreover, these phases and associated responsibilities, actions and challenges may occur unevenly, non-sequentially and/or simultaneously (Berke et al., 1993, Possekkel, 1999, Rubin et al., 1985). This complexity requires resources and skills from all levels of governmental and non-governmental sectors with managers capable of applying their expertise, resources and services comprehensively and flexibly to a given circumstance (Mileti, 1999, Waugh and Streib, 2006). Although the resources and skills required are common to many tasks in public administration, additional capacity is needed due to the scale and dynamic nature of most disaster circumstances (Olshansky et al., 2012, Waugh and Streib, 2006). Ahrens and Rudolph (2006) argue that ensuring disaster management responsive to dynamic local needs and situations requires decision-making power to be transferred from central to local entities (see also Waugh and Streib, 2006). Being accountable to and effective in local contexts through decentralisation and sharing of both power and representation provides opportunities for local populations to enhance equity and efficiency in their local democracies (Adger et al., 2005, Olsson et al., 2004, Ribot, 2003); this is fundamental for building local resilience (Tompkins and Adger, 2004). According to Paton et al. (2014), following the Canterbury Earthquakes, New Zealand, in September 2010 and February 2011, the political governance system continued its institutional adaptation promoting decentralisation and collaboration across different levels of government. This decentralisation is not to undermine central governments' abilities but to strengthen flexibility in disaster management systems through mutually complementing

initiatives such as coordinating individual arrangements, flows of resources and educational programs between central and local governmental/non-governmental sectors under broad objectives (Ahrens and Rudolph, 2006, Ribot, 2003).

Disaster management needs collaborative coordination

Achieving not only safety but also quality of life in a community is essential for disaster risk reduction (Geis, 2000). Being aware of both aspects helps to include all material, natural, economic and social environments in the process of management (Geis, 2000). Speed and quality also have to be balanced in disaster recovery (Shaw, 2014). Managing safety and quality of life in disaster recovery together is the backbone of sustainable development that harmoniously encompasses maintenance and/or improvement of social, political and economic opportunities as well as capacities to resist future hazards and changes (Ahrens and Rudolph, 2006).

Schneider (2002) points out that government officials and agencies tend to disregard the link between hazard-response-focused measures and livelihood-centred community planning. These groups often independently undertake tasks assigned according to the separated perceptions, leaving personnel involved unfamiliar with fields other than their specialties (Schneider, 2002). In addition, public attention is generally focused on immediate safety responses than the longer term aims of local livelihood recovery (Schneider, 2002). Peek (2012) also point out that even the empathy for the Hurricane Katrina evacuees that host communities once held did not last for a long-term. The decline in the long-term interest to support may have represented the defensive attitude of outsiders that discriminates the vulnerable against (Peek, 2012). As Waugh and Streib (2006) claim, however, no plan or action fits all aspects of a disaster circumstance perfectly, thus no individual or organisation without collaboration can deal with disaster management including risk reduction and recovery (see also Olshansky et al., 2006).

Holistic governance with community members as active players

Governance that values and involves all community-wide actors and beyond through meaningful collaboration, interaction and consultation is essential for successful risk reduction (Wisner et al., 2004). This ensures that cultural, political, social and economic

aspects such as ideologies, power relations, formal and informal networks, and resource flows are considered and included in the processes (Ahrens and Rudolph, 2006, Wisner et al., 2004). Authorities and/or agencies with power often overlook or disregard the significance of local knowledge and experiences and impose *mainstream* values with expertise developed outside the disaster-affected communities (Bird et al., 2009, Haalboom and Natcher, 2012, Howitt et al., 2012). Haalboom and Natcher (2012) argue that devaluing or ignoring local cultures hinders local societies' autonomy and capacity in disaster recovery and risk reduction. As a result, implemented measures and policies miss local needs, bring harmful consequences and/or create excessive dependency in local communities, while parties with power remain unaware or indifferent to these situations (Haalboom and Natcher, 2012). For example, a number of residents impacted by Hurricane Katrina in New Orleans were forcibly moved to unfamiliar places where they were unable to access the material, emotional and financial resources available to residents that remained behind (Weber and Peek, 2012).

As stated earlier in this literature review, local communities should be encouraged, not rejected, to participate throughout the disaster management processes as active constituents, not as dependent victims; this critical, active involvement of local communities and their members addresses their needs, issues and responsibilities clearly and correctly in their recovery and risk reduction, and develops associated measures that are socio-politically necessary and acceptable (Aguirre, 1994, Ahrens and Rudolph, 2006, Berke et al., 1993, Howitt et al., 2012, Norris et al., 2008, Pearce, 2003, Rich et al., 1995, Tompkins and Adger, 2004). What is important here is to *assist* local communities in ways that guide them to find themselves, surrounding situations and information that *they* need so they can access their strengths and resources (Mooney et al., 2011). Participation of community members in the collaborative governance synergistically develops trust, skills, capacity and awareness, leading to reduction of vulnerability and enhancement of resilience both individually and collectively (Ahrens and Rudolph, 2006, Olshansky et al., 2006). Furthermore, broader participation increases chances to bring positive modifications to the planning, decision-making and management processes (Possekkel, 1999).

2.6 Machizukuri and local sociality

Machizukuri is a community-driven planning concept

Machizukuri [まちづくり] is a key planning concept that strongly features community participation and is widely used both professionally and generally in Japan (Evans, 2002). Evans (2002, p. 447) introduces the general meaning of Machizukuri as follows:

The term machi-zukuri is a neologism derived from the noun machi (meaning 'town') and the verb tsukuru (to build). Usually used as a deliberate contrast to the term toshi-keikaku (the conventional term for urban planning), rather than translating it literally as 'town-building', a better translation might be 'community planning'.

According to Watanabe (2011), the term Machizukuri has gradually developed since 1947, when the term first appeared in the literature, although the history of community involvement in urban planning tracks back a little further, up to the late 1800s (Evans, 2002). Historical discussions on the theoretical definition of the concept of Machizukuri have explored potential dimensions (such as who, where, why, how and what) and categories (such as material, financial, mental and social), but have not yet reached an exact definition (Watanabe, 2011). However, Evans (2002) presents the following four features commonly identified as the core components of Machizukuri through the discussions (see also Watanabe, 2011):

- community participation as a fundamental, bottom-up approach;
- decentralisation of focus and decision-making in planning that appreciates *neighbourhood*;
- consideration of the balance between material and social aspects; and
- acceptance of the gradual nature (rather than radical changes) valuing local communities.

At the same time, Hein (2001) characterises the differences in approaches based on the material and social focuses in the field of planning as follows, stating that traditions, contents and aims of these approaches are distinctive.

[T]oshikeikaku [urban planning]: *administration initiatives that focus on overall physical structure and layout*

[M]achizukuri [community-building]: which is small-scale urban design that arises out of citizen participation and community organization (Hein, 2001 p. 221)

On top of the discussions above some studies provide additional notions on Machizukuri. Evans (2002) maintains that Machizukuri is based on a bottom-up approach, which predominantly consists of co-operation and partnership centring the community, rather than citizens attaining power over other stakeholders. Sorensen (2009) highlights the importance of the sense of ownership, among community members, that values the meaning and management of the local area. Mori (2012) focuses on the positive utilisation of synergetic effects based on direct and/or indirect collaboration between various stakeholders whose intensions may be different in disaster recovery.

Considering the discussions and features introduced in the existing literature, this study adopts and uses the term Machizukuri in this thesis as follows:

Machizukuri is a planning concept that:

- strongly features community participation with a decentralised focus and decision-making process typically equipped with a multifaceted, gradual and continuous nature that acknowledges local communities; and
- encompasses not only material features such as infrastructure and physical boundaries but also various non-material, social aspects and beyond. Including interactions and processes of the dynamic development of the town where material and social features are evenly met in a given context.

Local sociality wraps up all the above

Another important concept that this study adopts is *local sociality*. Although I have not successfully found an officially established definition of local sociality, similar to the case of Machizukuri, the term implies a vague but important idea that is closely connected with *local community life*. The earlier discussions presented in this chapter on community, social capital and networks, power-relations, governance and, particularly, on vulnerability and resilience collectively define local sociality in this context. That is, *local sociality* integrates together the

key notions of disaster recovery at a micro local scale. Considering these, this study defines and uses the term in this thesis as follows.

Local sociality is a concept that:

- encompasses vulnerability and resilience at both individual and community levels;
- individual and communities' recovery and everyday lives are based on and continue with;
- social capital and networks within/between individuals and communities interact with;
- various interaction of human- and power relations exist and affect the governance; and
- is a collective, critical component of Machizukuri and disaster recovery.

2.7 Disaster recovery

This chapter has introduced major concepts that closely connect and directly/indirectly affect disaster recovery. It has also explained that these concepts and their components' multifaceted, multi-levelled, dynamic and interconnected aspects have to be understood and some cases addressed to ensure successful development of disaster recovery at a local scale. Considering all these above, this section discusses the concept of disaster recovery as follows.

Disaster recovery is contextual and dynamic with various components that contribute to vulnerability and resilience

The degree and extent of disaster recovery significantly varies depending on whose perspectives are addressed in the recovery processes and how they are addressed, because recovery contains a wide range of highly complex activities (Quarantelli, 1999). Moreover, disaster recovery is neither a linear nor orderly process (Rubin, 1985, Wisner et al., 2004).

Pre-disaster conditions influence the various elements that constrain and enable recovery (Hsu, 2016a, Jordan and Javernick-Will, 2012) such as strong local bonds that may increase resilience and/or vulnerability at a micro-local scale (e.g. Cannon, 2008, Nakagawa and Shaw, 2004, Patterson et al., 2010). The interplay of these factors, however, is dynamic and complex, which makes it hard to measure at a local scale (Rubin, 1985, Wisner et al., 2004), and difficult

for external expertise unfamiliar with local pre-disaster conditions to engage with (Hsu et al., 2015, Veland et al., 2013), even though Rubin (1985) argue that looking into recovery as a holistic system that includes the contextual factors helps develop frameworks to explore disaster recovery. These contextual factors along with engineering, planning, administrative, political and financial domains essentially build a local society with different levels and types of vulnerability and resilience (Ingram et al., 2006, Rubin, 1985, UNISDR, 2009, Wisner et al., 2004).

Existing research has shown the importance of the contextual factors in disaster recovery. For example, Nakagawa and Shaw (2004) investigated the role of local social capital after the large scale earthquake events in some communities in Kobe, Japan and Gujarat, India. They emphasised the importance of social capital that is backed by the sufficient understanding and implementation of existing neighbourhood interactions and capacities to work collectively in locally contextualised disaster recovery (Nakagawa and Shaw, 2004). Birkmann et al. (2010) examined the significance of societal changes that occurred in Sri Lanka and Indonesia after the 2004 Indian Ocean tsunami. Their research demonstrated that risk mitigation responses along with societal changes brought on by disasters could increase or decrease local people's vulnerability (Birkmann et al., 2010). Weber and Peek (2012) identified resettlement issues in the lives of residents displaced from New Orleans as well as their relationships with host communities and policies that were experienced during and after the 2005 Hurricane Katrina event. Their research emphasised that social structures and additional trauma caused by the forcible displacement commonly impeded the disaster-impacted residents' recovery (Weber and Peek, 2012). van Kessel et al. (2015) investigated the needs and effectiveness of interventions to aid the recovery from and resilience against the impacts caused by the 2009 bushfires and 2010/11 floods in Victoria, Australia. Their study identified that the disaster-impacted citizens required, used and valued a combination of the interventions at multiple levels and stages as strategies to facilitate their recovery (van Kessel et al., 2015).

Dynamism and multi-faceted nature of vulnerability and resilience have to be addressed

Pre-disaster power-relations and cultural factors often create vulnerability (and resilience) in a local society (Cannon, 2015, Wisner et al., 2004). For example, communities often contain inequity and exploitation regardless of the presence of a disaster situation (Cannon, 2008,

Oliver-Smith, 2015, Woolcock and Narayan, 2000). In addition, such situation can be generated, maintained and/or exacerbated through socio-cultural inequities by the members of the disadvantaged groups' own communities (Bankoff et al., 2015, Cannon, 2008). At the same time, Nakagawa and Shaw (2004) maintain that sufficient understanding and implementation of existing neighbourhood interactions and capacities can help members of the community work collectively in local disaster recovery.

Vulnerability and/or resilience of a community and its members may also be generated at any given point in time (Birkmann et al., 2010). In addition, a resilience of a community in one aspect can simultaneously be a vulnerability because of the multi-faceted nature of a community (Patterson et al., 2010, Woolcock and Narayan, 2000). A broad range of material, social, environmental, economic and political processes also jointly affect vulnerability and resilience at a micro-local scale (UNISDR, 2009, Wisner et al., 2004) together with various changes induced by disasters (Birkmann et al., 2010). Therefore, capturing these dynamic and multi-faceted processes of recovery is critical to better understand the dynamic and multi-faceted vulnerability and resilience at a community scale (Birkmann et al., 2010, Schneider, 2002).

Social aspects of recovery should be balanced with material recovery

Disaster recovery efforts and public attention, however, tend to focus on immediate safety responses and short-term relief without linking to the long-term development that encompasses the critical and contextual factors for social, economic and cultural conditions (Berke et al., 1993, Schneider, 2002). Hayashi (2007) reviews the aftermath of the 1995 Kobe Earthquake in Japan and argues that disaster recovery has to consider physical (material), economic and livelihood (social) aspects. While recovery of the material aspect was achieved in a relatively short time (in several years), that of the economic and livelihood aspects, particularly the latter, was still not well-realised even 13 years after the 1995 Kobe earthquake disaster (Hayashi, 2007, p. 414).

In post-disaster times, authorities are often under significant time pressure to rebuild material structures and infrastructure and to do so in ways that not only allow return to normalcy as

quickly as possible, but also reduce future risk (Ingram et al., 2006, Shaw, 2014). Decision-making and responses that prioritise urgency over robust, accountable and effective processes risks overlooking or ignoring the complexities and non-linearity of critical elements of recovery processes that contribute to ongoing and future vulnerability, such as social, economic and cultural components (Ingram et al., 2006). Moreover, overpowering belief that material recovery is paramount might emphasise *command-and-order* in recovery too much and consider socio-cultural elements in local people's lives and their actions irrational or irrelevant to disaster recovery (Cannon, 2015, Gaillard, 2008, Manyena, 2006, McEntire et al., 2002).

Disaster recovery has to acknowledge dynamic, complex and contextualised local sociality

The complex and contextualised nature of disaster recovery, however, calls for local people's knowledge as well as their participation in the entire process of disaster management (Pandey and Okazaki, 2005, Wisner et al., 2004). Local people should be involved in playing active roles in disaster management processes to secure understanding and insight into pre-disaster conditions and as part of the local society to achieve self-sufficient recovery and increase disaster resilience (Pandey and Okazaki, 2005, Pearce, 2003, Shaw, 2014, Usamah and Haynes, 2012, Wisner et al., 2004). This also helps recovery efforts and processes to clarify local needs, issues and responsibilities in the entire cycle of disaster management.

One of the key elements in this setting is the scale at which both disaster and recovery are framed. In large-scale disasters such as considered in this thesis, the micro-local scale is easily overwhelmed by relief and recovery discourses that are driven at much wider scales of national response and global expertise. Yet the recovery of community, livelihood and well-being is given meaning at much smaller scales. Socio-cultural conditions influence vulnerability in a community (Bankoff et al., 2015, Ingram et al., 2006, Rubin, 1985, UNISDR, 2009, Wisner et al., 2004), and thus have to be addressed for effective and sustainable disaster recovery to take place (Howitt et al., 2012, Wisner et al., 2004). Disaster recovery should be achieved through a combination of governmental and non-governmental activities, using societal changes as turning points to recover from disaster impacts and to strengthen community capacities (Berke et al., 1993, Birkmann et al., 2010, Ingram et al., 2006, Wisner et al., 2004). Therefore, this study adopts the general objective of disaster recovery at a micro-local scale defined by Wisner et al. that:

a household should have not only re-established its livelihood, physical assets and patterns of access, but should be more resilient to the next extreme event (Wisner et al., 2004 p. 359).

Human relations are central to the local sociality that forms and develops with vulnerability and resilience

Observing the local sociality holistically before identifying the needs or solutions is important to address disaster recovery (Rubin, 1985). Coleman (1988) maintains that resources and the associated accessibility for recovery lies in human relations. The amounts and degrees of the resources and accessibility developed in a community significantly influence the vulnerability and/or resilience at different levels of a local society: individuals, households, groups and communities (Akama et al., 2014, Dale and Newman, 2010, Wisner et al., 2004). Considering these, this study investigates the human relations in local contexts that contribute to the resources and accessibility as well as the vulnerability and resilience in post-disaster times.

Disaster recovery and its associated factors are dynamic, complex and contextualised. Therefore, focusing not only on the outcomes but also the processes of disaster recovery will enable better understanding of the development and transition of dynamic and multi-faceted vulnerability and resilience at a community level. The relationship between disaster recovery and material and social aspects in/around it holds the key to find out how individuals and communities embrace and adapt to the recovery processes and outcomes. The methodological challenges involved in producing research that contributes to improved local engagement in recovery practices are considerable. To overcome these challenges this study adopted inductive and qualitative mixed research methods based on constructivist grounded theory approaches. These are addressed in the following chapter.

3. Methodology and methods

3.1 Introduction

In response to the literature review and the aims of this research, this chapter addresses the methodological background, adopted approaches and evolved methods that this study is based on. The first section discusses the conceptual background of the study to explain why inductive and qualitative mixed method approaches were adopted in preference to deductive, quantitative approaches. The second section elaborates the processes of data collection and analysis of case study materials based on grounded theory. This study successfully adopted and adapted grounded theory to achieve the research aims identified at the end of the Chapter 1 (Introduction) effectively and efficiently. The third section explores methodological, ethical and cultural challenges and key solutions that I identified in data collections and analyses. The chapter's concluding remarks discuss the potential roles and attitudes that local people expect a qualitative research study on post-disaster recovery to recognise.

3.2 Framework of the research

Developing an inductive approach in this study

Imposing *outsiders'* values and expertise in local disaster management may result in devaluing or ignoring local cultures (Bird et al., 2009, Haalboom and Natcher, 2012, Howitt et al., 2012, Hsu, 2016b). Indeed, deductive research may hinder or overlook the opportunity to investigate the needs and/or issues that exist in local societies in the wake of local catastrophe whether they are explicit or implicit. While deductive research examines validity of theories and/or hypotheses derived from existing studies, inductive research derives understanding, theories and/or hypotheses from the empirical world. Deductive research is often useful to show how well theories and/or hypotheses fit the real world and vice versa. However, this deductive approach may not be suitable when research objectives are indefinite or less-definite, as Towers (2012, p. 71) states 'there is a methodological imperative to eliminate confounding factors with experimental manipulations and controls because failure to do so would obscure 'the way things really are''. Furthermore, applying pre-established theories and/or hypotheses may jeopardise the potential of finding issues other than the designed research objects.

Inductive research, on the other hand, is often conducted to investigate complicated research objectives to build understanding and to draw theories and/or hypotheses out of them. Rubin (1985) claims the multi-faceted local system as a whole has to be observed to identify needs and solutions for disaster recovery. And as discussed in the literature review, local disaster recovery is often driven by human relations that determine the amounts and extents of resources and accessibility (Coleman, 1988); such established resources and accessibility significantly affect different levels of vulnerability and/or resilience at a local scale (Akama et al., 2014, Dale and Newman, 2010, Wisner et al., 2004). It is critical, therefore, to address causal and contextual factors of vulnerability and resilience as well as their interplay in a given local setting (Ingram et al., 2006). This is exactly why the current study develops an inductive research method to learn *from* local people's recovery experiences and analyse the factors that are entangled in those experiences and the contexts in which they evolve.

Qualitative-based mixed research methods and a longitudinal approach in multiple study areas

The research design task facing this study has been how to frame data collection and analysis approaches that would respectfully engage with local experience of disaster without assuming a specific theoretical framing or idealised expert-led outcome to recovery. Quantitative and qualitative research methods offer contrasting approaches to this research design task. Creswell (2003) suggests that quantitative methods typically rely on theories and/or hypotheses deductively framed at the beginning of a study. That approach aims to verify the theories and/or hypotheses and predict/explain the relationships between variables in the study (Bird, 2009, Creswell, 2003, Gelo et al., 2008), although it may be able to explore new understandings when techniques are applied in a creative way (Bryman, 2006). A quantitative approach is often considered effective when capturing general trends quickly; for example, quantitative research results may be useful for decision makers, as the authorities can quickly provide guidelines for actions accepting the simplicity of the results (Cutter et al., 2008). They can identify specific trigger points or levels in a particular indicator that require a response. Qualitative research methods, on the other hand, focus on the derivation and interpretation of meaning rather than measurement of indicators (Bird, 2009, Creswell, 2003). A qualitative approach aims to explore socially and psychologically constructed reality through research participants (Gelo et al., 2008). They draw theories and/or hypotheses out of data collections

and analyses inductively (Creswell, 2003). This method is often not or little pre-figured but emergent with open-ended-style data collections (Creswell, 2003, Gelo et al., 2008). Qualitative research methods are typically adopted to examine social phenomena and systems as a whole with multi-faceted and interactive interpretations (Creswell, 2003). They are particularly powerful in revealing meanings that are socially constructed through shared experience, which is the focus of their application in this thesis.

In order to examine the interplays of human- and power-relations that significantly affect vulnerability and resilience at a micro-local scale (Pelling and High, 2005, Wisner et al., 2004), it is important to consider the changeable nature of the factors (Pelling and High, 2005, Wisner et al., 2004, Woolcock and Narayan, 2000). Therefore, this study uses largely qualitative methods to build a longitudinal approach to better understand the transition of local-specific issues experienced by people in their disaster recovery. Considering the limited time frame of this study, I do not intend to claim that this study is a complete longitudinal study, which often requires a longer time frame with more regular visits for data collection and analyses. This study, instead, positions itself as the overture of a longitudinal study, which opens up and calls for opportunities for ongoing study.

To better understand the factors that facilitate and/or impede vulnerability and resilience, thus disaster recovery, as well as their interconnectedness at a micro-local scale, it is important to access locally contextualised factors that drive local people's responses and experiences. This present study, therefore, mainly adopts semi-structured interviews as a qualitative research method to address contextual issues and the associated human relations in the specific cases closely. However, it also marshals some quantitative data gained from previous studies (e.g. public survey results) to highlight and develop insights into the relationships between particular indicators and people's interpretation of their experiences. In this sense, this study adopts a mixed method approach, integrating quantitative and qualitative approaches. The mixed method approach allows comprehensive analyses of the collected data sets (Bird, 2009) and has a potential not only to reinforce the findings from both approaches but also to discover unanticipated aspects and understandings (Bryman, 2006). This hybrid application of methods is also reflected in collections and analyses of data sets. The following sections will further explain the methodological concepts, grounded theory, and

the specific methods adopted for this study, and their framing as an amended grounded theory approach.

Adopting (and adapting) a grounded theory approach

The grounded theory approach helps this study to investigate disaster recovery processes and implementation of risk reduction efforts at a micro-local scale and to better understand how societal factors influence communities' abilities to adapt to extreme events. Charmaz (2008, p. 86) demonstrates that:

[T]he core components of grounded theory studies are analytic categories developed while studying the data rather than preconceived concepts or hypotheses. These categories move your study toward abstract analyses yet simultaneously elucidate what happens in the empirical world.

Grounded theory allows researchers to collect information, identify research questions and issues, and analyse these questions inductively. Using grounded theory enables this study to learn from local people's recovery experiences and analyse the factors that are not always explicit in the official data sets collected to inform authorities' decision-making. Towers (2012) advocates constructivist grounded theory suggested by Charmaz (2008) that, instead of applying an existing theory to check its validity in the empirical world deductively, insists on listening and experience as critical methods for building understanding. This is the critical point for building appropriate research design and methods choices in this study, because ultimately it is the disaster-impacted people in their communities who *recover* in the post-disaster phase.

As discussed in Chapter 1, this study aims to:

- 1. Identify what socio-cultural, political-economic and contextual factors facilitate and/or impede disaster recovery at a local scale along with the similarities and/or differences between the case studies;*
- 2. Better understand the structure and functionality of human- and power-relations in each case study area and identify the associated vulnerability and resilience; and*
- 3. Explore wider relevance of insights from the case studies and integrative discussions.*

Charmaz (2008, pp. 107-108) highlights that grounded theory methods can develop ‘tightly framed theories that generate hypotheses and make explicit predictions’ on top of ‘construct[ing] conceptual analyses of a particular experience and pursu[ing] basic questions within the empirical world and try[ing] to understand the puzzles it presents’. A study into local disaster recovery, however, needs to aim primarily at accessing locally contextualised factors that disaster-impacted people experience in their lives and to develop a good understanding of such factors and their interplay. Furthermore, focusing on developing ‘tightly framed theories’ may risk the inductive, empirical study to come to deductive outcomes and/or overlook the importance of understanding the interrelating and transitional nature of such contextualised factors in local disaster recovery. Charmaz (2014, p. 1081) also states:

Recognizing points of convergence [shared by grounded theorists] as well as divergence may help novices develop informed perspectives that help them attend to their research rather than to seek the “correct” conception of the grounded theory method and subsequently use it like a recipe.

In contrast to Charmaz’s (2008) emphasis on developing theories to generate applicable hypotheses and predictions, the approach to construct conceptual and contextual analyses and build locally-developed understanding best fits with the aims of the study presented here. The following sections will elaborate the methods and processes based on constructivist grounded theory that this study adjusted and used to achieve its specific research aims, appreciating the flexibility of grounded theory.

3.3 Data collections and analyses

A mixed methods approach was used to best capture a broad picture of the recovery process of each study area, including a thorough understanding of local stakeholders’ experiences as well as achievements, issues and challenges identified. The methods consisted of field observations, focus group discussions, semi-structured face-to-face interviews, questionnaires and analyses of government documents, media reports and interviews and a

wide range of publications. The flow of major research activities explained in this chapter including data collections and analyses is chronologically listed in Table 1. Of which, the relationship between the case study areas, the phases of data collection and the methods used are presented in Table 2. This is followed by detailed explanation of each phase of the data collection and analyses that this study adopted.

Table 1: Flow of major research activities (FP: Fieldwork Phase)

	Fieldwork and data collection	Data processing and analyses	Literature review and writing
2012		Background research	
	Pre-fieldwork observations		Broad literature review
2013	Fieldwork phase 1 in Australia Fieldwork phase 1 in Japan	Development of interview	
2014		Transcribing of FP1 in Australia Coding of FP1 in Australia	
		Results of FP1 in Australia	Development of literature review
		Further development of interview in Australia Development of questionnaire in Australia	
	Fieldwork phase 2 in Australia	Summarising of FP2 in Australia Coding of FP2 in Australia	
		Results of FP2 in Australia Summarising of FP1 in Japan Coding of FP1 in Japan	
2015	Fieldwork phase 2 in Japan	Results of FP1 in Japan Further development of interview in Japan Development of questionnaire in Japan (not used)	
		Summarising of FP2 in Japan Coding of FP2 in Japan	
		Results of FP2 in Japan	
2016	Follow-up visits in Japan	Analyses of FP1 & 2 in Japan Analyses of FP1 & 2 in Australia Analyses of FP1 & 2 in Australia and Japan	Focused literature review Writing up Writing up Writing up Writing up

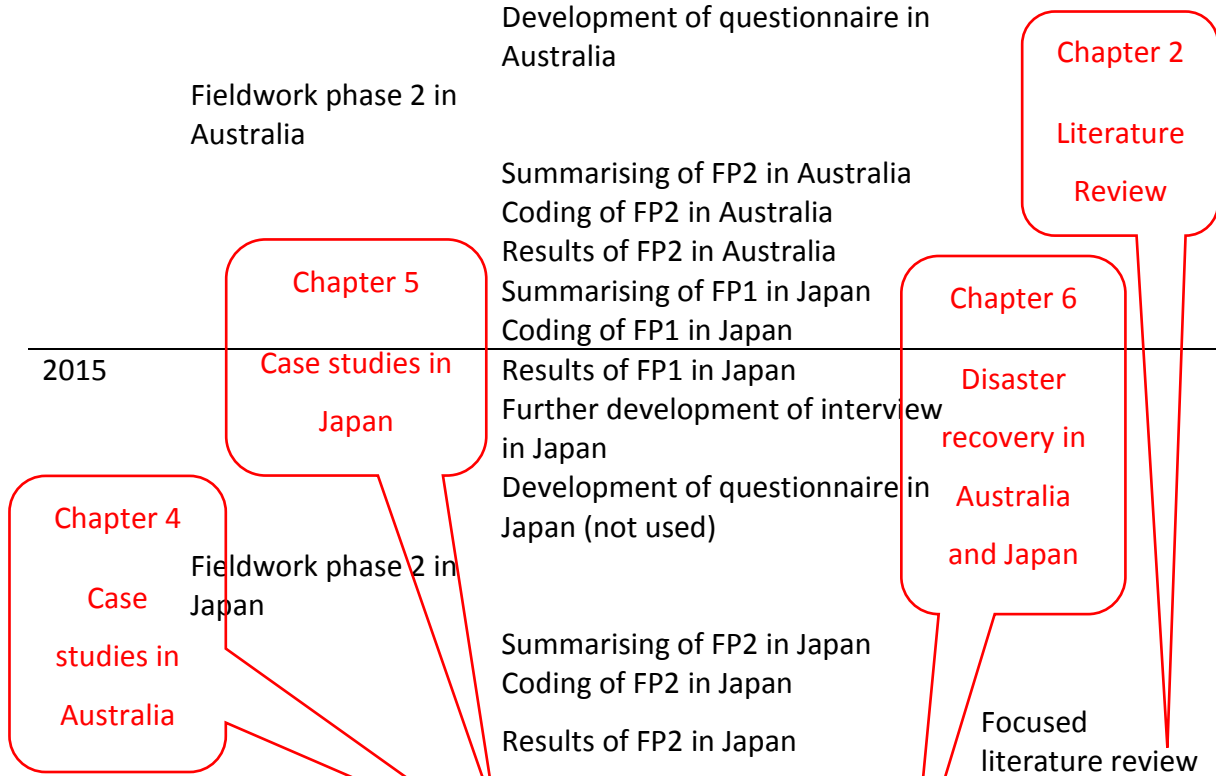


Table 2: Phases of data collection and methods used for each study area (FO: Field Observations, FGD: Focus Group Discussions, SI: Semi-structured face-to-face Interviews, Q: Questionnaires, DA: Document Analyses)

Data collection phases	Study areas			
	St George	Grantham	Koizumi	Namie
Pre-fieldwork	FO	FO	FO	FO ⁵
	FGD	FGD	SI	SI
	SI	SI	DA	DA
	DA	DA		
First phase of fieldwork	FO	FO	FO	FO ⁵
	FGD	FGD	FGD	FGD
	SI	SI	SI	SI
	DA	DA	DA	DA
Second phase of fieldwork	FO	FO	FO	FO ⁵
	FGD	FGD	FGD	FGD
	SI	SI	SI	SI
	Q	Q	DA	DA
	DA	DA		
Follow-up		FO	FO	FO ⁵
		SI	SI	SI
		DA	DA	DA

3.4 Pre-fieldwork

Field observations and document analyses

The field observations were conducted in order to obtain a detailed understanding of the local geography; locally specific recovery and risk reduction measures; physical and social impacts triggered by natural hazards and associated events that were relevant to this study; and status of the local environment including people, buildings and infrastructure that were removed, impacted and repaired. General information on each study area was gathered in the field observations, which included informal discussions with local residents, government officials and supporting groups to develop questions for the more formal focus group and semi-structured interview.

Documentary analyses were also undertaken and a range of published and grey literature was reviewed to increase understanding of each case study. Grey literature in this thesis means all

⁵ The field observations of Namie Town were conducted outside Namie Town in the pre-, first-phase and follow-up of fieldwork following the government-controlled entrance to the town (except passing cars on designated roads during the follow-up phase) due to strong radiation levels in the area. The observation inside Namie Town was conducted through the legitimate application process with local residents during the second phase of fieldwork.

publications and pre-publications other than academic publications. This includes government reports, newsletters, meeting minutes, newspaper articles, magazine articles, brochures, booklets, books and maps with both printed and digital formats. I acquired most of the grey literature online, but some were provided by research participants. Documentary analyses were conducted in parallel with field observations. The analyses helped me understand the case study areas and the general situations, particularly the background information on the study areas, the temporal sequences of the events and the details about the damages that were difficult to grasp by field observations alone. The field observations and documentary analyses continues as appropriate throughout the research period of this study to update information used. The detailed information on the numbers and distributions of the research participants is listed in Table 3. Further details about the research participants (gender, approximate age groups and status in disaster recovery) are listed in Table 4.

Table 3: Dates of the data collection with numbers and distributions of research participants⁶

Data collection phases	Dates and participants	Study areas			
		St George	Grantham	Koizumi	Namie
Pre-fieldwork	Dates	7 - 10 July 2013	17 April and 30 October 2012	23 July - 6 August 2012	
	Participants	16	2		
	Participants details	Residents flooded: 6 Residents non-flooded: 4 Council officials: 4 NGOs: 1 Others: 1	Council officials: 2		
Fieldwork 1	Dates	30 July - 3 August 2013	22 - 29 July and 6 - 7 September 2013	18 September and 29 September - 15 October 2013	18 and 25 September and 22 October - 1 November 2013
	Participants	17	25	27	29
	Participants details	Residents flooded: 5 Residents non-flooded: 6 New residents: 2 Farmers flooded: 1 Farmers non-flooded: 1 Council officials: 1 Others: 1	Residents flooded: 16 Residents non-flooded: 4 NGOs: 1 Council officials: 4	Residents flooded: 19 Residents non-flooded: 3 NGOs: 1 Council officials: 1 Academics: 3	Residents of Namie: 14 NGOs: 1 Socio-welfare Assoc-s: 7 Council officials: 3 Academics: 4
Fieldwork 2	Dates	11 - 15 August 2014	18 - 21 August 2014	30 January - 9 February and 12 and 28 February 2015	12 - 23 February 2015
	Participants	17	14	17	18
	Participants details	Residents flooded: 7 Residents non-flooded: 6 Farmers non-flooded: 1 NGO: 1 Council officials: 2	Residents flooded: 8 Residents non-flooded: 2 New residents: 2 NGOs: 1 Council officials: 1	Residents flooded: 12 Residents non-flooded: 1 NGOs: 2 Council officials: 1 Academics: 1	Residents of Namie: 11 Host communities: 2 Socio-welfare Assoc-s: 2 Council officials: 3
Follow-up	Dates	21 - 22 January 2016		7 July 2016	11 - 12 July 2016
	Participants	4		6	2
	Participants details	Residents non-flooded: 1 Council officials: 2 Others: 1		Residents flooded: 6	Residents of Namie: 2

⁶ The affiliations of the participants displayed in the table indicate their primary affiliations only.

Table 4: Dates of the data collection with numbers, gender, age groups of research participants

Data collection phases	Dates and residents	Study areas			
		St George	Grantham	Koizumi	Namie
Pre-fieldwork	Dates	7 - 10 July 2013	17 April and 30 October 2012	23 July - 6 August 2012	
	Residents	10 (Female: 2, Male 8)	N/A	N/A	N/A
	Age groups and gender	Female 50s: 2 Male 50s: 1, 60s: 6, 70s: 1	N/A	N/A	N/A
Fieldwork 1	Dates	30 July - 3 August 2013	22 - 29 July and 6 - 7 September 2013	18 September and 29 September - 15 October 2013	18 and 25 September and 22 October - 1 November 2013
	Residents	13 (Female: 8, Male: 5)	20 (Female: 9, Male: 11)	22 (Female: 7, Male: 15)	14 (Female: 6, Male: 8)
	Age groups and gender	Female 30s: 6, 40s: 1, 50s: 1 Male 20s: 2, 40s: 2, 50s: 1	Female 30s: 1, 40s: 2, 50s: 2, 60s: 4 Male 30s: 1, 40s: 3, 50s: 5, 60s: 2	Female 50s: 3, 60s: 3, 80s: 1 Male 30s: 2, 40s: 3, 50s: 5, 60s: 3, 70s: 2	Female 30s:1, 40s: 1, 60s: 4 Male 40s: 1, 50s: 1, 60s: 4, 70s: 2
Fieldwork 2	Dates	11 - 15 August 2014	18 - 21 August 2014	30 January - 9 February and 12 and 28 February 2015	12 - 23 February 2015
	Residents	13 (Female: 6, Male: 7)	12 (Female: 7, Male: 5)	13 (Female: 4, Male: 9)	11 (Female: 1, Male: 10)
	Age groups and gender	Female 30s: 4, 40s: 2 Male 30s: 1, 50s: 1, 60s: 4, 70s: 1	Female 30s: 1, 40s: 1, 50s: 2, 60s: 3 Male 30s: 1, 50s: 4	Female 50s: 3, 60s: 1 Male 30s: 1, 40s: 3, 50s: 5	Female 60s: 1 Male 20s: 1, 30s: 5, 50s: 2, 60s: 2
Follow-up	Dates	N/A	21 - 22 January 2016	7 July 2016	11 - 12 July 2016
	Residents	N/A	1 (Female: 1)	6 (Female: 1, Male: 5)	2 (Male: 2)
	Age groups and gender	N/A	Female 50s: 1	Female 50s: 1 Male 50s: 5	Male 20s: 1, 60s: 1

3.5 Fieldwork: Phase 1

Data collection

A general interview guide for both the Australian and Japanese case studies was prepared prior to the first fieldwork in 2013 based on the learnings from field observations and document analyses. The following initial guide was approved by Macquarie University's Human Research Ethics Committee in April 2013 (See Appendix 1 - Reference number: 5201300144).

Respondents will be asked to describe their experiences, including information on how long they had lived at that address and whether or not they had experienced flooding / tsunami there previously. If not addressed during the discussion, respondents will be prompted with questions such as:

- *Did you receive any assistance from family, friends, NGOs, government etc. during your recovery?*
- *What are your thoughts on the land-swap / relocation process?*
- *How do you rate your future risk to flood / tsunami and other hazards (compared to your neighbour / others in your community)?*
- *Have you undertaken any changes to reduce your future risk to flood / tsunami?*
- *Has the community dynamics changed since the flood / tsunami?*
- *How has your situation changed, if at all, following the flood / tsunami (employment, relationships, financial status, physical health, mental health, happiness)?*

At the conclusion of the interview, basic demographic information will be documented, including: age, gender, highest educational attainment, working status, household structure, length of residence within the community etc.

This refines the idealised open-endedness of grounded theory as Charmaz (2008, p. 87) suggests, providing 'a well-constructed guide [that] fosters asking open-ended questions, provides a logical pacing of topics and questions, avoids loaded and leading questions, and gives you direction as well as your interview participants'. Similarly, the guide above was used not to limit but to develop/extend the interview topics encouraging interviewees to talk about their experiences during and after the event freely.

The first phase of fieldwork was undertaken in St George and Grantham, Australia, in July and August 2013 and in Koizumi and Namie, Japan, in October and November 2013. Semi-structured interview sessions were conducted with local residents, government officials, non-

governmental organisations and academics. I solely conducted interview sessions for this study except for the sessions between 7 and 10 July 2013 in St George and between 22 and 25 July 2013 and in Grantham, when interview was jointly conducted with the principal supervisor, Dr Katharine Haynes. Numbers of interviewees in each study area are listed in Table 3. The typical length of each interview session was approximately one hour, although some of the sessions lasted more than three hours. The sampling technique adopted by this study will be elaborated later in this chapter (further addressed in Section 3.7 in the sub-section entitled *Collecting data sets and contacting research participants in different study areas*).

Stories shared by the interviewees were often different and/or new to my previous knowledge about each region. The initial fieldwork provided me an opportunity to grasp general situations and issues that concerned the research participants. As I increased knowledge and understanding through the initial fieldwork and associated research activities, the research interests of this study also developed. While material effectiveness of risk mitigation measures/actions were widely reflected in the initial interview guide, contextual human relations such as the roles, expectations, capabilities and challenges became more prevalent in the interview guide for the subsequent fieldwork.

Initial coding of the Australian interview data

The understanding of the local situations gained through my lens also influenced subsequent coding and analyses of the collected data sets. This subjectivity of the study, however, is in line with constructivist grounded theory as Charmaz (2008, p. 86) emphasises that:

[In Glaser and Strauss's early works] categories inhere in the data and may even leap out. I disagree. Rather, categories reflect interactions between the observer and observed.

Potential issues and/or further research questions were identified, paying attention to the interviewees' feelings, views and voices that were not necessarily articulated in the interview data sets. Charmaz (2008, p. 90) describes this stage that:

We probably struggle to grasp them. The data we 'find' and the meanings we attribute to them reflect this struggle. Neither data nor meaningful interpretation of them simply await the researcher. I assume that we are part of the meanings that we observe and define.

All the 2013 Australian interview data sets were transcribed by me, except four audio files outsourced, in preparation for the initial coding. This exercise, as recommended by Charmaz (2008), assisted me to become reacquainted with the data and gain a deeper understanding of each interview. However, this process also reflected the time-consuming aspect of the transcribing task. All these experiences highlighted the importance of considering the best efficiency and efficacy in undertaking research tasks carefully and flexibly.

After transcribing and before coding the 2013 Australian interview data, a set of 66 basic labels (hereafter nodes) were developed using the qualitative data analysis software, NVivo (version 10, which has been updated to version 11 by October 2016). These basic nodes prepared prior to the initial labelling (hereafter coding) were essentially developed inductively through my experience of conducting the fieldwork and also transcribing the data. In addition, these nodes were modified, updated, removed and new ones added to as my ideas and understanding developed (see Bazeley and Jackson, 2013). Hence, the basic nodes were pre-structured but not designed to limit my ideas, which was an appropriate adoption of the grounded theory method. Transcribing and the initial coding of the 2013 Australian data sets were completed by July 2014.

Dealing with the Japanese interview data – quality and timing

The interview sessions in Japan were conducted in Japanese language, as I am a fluent bilingual speaker of English and Japanese with the Australian official accreditation as a professional translator⁷.

⁷ Accredited by the National Accreditation Authority for Translators and Interpreters (NAATI) as a professional translator (NAATI number: 65847)

I developed a table of key topics identified through interview notes written during and immediately after the first fieldwork in Japan in September and October 2013. This process was undertaken in January 2015, prior to the second fieldwork in Japan by taking the following steps: 1) reviewing the notes; 2) extracting topics and ideas that I found important; 3) categorising the extracted sections into common themes such as community, daily-life, history/culture, money, support measures and time; and 4) listing the keywords and short descriptions of issues in a table that show Koizumi and Namie side by side (Appendix 2). Although there was a 15-month gap between the first phase of fieldwork in October 2013 and systematically identifying the key topics in January 2015, my understanding of these notes were maintained and developed through various formal/informal presentation and discussion activities such as the Higher Degree Research seminars organised by the Department of Environmental Sciences at Macquarie University. The table developed from the 2013 interview notes was updated with the 2015 interview data sets during and immediately after the 2015 fieldwork to see the transition and emergence of new issues/situations (Appendix 3).

Some of the 2013 Japanese interview data sets were outsourced for transcribing, while others were summarised, rather than fully transcribed, by me after the second phase of fieldwork. This data analysis method took advantage of my native understanding in Japanese language and culture and allowed translation of specific materials as appropriate rather than expending significant resources on transcribing material of little direct relevance to the study. For example, interview recording often contained socialising topics between I and interviewees that were important to develop a trustful relationship between them but not so much in terms of precise transcribing. Moreover, I was exposed to the interview data sets multiple times through attending, listening to and summarising the interviews. This approach enabled me to grasp and retain key ideas from the initial fieldwork efficiently, which was learnt through processing the Australian data sets.

3.6 Fieldwork: Phase 2

Theoretical sampling and focused data coding

A general interview guide for both the Australian and Japanese case studies was prepared prior to the second phase of fieldwork in 2014 and 2015 based on the learnings from the first

phase of fieldwork, subsequent coding and/or document analyses. Typical interview topics talked with existing research participants are listed below.

- How have you been since the last interview in 2013?
- Do you see any changes in the community since 2013?
- How is your interaction level with other community members?
- What do you think is needed for the community?
- How have the mitigation measures (in each area) progressed since 2013?

The second phase of fieldwork was conducted in the two Australian study areas in August 2014 and in the two Japanese case study areas in February 2015. Charmaz (2008) suggests that focused coding should be completed before conducting theoretical sampling. However, in this study, the theoretical sampling was based on the initial coding and then more focused coding was undertaken on all the data. This follows Robinson's (2014) definition of one of theoretical sampling processes, which further explores a research topic based on the provisional analysis of previously-gathered samples without hypotheses. Although each phase is not as perfectly independent and/or in the order that Charmaz (2008) suggests as the ideal approach, these steps worked efficiently to develop my understanding and helped synthesise the separate ideas and topics represented by nodes identified in the interviews and analyses into categories and theory. Therefore, this study effectively adjusted and adopted the grounded theory approach to the circumstances of disaster recovery maximising the flexibility of the method for a longitudinal approach. In this sense this study has developed a new approach and made a critical contribution to the literature on methodological aspects of disaster recovery. The main aims were to revisit the existing research participants to see the transitions since the 2013 interviews; examine the socio-economic-political situation in each study area; and recruit new participants who were not reached during the 2013 interview.

The 2014 Australian and 2015 Japanese interview data sets were efficiently summarised, rather than fully transcribed, following the strategy applied to processing the 2013 Japanese data. My knowledge gained from transcribing the 2013 Australian data ensured the effectiveness of summarising the 2014 Australian data. The prepared set of 66 nodes

increased to 126 with more detailed child and grandchild nodes⁸ through the initial and focused coding. The node structure was also changed significantly over the process. The Japanese data sets were transcribed, summarised and coded by November 2015 with the number and structure of the nodes further developed.

Developing questionnaires for the Australian case studies

Based on my understanding of the local contexts gained through the interviews and the coding process, questionnaires for the second fieldwork in St George and Grantham (August 2014) were prepared. Both printed and online versions were prepared and approved by Macquarie University's Human Research Ethics Committee in August 2014 (Reference Number: 5201300144 – Appendix 4). The initial idea of using questionnaires was to develop discussion with triangulation of qualitative and quantitative approaches in this study. Contents of the questionnaires mostly followed the aforementioned interview topics with demographic questions (Appendix 5). Qualitative topics commonly featured by the interviewees including relevant social settings, community consultations, recovery and risk reduction measures, and implementation of these were incorporated in the questionnaires in parallel to the demographic questions such as age, gender and location of residence. The wording of the questions utilised the terms and vernacular of the interview participants. The response rates were relatively low (St George: 19, Grantham: 15). The main reasons for the low response rates, based on my knowledge, appear to be that the targeted participants had generally *moved on* after 2 years in St George and 3 years in Grantham of the respective events. Many of the targeted participants were therefore, no longer interested or, particularly for the disaster-impacted people, were tired of raising their opinions after having unsuccessful experiences, regardless of what the failed opinions and experiences were.

The questionnaire responses, despite the low response rates, contain interesting aspects. For example, some local government officials expressed concerns over the issues that other officials did not mention or admit during the interviews after having been asked. In some instances, interviewees may have used the questionnaires as an opportunity to clarify their

⁸ Nodes are the 'points at which concepts potentially branch out into a network of sub-concepts or dimensions' that can be flexibly reorganised along with development of understanding of the data (Bazeley and Jackson, 2013 pp. 75-76). Following this, child nodes branch out from regular nodes, and grandchild nodes branch out from child nodes as sub-concepts.

opinions in an organised manner. In other instances, those who chose not to participate in the interview may have preferred the questionnaires as an opportunity to present their ideas anonymously. The questionnaire responses are, therefore, effectively utilised in this study not only to reinforce the interview data sets but also to identify new aspects and issues.

The questionnaires were also prepared for the second phase of fieldwork in Japan following and updating the format used for the Australian questionnaires. I, however, decided not to conduct the questionnaire survey in Japan, mainly because of ethical consideration that *research fatigue* (i.e. local people were already exhausted by a number of previous research activities in the area) was confirmed by many key participants. Furthermore, I already knew that some quantitative data sets such as public survey results were available and how those data sets could be applied to this current study after processing the Australian questionnaire results. I also paid maximum attention not to exacerbate the fatigue because of interview, confirming the participants' rights to withdraw from the study at any time. All the interviewees that I contacted for the first and second time during the second phase agreed to continue their participation, possibly helped by the direct, personal familiarity with either me or the key participants of snowball sampling, which this study adopted (discussed later in this chapter).

Evolving data collection and analyses through the process

The constructivist grounded theory approach suggested by Charmaz (2008) was adjusted in some sections of this study, such as the order of steps and goal setting, to customise the approach to the aims of this present study. The adjustments evolved over the entire duration of this study, based on learning efficiency and appropriateness of applying available resources and techniques at each step. In this sense, this study successfully achieved not only the research findings and discussions through collecting, processing and analysing data sets but also the methodological development through adjusting and synthesising research methods to best suit its aims. It is the flexibility of the grounded theory approach that enabled the appropriate adjustments and incorporation of the methods (Charmaz, 2014) to effectively access and investigate complex yet critical issues of vulnerability and resilience (Handmer, 2003, Pelling, 2012, Wisner et al., 2004).

3.7 Ethical and cultural considerations

Conducting interviews and questionnaire surveys during the early phases of recovery

This study takes ethical and cultural considerations seriously, as it addresses disaster-impacted people's recent experiences predominantly with face-to-face interview sessions. Sufficient attention was always paid to comply with ethical principles throughout the duration of the study, for example considering the research fatigue as mentioned above. Firstly, this study acquired an approval from the Macquarie University Human Research Ethics Committee (Reference number: 5201300144) for its research and fieldwork design in April 2013 (Appendix 1), before contacting potential participants in this research, followed by subsequent amendments. Secondly, the research participants were fully informed that their participation was voluntary, thus could be withdrawn at any point of the study without any obligations or consequences. The participants' anonymity was also assured and information provided was kept confidential. I distributed and collected consent forms (Appendix 6) to/from all research participants with their signatures, providing each participant a copy of the same form on which all critical information about participation was presented. Thirdly, digital audio recording was undertaken during interview sessions. The purpose of recording was to support note-taking, to increase the quality of communication time between interviewers and interviewees, to ensure all information given during the interview was retained and to reduce the prospect of error. I always asked interviewees for permission prior to commencing the interview. All other recording activities such as taking photographs were undertaken with prior approvals from relevant sources as appropriate.

Building and developing trust with local people

As an outsider in each study area, I made my best efforts to gain and develop trust with local people including research participants within the limited time of his visits. As part of the trust building, I always visited local governments, residents including key persons and other supporting groups during the early stages of the fieldwork. I shared my research aims and intended activities openly with all participants during each interview session. Participants occasionally expressed exceeding levels of expectation for the research outcomes to push particular agendas. However, clarifying the aims and roles of the research and researcher respectfully but confidently allowed both participants and me to develop mutual understanding of the impartiality of this research and a good level of trust.

At the same time, this independence as an outsider helped the quality of interviews. A number of participants mentioned that they felt comfortable to share their thoughts and/or issues with me, because I was free from local interests. Participants occasionally became emotional during their interview sessions. For example, some interviewees physically expressed frustration against inadequate mitigation measures or helpless situations, and others shed tears over remembering bitter memories and/or realities in their post-disaster lives. However, they all quickly resettled after having a brief silence despite the presence of me. This was underpinned by the established trust and as a consequence, all interview sessions were successfully completed. The university's human ethics information and consent form (both printed and online) for the participants also stated available information on further assistance/counselling in each study area for those who were in need.

Visiting each study area multiple times also developed trust with local people. During the first visit I mostly focused on establishing respectful relationships with local people to secure the feasibility of the study. This initial phase of the study was critical and required considerable physical and mental efforts by me. To manage this, I avoided arranging multiple interview sessions in a day when possible, and regularly contacted my supervisors to share ideas and concerns.

Interacting with local people in and out of interview sessions and having them understand my genuine interest in *their* thoughts, experiences and lives enabled a good level of trust to develop. The rapport gained in the first visit facilitated the smooth development of the more in-depth subsequent visits where local people seemed more at ease. A number of local people appreciated that someone cared about *them and their lives* over a long period of time accepting them as research *participants*, not as mere *subjects*.

Collecting data sets and contacting research participants in different study areas

Communication with local authorities in the early stage of the study helped establish the formality and clarity of the research aims and activities in the areas. Each local government was supportive of the study and fieldwork. In terms of data collection, I mostly developed

contacts with local residents and supporting groups directly without seeking assistance and contacts from local governments. This approach not only avoided putting extra workloads on the governments but also minimised the risk of having political influence on selecting participants.

Apart from the difference between the general sampling in the first phase of fieldwork and the theoretical sampling in the second phase presented earlier in this chapter, (see above), this study adopted snowballing sampling, which involves referral processes from one participant to another (Atkinson and Flint, 2001, Heckathorn, 2002, Robinson, 2014). Snowballing sampling⁹ is suitable for a community where the members know each other well and are interconnected (Heckathorn, 2002). The communities of the four case study areas of this study had close connections between members in different post-disaster situations. This sampling method is also particularly effective to recruit participants from vulnerable groups (Atkinson and Flint, 2001, Robinson, 2014).

Atkinson and Flint (2001) identified potential challenges in snowballing sampling such as biased selection, finding a starting point and interaction with vulnerable research participants. However, this study paid attention to overcome these points. For example, I addressed multiple networks in each study area to acquire/maintain different perspectives, contacted various entrances to a community to find ways to commence the snowballing, and applied sufficient time and interaction to establish/develop trust with the participants.

Snowballing techniques worked very well in all study areas despite the locational and cultural difference between them. The only difference in the initial recruitment of participants between Australia and Japan was that research participants, particularly the residents, in Australia were often contacted directly, while participants in Japan were often contacted indirectly through a third party (e.g. NGOs, academics). These different approaches worked efficiently considering the cultural difference. For example, door-knocking could be less

⁹ This study interprets *chain-referral sampling* defined by Heckathorn (2002 – originally stated by Erickson (1979)) as snowballing sampling.

welcomed in Japan than in Australia. However, the same process was taken in each area once communication with key persons was achieved. As the physical size of each study area was relatively small, I was able to reach the key persons in the community who knew the local people and social structure very well. These key persons supported me and the study significantly not only sharing their stories but also connecting me to a number of other relevant people in the area. Those who were connected also introduced others and the networks developed. I regularly updated the key persons about the progress of the fieldwork and the study, which also developed the level of the mutual trust further.

Limitations and biases

Although I made my best efforts to maximise the adopted methods and approaches, this study inevitably contains potential limitations and biases. Firstly, differences in the numbers, lengths and opportunities to visit each study area may have affected the depth of individual case studies. For example, I may have had more opportunities to gain greater volumes of information in some areas where a strong level of connection was established than in other areas. To overcome such potential biases, I allocated similar amounts of time for writing each case-study sub-chapter (under Chapter 4 and 5) to evenly develop my understanding of the data/information gained possibly in different volumes.

Secondly, the range of participants was limited because of the locational limitation. For example, those who had moved out from the community for various reasons were difficult to cover in this study often because of the physical distance and the lack of connection with the remaining community members.

Thirdly, some biases in generation and gender may have occurred in the snowballing sampling, although I maximised the theoretical sampling to minimise such biases. For example, the participants referred by the key member(s) of a community were often in a similar age group, typically middle-aged and older. Gender of the participants was less driven by the key member(s)' characteristics. However, it was often beyond control of me, because snowballing predominantly relied on the network(s) that the *source person(s)* had. Some limitations and biases in age groups of the participants may have remained, although I approached multiple

networks and conducted thematic (focused) sampling to fill the gaps in each study area. These issues may have also been affected by generational difference in the interest in community matters, although it is out of scope of this study.

Fourthly, the case study areas that this study coincidentally selected are rural towns, or at least not highly urbanised cities. This common characteristic has ensured strong wider relevance of this study to the recovery cases of other rural communities. However, levels of that relevance to highly urbanised areas are unknown.

Lastly, the structure of each case study chapter (and sub-chapter) is different. This occurred because of not only the physical and social differences between these areas but also the adoption of grounded theory approach. For example, some case studies follow the timeline, and others are structured on a topic basis. This may be a limitation but also a positive outcome of pursuing the best structure of each case study. The interview guides for each study area also developed individually for the same reason.

3.8 Concluding remarks

This chapter has explained the development of the methodological approach and explored the applied methods that the present study is based on. It has discussed the appropriateness of the application of an inductive approach and the qualitative-based mixed methods to best address the aims of this study. The section on data collection and analyses explicated the applied methods and longitudinal research processes further justifying the adoption of an adjusted constructivist grounded theory approach. The flexibility of the methods enabled the effective collection of in-depth data at multiple points of time to investigate the complex formation, development and influence of vulnerability and resilience during post-disaster periods.

I identified trust as a key factor for successful fieldwork and research activities through his ethical and cultural considerations. A good level of trust with research participants not only enabled but also facilitated the study significantly. Researchers are often outsiders for the

local people who live and/or work in the study areas. However, the rapport shared with local people based on honesty and respect has a potential to turn the negative recognition as an outsider into trustful partnerships. Although closeness to research participants potentially causes adverse effects in research such as loss of objectivity, the established trust far 'overweigh[s] any negative side effects' (Haynes, 2005, p. 120).

The long-term connection with the study areas encouraged disaster-impacted local people to review the past and to consider their future. This is not to say that this study assisted research participants to manipulate their interview responses nor romanticise their past and future. Moreover, some local people had perhaps *moved on* and did not show their interests in the study. However, a number of participants expressed their thoughts and shared experiences regarding their disaster recovery more holistically in the interviews during the second phase of fieldwork than the first one. The points discussed in this section will be further examined with research findings presented in the following chapters. The following two chapters will explore disaster recovery in each study area using quotes verbatim and summarised (and translated as appropriate) so that individual voices are heard.

Section II

Case Studies

Chapter 4: Post-Disaster Recovery Following Floods in Queensland, Australia

Chapter 5: Post-Disaster Recovery Following Earthquake, Tsunami and Nuclear Accident in Japan

Chapter 6: Post-Disaster Recovery in Australia and Japan

4: Post-Disaster Recovery Following Floods in Queensland, Australia

As described in Chapter 1, the affected communities of St George and Grantham were impacted by a series of major flood events between 2010 and 2012. St George experienced slow-onset riverine floods with no fatalities. Three floods inundated relatively small areas of the town over a period of two years. Local responses to these events focused on the changing agricultural landscapes and their effects on the floodplain on the other side of the river from the town and the responses of local and state authorities, which included construction of a flood control levee intended to reduce the impact of future flood events.

In Grantham, a single rapid flash flood event in 2011 caused 12 deaths and its unprecedented nature prompted major public debate and an unprecedented policy response in the form of a land swap that offered affected landholders an opportunity to relocate from floodplain locations to flood-free areas in the local district. The complex social and institutional responses reflected the challenges of the disaster to public discourse and the reliability of public policy in changing environmental circumstances – which in this case were exacerbated by polarised political debate around environmental issues including the role of anthropogenic climate change and its implications for Queensland.

To assist the reader in understanding the setting of the Queensland cases, this chapter first provides a visual introduction in the form of a photo essay for each location before presenting the case study findings.

Visual introduction of QLD study areas: St George and Lockyer Valley

This section briefly presents important features of the local settings of each study area that visually assist a broad understanding of the research findings.

St George



Figure 2: The 2012 flood in St George (ABC News, 2012a, 7 February)
Three floods between 2010 and 2012 inundated similar sections of the town.



Figure 3: Balonne River in St George (Okada, 31 July 2013):
“Car weary legs will appreciated the two kilometre stretch of shady riverbank walkway flanking the town.”
(Balonne Shire Council, 2016b)



Figure 4: Flood levee constructed by the Balonne Shire Council (Okada, 10 August 2014)
The major mitigation measure protects a large part of the town. Some sections of the levee have a height of several metres going through private properties.

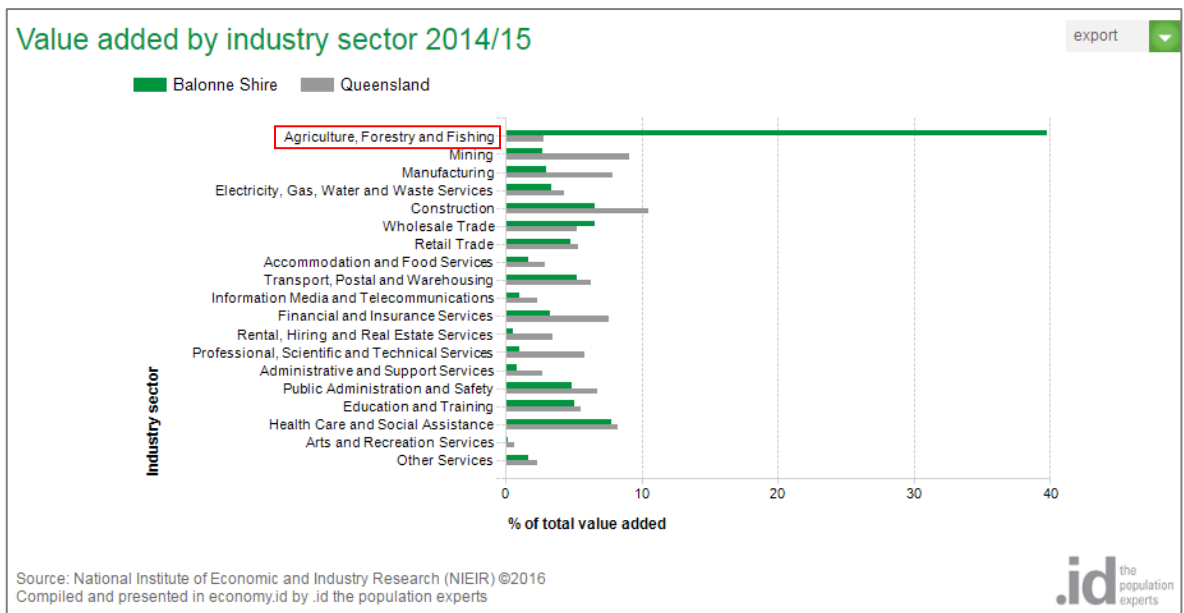


Figure 5: Strong local industry – cotton farming sector (.id, 2016)
“Cotton is the Shire's primary industry, with Dirranbandi (a neighbouring township) home to the largest irrigated cotton farm in the southern hemisphere...” (Balonne Shire Council, 2016a)

Grantham



Figure 6: Aftermath of the flash flood (Sydney Morning Herald, 2011, 13 January, photo by Dean Suffron) A flash flood that media described as an ‘inland tsunami’ destroyed low-lying areas of Grantham.



Figure 7: New estate on the hill (Okada, 27 July 2013)
The Lockyer Valley Regional Council developed a nearby hill for its main mitigation measure entitled ‘land-swap’ that offered relocation opportunity for the flood-impacted residents.



Figure 8: Farms and farmers in the floodplain (Okada, 19 August 2014)
Agriculture is a major industry in the region; many farm lands are located in the floodplain, utilising fertile soil.



Figure 9: Locally iconic butter factory (Okada, 21 August 2014)
The factory stopped its operation some decades ago, but the building was renovated for community use by charity groups after the flood.

St George

*I don't think it's possible to get everyone back together again now, because the town is so split now. And the levee has made even a bigger split.
[Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]*

This sub-chapter examines the recovery process and outcomes for the St George community and its members after the floods between 2010 and 2012. This sub-chapter incorporates background material such as policies and publications and datasets acquired during fieldwork in Sections 4.1.1 and 4.1.2. The following Sections are predominantly based on the fieldwork datasets.

The sub-chapter begins by explaining the construction of the flood levee as the primary mitigation measure and the spectrum of community members' views on the levee. Financial support options provided to some of the levee-excluded owners are then explained. To understand the causes of different perspectives, this sub-chapter addresses the processes of information sharing and community participation between the Balonne Shire Council (BSC) and different groups of the residents, followed by a further focus on communication and the power-balance between the different actors. This sub-chapter then investigates various levels of vulnerability among flood- and/or levee-impacted residents, how it is understood in the community, and how differences in that understanding impacted the recovery. After examining relationships within and between residents and the BSC, another overarching influence of powerful industries are addressed. The concluding remarks discuss the balance between mitigation measures and recovery.

4.1.1 Levee construction and funding support for mitigation

Council levee

The BSC released its plan to build a flood levee with a total length of 4.1 kilometres for St George in February 2013, comprising three sections extending from a) Mitchell Street to Bowen Street (1.4 km), b) Bowen Street to Barlee Street (0.9 km) and c) Barlee Street to the

St George Showgrounds (1.8 km) (Balonne Shire Council, 2013b, The Chronicle, 2013) (Figure 10). In stage one of the levee undertook to protect homes and the aged care facility located in the sections a) and c), while stage two joined the levees with a block wall in the middle section of b) to protect the main part of town (Queensland Government, 2014). The cost of 5.6 million AUD was jointly funded by State and Federal governments and a partnership between the Balonne Shire Council and the Churches of Christ, owners of the Warrawee Aged Care facility (Queensland Government, 2014). The levee was completed by 31 July 2014 (Balonne Beacon, 2014).



Figure 10: The approximate location of the levee with street layouts in St George (Source: Risk Frontiers, Data from Balonne Shire Council, 2013a, Balonne Shire Council, 2013b, Queensland Reconstruction Authority, 2012)
 Dotted lines extending toward northeast represent the sections a (pink), b (pale pink) and c (pink) respectively.

Controversy over diverting water by temporary levees during 2011 and 2012 floods

The temporary dirt-levees were established during the 2011 and 2012 flood events and while the temporary levees protected houses on the right side, limitations in coverage were acknowledged.

[I]n the 2012 flood... we [BSC with State Emergency Services] were building a levee bank for the middle of town on the streets... I think it was four and half K[ilometre]s of levee bank in... 36 hours... [W]e just brought dirt in from everywhere and just plunked on the road. And it stopped the water. [Interviewer: So, is it the same position where you put the levee for the 2011 event?] Pretty much. Yeah... [Interviewer: Did you hear someone telling you, for example, "Oh, why did you put the levee at the back of my house?" or something?]... [T]here were people against that. For sure. Because they were on the wrong side. But, well, it's one of those things... we had to save as many as we could. We can't save everyone. [BSC official, 2013]

On top of the issue of which side of the levee homes were located, some interviewees also reported that the temporary levees diverted water and changed the level of flooding in different sections of St George.

[T]his is one of the highest parts in town. We are higher than town is... we are probably a metre and half higher than there. So, if we don't have the levee to protect the town, the rest of the town would be very badly flooded before it came into our house... So, people complain about the levee. But, this house didn't flood, the next one flooded badly, the next two were very badly flooded... [A]ll the rest of down the street here were all badly flooded. The levees they put up [during the 2012 flooding]... would have created a little bit of a problem here. Because that water normally would have gone through town and spread more. But it would have lifted it here maybe an inch or so... it would have made a difference to some of these other houses. [Resident of St George, whose house was located on the protected side of the levee (2013)]

Despite the divisive outcomes of installing the temporary levees between the protected and unprotected residents during the previous flood events, the BSC decided to build a permanent flood levee in St George. The BSC had been struggling with getting through the competitive process of the State government's funding for disaster risk reduction. Learning through trial and error in the application process the BSC was provided funds to build a flood levee, which had been successful in other areas in terms of acquiring funding approval.

[W]e've [BSC] been flooded twice and for the third time. They [other towns that successfully built levees] said "Well, why don't you build levees?" [We said] "Well, we applied. We can't afford it." And the money was magically forthcoming plus some extra. [BSC official (2013)]

Varied views on the council's permanent flood levee

In the April 2013 meeting (Balonne Shire Council, 2013e: 19 April 2013 – Meeting minutes P.8 – extracted and summarised), it is described that:

The Land¹⁰ is considered to be most suitable for flood mitigation purposes because... the proposed use of the Land maximises and balances social, economic and environmental benefits to the local community.

The levee is designed to protect the majority of the town, but approximately 50 households, who live near the river, will be excluded. Despite the aims of the levee construction plan, the respondents' concepts of *vulnerability* and *social balance* were different to those of the Council's. Views on the proposed effects of the council's flood levee varied, particularly because the planned and constructed position of the levee excluded 50 properties to maximise its physical efficiency calculated by the BSC-outsourced hydrological experts. Interviewees whose houses were excluded from the levee protection heavily criticised the council anticipating that the council's levee would split the local community both physically and socially. One councillor advocated this view, but apparently the BSC did not.

More prominent people live down here... [T]he people down this end of town, they are not the wealthiest part of town. The wealthiest part of town live up on the top end. You know, it's discriminating against lower socio-economic members of the town... the levee bank's gonna split the community. [Balonne Shire Councillor (2013)]

There were also concerns that the water level of future floods outside the levee would increase because of the potential bottle-neck effect that might be caused by the council levee

¹⁰ The Land is described earlier in the minutes as "Council propose to acquire all existing rights and interests in the land described in the schedule" (Balonne Shire Council, 2013: 19 April 2013 – Meeting minutes P.7).

and the agricultural structures on the other side of the river a point to which will be discussed return later in this sub-chapter. Some residents even questioned the validity of the council's levee considering the greater height of the agricultural structures. The agricultural structures were reportedly installed along the other side of the riverbank by a large-scale cotton farmer for farm irrigation and protection purposes. A number of interviewees, particularly those whose houses were inundated, believed (or at least wondered) whether these structures restricted the flow of floodwaters and concomitantly increased the water height during the floods.

She [Mayor] doesn't have enough knowledge. What she's done is quite possibly going to be worse for the town. She's created another bottleneck in the river. It will back up the water to 20 km upstream. There are other people living in that area. And you've got [that] dam structure. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

They [BSC] spent a fair bit of money. But I still reckon they could have reduced the risk by getting rid of the agri-levee on the other side of the river, [an agricultural company]'s water channels. They didn't want to go there. Kia-Ora channels are 16m high, which makes 14.5 m a bit lame anyway. They pump water up and gravity feed the water across the property. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

Many flood-impacted interviewees wanted independent verification of the potential influence of the agricultural structures on the other side of the river as well as its joint effects with the council flood levee on the water levels calculated in the BSC's hydrological modelling. However, according to the interviewees, the BSC did not agree to disclose the datasets that had been used for its hydrological modelling, which the interviewees viewed as public information.

I asked this officer [at BSC] the other day to give me a copy, or could they please give me a copy, of the final report on their hydrology study that shows, that you can see, how they base where they're building the levee bank upon. There's got to be a report saying why they are building the levee

bank where they're building it... They can't give it to me... It's... public information. [I] Still haven't got it. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

[A]ll the flood modelling from QRA [Queensland Reconstruction Authority], you cannot get any heights of them, any data... They refused to answer to many questions. They weren't upfront with everything. It's been a lot of cover ups here... Lots of things have gone on that shouldn't have gone on. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

BSC officials, during the interview, stated that the council's hydrological modelling showed that the agricultural structures would have little influence on the water levels. This advocacy was often backed up by hydrological experts involved in the planning process. Interviewees whose houses were protected by the levee generally welcomed it. Some stated that something had to happen in order to avoid the costly damages to the aged care facility that had repeatedly occurred during the previous flood events.

Interviewee 1: *We had a look at [agricultural] levees below town and remove them...*

Interviewee 2: *To model... to remove them?*

Interviewee 1: *... [T]he impacts were not significant [BSC officials (2013)].*

Council already had run so many scenarios of hydro study. Some say this and that but not backed up by scientific modelling. But council spent a lot of money for planning, they ran the scenarios through the computers with engineers... Local knowledge is useful to some extent, but maybe not for where to place the levee etc. The hydro modelling includes various factors, the amount of water etc. I trust the hydro study and modelling, and hope for the best. [Resident of St George, whose house was located on the protected side of the levee (2014)]

It [the flood] entered the aged home down here. So, putting a levee up... there's all sorts of arguments going on about it. But, it has to happen in my opinion. Something has to happen. Because there's an aged home down here, which is costing hundreds of thousands of dollars, every time there's a

flood. [Resident of St George, whose house was located on the protected side of the levee (2013)]

Some interviewees anticipated that the levee would only protect the aged-care facility and a small number of properties in the town, although the BSC reportedly promoted it as if it would save the whole town. The reasons for this were that most of the levee-protected homes were not impacted by the recent floods and it was believed that the majority of the homes were safe even without the levee.

... I just don't think the town is ever gonna completely flood... I do have this feeling that they [BSC] think they are saving the town by doing the levee. I don't think they are. I think they are saving a few properties, like Warrawee... I don't think they are saving the town. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

Financial support for mitigation measures

In 2013 Balonne Shire Council implemented a policy designed to protect those homes not protected by permanent or temporary levees (Balonne Shire Council, 2013f). The policy comprised 1) the voluntary house raising, 2) relocation (land swap), and 3) private flood mitigation. Total funding up to a maximum value of 1.9 million AUD was provided through the Queensland State Government's South West Queensland Flood Mitigation Fund (SWQFMF) in conjunction with the levee works within the St George township. The policy applies to households flooded in the 2012 St George flood. The properties that would have been flooded if they had not been raised following the 2010 flood event were also included. Requirements and summaries of assistance regarding this policy are shown in Table 5.

Table 5: Requirements and summaries of assistance under the Balonne Shire Council House Raising / Relocation / Private Mitigation Policy (P.5-6 – extracted and summarised)

Assistance Type	Land	House	Assistance
A. House Raising	Located within the Balonne River Catchment and included in the St George Flood Investigation Area (as shown on Figure 10 and 11).	The house is brick veneer, double brick, masonry block or constructed on a concrete slab (for the option B & C only)	Level A
B. Relocation (Land Swap)		The Habitable Finished Floor Level is at or below the 2012 flood level - 13.95m (199.72m AHD) at BOM Gauge - which approximates a 1 in 100 year flood event – plus 550mm	Level B
C. Private Flood Mitigation		The house was built before the February 2012 flood event The house is not used for commercial purposes or owned by a government entity The house is not protected by permanent or temporary levee works shown on Figure 10 and 11	Level C
D. Buy Back	Buy back is not provided for under this Policy.		

Flood mitigation works such as house-raising (other than repairs) funded by insurance payouts or other external funding sources were not included in the scheme. The Council had an authority to request that applicants provide details of any insurance payouts or to contact their Insurer.

Level A Assistance (P.7 – extracted and summarised)

A proportional subsidy will be offered of up to two thirds (2/3) of the costs capped at a maximum total amount of 30,000 AUD for each affected property towards the cost of raising the eligible house. The actual contribution will depend on the number of applicants to the scheme. The contribution must be used for house raising costs only.

Level B Assistance (p.8 – extracted and summarised)

Council has a limited supply of vacant land available for Land Swap in Scott Street (11) & Andrew Street (2), St George. In return for the owner signing over ownership of their house and land to Council, Council will provide a block of land and up to 5,000 AUD

contribution towards any legal costs. The relocation of an existing house or the construction of a new house must be undertaken at the applicant's own expense.

Level C Assistance (P.9 – extracted and summarised)

A proportional subsidy will be offered of up to two-third (2/3) of the costs capped at a maximum total amount of 30,000 AUD for each property towards the cost of suitable permanent private flood mitigation works. The actual contribution will depend on the number of applicants to the scheme. Private flood mitigation works may include removable flood barriers, waterproof fences, floodskirts and flood boards that seal doors and windows, as well as any other works or products that provide flood protection subject to Council approval. The funds must be spent on flood works or flood protection products. The funds must be expended as part of the program so reserving funds for future temporary works in the case of a flood is not an acceptable solution.

Temporary Land Planning Instrument

In order to avoid new building and earth movement in the area outside of the council's levee, a Temporary Land Planning Instrument (TLPI) was adopted by the Council in July 2012 (Balonne Shire Council, 2012a: 20 July 2012 – Meeting minutes). The TLPI, which came into effect on 20 August 2012, identified the flood investigation area (Figure 10 and 11) and placed restrictions on development in these areas. For example, one resident had attempted to raise his empty block of land that was ear marked for development prior to the floods, with soil. Because of the TLPI the resident was ordered to remove the dirt (Balonne Shire Council, 2013d: 15 March 2013 – Meeting minutes). A public meeting was arranged on 6 August 2012 to explain the impact of the TLPI and discuss flood mitigation measures (Balonne Shire Council, 2012a: 20 July 2012 – Meeting minutes), although some interviewees recalled that no consultation was provided by the council about the TLPI.

In August 2013, an updated TLPI was adopted, which came into effect on 19th August 2013 for a further year (Balonne Shire Council, 2013a). According to a BSC official, the minimum habitable finished floor levels (i.e. freeboard) for St George was relaxed by 0.45 m as more detailed results became available from additional hydrological studies.



Figure 11: The approximate location of the levee (Source: Risk Frontiers, Data from Balonne Shire Council, 2013a, Balonne Shire Council, 2013b, Queensland Reconstruction Authority, 2012) Homes that will be outside the levee and unprotected, as well as inside the flood investigation area, are offered the three risk mitigation options.

How the council developed the three options for mitigation

A BSC official stated that the BSC developed support options for those whose houses would be on the wrong side of the levee after the council had realised that certain numbers of houses in the town would be excluded from the protection of the council-proposed levee.

We developed the package over time. Ah, initially it was all about building levees. [It] became obvious that ...people [were] gonna be on the wrong side of those levees. And the Mayor pressured the State Government for funding for raising houses... but those people on the wrong sides, not everybody could raise. But it has to be the first option... [T]he flood mitigation measures, if those people on the wrong side of the levee that haven't got the option to raise but do have an option of building a private levee or some other way of mitigating their localised area, like, combined that with neighbours. So it was a hierarchy of need. [BSC official (2013)]

Of the three mitigation assistance options, the BSC officials admitted that no resident had signed up for the relocation option. Almost all interviewees considered this option as unfair, mainly because the differences in the values of the two land sites (current and proposed site) were too great to consider.

I sat down with the deputy Mayor. And I said "Let's have a look at this land-swap." And he said "Yeah, what do you want to know?" and I said "Well, you know, I want to get your thoughts on it." I said to him "As I read this, it says you will give me a block of dirt, if... I sign over my house, take this place as an example, I sign over my house, which is insured for... \$800,000. I sign over the acre and a quarter, I sign over the shed, and you give me a quarter of acre of dirt the other side of the town, which is lower than this... and \$5,000... towards legal fees." And I said "Do you think that's fair?" And he said "yeah"... As long as I'm concerned. We are talking a million dollar pass, for a block that's less than a-fifth the size lower and nothing on it. It's a bit of a mind spin, you're trying to see things from the perspective of other people. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

Flood impacted residents wanted a buy-back scheme, but it was not applicable because estimated costs were assessed by the Council as too great.

There was a lot of pressure to do buy-backs, but there was just never the cash... [T]here was a huge expectation from some people... And there was real anger and resentment when they predict the message did sink through that "No, we are not going to buy your land back because you get flooded. These are the options and this is the money available." [BSC official (2013)]

Another point of view not on the options themselves but on the fundamental ideas of financial supports for flood victims was that equitably helping the victims out would be an unfair burden on tax payers.

I think it becomes too much of a financial burden to the state... If they start buying back houses in one area... they have to buy out ... every house that if they get flooded in the future. I feel like it's very hard on the people who have been flooded but I can't think of how you equitably help them without creating too much of financial burdens for the rest of the society. [Resident of St George, whose house was located on the protected side of the levee (2013)]

Varied views on the funding for house raising and private mitigation

Views on the council's funding for individual mitigation works also varied. The first view was that the offer was rather generous considering that choice of living areas had been/were free for everyone i.e. responsibility lied on individuals.

[T]hey [BSC] are only giving what has been given to them. So they can't really do any more than that... [S]o, I think it's a fairly generous offer. After all, no one twisted anybody's arm to go there [the flood-impacted area]. No one twisted my arm to buy this place. You know, I came here with my eyes wide open. They [the flood-impacted residents] all came there [the flood-impacted area] with their eyes wide open. And the council is helping them... We as rate payers are helping them. Or as tax payers or whatever. So... I think it's a fairly generous offer. [Resident of St George, whose house was located on the protected side of the levee (2013)]

Everybody, basically everybody that was in the house knew that there was a potential for that house to flood... So, if you buy something and you know it's getting a potential flood, you know, if somebody comes along and stops you flooding, you gotta be pretty thankful for that. [Farmer of St George, whose house was located outside the urban and semi-urban areas (2013)]

The second view was that the 30,000 AUD-capped funding were neither enough nor reasonable. The flood-impacted area in St George was almost the same as the levee-excluded

area of the town. Therefore, interviewees claimed that more funding should have been allocated for the flood victims to recover and reduce risk rather than spending most of the State government's funding for constructing the council levee to protect the non-flooded people. Some were concerned about the cases that house-raising would not physically be an option, for example slab-on-ground houses. Although flood-fences can be installed around these houses as private mitigation, heights of the fences were limited at 2 metres from the ground under the building regulation, according to a BSC official. This prevented many of these houses from having these fences higher than the council levee.

[T]he two-thirds of the cost to raise by house [will be subsidised by the BSC's funding] to a limit of \$30,000. Now, to raise that house could cost anything from [\$]60,000 to [\$]75,000. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

[I]t's not fair that the majority of the town are protected free of charge. And we have to go into debt for our protection. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

[T]he \$3.9 million that goes into the levee bank is protecting that other part of the town and \$1.9 million here to raise houses... they should be other way round. They should be looking after the people down here... All these policies come into play actually discriminate against the people on the outside the levee... They [Other councillors] are the people forking out the money. And the people on the top side of the levee... [t]hey are getting protected. Their land values are still appreciated. Their insurance [premiums], they are probably going down. People on this [wrong] side of the levee, their land is virtually useless... No one's gonna buy the house off them. Insurance companies are not gonna insure you. Because they can see the risk. It's... councillors who, [are] bringing out all this policy is to limit the development down here [with TLPI], but not only limit the development, but limit what you can do to mitigate against the flood. [Balonne Shire Councillor (2013)]

*And, I think, they [residents who are excluded from the levee protection] are sacrificing their homes, their homes to build a levee to save the town. So I think, a little bit more compensation should be given in their way.
[Interviewer: To make it... fair?] Fair, yes. Yep. [Resident of St George, whose house was located on the protected side of the levee (2013)]*

The third view was that the BSC's funding supports were provided only for the urban and semi-urban areas; residents and properties outside these areas (i.e. rural) were disregarded. Interviewees who lived outside the urban and semi-urban St George areas felt that they were abandoned.

This house, we are classed as rural zone, which is outside the mitigation funding area. So we have to do everything by ourselves. [Interviewer: Isn't there any consideration for support?] No. Nothing ... There are residential, rural residential and rural. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

4.1.2 Lack of information-sharing and BSC's political pressure on residents

Poor information sharing led some residents to form the residents' flood committee

According to the BSC minutes, the 10 million AUD flood mitigation fund for the south western Queensland region was advised by the Premier in February 2012 (Balonne Shire Council, 2012b: 24 February 2012 – Meeting minutes). Recommendations for residents who were to be outside the new levee were discussed in the Council in February 2012 (Balonne Shire Council, 2012b: 24 February 2012 – Meeting minutes).

The BSC adopted and released information on the flood mitigation measures in St George: the levee plan and the Voluntary House Raising / relocation (Land Swap) / Private Flood Mitigation Policy in February 2013 (Balonne Shire Council, 2013c: 15 February 2013 – Meeting minutes). Respondents in a broad area of St George also recalled that the topic of the levee plan and flood mitigation assistance were only released to them around March or April 2013. This shows that the plans had not been shared with the public prior to the official release in February 2013, at least for 12 months. In addition, one resident was first informed about the levee plan in a newspaper, not from the Council.

Certain members of the community, dominantly those who had been flooded and were on the wrong side of the likely levee, began to feel that their concerns were not being addressed

appropriately and therefore formed the St George residents flood committee. According to interviewees, the BSC officials attended the meeting that was held by the residents' flood committee.

[T]he committee was only formed because nothing was happening. Council was doing nothing and telling nobody anything. So, we did finally get sick of it, especially the flood affected people. [Resident of St George, whose house was located on the protected side of the levee (2013)]

[W]hen we called... the first meeting, we didn't invite the council. Then one of the councillors came to me... he's deputy chairman, and he came to me and said "[The name of the resident], I heard you are having a meeting." And I said "Yeah". And he said "Why weren't we invited?" And I said "I didn't think you'd... be interested." And he said "Well, you said if you are having a public meeting, we should be invited." And I said "Oh well, if you think you should be invited, you are invited. Come along. Bring the whole council, yeah." We were having the meeting at the RSL [the licenced commercial venue operated by the Returned and Services League of Australia]. So they came along. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

The recalls from both sides, the BSC and the committee members, on how the flood-impacted residents' questions were addressed were contrary to each other; while the BSC officials emphasised that all the questions were answered clearly, the residents' flood committee members didn't think that their questions were answered at all.

We had a residents' action group form as well. And they got a bit of air initially... They ran two public meetings of their own. [W]e fronted the first one. We were stuck up the front like we were on trial, anyway. Ah we answered everything clearly. [BSC official (2013)]

[E]very question that we asked them, they [BSC officials and councillors] wouldn't answer... I said to, to one of them... "Did they [cotton farmers] put in the water that came down the Glea [flood spillway on the other side of the river where flood water used to be naturally released], that was overflow from the Glea, or that came in?", "Oh, I don't know." And I asked another councillor "[the name of the councillor], do they do that?" He just got up and

walked out from the meeting. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

[T]hese are the questions that we asked... we asked 21 questions of council. And... we sent it in writing... that was in February, and we still have not received their response... they say in the newspaper "Oh, we've answered those questions and...", but they haven't. [Resident of St George, whose house was located on the protected side of the levee (2013)]

In March 2013, the Council forwarded the levee construction plan, negotiating land purchase (Balonne Shire Council, 2013d: 15 March 2013 – Meeting minutes). However, the March 2013 meeting minutes of the Council (Balonne Shire Council, 2013d: 15 March 2013 – Meeting minutes pp. 8-9 – extracted and summarised) described:

- ST GEORGE RESIDENTS FLOOD COMMITTEE – the St George Residents Flood Committee requesting answers to a series of questions in relation to a Levee for the Town; Temporary Local Planning Instrument; allocation of funding grants among other things.
- Council advise the St George Residents Flood Committee that Council has recently completed a series of information sessions that addressed these issues and it is disappointing that
 - some committee members chose not to attend, furthermore
 - the **Council did not see the exchange of correspondence as an effective way** to address the concerns and extends an invitation to the committee to meet with Council to discuss their concerns.

Eventually the residents' flood committee was exhausted and lost its function.

And in the end, I think we just rationalised them to death. But they certainly lost a lot of public support once it was clear that they were just pushing an

agenda that was just anti-council and not helpful. You know, it makes you angry on one level, but they deserve to nothing, yeah. [BSC official (2013)]

Less than four weeks after the controversial committee lodged a complaint about what it believed was nepotism within the ranks of the Balonne Shire Council, three sources have provided unconfirmed reports to the Balonne Beacon that it has "fallen apart at the seams" and folded. [The Chronicle published 9 April 2013]

At the community information/consultation session

Public information sessions were arranged by the Council and commenced on 3 March 2013, according to a Council official. These sessions were designed to cover topics such as impacts from the proposed levee, impacts from agricultural levees and support options available for the residents to be outside the levee (Balonne Shire Council, 2013b: Media Release).

The public information sessions were very hostile. As some residents recalled, the stress level of those flooded had already been pushed to the limit after experiencing three floods in two years. Stress was further exacerbated by inadequate timing, interaction and communication between the BSC and flood-impacted residents. However, this extreme level of stress that the flood-impacted residents had been going through was not interpreted by the BSC in a compassionate manner because of the extremely emotional responses from the attendees. One resident stated that this situation indicated a lack of capability of authorities such as the council.

I think they were already too hurt. You know. They had three floods. Some of these houses have been flooded three times in two years. And they, they get so hurt and so angry. So they just can't control their emotions under any circumstances. It's not that they went to the meetings in a perfectly good frame of mind... They were already in a state, a terrible state, when they went to the meetings. It didn't take much to upset, yeah. [Resident of St George, whose house was located outside the urban and semi-urban areas (2013)]

Interviewee 1: *The only things... not found it difficult but we were not totally productive, were the town hall public meetings. I think people expect them*

[public meetings to deliver desirable news for them], but it just turns into a yelling match and two or three people monopolise it. And you get nowhere. We had much greater success limiting our numbers to just over 20 at a time. And getting them into a smaller, more confined space, where they felt more reluctant to stand up and yell at you. And it was more of a conversation than a screaming match.

Interviewee 2: *Yeah. And there was questions, you know, throughout and I think a lot more expectations were put on a table to start with as well. So, there was an agenda for the meeting. [The name of the interviewee 1] outlined clearly about... asking questions, perhaps along the way at these certain checkpoints. [BSC officials (2013)]*

[M]aybe that authorities left in control of the flood recovery at a local level possibly don't have the skills to handle people with that level of emotional trauma. [Resident of St George, whose house was located on the protected side of the levee (2013)]

Although the inconclusiveness of the sessions was recognised by both the Council and the residents, they have contrary views on the level of subsequent communication – the Council believes all the residents outside the levee were the most informed being contacted individually, while the respondents outside the levee claim that no opportunity for further communication was offered. In particular, generalising the situation with the word *everybody* negatively affected the residents' trust levels in the BSC, because many of the flood-impacted residents interviewed felt that they did not fit in the category of *everybody*. The level of trust worsened particularly after the BSC broke the promises made and people's expectations for further communication failed.

We hold public meetings and... the mayor stand up and say... "We promise that we will get back to you [flood victim] all, each and every one of you, I visit you within a month". Six months later we still haven't heard anything. So it's been public commitment... and they have promised and promised to engage with them but that's not happened, which is sad because... it could put a lot of the fires out because... there hasn't been the communication. [NGO staff (2013)]

Furthermore, some respondents felt the decisions had already been made and the meetings were PR attempts to placate, cajole and convince. Instead respondents felt that community

members should have been involved from the beginning as stakeholders in the decision-making process, contrary to the description in the Council's Media Release (2013, P.2) stating "The decision to build the levees comes after... consultation with... *stakeholders* from the community".

Council have never wanted to listen to people. All they wanted to do was maybe attempt to hide the problems that it is... [Interviewer: It was called consultation but not really...] No. They just told us what they were doing... Now the levee's done [in St George]. She [Mayor] has celebrated and... a Minister had a pat on her back. She's getting money for another one in Bollon [another township in the Balonne Shire]. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

Poor communication – also with the levee-protected residents

The April 2013 Council meeting minutes stated as follows (Balonne Shire Council, 2013e: 19 April 2013 – Meeting minutes P.7 – extracted and summarised).

- ... Council propose to acquire all existing rights and interests in the land described in the schedule ("the Land") to the Notice of Intention to Resume a true copy of which is annexed hereto for flood mitigation (public utility – levee bank) purposes.
- Council, as a constructing authority under the Acquisition of Land Act 1967, intends to take all existing rights and interests in the Land for flood mitigation (public utility-levee bank) purposes for the reasons detailed below.

Some residents interviewed criticised the BSC's intention to *resume*, because those whose lands were likely to be affected by the levee reportedly received legal documents without being provided the full detailed terms and conditions. Several interviewees criticised the BSC's forcible approach that the council accessed their properties without official agreements with them using a *bullying tactic*.

[B]ullyng tactics. To try to get us to sign easement documents. There's two particular staff members [of BSC] that came, saying "you need to sign because you are the only people that haven't signed." When we [neighbours] all talked to each other and found no one has signed. Their [BSC] business was very, very unprofessional. [Interviewer: Did anyone point it out to the council?] Yes. Some people wrote letters. But it didn't do anything. [Resident of St George, whose house was located on the protected side of the levee (2014)]

They [BSC] have no respect to people's feelings. None whatsoever. There's a girl over here [neighbourhood]. She almost had a nervous breakdown over it. They went through her yard and dozed every tree out [to make way for the levee] and... Bloody mess that was. [Resident of St George, whose house was located on the protected side of the levee (2014)]

Interviewees claimed that the BSC constructed the flood levee across people's backyards despite the lack of agreement on terms and conditions for the levee which was made of compacted dirt reached a couple of meters-high. Although these interviewees' houses would be protected by the levee during future floods, they felt their quality of life was significantly impacted by the forcible instalment of the levee. Moreover, affected property owners were extremely frustrated and traumatised by the physical damage to their land blocks and the psychological damage caused by the BSC's series of actions (and inactions). As a consequence, some of them were considering selling their properties and moving elsewhere.

This is our yard. It goes right over that other road. I had all this mown and gardens down here. I had fruit trees all way along here. And they [BSC] dozed all that out. There's been no compensation. No right of entry or anything given. They just came in and did it... They told us, when they did this, that they would replant our trees, that they would maintain this bank. But they would never ever come into the yard to maintain the bank. They would keep that clean and has to be kept tidy. They would plat the trees. They would put an irrigation system for me. None of them has been done. Nothing. I was guaranteed that I would be able to drive my lawn mower over that. And I cannot. My wife cannot get over the bank on that side. I bought this block of land because I've always... wanted more than just an allotment. So I had sheep out there. And I was going to plant more trees over there, fruit trees. But now I cannot even get there. [Resident of St George, whose house was located on the protected side of the levee (2014)]

[After the levee has been constructed] I invited the Mayor to my backyard. She said I agreed to have the levee; I said I agreed to have levee but conditions were not met. The Mayor exactly said "I go on a handshake. I don't have to have things signed." When my sons pointed out the misleading gesture, she didn't know what to say. [Resident of St George, whose house was located on the protected side of the levee (2014)]

A BSC official in charge of the levee project, during interview, admitted that the levee construction commenced and completed before legally-viable agreements were secured at some places where the levee was constructed to meet the tight time frame of the project. The official described the situation a set of challenge rather than that of problem, and did not specify the sections without the legal agreements. Further email communication with the official indicated that the BSC made access to residents' land blocks based on either written agreements signed or verbal *agreements* over the phone.

Typically it's better if you can have the legal paperwork sorted out first. But, because we were on such a tight time frame... we are still going through the legal paperwork even though the levee bank is actually constructed. So that's... I wouldn't say it's a set of problems, but it's definitely its own challenge. Because... we've built it now... and it's after the fact that we are trying to get people to agree to terms. So that would be definitely... one thing that would have been better [if it was] the other way round. But we just to meet those time frames, we just had to do it that way [BSC official (2014)].

We sent those letters and got permission first before we went on their properties at all. After they signed and returned those forms, we could do whatever we needed to in relation to construction. If we had to access a residents land before the permission was signed, we just phoned them to ask permission. [BSC official (email received 15 August 2014)]

Impediments for local residents to resolving the issues

Although local residents were impacted by the pressure from the BSC in various ways, interviewed residents stated that they eventually had to give in to the power-balance. For example, it could take too much money, time and energy for individuals to take the issues to court, while there would be no guarantee of winning.

The whole trouble is I'd like to take a legal action, but it will cost a fortune. It will cost me \$50,000 without even taking the council to court. And if you won, they will challenge it. You could be in court for many, many years. And it's not worth it. Better off selling out. [Resident of St George, whose house was located on the protected side of the levee (2014)]

I think only thing that will solve our situation is if we won our court cases against them [big local industries] all. Apart from that there's nothing we can do against [the name of an irrigation company] and the property across river this side. It costs a lot of money and time to do that. So it's nearly a no win situation. You're going die trying or run out of money. And that's what they do to a lot of people. People give up. [Resident of St George, whose house was located outside the urban and semi-urban area (2014)]

This overwhelming frustration led some interviewees, mostly local residents who were impacted by the floods and the aftermaths, to feel exhausted and distrust in the authorities. Some interviewees could not help being doubtful about everything that the BSC does from now on because of their traumatising experience with poor communication and subsequent decrease in the trust level. When asked, whether this affects your view of the council or not, a resident replied:

Yes. From now on, I would have to question council's decision-making ability whether they are still doing dictatorship or listening to the people. [Resident of St George, whose house was located on the unprotected side of the levee (2014)]

Views on the communication with the Mayor

As presented earlier in this chapter, a number of interviewees stated that announcements made by the BSC were often very assertive, which made some residents including flood victims upset. Some interviewees positively acknowledged the Mayor's strong initiative that made things happen. However, a number of interviewees, including the ones that acknowledged the Mayor's initiative, also believed that the Mayor's strong personality affected the BSC's way to communicate with residents (and possibly others) and that she was mostly concerned with pursuing her own *achievements*. In addition, an interviewee stated that the Mayor clearly put pressure on the community members not to seek external (i.e. beyond the BSC) support.

[T]hese are the arguments, these are why people are so annoyed. And ... never have we been able to sit down and talk on a one-on-one basis with someone that can make some sense out of any of it. And yet... they [BSC] are telling us that this is what's gonna happen. Not what "Would you like to... see this happen?" [but] it's "This is what is going to happen", you know. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

So, it's because of her personality that she wants to have something done whether it's right or wrong, it's achieved and I've done it. If you're that sort of person, you need to gear everything to be positive, it's a great thing. You cannot say "I don't know if it's gonna work." As a leader, maybe it's a good quality to have. But for a lot of people, even some councillors, they felt steam-rolled. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

Even I've tried with media to be heard but they just squashed it. At one flood meeting in here, the Mayor brought up and looked straight at me "Every time something gets on the TV or on the radio about this out here, we get a call from above to shut it down." I don't know who above is. She didn't elaborate on that. But she was quite upset that people were going above and out to the media trying to say things. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

Views on the communication with the Communications Officer

A number of interviewees also pointed out that the Communications Officer at the BSC did not achieve a good level of communication either. Although the schedules of mitigation projects were successfully maintained to meet the requirements given by the State Government, some interviewees commented that the communication approach was not taken in a way that all stakeholders felt that they were properly addressed. As one of the interviewees stated below, I consider that this view is not the condemnation against the Officer as an individual but caused by an institutional flaw that severely impacted the communication level between the BSC and residents in disaster recovery.

The woman they've [BSC] got, who is supposed to be talking to people here that was employed for the flood, she's been ordered out of a lot of their

yards. They've told her... never come back. Because she is just playing bloody stupid. Has no idea. No idea. She is sort of being given a short shift or whatever she's gone. People have just said "No, we don't wanna talk to you, [the officer's name]. You don't know what you are talking about." [Resident of St George, whose house was located on the protected side of the levee (2014)]

[S]he's very young and she's dealing with people that have been around for a lot longer, and who would have a lot more general knowledge about this place... So there's been flooding and so, probably that's been difficult that she's the spokesperson... Because you probably do need someone who's got a bit more [experience]... [N]ot that's to blame any one individual. It's just, that's probably been difficult. So the communication probably isn't fantastic. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

The Communication Officer's comments reflected the challenging situation of dealing with the levee construction with local residents as follows. The combination of the comments indicates that the Officer, on one hand, insisted that necessary information was *sufficiently* delivered (whether it was a one-way or two-way communication), but on the other hand recognised the dilemma of balancing expectations from both sides – the council's projects and the residents' feelings – as the council official in charge.

So, basically everybody on the wrong side of the levee, particularly down... in these few blocks, was all contacted individually. So, letters were sent, phone calls were made, information packs were dropped off. We spoke with all these residents. And so... the people who had the chance of most being impacted by our decision were sure to have the most knowledge [BSC official (2013)].

[For] some people it is still an extremely raw topic. And... it is very emotional still down to this day. There are... people even on the inside of the alignment, who are being protected, who may, for whatever a reason, be unhappy about something about the levee bank. And when I go to the shop, they can't look at me anymore... they won't look at me anymore. I'm the levee bank person... So it's not because of me not wanting to, it's more about... working out what's sensitive for them and not continually throwing myself in their problems and... yeah... [Is there anyone who can work in between you and the residents?] It's me... the house raising stuff, like all of them are council

projects. And council just has a representative to liaise. And that's me... on most of that... So it's the thing... I guess... taking out their feelings of what council have decided on the person that they see, yeah. [BSC official (2014)]

BSC's limitations possibly contributed to the poor communication

Some interviewees identified that recent centralisation of local political structure along with the tight time frame of the project and key BSC officials' egos may have additionally contributed to the BSC's decisive approach prioritising planned achievements over shared processes. At the same time, the financial limitations and lack of expertise of the BSC as a regional local government posed challenges in the implementation and maintenance of recovery and mitigation measures.

Our council has changed a lot. This is a massive shire, and St George is a big financial centre [of the shire]. We used to have divisional voting to have representatives from each area. I felt it was a better representation. We don't have that anymore. It may have stopped nearly 20 years ago. We have less numbers of councillors as QLD had amalgamation of councils few years ago. We now have 4-5 councillors, which used to be 12, although we didn't have amalgamation here. We changed the nature of the council. Now there are more paid persons, which can be a political role. Whereas it used to be more doing something for your community. They still do that but it's changed. For example, Mayor's job is fulltime now and earns a large amount of money. The role used to be more like an additional task for someone in the community. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

Often in a little town like St George, engineers come but they are not committed. We have doctors who are committed. ... The engineers probably think it's a good decision to have the wall on Terrace. But we are going to be left with their decision. [Farmer of St George, whose house was located outside the urban and semi-urban areas (2014)]

4.1.3 Impacts and coping capacity further affected in the community

Self-coping and social vulnerability varied

Most flood impacted interviewees found ways to deal with the physical damage caused by the floods, particularly in the early stage of recovery. Some residents accepted the damage and

loss because they couldn't change what had already occurred. Others picked themselves up and moved on.

[W]hen the water was rising and rising, rising and we didn't know when it was gonna stop, that was probably 'the' most stressful. But once when you knew it was in the house, it was like "Oh, OK." It's done. And then it was just... "[I] deal with it". Yeah. Because now it's happened, you can't change it. But, I think the anxiety and the tension of not knowing whether it was going to go in or that was... that was stressful. But um yeah, once it was in, you can't do anything about it. [Resident of St George, whose house was located on the protected side of the levee (2013)]

We need... to all move on if... people can move on. Some people are finding it hard to move on. But... you just, you've got to do it for your own frame of mind too... You know, there's a few people that... I worry about, who... take it really too hard. And I think "... what's this doing to them?" You know, really, for their own health. For the older people, you know, down the street. So they, you know, it's a heartfelt topic to them and I can understand that. But, you know, when do we move on? [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

However, there were many more cases of those who were too traumatised to recover or even to think about recovering. Moreover, a number of interviewees declared that they sought professional counselling and / or medical services. This was not only because of the physical damage caused by the series of floods but also because of the uncertain, protracted and frustrating situation following the flood, in which they felt there was *no way out*. Some residents remained on medication for depression and lack of sleep.

So there were a few issues there and a lot of the community groups, some of these people down the end here, some of them recovered, some hit the ground running and stepped up and did a lot of work; some of them because of their age never are gonna recover. And, I also have to add, some don't really want to recover. Do you know what I mean? Like in their own mind they think that they are so shattered about what's happened that they've got, emotionally they haven't got the inner strengths to get up and go. [NGO staff (2013)]

And then you have your emotional component. And... I've sort of hit the wall a bit. Yeah, I had to go and... get some sleeping pills... because you're worrying about a whole bunch of different things more than you normally would... it just go on and on type of deal... And you know, in our case, at our age, it just means you can't retire. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

Flood- and/or levee-impacted interviewees often stated that their interaction with other community members was not really affected by the floods and/or the related issues. However, at the same time many of the interviewees did not believe that their hardships were understood by the others. This lack of understanding widened the gap between the impacted and the non-impacted. Some flood-impacted residents felt that others in the town had moved on leaving them and their issues/difficulties behind. In an extreme case, one flood-impacted resident completely lost faith and isolated oneself from others in the community.

[F]or the majority of residents that are not affected by the levee, it looks that the council did a good job, establishing levee, holding meetings and listening to those who were affected [because the majority don't know the stories of the flood- and/or levee-impacted residents in detail]. Whereas, we weren't heard, no one provided feedback. So we will have different views because of that. [Resident of St George, whose house was located on the unprotected side of the levee (2014)]

I don't interact with people in town even things other than floods. I don't want to. I just look at some of them "I don't like what you did to me", "I don't like how you didn't have balls to come and tell that you were going to do it to me." They are not nice people. They could have all got together and said "We got water through your house to save our cotton farms. But we can send our wives to clean up the mud." They didn't do that. Prior to the floods, we didn't have problems with people... I don't think it's possible to get everyone back together again now, because the town is so split now. And the levee has made even a bigger split... If you try to get together as a group of flood affected or something, Council soon make sure that they victimise every person in the group, so it doesn't go anywhere... I don't want to have anything to do with them anymore. I'm over them... I've lost interest in them all. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

Perception of greater impact and hardship elsewhere affected the community

The scale of the events also affected interviewees' varied perspectives. Many interviewees considered that the severity of the flood impacts to St George as a whole were far less than that experienced elsewhere such as in the Lockyer Valley where a number of fatalities occurred. However, others, particularly those who were directly impacted by floods, emphasised that the initial damage and the aftermath and ongoing issues had significantly affected their lives as individuals.

Although the flood here was the centre of attention during the event, it's still a minor thing compared to other places such as Grantham and Brisbane that involved human loss. [Resident of St George, whose house was located on the unprotected side of the levee (2013)]

In St George, the flood and the council levee don't affect the majority of the town. But these factors changed everything greatly for those who are impacted. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

Blame and controversial land planning entwined

According to a locally-knowledgeable interviewee, the 2010-2012 flood impacted area may have been made available to develop as residential blocks a number of years ago with an involvement of the then BSC. However, a BSC official stated that the development was approved by the state government despite the BSC rejecting the proposal. Most interviewees admitted that people should have never been allowed to build houses in such a hazardous area in the first place, but their views on the liability for the residence varied.

The low-lying land was made available for residential development long time ago. Apparently the council at the time was involved, but there's no evidence other than anecdotes. [Resident of St George, whose house was located on the protected side of the levee (2014)]

[T]here was no flood mapping at all and the planning scheme, which is not unusual in Queensland. It was all over the place... [T]he planning scheme itself was developed by well meeting people with a fair bit of local

knowledge. And just by application of local knowledge some places were excluded... [T]here was actually a turning point and... it does actually go back to the provisions where the aged home is... [C]ouncil refused the application. And the State intervened, called the application in, and overrode the council's decision and built it on that land... That's when the development of that end of town started with that State intervention... [I]t's certainly expanded from there. But once it went down there, there was sewerage down there, there was water down there. There was localised fill and that saved some of those places. Some of them proved not to be high enough, or high enough from the first [2010] and second [2011] events, not in the third [2012] event [BSC official, 2013].

What I cannot work out is why they built their houses in the flood area, particularly a few of them lived in St George all the time. Before the floods, I told one of them, the second vocal one, and his house went under. Locals who lived here forever and they know it goes under, but they still bought and built down there. I think people have short memories in this town. [Interviewer: At the same time, they were allowed to build there...] Yeah, which is a bit weird. They should have had stipulations on height. Because it's the lowest point. I remember flood in 80s and 90s, it always goes under. So that's why I couldn't work out. Although those floods were not quite as high, it still went under. A lot of the houses weren't even there then, actually. The area below the bridge, pass the bridge and go down Albert Street, was expanded in 90s. A lot of them were either newly built or brought in over last 20 years. [Resident of St George, whose house was located on the protected side of the levee (2014)]

Agricultural structures were an un-addressable issue

A number of interviewees claimed that the agricultural development on the other side of the river effectively functioned as a big dam and/or levee that blocked the natural course of flooded water, which raised the water height on the town side. The enormous-sized cotton farms were developed on the former flood spillway, which is locally called the *Glea*, utilising the rich fertility of the soil. Reportedly, these agricultural structures had been built by cotton farmers to develop their irrigation system and to protect their farms from flooding. The *Glea* had reportedly been blocked up with vegetation and earth, both naturally and by farmers.

*It's not that I am trying to stop farming. But what I'm trying to get back to is the *Glea* could better manage our current river system. Because now that ... you've got that water storages, you've got every bloody water course up and down, this river is blocked off. And that's every water course... And now we've got our council building a levee bank instead of taking those things on,*

*you know. Put the money into the Glea, and use the Glea as an asset.
[Resident of St George, whose house was located on the unprotected side of
the levee (2013)]*

A respondent to the 2014 questionnaire, who categorised their occupation as “government”, selected the answer “I believe that the private flood levees affect flood risk to my community” out of multiple options to the question “Which of the following statements most accurately describes your opinion on the private levees on the agricultural side of the Balonne River?”. This indicated that some government officials thought that the agricultural structures influenced the flood risk at least to some extent. Corresponding to this, a BSC official also explained, during their interview, that the council had sought ways to regulate the agricultural structures asking the state government for support, because the BSC’s capacity for the task was limited in many ways. But the state government’s response did not recognise its responsibility to tackle the issue.

[T]here was a request to have a look at levees in particular below St George. We went to the Queensland Flood Inquiry... made a submission and gave evidence that somebody has to be responsible for the levees across the floodplain. We didn’t have the capacity to do it. We haven’t got the hydrologist. We haven’t got the engineers. It had been in the state and they’ve withdrawn from it... [T]he recommendations of the commission came down and said, “Yes, somebody should regulate it” but didn’t say who. So... that is a moving feast [BSC official (2013)].

Some other interviewees pointed out that the flood-impacted residents had not been listening to people other than themselves. These interviewees thought that, on top of the challenge in communication between experts and public, the flood-impacted residents’ excessive anger may have manipulated their interpretation of the hydrological reports to identify the *responsibility* at others.

The fact that they [BSC and hydrologists] could not be definitive was interpreted as ambiguous. And conveying scientific concepts to general public is challenging too. [The interviewer: Same material can be interpreted differently too...] Yes... They wanted more responsibilities taken by farmers.

[Resident of St George, whose house was located on the protected side of the levee (2014)]

Unfortunately, a lot of people in town think cotton farmers are to blame. A lot of ignorance as well. I've heard a lot of "It's all the cotton farmers' problem, because they built their dams." You have the smart one who sees the bigger picture, and you have the others. [Farmer of St George, whose house was located outside the urban and semi-urban areas (2014)]

However, some interviewees stated that the cotton farmers pressured the local residents and even the BSC not to introduce anything that would effect agricultural structures and development, which reportedly had no restrictions (as of August 2014). Interviewees confessed that a number of community members, even the BSC, could not take action against irrigators and cotton farmers, because the members' livelihoods often depended on the extremely powerful industries in the region.

[T]here was no regulation [for land development associated with agricultural water course management] going on. Council thought they would do better finding out about this. So, the next council meeting... as I walked up the stairs into the meeting room, the stairs were lined either side with cotton farmers. You know. And one just heisted me and said "You might be able to walk in, but we probably have to drag you out." You know. Then... they all came into the room. And they stood there and... just intimidated the whole meeting... And councillors are only people. You know. So they just went to water on the whole issue and said "This is too hard." [Resident of St George, whose house was located outside the urban and semi-urban areas (2013)]

What we found here by speaking out about structures around us is you get extremely victimised. Because the irrigators have a lot of power. Most of town work for the irrigators or have businesses. It makes very difficult to get anybody to come forward or say things. They know the problem. But they don't wanna, they cannot say anything. People have lost their jobs over speaking up. And people still cannot get work in town, because they spoke out. I have lost a lot of business through speaking out. [Resident of St George, whose house was located outside the urban and semi-urban areas (2014)]

If it wasn't that strong enterprise, there may have been different options, for example negotiating to move the wall or exchange thoughts etc. [Resident of St George, whose house was located on the unprotected side of the levee (2014)]

In addition, some interviewees reported that the Mayor had visited cotton farmers informally without other officers. This heightened the residents' distrust and scepticism in the relationship between the BSC and the powerful industries.

Our Mayor, she was supposedly going over and have meetings over there [cotton farmers' agricultural developments] without any other representatives, without any other councillors or whatever. She was going on her own. So who knows what was said and all those sort of stuff. You know. She was looking out of interests over there more than the interests in town, I'd think. That was the thing that a lot of people sort of didn't like. [Resident of St George, whose house was located on the unprotected side of the levee (2014)]

Prioritising prosperity over flood victims' recovery?

On top of the lack of understanding between the impacted and non-impacted, the dominant cotton farmers were noted to have a very large contribution and influence to the town. Almost all interviewees acknowledged that current prosperity of the town was developed and maintained by the strong cotton farming industry.

We've got a wonderful town here, wonderful Shire, wonderful part of the nation. A lot of people do different things, which makes it great. Different enterprises going here. All those things are positive. Majority of those positive things, most of the town of St George and the Balonne Shire. And just a few negative things. If there is good things there, you must say that. If there's bad things there, you should also be allowed to say that. [Resident of St George, whose house was located on the protected side of the levee (2014)]

I... think long term prosperities is the only thing that really sorts communities out. You know, you can do stop gap things and little measures, for the end of the day everybody's got to be getting a good quality of life for a long period of time. I think the solution for the community is to be vibrant and...

prosperous. [Cotton farmer in St George, whose house was located outside the urban and semi-urban areas (2013)]

However, some interviewees questioned that the political action was taken in favour of protecting big industry over flood-impacted residents. In parallel with this, some others pointed out that many residents, presumably a large number of the levee-protected, did not advocate the idea of sharing the cost of mitigation for the non-protected, which was possibly the indirect cost of the town's prosperity.

No council legislation. They [cotton farmers] can do whatever they want, while you [residents whose houses are located within the Flood Investigation Area] can't do anything here to protect yourself. That's what basic, basically comes down to. So in another words... government and probably local government are backing the bigger people, bigger pay-checks. They are not worried about that psychologic, psychologically it's damage to these people in here, whereas over there wouldn't worry anybody, because it's... multi-million dollar company. And they can afford to fix up anything goes wrong, whereas this side of the river they [the residents] can't. You know it's a socio-economic thing. [Balonne Shire Councillor (2013)]

[The name of a resident of St George] proposed at one of the public meetings, in front of 200-300 people, that all tax payers who would be protected by the council levee should fully compensate the residents outside the levee. But it was not advocated by other attendees. [Resident of St George, whose house was located outside the urban and semi-urban area (2014)]

4.1.4 Lessons from the St George case study:

Risk reduction measures negatively impacted the vulnerable

Recovery and risk mitigation measures impacted residents of St George unevenly pushing the vulnerable to a more vulnerable position. The BSC's focus on the flood levee construction was aimed primarily at risk reduction for the town's majority rather than disaster recovery of the flood-impacted residents. Moreover, many of these flood-impacted houses were excluded from this flood levee. Owners of these flood-impacted and levee-excluded houses were provided with the BSC's funding supports for individual mitigations that were typically

insufficient to compensate the remained or increased flood risk, or were even classified ineligible depending on the location.

At the same time, the BSC had to make decisions under a different level of political power-balance. The BSC's limited capacity in size, expertise and finance only enabled the BSC to take solutions with external supports that were available and feasible in a limited time. These limitations possibly contributed to the preference for *quick* solutions. This may be accountable for the poor level of communication as BSC's institutional failure and the series of forcible approaches taken.

The local power-balance created uneven situations

According to a range of interviewees, the BSC exercised political power in a rather repressive way, which exacerbated the situation for less-powerful community members, who were impacted in various stages after the series of floods, for example:

- rejecting the residents' flood committee since the public information session due to the committee's *aggressive* approach;
- resuming some residents' private lands for the levee construction without formal agreements; and
- imposing political pressure on residents not to interfere or even object the BSC's initiatives.

Moreover, most interviewees were aware of the conflicting idea that actions taken by the local economic giant, the cotton farming industry, may have marginalised the vulnerable, but also hugely contributed to St George's financial prosperity. Vibrant life style provided by the prosperous financial contribution impeded the non-flooded residents and the BSC from actively discussing the issue being caused and accelerated by the uneven power-balance.

In some situations, indifference and blame rather than recovery was privileged. Such presence and use of power-balance minimised opportunities for the community members to communicate on *their* issues and challenges. As a result, different groups of the community

members often could not and/or did not understand situations of others in the town. Particularly, interviewees who were impacted by floods and/or mitigation measures often admitted that their issues were not properly understood by or even shared with others. Some appeared to have given up explaining their situations and become quiet after failing too many times, while others considered this very quietness as a sign of *recovery* that led them to general indifference.

In addition, this lack of mutual understanding drove the different groups to blame each other. Although interviewees presented different views on the post-flood situation, the focus was often similarly on whose fault and/or responsibility it was instead of how best to recover and reduce risk. This conflicting relationship was determined by the uneven power-balance between different groups of people in St George, exacerbated by a lack of meaningful communication.

Grantham

[I]t's an experience I'll never forget... The water coming through, we could handle. Quite frankly, and please excuse my language, it's the bullshit after that we had problems with. We had so much trouble with. [Resident of Grantham, who did not participate in the land swap (2013)]

This sub-chapter investigates the recovery processes and outcomes of Grantham community and its members after the devastating 2011 flash flood at a micro-local scale. This sub-chapter incorporates background material such as policies and publications and datasets acquired during fieldwork in the Section 4.2.1. The following sections are predominantly based on the fieldwork datasets.

The sub-chapter starts with the overview of the LVRC's land-swap project, the primary recovery and mitigation measure, which is highly relevant to other findings. This is followed by addressing issues on the project participation at an individual level such as timing, finance and livelihood. It then explores other related issues in recovery along with their connections to the project. The sub-chapter looks into issues in recovery at an individual scale by categories of mental health, social impacts beyond hazards, services/businesses and public understanding. In parallel with these issues, the sub-chapter then addresses Grantham community's human-relations affected by multi-layered clashes occurred between different groups, including: authorities and residents; the LVRC and the community recovery centre; and some residents and other residents. Of which, the intra-residents conflict is further investigated identifying its potential causal factors of community history, media attention and gathering venue and opportunity to address the mechanism of community recovery in Grantham. This sub-chapter concludes with remarks that point out how combinations of issues identified in this sub-chapter indicate important factors of disaster recovery.

4.2.1 Land-swap

Overview of the land-swap project

Grantham was impacted by severe flash flooding in January 10, 2011. Soon afterwards, on 8 April, the LVRC acquired approximately 935 acres of freehold land adjoining the existing township of Grantham on a hill-side that had not been affected by the recent flooding for the proposed new development (Lockyer Valley Regional Council, 2012b, Queensland Floods Commission of Inquiry, 2011b). The LVRC funded the land purchase from internal resources and the site was considered large enough to accommodate future growth of the town (Simmonds and Davies, 2011, Lockyer Valley Regional Council, 2012b).

The land-swap program offers an opportunity for resettlement in the new development area for the 119 Grantham and surrounding property owners whose houses were heavily affected by the 2011 flood event (Lockyer Valley Regional Council, 2011a). The following has been extracted from the Grantham Relocation Policy document (Lockyer Valley Regional Council, 2011a).

- Eligible property owners have an option to swap their existing residential land for a land block of similar size within the newly developed area.
- Residents undertaking the land-swap can nominate their preferred block(s) within the new development, although final selection will be made by a ballot. The ballot will be conducted by an independent consultant to ensure complete transparency of the process.
- Participation in this program is completely voluntary.
- The LVRC will assume ownership of the vacated land in the flood-affected area for non-residential use (e.g. grazing, pasturage, etc.), while the landholder will be responsible for removing the existing buildings from the vacated site.
- Eligible landholders will be exempted from paying transfer duty on their new lots (Simmonds and Davies, 2011).
- Special grants of \$35,000 will be provided by the State Government for eligible landholders to supplement resettlement costs (Simmonds and Davies, 2011).

The initial ballot was held on 6 August 2011 and 72 land-owners took up the offer of a land swap. A second ballot was held on 18 February 2012 and a further 12 residents took up the offer. 85-95% of those that took up the offer were allocated one of their top three block choices (Lockyer Valley Regional Council, 2012b).

Originally designed to end on 30 June 2012, the land-swap offer was extended a further 12 months to increase the take-up by flood-affected residents (Lockyer Valley Regional Council, 2012b). As at July 2013, all 115 blocks in the new estate had been signed up and 45 houses had been either completed or were under construction. The LVRC has incorporated flexibility within the project to accommodate unforeseen developments or advances in knowledge. For example, Laidley South, which was not originally included in the target areas of the land-swap scheme, is now eligible to participate in the resettlement project, in view of its high risk of flooding (Lockyer Valley Regional Council, 2012b).

Speedy implementation

On the morning following the flood, it was clear that parts of Grantham were destroyed and what remained was severely damaged. After witnessing the destruction, the LVRC Mayor recalls thinking “If you’re ever going to make a change, now’s the time to do it” (Lahey, 2011). This was the stimulus for action by the LVRC, who immediately set about discussing better options before rebuilding in flood affected areas commenced (Lahey, 2011).

Simmonds and Davies (2011) explain that the LVRC made a critical decision to act quickly, finding non-flood prone land close by for community resettlement. They wished to provide certainty and establish a clear vision for the future for the community. It was supported by a number of residents, who were faced with difficulties such as declining land values and a lack of existing flood-free residential lots (Simmonds and Davies, 2011). The LVRC decided on a policy of eliminating the risk of future flooding entirely, rather than simply mitigating it against such a possibility. The policy involved the voluntary resettlement of residents from the flooded townships of Grantham, Murphys Creek, Postmans Ridge, Withcott and Helidon, whose homes had been destroyed or suffered major damage (Lockyer Valley Regional Council, 2011a). The resettlement area (residential section) and the flash flood-affected area in

Grantham are physically separated at the closest point by approximately 50 m. The difference in ground elevation of the two closest sections is about 3 meters (Figure 12).

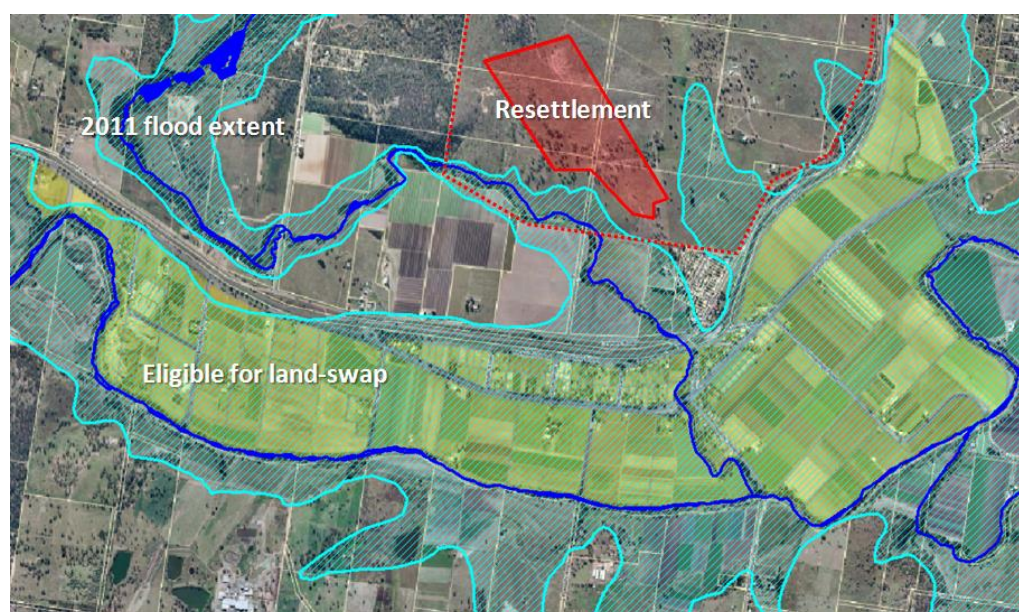


Figure 12: Resettlement area and the estimated 2011 flood extent in Grantham

The light blue shade represents the estimated 2011 flood extent, the yellow shade covers the area eligible for the land-swap scheme, the red boundary with dotted line represents the approximate resettlement site and the red shade shows its approximate residential section (Source: Okada (2014), Data from Lockyer Valley Regional Council, 2011a, Lockyer Valley Regional Council, 2012a, Queensland Reconstruction Authority, 2016)

In April 2011, the new development area was acquired by the LVRC for the resettlement, altering the urban footprint of the township (Queensland Floods Commission of Inquiry, 2011b). A previous proposal for urban development of the area had been rejected (Harwood, 2013, Queensland Floods Commission of Inquiry, 2011b). The LVRC worked closely with urban design and planning consultants to: a) arrange a site analysis; b) facilitate planning workshops with the community; and c) establish a preferred master plan for the new site, engaging with the community throughout the process (Simmonds and Davies, 2011)(Simmonds and Davies 2011).

In order to better understand the needs and visions of local residents, extensive community consultation and a series of meetings were facilitated by senior Queensland police officers and LVRC officials (Lahey, 2011, Queensland Reconstruction Authority, 2013, Simmonds and

Davies, 2011). The LVRC believed that successful recovery should be responsive and adaptive, and empower local communities to move forward (Lockyer Valley Regional Council, 2011b). The focus of this initiative was placed on the local residents and businesses, in supporting them to be safe, secure and sustainable, while developing their future risk awareness and preparedness (Lockyer Valley Regional Council, 2011b). The master plan, which reflected the community's voice (based on consultations and meetings), was presented to the community on 26 March 2011 – just 10 weeks after the flood event (Simmonds and Davies, 2011).

Inter-governmental challenges – State government was not supportive for LVRC

The LVRC also worked closely with media groups throughout the project term to keep the local residents informed and to sustain the recognition of the project among political leaders (Lockyer Valley Regional Council, 2012b). However, the Queensland Government was against the idea (2013). One LVRC official stated:

Council then made the decision that we would... first of all talk to the government... State government officials were not keen... to them [the resettlement plan] was too simple, it couldn't work, why would you even consider it, all those sorts of things... I think that aspect of government's response is very typical to what happens in Australia. People don't like change... they absolutely detest change. But here we had something that was so, so obvious... the place has been destroyed. You've got a safe piece of land right there in a perfect circumstance. Why wouldn't you at least investigate it? But they didn't even investigate it." [LVRC official (2012)]

As the LVRC plans developed, the state government revealed that they would not support the project.

I met with the Premier at that time. And I just said "...We will be proceeding." And she said "... It will be at your financial and political risk." [LVRC official (2012)]

It was also reported that the state government desired that all communication regarding the LVRC resettlement plans to be filtered through them.

[T]he state government, through the [Queensland] Reconstruction Authority and the Premier, wanted all communication through them even to the federal government. We [LVRC] were totally against that and didn't participate in that. We made our own approaches to whoever we wanted to approach... Had we gone through them, we wouldn't have the estate. [LVRC official (2012)]

Another issue noted by officials was that the state government was concerned that they would be obligated to match, dollar for dollar, any federal money handed down to the LVRC, which they were reluctant to do.

We [LVRC] then met with the Prime Minister. We made our arrangement for them to give us some money. After the federal government had given this money, the state government then realised they were in a bad circumstance. It was all about politics. It was about control, all those sorts of things and not wanting to spend money. [LVRC official (2012)]

However, once the LVRC received contributions from the federal government, the state government reconsidered their stance. This brought the total financial package to 18 million AUD for the provision of infrastructure for the new site (Lockyer Valley Regional Council, 2012b).

Challenges for participation – land-swap as risk-mitigation was appreciated, but not everyone were able to participate in the land-swap

Almost all interviewees appreciated the effectiveness of the land-swap scheme in risk reduction. However, a number of concerns were also identified with its implementation. Many respondents discussed the fact that there had not been enough consultation and that the process had been rushed. Although people noted that there had been numerous meetings, those who had dependents or worked out of town had found them difficult to attend. Others noted that they had found the initial meetings too stressful and had stopped attending, as many people were angry and the meetings were less about planning for the future and more about blame.

[W]e weren't able to attend very often with a little baby and we, both of us working... [Resident of Grantham, who participated in the land-swap (2013)]

[S]ome people who lost their loved ones were very very angry and very upset, because ... more should've been done, it should've been prevented and so on. So they wanna put up court cases and that. And they made all this known in that public meetings when we were supposed to be, you know, working together to recover. And so it brought a fair bit of... you know, ill feeling between the people so much so that in the end, the Mayor refused to come to the meetings again. 'Cause there was, you know, blame him for this and that. [Resident of Grantham, who participated in the land-swap (2013)]

The speedy introduction of the land-swap scheme was not early enough for some residents, according to the council officials interviewed. Those residents flooded in Grantham had spent money such as insurance payouts to repair their houses immediately after the event. When the land-swap scheme was introduced, they could not afford to participate in it. Other interviewees were concerned that some residents, after they signed up for participation in the land-swap, regretted having made rapid decisions and/or had not correctly understood the level of assistance that would be provided. Respondents thought this was because they had not been in a fit state to listen or make decisions at the time. Some interviewees criticised the rushed approach taken by the LVRC:

It was all too rushed... and people were... all in shock... they really couldn't think. And I'm sure some of them... [who] did the swap... then found out "Oh, it's gonna cost us all these thousands and thousands of dollars to... put a home on it. I haven't got them"... And they regretted doing it... I think it was too rushed, too quick... not enough consultation... I don't know, 'cause I wasn't involved in it... but whether they didn't explain to the people what the... whole deal [would be], or whether the people themselves just... couldn't think straight... with the trauma and the loss of everything... I think that was probably half the problem. [Resident of Grantham, who did not participate in the land-swap (2013)]

[W]ith the community, it could've been a little bit more ... sympathetic to the community. I know they had to do what they did. It had to happen. And it's a brilliant thing for Grantham as you know like, I think it's wonderful what

they've (the LVRC) done. But, there was a lot of anger, forcing when people weren't ready. [Resident of Grantham, who worked at the community recovery centre (2013)]

Interviewees also pointed out that the additional financial burden for each eligible resident was too great. The participation typically required either cleaning-up of the existing land and building a new house on the new estate or repairing the existing house and moving it to the hill with all the utility fittings in place. Some residents stated that they wished to move but simply could not afford to do so and because of this felt that some of the most vulnerable individuals had been left out from the scheme. These included people who had been uninsured or had not received a full pay out, did not have independent financing or assistance from friends and family, or were unable due to disability, family commitments or age to work and pay a loan. For some residents the financial barriers to moving were significant. In other cases, because there was too little or no structural damage, the insurance payout would not cover the cost of building a new house and/or the owners of these properties were not considered eligible for the land-swap. These people felt unsafe because of the future flood risk and a potential decline of their property values.

[W]hilst that (land-swap) was very good for some people, who lost... all their house... and everything... the ones in this street here in high houses and other people in high houses... [those who] didn't get the total write off of their insurance of total claim on their insurance couldn't afford to really relocate... The cost were too great... Especially where you are a pensioner... they couldn't borrow money from the bank... they couldn't afford the extra expense to move up to the new area. Even though it was probably a good idea, however I think it would have been great, had they considered those type of people more to assist them up there. But they didn't. [Resident of Grantham, who did not participate in the land-swap (2013)]

Respondents who owned farms, businesses and large-land blocks found the scheme was not suitable for them. The land block sizes in the new estate were often too small for their existing lands. Moreover, the land-use zoning could not be changed after the flood and it would typically require years to get permission to subdivide farmland for residential sections. This subdivision issue was raised by some interviewees. One who preferred not to be recorded added another reason for their decision not to participate in the land-swap. The reason listed

was that physically separating residential section from their work sites might increase the risk of their stock and machinery being stolen because of their absence during the night.

[W]e couldn't do the land swap because... our house wasn't subdivided from the farm. So it wasn't on a separate deed from the farm... And we couldn't move our house up there, because it's brick. You couldn't pull down the bricks to move it up there... and we... wouldn't be able to swap the farming area for land up there anyway, because it's not farming land. So... we have to stay here. And there are others in that same situation. [Resident of Grantham, who did not participate in the land-swap (2013)]

4.2.2 Difficulties that flood-victims faced during recovery

Issues that the flood-victims were facing: pain and trauma

In Grantham, even two years after the event, interviewees were still suffering from their experience of the flash flood event. Some residents described rescuing their neighbours crossing the very rapid flow of water that was smashing cars and shipping containers into pieces in front of them. Interviewees often claimed that they couldn't sleep, had to see mental health practitioners and became upset every time it rained. Some residents whose houses were not flooded also suffered. The shock had affected some interviewees physically so that they could not go back to work for an extended period.

[S]ubconsciously... we didn't realise we were doing that until I talked to my psychologist. When it was raining at night, [the name of the interviewee's spouse (or partner)] would go to bed about 8 o'clock. I wouldn't go to bed till 1 or 2 o'clock. And when I went to bed, [the name of the interviewee's spouse (or partner)] would get up and watch TV. And [the interviewee's spouse (or partner)] said "Yeah, you've got one on watch all the time." I must admit I still... do go to bed late. Like the other night, when it was drizzling, I didn't go to bed till 1 o'clock... But it's not as bad as what it was. But it just drives you insane. Because you try to sleep, you can't sleep. All you can think of is rain and water and... yeah. And because we're only under a tin roof, you can hear every drop of rain. [Resident of Grantham, who did not participate in the land-swap (2013)]

Despite the long-term needs for mental health services for an extended period, these services were often suddenly cut off rather than being gradually withdrawn. According to interviewees,

some residents found that their mental status needed to be addressed by medical practitioners after two years of self-unawareness or -denial. Others suffered from the limited availability of health benefits for the disaster victims despite their prolonged symptoms.

[T]hey actually saw it actually happened to his family. And they are traumatised of what they saw... it took two years for the... family to actually get it out of the system. He's actually talked about it now, and he got counselling two years later. Whereas he was having nightmares, and he didn't know why. [Resident of Grantham, who worked at the community recovery centre (2013)]

I've been seeing a... psychologist... down Mental Health in Ipswich... Now, they've [government] actually stopped... so I'm seeing... the social worker in Gatton. But with my psychologist, they only give me 10 visits a year through Medicare. So... of course, that is finished now... and the support is just not continuing. It's just that they said "No. Everyone's better. If you're not better, you know, it's your own fault. Move on. Don't. Finished." And unfortunately that's not the case. I agree a lot [of the disaster victims] have moved on... They've got their houses, you know, they've got their families... entrenched back into... not the same life, but different type of life... But... some of them, it's not happening for, you know. [Resident of Grantham, who did not participate in the land-swap (2013)]

However, the difficulties that the interviewed flood-victims had been facing were generated not only by the direct impact of the flash flood but also by various situations that took place during the recovery phase. Such situations often vary but relate to the process of and the associated interaction in recovery, which will be elaborated later in this chapter.

The aftereffect is the worst thing... you can handle the flood but everything after is the hardest part trying to get your shit back together. [Resident of Grantham, who participated in the land-swap (2013)]

Issues exacerbated by some builders and financial institutions

Some flood-impacted residents have been left with insufficient services provided by builders. This has caused extra delay in their recovery. Some regretted having had such services to fix their houses, as they no longer had financial means to take alternative measures such as

participating in the land-swap project. In addition, impacted residents stated that relevant authorities/institutions were often not very helpful.

[T]he government brought in all those builders... "Yes. I'll fix 50 houses." And the government says "Well, here's 2 million bucks. You go and fix 50 houses."... And some blokes that would probably only know what a brick is say "Oh, we will do it." You know, so they do it. They fall down. Or they don't turn up. Or they go broke... They... didn't finish it [their job]. They didn't do it correctly. They still haven't finished it... So you got to ring up. And "Ah..." they go... And then, the last builder that was there, he said to me, he said "You'll be in your house before Christmas." [It was the Christmas] Last year. [i.e. the builder still had not finished the work at the time of the interview]. [Resident of Helidon – near Grantham, who did not participate in the land swap (2013)]

The builder came in. And I said "This is the house I want. This is how much I've got. Can you do this?" He said "Yes. I can do it."... and then he said "Look... I'll get your house done... So I paid him small money... eventually I paid him a lot. And he came back looking for more. And I said, well, "No. I've given you the money." And he said "I can't finish your house"... The only thing I can do is try to take the builders through... civil court. Now, one, that takes money to have a solicitor, and two, all he's got to do is say 'broke' and I can only pay you \$3 a month... I honestly do not have the energy to go down those tracks... I could try and fight BSA [Building Services Authority] and try and get a bit more out of them... There's ... [a] few people that are having problems... We alerted the BSA... June, July last year, that we thought that there were problems here. And the basic answer is... instead of trying to fix problems... "No. You have to wait until the builder's finished... and come and see us then"... I don't understand that. [Resident of Grantham, who did not participate in the land-swap (2013)]

I went to the bank. Ah we had our mortgage. Because I wasn't working, because I couldn't work... um... virtually they couldn't give a shit. They said that... "Oh yes, we will give you three months so that you don't have to pay your mortgage." Oh, that's good, got something. But then it gets later, three days later, and [they] say "Well, these are the dates you don't have to pay your mortgage, but at the end you got to pay us \$1,960 of interest." [Resident of Grantham, who did not participate in the land-swap (2013)]

Victims' frustration caused by societal lack and misrepresentation of recognition and understanding behind positive publications

Difficult situations for the flood-affected residents were often exacerbated by the lack of recognition and/or understanding of the individual lives in their recovery behind the *positive* stories that were often widely publicised. They were typically frustrated, because they felt that *their truths* had not been addressed properly or understood by others.

[I]t's been a long struggle... [A] lot of people [are saying], "Grantham it's all back how it's supposed to be." and "Everyone's fine." and "If you haven't moved on, it's your problem." [It's] Not... because... you don't want to move on. And it's not the matter of that. We want to move on. But look where we are living... we are in the machinery shed. [Resident of Grantham, who did not participate in the land-swap (2013)]

[A] lot of things happened in the flood that was publicised on the TV, which was false. A lot of people were congratulated and got medals. They did nothing. A lot of people that did a lot of work and pulled this [community] virtually out of the... mess we were in... were never recognised. [Resident of Grantham, who did not participate in the land-swap (2013)]

The trauma that was created by the council, by... some of the other authorities involved. That has been the biggest trauma. And insurance of course, that was and still ongoing. [T]he sad part is, they don't wanna know about it. They don't wanna speak to you about it. They don't wanna resolve the situation. [Resident of Grantham, who did not participate in the land-swap (2013)]

Some interviewees also claimed that they experienced political pressure from the LVRC to agree to an uneven distribution of rates remission, which was reportedly granted for the flood-impacted property owners for the first six months after the 2011 flood. The LVRC did not consider these homeowners eligible without explanation, but came back proposing a *confidential agreement*, which some interviewees did not agree to. These interviewees were angry about the approach in which negative were being covered up by the positive achievements that the LVRC promoted. Some interviewees were planning to move out of the region because of their experience with the LVRC.

We contacted the ombudsman. The ombudsman worked for 2.5 years to get to the point that the council would agree to refund us our rates that we paid, provided, this is the provided that the council put on, that we signed the council's confidentiality agreement not to speak about their treatment of us. We did not sign the confidentiality agreement with council because that would be suppressing the truth of what has happened here. So I don't have any respect for the council when no one else had to sign a confidentiality agreement with the rates issue. So to me that is nearly a form of blackmail to suppress the truth. The problem will remain unsolved because we refuse to sign a lie. [Residents of Grantham, who did not participate in the land-swap (2014)]

4.2.3 Conflict and tensions between authorities and local residents

Power-balance: Authorities – repressive approach during block-out and search

Residents in Grantham were locked out from the town by authorities including the local government and the police for approximately 10 days following the flash flooding due for searches for missing people. Although interviewees understood the importance of the rescue activity, they were not informed of this at the time of the lockout and many expressed strong dissatisfaction to how the situation was handled and communicated. According to some interviewees, they felt that they were treated as if they were useless, a nuisance or even like criminals.

We left here that night [for evacuation]... we had two sets of clothes each... thinking "... I'll be home in the morning"... not thinking that authority wouldn't let us back. [Resident of Grantham, who did not participate in the land-swap (2013)]

They [authorities] were overwhelmed by what happened... But our frustration was with... there was no one person or one entity in charge. We... suggested to them that they could leave us come in for an hour, get what we needed and see to what we needed too and then go back out. We were quite willing to do that. But, because you couldn't talk to one person in charge or anybody in charge, they wouldn't let you do it... We, we couldn't do just a simple thing like that... They use the excuse that there was a criminal, they called it a crime scene. It's the only way they could keep people out legally. But there was no crime ever committed. [Resident of Grantham, who did not participate in the land-swap (2013)]

I said... "I've got hay in the shed and the water's gone through the shed... It's gonna burn down." 'Cause when it gets wet, it'll just heat... and combust and... bang. And I said "I've lost enough now. And I don't wanna lose my hay shed as well." He [a police officer] said "Well, if you cross this line... I'll arrest you." [Resident of Grantham, who did not participate in the land-swap (2013)]

Many interviewees identified that the way that lockout was operated compounded the disaster impacts and made the recovery situation worse. Farmers often claimed that they could have saved at least some of their products if they had been allowed to make a brief visit to their properties during the lockout. As a result, they lost their existing livelihood completely, i.e. exacerbated the process of their recovery significantly. In addition, the economic damage was long lasting as they had to replant the crops and wait until harvest to achieve their first income after the flood. Not being able to produce for a few years also meant that they lost their customer base. Some interviewees said that they would not leave the property in the next emergency situation because of the extended loss and the subsequent hardship.

So we had this much [water] in through the sheds... [B]ecause we are in the hay business... we really needed to get in and get all that hay off the top... to stop it. But because they [authorities] kept us out for 9 days... it went through the whole lot. So we not only lost what we had in the paddocks, which was... our income to come, we actually lost our income full stop. We lost everything... [A]t this stage there is no way they will make us evacuate here... No. No. They will have to handcuff us and arrest us. There is no way they are going to put me through that again. [Resident of Grantham, who did not participate in the land-swap (2013)]

Another aspect that interviewees criticised was that the police and other authorities had failed to involve local residents in discussions that would allow the search and rescue process to benefit from their knowledge of local geography. This lack of understanding sometimes resulted in inefficient or even disrespectful outcomes of the search activities. The interviewees emphasised the importance of incorporating local knowledge and experience in disaster recovery.

I found a dead woman down in there [near Gatton]. When the water went down, she was in there the next day. Just her wrapped around the trees. They [authorities] didn't know. [Resident of Helidon – near Grantham, who did not participate in the land-swap (2013)]

[T]hey kept us out for so long and the army and police said that they were searching the area for bodies... They searched up to four times. They told us. When they did eventually let us come back again, and they still had people missing... um, I know one person just down street from us found a body at the back of their place. Now, police and army's told us they had searched up to four times. Over the same areas. And they still missed it. My opinion was if they would have let us in sooner ourselves, we would have found these bodies before they were... so badly decomposed... [T]he only reason this fella had found the body was because he saw all maggots on the ground... I think they could have used a little bit more compassion. [Resident of Grantham, who did not participate in the land-swap]

The contribution of the army to the search at some point of these ten days was, in general, positively acknowledged by the interviewees. However, some were upset by the trade-off that the quick and effective heavy labour provided by the army also destroyed *everything*, which included items that residents were emotionally attached to.

[W]hen the army came in... some sergeant said... "I want that cleared!" So they go and clear it all. And I go this is my place and I don't want you on it. And they just said "Tough! We were told this is what we have to do."... And then you go, you've [the army] taken away all my dirt. Soon they bring a heap of silt bucket dump on your land. You know... it was just a big joke. Very poorly managed. [Resident of Helidon – near Grantham, who did not participate in the land-swap (2013)]

We ended up... the army came... [T]hey just threw everything. It was good because they got in like a whole crew of them. And they got in and just knocked out the windows and just dug stuff out of the house and just threw it away. But then... 'cause it was so quick and it was so many people, you didn't get a chance to dig through and find things that might have been saved... [T]hey just came and loaded it all up in the truck and took it, as not until afterwards... we didn't think to see if we could find my jewellery box that I have my bracelets from when I was a new born and things like that. So everything like that was gone, yeah. [Resident of Grantham, who participated in the land-swap (2013)]

Conflicts between flood-impacted residents and LVRC sparked at the community meetings

Some interviewees stated that the relationship between the LVRC and local residents appeared to be supportive particular when the LVRC officials including the Mayor visited the evacuation shelters immediately after the devastating flood event. The officials respected the ways that these shelters were operated by and for the local residents. For example, an interviewee recalled that the Mayor challenged some impractical bureaucratic processes brought to one of the evacuation centres by other public organisations.

[A]fter we went to Helidon [another town near Grantham]... to the recovery centre [evacuation shelter] down there... it was all the locals that was doing everything in there... they went over... got the cold rooms, brought them over to bring all the cold food and everything else in... [E]veryone dug into the freezers, fridges... they have the cold rooms there and everything. And then, all the government departments started walking in. And they decided that "you can't have meat in the same cold room as vegetables. And you'd have to throw this out. You'd have to throw that out. And it's not cold enough" and everything else. Now I was actually standing there, when [the Mayor] got on the phone, rang [the name of someone who had the appropriate machinery] and said, "... I'm sending someone in. I need a refrigerator truck. Have you got one?" And he just turned around and said "You got a... HR licence?" This guy said "Yes." He said "Right. Get someone to get you into Gatton... and we shut, shut them up." [Resident of Grantham, who did not participate in the land-swap (2013)]

However, according to many interviewees, community meetings held afterwards became very emotional and aggressive. Because the flash flood took 12 lives as well as a number of buildings and infrastructures with almost no warning, many people in Grantham were still in shock. Residents especially those who lost close relatives and/or friends were reportedly extremely vocal and accusing the LVRC officials for not being able to prevent the disaster. As a result, the Mayor left and refused to attend further meetings, according to the interviewees.

Two points of view on this incident emerged in the interviews. One is that the LVRC including the Mayor should have accepted the situation that the disaster-impacted residents were still in an extremely emotional state of mind instead of rejecting it. The other is that residents should have respected that the LVRC provided as much support as they could during and after

an unprecedented event. According to some interviewees, this incident seemed to have begun the disconnect between the LVRC and the community flood recovery centre, which will be elaborated later in this chapter.

He [the Mayor] walked out of the meeting. He said he'd never come back. And I said "But [the name of the Mayor], um people are still angry." It's, they are not really having a go at him. They weren't. They just wanted answers. But he couldn't give them those answers so. And he said "I'm not coming out here take abuse." Well, I was copping bits but I was still there doing my job. You know like, he's the Mayor. He should have been in front of me... he should've been there supporting it. But... he didn't. And... yeah, we fell out. [Resident of Grantham, who worked at the community recovery centre (2013)]

[A] lot of things that... they [residents of Grantham] don't realise that council were doing... [A]nd that the council's not given a credit for it... Have they [LVRC] made mistakes? Yes, I think they have... Have they tried to do... things at the best they can? Yes, I think they have... because as far as I know, that, there hasn't been, ever been, anything like this [scale of disaster]... [T]he biggest thing is a lot of people were looking for somebody to blame. And unfortunately they put the council up to blame. And it's not their [LVRC's] fault. You know. It's, it was something totally unforeseen... and it took some people a long time to accept that. [Resident of Grantham, who did not participate in the land-swap (2013)]

4.2.4 Tense relationships between authorities and the community recovery centre

Operation of the community recovery centre and its deteriorated relationship with LVRC

The community recovery centre in Grantham was operated mainly by local residents and volunteers. Reportedly this recovery centre started immediately after the event along with evacuation shelters in other areas in the Lockyer Valley. Among many others, some key individuals started providing essential goods and services, such as food, shower facilities and donated items, coordinating various public and private organisations as well as volunteering local residents. One of the key persons began working to support other community members according to the needs and availability on the ground rather than being based on a previous administrative structure if it existed at all.

[T]hat was the first real experience of being a community member, was after the floods, as soon as the floods hit that virtually came into play... [O]n the Wednesday after it'd hit... I was called in and asked a help... they needed a lot of gear... help underneath stressed people coming in to the school [where the precursor of the community recovery centre was located at], people not knowing whether their families were dead or alive. All that sort of thing was happening. [Resident of Grantham, who worked at the community recovery centre (2013)]

In addition, many interviewees acknowledged that the centre was not only providing donated goods and services but was also the go-to place for local residents to gather, talk and care about each other, because their previous gathering venue, the local hotel (pub) in Grantham, was destroyed by the 2011 flood. Particularly for the vulnerable, the centre became the sustenance of their lives in recovery. The centre was closed by the LVRC in June 2012.

[I]t wasn't necessarily to talk about flood stuff. It was more about 'what's going on now.' You know, "How many bales you got?", "How's your lucerne going?"... "Bit of rain tomorrow" or whatever. It was more... informal community stuff, rather than flood stuff. And... they sort of... chopped a pin on it which was a shame... [the name of the interviewee's spouse (or partner)]... definitely notices that there is a difference... because he is not having the communication with male company like he was... But at least up there, you could go up and... have a feed, have a chat, come home. You know. Two hours, he's happy, he's out... he's had a bit of a talk... But he really misses that so as his father. And there's a few others that do too. [Resident of Grantham, who did not participate in the land-swap (2013)]

All I know is... when the... flood first hit, first week... they put a big white marquee at the top [part of Grantham]... And... it would have been 10 days... And the wife went to work and son went to work and that. And I was on my own. And I felt completely, totally, utterly lost. I went there. I walked into the marquee. Way down the other end there, there was a blond haired lady, just sitting there. There was nobody else around. So I walked up and she said "How can I help you?" I said "I don't know." And from there... she just became a rock that you go to. And she was just the rock that I went to. And she helped me... oh heaps. I owe that lady a lot. I really owe her a lot. And so does the community. [Resident of Grantham, who did not participate in the land-swap (2013)]

The recovery centre also supported financial aspects of the disaster victims' recovery. One of the key persons at the recovery centre appreciated that various organisations such as church groups offered donations, which enabled the centre to arrange social events for and with local residents. Also, the centre was raising funds to assist the most vulnerable flood victims to relocate. However, according to an interviewee, the LVRC including the Mayor blocked the centre from raising funds, criticising the recovery centre was *non-professional*.

Well, there's two [flood-impacted residents] in Harris Street that want to go [to participate in the land-swap] but can't afford to go... [T]here's one in William Street, they are pensioners. They... wanted to be the first out of there. I had actually raised nearly \$50,000 to help move some of those people, and Council chopped it. They went to the people [who] I got the funding from, they said "No. The Council's got to be responsible for it" and they stopped it. The people rang and told me they intervened. [Resident of Grantham, who worked at the community recovery centre (2013)]

The disconnection between the LVRC and the recovery centre, essentially the Mayor and the leading person at the centre became worse. According to the interviewee, the LVRC stopped providing any information to the centre, interfered in social events organised by the centre and, spread negative rumours about the centre, calling the centre *non-professional*.

Because... Council didn't want me there [the community recovery centre]. They wanted me to close the place down. The residents didn't want it close down. So I have this fighting with Council, I'm still fighting with the Mayor... I should've gone when he told me to go... June last year [2012]... Department of Communities said "[the name of the interviewee], go before [the name of the interviewee] need protection". That's virtually what they told me. And... it's pretty bad when you've worked so long with the community, but your local council [does] not... I get on with a lot of people in Council. Don't get me wrong. It's just their attitude... It's because they didn't have the control of the people [who] were coming to those meetings every week. And [the people] were coming to those meetings every week until June last year. I had one meeting [in] the week [that] I closed [the centre]. Right? And I get up the 70 people in that centre for a meal, talking about their issues. I still had government officials Councillors mixed in with those community members, talking to them that they weren't coping. And they still those same people, visiting these people that haven't moved forward. You know like, there was a place to come to if they needed. [Resident of Grantham, who worked at the community recovery centre (2013)]

The community centre was closed in June 2012. According to an interviewee the closure was announced by the LVRC in a one-sided manner; the leading person involved was not informed about the plan by the LVRC but found out through the media.

And I'm angry with them [LVRC] because they want to ignore the fact that this community still needs that place. [The name of the Mayor] did, he put it in the paper that it was closed. It finished this week. Never discussed it with me, who was running it. [Resident of Grantham, who worked at the community recovery centre (2013)]

This study will not speculate as to the actual cause of the sudden and quick closure of the recovery centre or the reasons for the accelerated conflict between the LVRC and the centre. However, it is evident in the interviews that the closure disappointed local residents, particularly the vulnerable.

[T]hey [LVRC] shut down the community [recovery] centre, which was a shame... I think they tried to shut it down so that people would move on. But the problem is... I don't think it [the centre] was actually stopping people moving on. It was more of a way of people getting together. [Resident of Grantham, who did not participate in the land-swap (2013)]

As a result of the significant fall-out, interviewees expressed their disappointment that efficiency and effectiveness of the local recovery in Grantham was heavily compromised because of the lack of collaboration.

There's a lot to be learnt out of what happened here... because when we had the access we could've done a lot more together. Then, not saying that I was brilliant at anything, it's just people were offering it to the community and I was sort of here so people were coming to me. Had they not gone... and... stopped things, a lot more would have happened. [Resident of Grantham, who worked at the community recovery centre (2013)]

4.2.5 Conflicts and contested local power among residents

Tension between flood victims over the land-swap participation

It was identified to some extent that the land-swap contributed to the gap between local residents, particularly among flood-impacted community members of Grantham – while some residents participated, others did not or could not. The gaps between the land-swap participants, the non-participants and those who were not flooded were physically distinct and socio-economically significant. For example, the participants physically moved their residence to the new estate on the hill for a site with reduced flood risk and some financial support provided by the governments, while the non-participants received almost none. Conflicting views on each other between different groups of residents were identified in the interviews.

I don't wanna live in Grantham anymore. I don't even wanna live... up on the hill with the people up there. They... just turn their back on us... And they didn't wanna know us anymore. 'Oh, you're not going up the hill. We don't wanna know you.' It's just... stupid. It's childish. [Resident of Grantham, who did not participate in the land-swap (2013)]

[T]he people down here down the bottom [floodplain] turned on me because I moved [to the land-swap estate]. As soon as I moved they got the shits with me." [Resident of Grantham, who participated in the land-swap (2013)]

We had grants from [State] government when we moved to here [the land-swap estate]. Just before Christmas 2013, government closed that account [that the State pooled support funds for land-swap participants] down and we received additional payment, which was the money that was left in the account [and that] was divided between the families up here. That had caused tension again in the community. I had someone who chose to stay at the bottom come to me... because she was gonna go and complain to the Mayor and the Premier, because we had assistance again, where she hadn't... [T]hey [People who remained on the flood plain] are under the illusion that the new estate residents are sitting there with no debts and everything was paid for them. People who chose to stay down there feel that council and everything work against them because they chose to stay there. [Interviewer: So is it a new tension?] I think it will bring back to the original stress of the land-swap matter... That [initial] State government grant was distributed by BSA divided between families that received the original grant of \$35k. The additional grant was \$18.5k. We were very, very grateful for

that, although we felt guilty when looking at some others [who] got cranky about it. [Resident of Grantham, who participated in the land-swap (2014)]

Attacks and burdens made by some residents against the key person at the community recovery centre

In parallel with the conflicts between the community recovery centre and LVRC, as well as between the participants and non-participants of the land-swap, some interviewees stated that there were prolonged issues between residents over the *power* to control the community. One of the interviewees described a potential but typical cause for the situation as follows.

“[W]hat happened is a few of the old generation [such as one that had] one of the streets named after one of them... felt “Oh, who are you [people who worked at the community recovery centre]? ...[Y]ou’ve just come in [to Grantham] and you’ve taken over [the initiative in the community]” while I didn’t take over. I was asked to do what I was doing. And I did it as a volunteer, I didn’t ask for money. [Resident of Grantham, who worked at the community recovery centre (2013)]

A number of harassing and threatening situations reportedly took place at the community recovery centre to one of the leading people there, possibly as an indication of the contestation described above – *who leads the community*. This negatively affected the recovery of the community in Grantham, creating additional concerns and burdens on those who supported others.

[W]hen a few locals started acting up, I had to have one of them (staff of the centre) sleep in the centre, because they were getting under the tent, turning those freezers off, pinching the stuff... They wanted me gone. ‘Cause, they should have been in charge. Because I’m an outsider. ‘Cause I haven’t lived here all my life... But, it got to the stage where the police had to intervene. ‘Cause... the government gave me a ute [utility truck] and I was the first one to get it, government ute. ‘Cause, it was costing a lot of money to do what I was doing... [T]hen one of the locals... kicked the car and it dented... [O]ne tried to run me over in the street... It got really bad...I just went to the police in the end and just said “You gonna have to put out a patrol out here.” We had a patrol, going around protecting the centre to keep things going for the people who genuinely needed it. It was... [t]he ones that weren’t affected, but the ones playing up. I’ll never forget. [Resident of Grantham, who worked at the community recovery centre (2013)]

Some flood victims became over-reliant on others after getting used to being supported during the initial recovery phases, which adversely impeded their recovery. At the same time, according to the interviewee, the community overall became overly reliant on the recovery centre and the key people there, expecting *someone to make things happen*.

Key person exhausted as a result of the series of bitter experiences

The walls of difficulty encountered in dealing with the local government, the anti-recovery-centre group of residents and the increasing reliance of the community significantly impacted the recovery-centre-leader's motivation leading to a feeling of burn-out, if not a significant trauma. The key person remained supportive for the local community of Grantham to unite, but was no longer willing to practice leadership because of the exhaustion.

I said "I'm tired. I'm really tired. I am stressed from all this crap... I need to get my life back"... I end up having three-month counselling after it, because I was at... the bottom... really going through too much. But... I've never stopped doing it [supporting other residents of Grantham] [Resident of Grantham, who worked at the community recovery centre (2013)]

I don't know if I will be up there in the [progress] association. I've been asked to. And I keep saying "No. I don't wanna be the leader anymore."... But we need someone else. Another group to take on some responsibilities. I'm happy to push it forward to get it up and running and do my bit as a community member. But I don't want to be up there fighting everyone either. [Resident of Grantham, who worked at the community recovery centre (2014)]

Potential reasons for the lack of local autonomy 1: History of the town

According to some interviewees, the community of Grantham had not been particularly proactive in working for and with the community even before the 2011 flood. The town went into decline after the Warrego bypass was introduced reportedly some 30 years ago. Such historical lack of community activeness and the general decline of the community may have contributed to a general lack of the sense of self-value as a *community* between *its members*.

Grantham... never had a hospital, [but] it did have a lot of facilities like banks and shops and so forth... 25, 30 years ago. But... because... when the Toowoomba bypass [which took over the traffic from the local main road in Grantham] was built, then... it shrank after that [LVRC official (2013)].

The Grantham community before the flood was non-existent... nobody knew anybody. It... was a sleepy little town... I moved here, because... this life-style I like, quite placid, slow moving, no fences... after the flood, yes, I met a lot of people, made a lot of friends... we go to the community hall every week, ah had a meeting every week and have a BBQ... everything was going really good and... After the money was all... distributed out... ah let's say 100 people came every week, after the money distributed 25 people came. Then there was nothing to get. All, all gone. They were the ones that came to get money, got some money, and they were gone... [S]o a lot of people... sort of drift away. [Resident of Grantham, who did not participate in the land-swap (2013)]

I think it should be more community led. But, I'd lived here a long time, there were things didn't work because everyone got interested at first and stopped afterwards. I think that's just general apathy. [Resident of Grantham, who participated in the land-swap (2014)]

Potential reasons for lack of local autonomy 2: Media attention brought both positive and negative effects

Some interviewees pointed out negative outcomes of the LVRC's strategy to work closely with media groups. For example, physical presence of the media crew was reported to have damaged the mental recovery of the traumatised residents. In addition, some respondents stated that they had to search for *correct* information among a number of sensationalised reports. Others stated that being the centre of attention might have increased some residents' expectation and dependency for support over time.

Mayor is right in some ways that people become more dependent. [The name of the then QLD Premier] also told us that it's one off help. We suffered from a disaster but should remain self-sufficient like in old days. However, some see a gravy train. [Resident of Grantham, who worked at the community recovery centre (2013)]

Some of the issues like health issues etc., I honestly think that some of that was more hyped up and it's seeking for attention... They get on TV and Grantham's name is in the paper again. [Resident of Grantham, who moved in to Grantham after the 2011 flood (2014)]

In addition, a new *cancer scare* controversy attracted public attention in 2014 and brought Grantham back to an unsettled situation. The cancer scare claimed that the floodwater contaminated the soil and agricultural products, thus affected human health condition in the area (The Chronicle, 2014b). Many interviewees, both the participants and non-participants of the land-swap, were disappointed that the community of Grantham was impacted again by negative attention re-generated by some other community members.

Lockyer Valley Mayor... has come out in support of Lockyer Valley farming families... [stating] "To call into question the safeness of Lockyer Valley produce is disgraceful, particularly when these statements are made without any evidence whatsoever." The Queensland Department of Agriculture, Fisheries and Forestry released a statement late last week which said the ongoing testing of the region's vegetable, beef and dairy industries had not detected any significant contamination issues caused by the flooding. [The chronicle published 27 May 2014 (The Chronicle, 2014a)]

People just want to get on with their lives instead of having all this keep coming up. That negativity spreads. I don't think they [people who raised the health issue] thought about the wide-ranging consequences of such negativity on farmers and other businesses as well. [Resident of Grantham, who did not participate in the land-swap (2014)]

Potential reasons for lack of local autonomy 3: loss of gathering venue and not being able to regain it

The cancer scare also further delayed the process of securing a place to get together for the Grantham community. Many interviewees stated that the loss of the local pub in the 2011 flood had further impacted the community's ability to interact in Grantham. Another gathering venue, the community recovery centre, was also closed in June 2012. While no clear solution existed, the aforementioned Grantham butter factory, an iconic building of Grantham, was refurbished by the Rotary Club in Toowoomba South and handed over to the LVRC for

community use. Interviewees acknowledged residents' expectation that the Factory could be available as the community centre – as a means to help pull the community together.

So, it's been too long. Too long for having a social hub in town... the centre was more of that... [B]ecause that's gone now, there is no social part in town... there should be something. That's why we were hoping the butter factory. But, we don't even know when we gonna get that. So, they have opened it. There was a massive opening, [but] still nothing... It's just taking too long for the community. 'Cause, the longer you leave community without bonding or some sort of interaction, people walk away from that community spirit. You know like, you see people just moving on to other areas and they lose that contact with those people that they had bonded with through grief, virtually. [Resident of Grantham, who worked at the community recovery centre (2013)]

Although the refurbished factory officially reopened on 30th June 2013, its use for daily community activities was not realised because issues such as safety, security, maintenance, scheduling and costs still needed to be sorted through official negotiations and agreements between the LVRC and local residents. This required the local progress association (an official community group that deals with community matters) to be formed, but the process to form the association was interrupted, because, according to interviewees, the excessive attention caused by the cancer scare upset community members.

[The leader at the community recovery centre] was trying to organise a meeting to form a progress association, which is to do things to bring community together and give the community a voice... At the closure of the community centre, there was an agreement that any of the property that have been donated to the community would be governed by the progress association. Therefore, there would need to be a progress association established. [The leader at the community recovery centre] had one meeting around May 2014. And she had organised another meeting when this health thing brought up. And she cancelled that meeting, because there were too many people upset about the health scare. [LVRC official (2014)]

I think we were close to that [establishing the progress association]... Just have a few little people, who seem to need to be out there, causing an upheaval... [t]hat vetoed the progress association. So when all of that simmers down, we can probably go ahead with it. Which is a shame.

[Resident of Grantham, whose house was not inundated by the 2011 flood (2014)]

4.2.6 Lessons from the Lockyer Valley case study:

The land swap scheme did not address all the issues required for recovery

The idea of the land-swap project was often positively acknowledged by a wide range of the respondents. However, the affordability and appropriateness of participation was a financial and logistical challenge for some residents without stable income and/or insufficient insurance payouts or operational issues concerned with farming and other income generating activities. The strong initiative taken by the LVRC to achieve its vision of recovery and risk reduction didn't always work harmoniously with all community members. Some felt it had been rushed and that other support options should have been available for those who could not or would not participate in the land-swap such as farmers.

There were pros and cons in attracting strong attention to the town

The LVRC's strategic promotion of Grantham successfully gained external support such as the State and Federal governments' combined 18 million AUD in aid despite the state's opposition in the initial phase of recovery. Despite physical and financial achievements, the intense and prolonged public attention adversely impacted community members' local life. Some interviewees considered that the LVRC only propagated its positive achievements and neglected other issues and challenges that occurred during and after the flood. This sometimes led to a strong level of distrust towards the LVRC. At the same time, other residents sought public attention with negative topics such as the cancer scare. A wide range of interviewees were demoralised by the recurrence of negative attention. This delayed the recovery and development of the community in which the members had started to build a *sociality* that was a weak fabric binding members even before the disaster.

Conflicts over the exercise of and contestation over power that unsettled relationships and delayed local recovery

Along with the health scare the same group of residents took a series of negative actions to prevent the Grantham community to unite, according to some interviewees. Such actions included accusations and attacks against the community recovery centre that it was chasing

power in the local area. This prevented the Grantham community from forming the progress association, which in turn further delayed the process by which the community could move forward in recovery.

Another major conflict between the LVRC and the residents-led recovery actions, such as fundraising and recovery centre operations, ended up with the forcible closure of the community recovery centre. Although both parties strived for recovery, the clash of different recovery visions lost the potentially positive opportunity for working together and slowed the momentum of the autonomous community development. These conflicts that had existed before the flood and were magnified by the event. Such tensions and conflicts impacted the people's lives and their trust in authorities charged with oversight of recovery processes.

5: Post-Disaster Recovery Following Earthquake, Tsunami and Nuclear Accident in Japan

The Japanese case studies, Koizumi and Namie, were impacted by a combination of large-scale earthquake, tsunami and in the case of the latter, an accident at a nuclear plant in March 2011. The extent and scale of the combination of disasters present significant challenges to local recovery processes. In Koizumi the focus was always on earthquake and tsunami responses. Major parts of Koizumi were destroyed by the enormous tsunami with 40 deaths. A tight-knit community, which had developed since seventeenth century or earlier, chose to relocate to a high, safe ground collectively as a community among many other communities in the affected region. While the project progressed slowly but robustly, it also faced challenges due to time, finance and politics.

In Namie, the nuclear plant accident brought about severe radiation contamination; as of October 2016, the town's entire 21,000 residents are still under the evacuation order. Political direction of relocating or returning to the town remains uncertain. Various local groups are working on projects for relocation or returning, but the uncertainty is impeding the speed and integration. The prolonged displacement with the overwhelming uncertainty has significantly impacted the lives of Namie residents. Namie's presence as a community is increasingly at risk as its members develop their lives outside the town without connection to the original community for an extended period.

To assist the reader in understanding the setting of the Japanese case studies, this chapter first provides a visual introduction in the form of a photo essay for each location before presenting the research findings.

Visual introduction of Japanese case study areas: Koizumi and Namie

This short bridging section presents features of the local setting in each Japanese study area that visually assist a broad understanding of the research findings.

Koizumi



Figure 13: Group relocation site (Koizumi Chiku no Asu wo Kangaeru Kai, 2015: Facebook page, 22 September)

The 2011 tsunami led the residents of the Machi area, Koizumi, to relocate their community from the low-lying land (near the bridge) to the inland, high ground.



Figure 14: Community gathering (Okada, 6 October 2013)

The tight-knit human relationship based on mutual support has developed through history. Among many other social occasions, this is a barbecue gathering following the annual local sport festival.



Figure 15: Tsunami levee near Koizumi at 9.8 m (Yomiuri Shimbun, 2014, 8 September)

An enormous set of tsunami levees are being constructed in Iwate, Miyagi and Fukushima Prefectures extending over 400 km with an estimated cost of 1 trillion JPY (about 12 billion AUD) (Nikkei, 2016). The levee in Koizumi will be 14.7 m-high.



Figure 16: Emergency housing units (Okada, 9 February 2015)

Emergency housing units for Koizumi were installed at several scattered places in different timings because of the limitation in public land availability. Typically, each estate comprises a number of small units as a cluster.

Namie



Figure 17: Security gates to Namie Town (Okada, 19 February 2015)
Everyone (including the residents) who enters the town going through the high radiation area has to pass the security gates.



Figure 18: Unrepaired damage in Central Namie (Okada, 19 February 2015)
Many buildings were left unfixed in the Town. No one lives in Namie Town (as of November 2016), because the town's entire 21,000 residents are still under the evacuation order.



Figure 19: Post-disaster public housing for Namie residents (Okada, 16 February 2015)
 These houses were being built not only in Namie Town but also in other cities in Fukushima Prefecture (the photo was taken in Kori Town).



Figure 20: Local festival brought to outside Namie (Okada, 13 February 2015)
 Local festivals of Namie are held in the host towns and cities, which develops Namie people's bonds not only within but also with outside the Namie community.



Figure 21: Academic research project to retain memories of the ‘lost town’ (Okada, 23 February 2015)
“Retaining, retrieving and recording the memories of the evacuees’ hometown is one of pressing tasks, because evacuees are forced to stay in scattered, temporary lives without a prospect of return. (Tsukihashi et al., 2013)”

Koizumi

Because it's not only us [the leading community group] but everyone that creates the town. So, it's fine that anyone gets involved, isn't it? Because it is the town created by everyone. [Koizumi Tomorrow Group member (2013)]

Here this sub-chapter investigates the recovery process and outcomes of the Koizumi community and its members after the devastating 2011 tsunami destroyed a large part of the town. The sub-chapter begins by exploring transitions in the local human-relations in the community since the pre-disaster, changes in the lives of the people and how people coped during the recovery. It then present two major recovery and mitigation measures taken in Koizumi: first, the group relocation project of the Machi sub-area and secondly, the construction of the tsunami levee. With a good understanding of those projects' processes and their effects on the community and their lives, this sub-chapter focuses on the local governance of Koizumi, particularly on the socio-political power-relations with consideration of historical and current changes. The concluding remarks discuss the important factors that jointly influenced Koizumi's community recovery including close human-interactions, the processes of group relocation and levee construction, and the interplay of power-relations and broader changes.

5.1.1 Changes in the community life

Community interaction – pre-disaster time

Koizumi was and is a tight-knit community where almost everyone knows everyone. Participation in neighbourhood associations is considered normal in most local societies in Japan. Likewise, most people in Koizumi joined the Shinkokai structure for mutual assistance. The Shinkokai structure may be particularly rigid but is not an unusual system to witness in Japan. Based on the Shinkokai structure, the Koizumi community has a number of umbrella groups and events such as a children's association, New Year events, autumn festivals and other ceremonial functions. These frequent gatherings connect community members both formally and informally over many years.

The concept of taking care of each other, *Yui* [結], has been developed not only through the Shinkokai structure but also a long history. The 2011 tsunami reminded many interviewees of their strong connection and attachment to their community life, which they had taken for granted prior to the disaster. Interviewees were proud of the high level of trust in the community, which was noted as one of the main motivating factors for them to recover and rebuild their lives in Koizumi. Many interviewees wanted to pass on the historical tradition of taking care of each other to future generations; some even considered this as a personal mission. According to an interviewee, such feelings may only be understood by those who experienced *the loss*.

I didn't think about leaving Koizumi... I didn't think about leaving Koizumi at all... (On top of that I was born and raised in Koizumi) there is the history that has been passed on for tens or hundreds of years. I thought that the history would terminate once I had left here. I had a sense of... mission that 'who would pass the history if I didn't do it?'... Yeah, I had that feeling. [Resident of Koizumi (2013)]

It's interesting that I didn't think about the connection with other locals very much prior to the disaster. However, I got a strong impression when I went to the evacuation centre after the town was destroyed. We worked together on preparation of meals and cleaning afterwards surrounding washtubs. It was a sense of solidarity that I cannot explain well but felt after a long time. It was a very happy moment. It was fun to work together. Looking at the destroyed town from high ground I felt a surge of something in myself. It was my attachment to the lost place that we had lived together for generations. It was very meaningful that we had lived here, although I wasn't aware about it [before]. Perhaps such feelings can only be understood by those who experienced the loss. It cannot be understood until it has been lost. It can be understood because it was lost. It is the significance of the casual greetings and chats. [I found that] yes, we are connected [to each other]. [Resident of Koizumi (2013)]

Interviewees also noted how close community relationships can be annoying at times. For example, some might feel that such closeness surpasses their sense of privacy when others are accustomed to share rather private information and interact closely in their daily lives. There may be some people who would want to but cannot leave. However, according to the field observation and interview data sets collected for this study, it was considered that most

people interviewed generally enjoy or at least accept the community life as shown in their long-term residence. There might be some people who had already left the community before and after the disaster, but addressing their lives is beyond the scope of this study.

Community interaction – post-disaster

The high-level of mutual understanding in the community members and their social structures helped communication between residents and leaders of Jichikai-s (neighbourhood associations at emergency housing estates) as well as the Koizumi Chiku no Asu wo Kangaeru Kai (the group of leading residents for the Machi group relocation project – hereafter Koizumi Tomorrow Group: KTG). For example, leaders of these groups already had pre-existing trustful relationship with others through living in and contributing to the community. The same principles were applied to the leading members within the KTG; the leaders didn't have to create new rules to manage the group. Most interviewees recalled that they had a very cooperative time at the evacuation centre despite the extremely tough conditions. They shared food, space, fuels, group-work and so on. School children were also proactive working on tasks at the evacuation shelter, organising residents into groups, etc. This showed that children were trusted by the local society as co-workers in the emergency situation, not as mere vulnerable citizens. The aforementioned Yui relationship was practised in many ways.

The cooperative air changed when the evacuees started moving from the evacuation shelter, a local school gymnasium, into the emergency houses. Some evacuees moved to the emergency houses first, while others had to wait their turn at the evacuation centre, as these temporary accommodations were not available all at once. Many interviewees were sceptical about the allocation process for emergency housing units. Some claimed that the units were systematically allocated to the residents by sub-areas in Koizumi, although the drawing was supposed to be random. Others reported that distribution of donated goods and services also generated conflicts between residents. Interviewees did/could not identify the exact factors or reasons that made others behave in such ways. However, they realised that, along with the extraordinary state of mind caused by the stress, grief and fear associated with sudden loss of everything, behaviours, which were unknown to each other despite their long-term associations, surfaced in such a desperate situation. The conflicts were no longer obvious but remained as of 2015, and were considered to linger.

I stayed at the evacuation shelter, the junior-high gym, for two and half months. When the emergency houses next to the school were built, the drawing process was supposed to prioritise households with the elderly, kids or sick, but it was found to be completely different. Some were selected based on the pre-disaster neighbourhoods, some others got the opportunity through the back door. As a result, people who suffered from cancer and/or were in their 90s were left behind. We had a huge trouble at that time. Perhaps some things couldn't be helped, but everyone wanted to move out from such a gym. So, it got ugly... [Interviewer: Did it create a gap between the people selected early and the remained?] The gap was very wide. When I was still staying at the gym, I wanted to visit my friends who were living in emergency houses to use their baths... [t]hen, the people at the gym [said] "Don't go". It was like a hostile relationship... although it was friendly before (this happened)... [Interviewer: Does it mean everyone was driven to the edge that much?] Yes, indeed. [One] had no privacy, couldn't change clothes and couldn't lie down with arms and legs outstretched. It was a big event. [Interviewer: Did the conflict remain afterwards?] Not really. [People] apparently talk to each other as normal. But, when the topic touches what happened then, people who were not selected still remember. [They say that they] will not forget for the rest of their lives. [Resident of Koizumi (2013)]

An interviewee had initially considered individual relocation, because they had their farm land blocks outside the tsunami prone areas on which they could build a new house for themselves. However, their individual relocation plans were blocked by neighbours with irrational requirements such as direction of smoke or wastewater that one often cannot control. The interviewee then considered joining a group relocation project in their area, however, their plans were blocked again, because the neighbours were competing against others who managed the group relocation project in that area. The interviewee was even threatened by the neighbours that they would completely cut the interviewee off if the participation in the project was made. The closeness in a rural community such as Koizumi often involves blood relationships. Both positive and negative matters have a high potential to affect not only the persons directly involved in a particular topic but also their extended family members. According to participants, many of these conflicts had existed prior to the disaster and were now exposed and magnified. This excessive closeness in the community functioned as pressure and led these interviewees to leave the original sub-area.

I didn't join [the group relocation project of my sub-area], because my [relative] told me that she/he would cut me off if I joined. The sub-area also holds internal social constraints such as background stories on ownership of the land developed for the project and human relationships. I was threatened [by others] that they would consider me as part of 'over there' if I joined 'there'... [Interviewer: Why didn't you build your house individually?] There are constraints based on neighbourhoods, which is typical in countryside. To build a house, [I was given] trivial potential issues [by neighbours] such as not to drain water toward their land blocks and not to direct smokes towards them. Those who complained have grandkids, who are friends with my kids. I reluctantly gave up [on building a house individually], because I didn't want those kids fall out for living next to each other... The location was the best for equipment storage... and easy access to the farm though. [Resident of Koizumi (2015)]

Unfortunately and as noted earlier, for some, the trust that had been established over a long time period was rapidly lost. Interviewees also discussed how the strong local ties often restricted recovery options. Through such experiences some interviewees even doubted their own thoughts and behaviours.

It's like "really?". Well, every single action affects like this. It somewhat prevents me from talking, or I back away from it... I was somewhat scared. It's like "what am I doing?". Well, 'I'm not [normally] like this, am I?' Yeah... I experienced it... It's like "how am I looked [by others]?"... Then, I realised that it's OK to be myself... I interacted with others as usual regardless whatever others think... Some people who I used to talk with left me, while others who I had never spoke with started talking with me. So, I realised that it's OK to remain as myself... It was like five people came while three people left. [Resident of Koizumi (2013)]

In other cases, some residents suffered serious ongoing health issues or even lost their lives in the course of recovery. Some have managed to work through the impacts; others have found it extremely difficult to re-establish their lives. For example, at least three middle-aged residents who played major roles in the community recovery and the group relocation project suffered from strokes between 2013 and 2015. On the last day of the 2015 fieldwork in Koizumi, I was informed that one of the interviewees suffered from stroke. The informant emphasised the reality that both a certain number of old and young residents lost their health or even lives over the four years, although any direct causal connections between these cases and the tsunami event and its aftermath are unknown. However, it was clear that the illness

brought additional pressure onto their disaster recovery and subsequent lives at both individual and household levels. This shows that plans for disaster recovery are not always achieved as planned, i.e. changes and challenges in disaster recovery occur at any point of time.

My husband suffered from bleeding in the brain in January 2014. Although it seems difficult for him to have a high attention span at times, it was a good thing in a bad situation that he developed no particular aftereffects... However, our family business got extremely busy over the two weeks while he was hospitalised. When I completed visits to our clients to apologise for inevitable cancellations, I had a terrible pain on my back and suffered from shingles afterwards. Fortunately, our daughter was able to take care of my husband as she was studying at a nursing school near the hospital. [Resident of Koizumi (2015)]

[H]eartbreaking events occurred. A certain number of residents couldn't wait four years and rebuilt [their houses] by themselves due to their family reasons. Some of them passed away only several months, less than a year, after the houses were completed. They were typically elderly residents. In addition, there was a family breakdown, although I'm not sure whether it was because of the disaster or not. The wife had to look after her parents at their house all the time, and the husband was left alone. The husband, who was still young in his 50s, committed suicide. Such incident occurred... I really don't know what to say... I cannot see through every single person's mind... It's tragic. [Resident of Koizumi (2015)]

Some interviewees developed trustful relationships with new and/or old neighbours during the recovery. For example, some elderly residents became close with their young neighbours in the emergency housing estate. Well-established and maintained social networks helped residents in applying for governmental funding support, finding builders and/or legal practitioners etc. In addition, some residents are motivated to support new and old friends and their families who are in extremely difficult situations.

Eventually I'd like [this place] to be a gathering place... A friend who was working hard at emergency housing and for the group relocation project suffered stroke. He lives out of a wheelchair but cannot speak... The situation must be tough for his wife. Considering these I'd like to create something that we can be hopeful for, although there's a long, long way to go. I wish if

*we could do it here... Elderly ladies can enjoy having tea together too.
[Resident of Koizumi (2015)]*

These changes prompted residents to re-examine their interaction in the community in many ways. Some residents believed that a significant amount of time is needed to recover the relationships and trust damaged following the disaster, because the community life has been developed through a long history. This is a challenging but interesting point of Machizukuri – building a town and community life.

The settlement that had been built over generations was destroyed at once in a couple of hours. Considering this, the settlement that had been built over hundreds of years cannot be restored within a year or two, can it? Although governments are working desperately hard calling out 'Recovery, recovery, restoration, restoration', it cannot be done so quickly. It took a long time to build, so it will take a long time. Four years is still an early phase. We have to accept the fact facing the big force of nature... It is a building-up from now. Although we all belong to the Koizumi area, new neighbours will be different [from previous ones]. All the neighbours will be well mixed that conventional micro-areas of Naka-machi, Shimo-machi and Shin-machi may not be retained. This is a completely new start. [Resident of Koizumi (2015)]

Confidence, motivation and visibility provided certainty to the interviewees in their recovery

The community worked together during the emergency phase such as fixing roads and managing the evacuation centre, although some aforementioned new and existing interactive issues occurred and/or surfaced afterwards. In addition, interviewees knew that it was impossible to reproduce the town in its pre-disaster form. Their acceptance of disaster loss generated certainty that supported the community's commitment to recovery and moving forward.

For many interviewees moving out from emergency housing and moving into a new house was a very strong motivation. Interviewees often noted typical challenges of living in emergency housing. One of their challenges was overcrowding with many family members from different generations living together in a small unit. Some interviewees dealt with this by maintaining a comfortable distance to each other to avoid potential conflicts. In addition, several units are built as a cluster with narrow pathways due to limited budget and space. One

of the interviewees' immediate hopes is to build and live in their new houses, where they won't have to feel stressed because of the proximity to other family members and the noise outside. Furthermore, the emergency houses were designed for approximately two years of use. At the time of interview people had been living in them for four years and the units had developed a number of structural troubles such as developing moulds inside and decaying wooden foundation.

The tough aspect was... both physical and mental matters. Four family members including my kids and wife sleep in 4.5 tatami-mat-sized [room] [approximately 7.44 m²]. Kids got flu and pass it on, because we live in a small space. It is stressful in terms of health. I cannot sleep well... Cars often go by, which is noisy. It starts early in the morning. There are also noises from neighbours. These aspects are the toughest. My motivation may be based on inertia (laughter). I have no option but think that it's only one more year or two... [The new housing plan] is still vague. There is still one and half years to go. I have ups and downs in my motivation. I have to keep working too. [Resident of Koizumi (2013)]

I used to live [with my son's family before the disaster]. But there's no privacy whatsoever at the emergency housing unit with thin wall sheets. So, I try not to stay at home. If I was at home, [other family members] wouldn't feel relaxed. My work is off over the weekends, but I try not to stay at home as much as possible going out for farming and other chores. I can do this, because I've got a car. I just have to come home in the evening. I really don't want my family to breakdown before we get to the new house because of being too close [to each other]. [Resident of Koizumi (2015)]

Some interviewees discussed how their focus on raising their children kept them motivated and focused on a positive future without being too obsessed about *disaster recovery*. Some residents appreciated that they have jobs to work on during recovery. In both these cases, the residents recognised that they have motivation to keep them going.

Interviewee 1: *I was only able to think about living day to day.*

Interviewee 2: *It was very busy.*

Interviewee 1: *When I think about house-rebuilding, I think 'I have to build it'. But I was very busy talking care of my kids in my daily life. So, I somewhat*

don't really have a feeling of 'being impacted by disaster'. Instead, I had a strong feeling of 'I have to raise [my kids]'. I'm not sure how I would feel once my daughter has left home in the coming spring... It was extremely busy as if each day was passing in a second.

Interviewee 2: *It was busy not only with our bodies but also in our heads. We had to do this and that. Ideas and bodies didn't work together.*

Interviewee 1: *That's right... [The tsunami occurred] the day before my son's graduation from junior high-school ... The exam [for high-school] had already been done. Then it was successful, and the next thing was how he would commute to Kesenuma. Starting from there, situation kept changing very quickly. We had our kids when we got older, but it was fortunate that we were with our kids. If we were settled [from raising kids] and kept thinking about nothing but the disaster, we would have got exhausted much more... So, it was a good thing in a bad situation. However, I feel sorry for our old lady [mother-in-law who moved to a nursing home after the tsunami]. She had lived in the house for a long time. [Residents of Koizumi (2015)]*

It was really surprising. I talk with my colleagues that we somehow did it without being sick from a deteriorated condition from not much food and no bath. But we thought we had to work. It is very important to have something to do. Whatever the situation was, I think that having my role somewhat supported [myself]. I lost a lot of weight from working day by day under pressure, but didn't catch cold or anything. [Resident of Koizumi (2013)]

5.1.2 Group relocation project

Koizumi district consists of three areas: Hama (south), Machi (middle) and Zai (north). Each holds an official relocation project that the main policy for group relocation (the Act Concerning Special Financial Support for Promoting Group Relocation for Disaster Mitigation – hereafter Group Relocation Policy) is applied¹¹. Here this sub-chapter predominantly looks at Koizumi's largest group relocation project of the Machi area that involved more than 50 households. Table 6 includes the main criteria and benefits that the Group Relocation Policy required and provided for each project. Figure 22 shows positional relationships of the Machi group relocation project.

¹¹ While some projects adopted the Group Relocation Policy to obtain supports described in Table 6, other groups relocated collectively on their own, which were free from both the supports and the requirements.

Table 6: Summary of the main criteria and benefits that the Group Relocation Policy require and provide for each project (Japanese Cabinet Office, 2016, Ministry of Land Infrastructure Transport and Tourism, 2016 – extracted, summarised and translated)

Project name	Project Promoting Group Relocation for Disaster Mitigation
Items to be subsidised	<p>Items:</p> <ol style="list-style-type: none"> 1. Purchase and development of the land for the estate 2. Funding support for the participants to build houses and purchase land-blocks (interest equivalents for the loan) 3. Development of public facilities in the estate 4. Buy-back of the farms, etc. in the areas that relocation is promoted 5. Development of communal workspaces in the estate 6. Subsidy for the participants to move their residence <p>(National government's) subsidising rates: Three-fourths of the cost¹²</p>
Requirements	<p>Houses are located within the areas that have been impacted by disasters or designated as the disaster hazardous zones.</p> <p>The estate will consist of 10 or more houses.</p> <p>When more than 20 houses relocate, of which 10 or more houses will relocate collectively. A half or more of the participants will form the estate.</p> <p>All houses relocate from the area that relocation is promoted.</p>
Policy based	The Act Concerning Special Financial Support for Promoting Group Relocation for Disaster Mitigation
Proprietor	Municipalities (or Prefectures)

¹² In the case of the 2011 Great East Japan Earthquake, the national government subsidises the 100% of the cost for the designated items, covering the one-fourths of the cost that relevant municipalities normally bear.



Figure 22: Positional relationships of the Machi group relocation project (Source: Risk Frontiers, Data from Geospatial information Authority of Japan, 2016)
 Red shades represent the 2011 tsunami inundated areas. Yellow shades indicate approximate location of Machi, Zai and Hama areas of Koizumi. Green circle is the approximate location of the Machi group relocation site.

Certainty supported the group relocation project

In 2013 many interviewees discussed their hopes for the future and how their wellbeing improved once the relocation and rebuilding became visible in the form of land development and block allocation. Until this point the invisibility of the progress and the repeated changes in participants' numbers meant that the participants had been preoccupied with the uncertainty. In 2015 many residents remained hopeful about their new lives. The local government also recognised the importance of the visualisation of recovery. A Kesennuma City Hall Official stated in the interview that the mayor described his view on 2014 as the year of real progress in recovery and 2015 as the year of real experience in recovery.

Many interviewees were strongly attached to Koizumi due to their interactions and relationships with other residents that have been established over a long time. However, their

attachment and these relationships were strengthened and refreshed by the shared experience and losses caused by the tsunami. Most stated that they would not leave Koizumi. Their local attachments motivated the Koizumi residents to recover together in Koizumi and build their homes and community lives for their future together. Such motivation and confirmation of trust enabled the local people to share the aims of the Machi group relocation project and generate certainty among the participants. Collaboration with experts and academics with realistic yet positive views also helped interviewees build further certainty. After a series of workshop sessions and community discussions, a high level of community consensus was achieved in the relocation project.

Trust in the group relocation

Participants, including the leading members of the KTG, took part in the group relocation project, although they often had other means to build their houses individually such as on their farms. The decision to participate was often based on the primary aim of the group relocation to rebuild their *town and community life* together rather than just *houses*. The KTG members have learned and worked on the project as it progressed, sharing the vision of the project. The KTG meetings and workshop sessions were kept open to everyone, because they believed that the town will be not just only for the KTG members but for everyone. Actions made by the trusted leaders often encouraged others to work on their individual recovery as well. The participants' sense of community is well demonstrated by the fact that they will wait before conducting their traditional rice cake-throwing ceremony, the local custom to celebrate the completion of house building, until all the houses are built.

The relationship and negotiation with the landowners of the relocation sites on high ground (often in mountains) is a very important step. This affected relocation projects in many ways. The landowners are often local residents, some of whom were flooded. The interviewees recalled that group relocation projects were often delayed or troubled, because they could not reach agreements with landowners of the desired relocation sites. The Machi project also failed in their initial attempts, but the good level of community relationships backed the negotiation and the landowners of the current relocation site relatively quickly consolidated to support the community.

[I] did the ground-work beforehand so that everyone [the land holders] agrees... As the land-acquisition unit price for the Sanriku Freeway [under construction] had already been released... [we] might reject [the land procurement for the group relocation project] if there was a big gap in prices [between these two projects]. I proposed everyone to solidify as I cannot deal with [these offers] by myself. Then, the Sanriku Freeway offered 890 thousand [JPY] [approximately 10.5 thousand AUD] for mountains, while this [group relocation project] offered 850 thousand [JPY] [approximately 10 thousand AUD]. We discussed and agreed with no objection to help [the community] as this [price for group relocation project] is reasonable. I think there were in total 11 landowners. [Resident of Koizumi (one of the landowners) (2013)]

Different previous life-styles also affect residents' decision-making in relocation and rebuilding

According to the interviewees, the Machi group relocation project attracted more than 100 households at the initial stage. However, some residents, mainly from sub-areas other than Machi, withdrew because their needs did not fit with the limitations of the group relocation policy. For example, the designated size of the new land block (100 tsubo = approximately 330 m²) is considerably smaller than what residents in the rural areas typically live on. Some residents also preferred to live closer to their original sub-areas and retain their life-styles. Houses in Zai area used to be remotely located in the area, and those in Hama area were located close to the local ports; many residents from these areas are not accustomed to live in a cluster estate with small-sized (by their standards) land blocks. In addition, there are also some residents from the Machi area who preferred to have a greater distance between neighbours and take individual relocation projects. Those who prioritised their previous or preferred life-styles often took part in other group relocation projects in their sub-areas or build houses individually.

[A]s well as the time taking, there's a limitation in the size of 100 tsubo [approximately 330 m²]. It is not [suitable] at all for those who work on farming and fishery like us... I luckily had my land, so I will build a house on it, which is about 250 tsubo [825 m²]. [Resident of Koizumi (2013)]

In addition to the limitation of space and styles, residents of these sub-areas are proud of their localities. The pride seemed to maintain some rivalry between the sub-areas. However, in this

case, the rivalry was not hostile but positive. These sub-areas with different localities constitute Koizumi district maintaining their identity as a local community of Koizumi.

Although we often talk about locality [of Koizumi], there are Hama, Machi and Zai areas. Perhaps sense of locality based on each of these areas is strong... [Interviewer: Does it include something like a rivalry feeling?]... I think it did, for example 'we will boost our area better than Machi'... At least I had such feeling. That's why I purposely participated in the festival that was organised by Machi area. I also became the committee leader and launched fireworks... I strongly wish Zai [East] area to be vibrant. [Resident of Koizumi (2013)]

I have a spirit of a fisherman. Lifestyles in the town and on the coast are different. People in these areas look similar but think differently. I strongly feel that. [Resident of Koizumi (2015)]

Disaster public housing works as a safety net option

Disaster public housing offers permanent shelter for disaster victims with reasonable rents. Local residents are not always capable of or need to build new houses, whether individually or collectively, to re-establish their lives. For example, elderly residents may prefer to continue the community life that they are comfortable with instead of suddenly moving to an unfamiliar place to live with their children or relatives. Others do not have the financial capacity to build a new house but want to stay with the community. In order to meet the needs of these people the Koizumi community progressed the disaster public housing project with Kesenuma City Office along with the Machi group relocation project. The public housing units in Koizumi are mostly freestanding or terrace houses with the potential for future ownership transfer and buy-out. The public housing is located in the middle of the relocation site so that the tenants, who tend to be socio-economically vulnerable, will be easily involved in the community life.

Challenges in the group relocation: a drawn-out process

The waiting time is one of the major issues that impacted a number of interviewees' recovery. Interviewees often criticised governments' response and policies for the delay in the group relocation. Many who participated in the group relocation thought at first that the progress of relocation would be much quicker than it turned out to be. A relatively large number of

residents left the project because of the long waiting time. The decrease in participant numbers impacted the remaining participants practically and emotionally, affecting the scale of the new estate and community life that they were re-establishing. In addition, the decline of participants necessitated adjustments of the development plans, e.g. the size of land-development, the allocation of land blocks, etc., which further slowed the progress.

[Taking a long time is] very stressful. There is also an issue that how much longer or if elderly residents can stay alive until their houses are built. [Interviewer: In the beginning, were you aware that it would take this long time?] I was not aware of it at all. I thought it would be two years or so. I thought, as a non-expert, that it is just to cut the mountain, flatten the land and build houses. However, to do that, it takes a very long time to apply for the City, acquire approval from the Prefecture and move onto the Minister. It also took a long time to discuss budget matters. [We are] told that it would take five years to build a house. We had never lived in this kind of place [emergency housing]. We all used to live in large freestanding houses. We have nothing now; I cannot store my own items. There's no space to use a computer, to read a book or to drink alcohol... [I] come home after work, but there's no space to relax, which is significantly [stressful]. [Resident of Koizumi (2013)]

Well, this is an extreme case, [but I] will go to the temple [heaven] sometime soon. The most important point is that I wanted to build my house quickly and go to the temple [heaven] from my own house. [I] was told that I developed cancer, cancer at a very bad level... I had anticancer treatment twice or so... I don't know when I will be picked [to heaven], so I want to build a house quickly. [Resident of Koizumi (2013)]

Despite the motivation boosted by the visible progress of the group relocation project, interviewees faced new challenges particularly in 2015 such as building costs and service availability.

Although I had rebuilt my house before [the disaster] a couple of times, I had furniture and belongings then. However, I have to prepare not only the building but also furniture for the relocation to the high ground this time. I only have a minimum amount of belongings [at the moment], because the emergency housing unit is small. It will be a tough year ahead. A number of things are coming down to reality. For example, [repayment of] loan starts

once the construction [of the house] has completed, and floor plans have to be prepared in time to apply for [grants]. It was relatively easy until last year, because things were still in imagination. But, from now on, builders will come, and the house will be built in several months. Time will run out if I don't bring [everything] forward quickly as my family members get older. I wonder what I should start with. [Resident of Koizumi (2015)]

5.1.3 Levee construction

Divisions generated by levee construction damaged the community

Contrary to the group relocation project, many interviewees were disappointed by the consultation process for the levee construction plan, which divided the town. The local government officer interviewed was aware of the importance of taking adequate time for consensus formation. However, according to some interviewees, it was some local people who pushed others to quickly achieve the *consensus* because of personal interests. For example, landholders may benefit through renting their unused lands for material storage of levee construction. Other business opportunities may also present themselves as the levee construction progresses.

There was reportedly a precedent for local land-use conflicts when the debris disposal plant was built in 2012. According to some, the construction was heavily delayed because of active opposition from some residents who were concerned about environmental deterioration. The plant was eventually built but had to be demolished only after several months of operation due to the initial land-use agreement that the land was to be returned with its original condition on the promised day. Some people questioned that this shortened operation was a waste of public money, others particularly the beneficiaries, were not happy about the loss of opportunities.

Some residents' groups and leaders attempted to address the levee issue, but were heavily targeted and criticised by people who would benefit from the levee construction. At the same time, members found it difficult to maintain the group consensus when certain members started manipulating the group's primary policy to suit their own personal agendas.

Most residents of Koizumi including the KTG are hesitant to discuss the levee issue, mainly because they wanted to avoid its potential negative influence on the well-progressed group relocation project as well as individual relocation and recovery projects. Complicating the levee issue might also generate further changes in the levee plan including levee height and inundation models, thus affecting some residents' housing recovery. For example, re-calculating the levee height may influence the designation of the no-building zone. Many interviewees were not satisfied with the *process* – how the levee plan was introduced and dealt with in the Koizumi community, which contrasts starkly with the Machi group relocation project.

Koizumi community was damaged a little. Machizukuri went really well with work and support from KTG and Professor Mori. However, the discussion over the coastal levee didn't go well. In a way it divided the town between for and against. For the group relocation project the process developed smoothly, welcoming advisors, building the plan for the new town through the workshop over two years headed by capable residents, setting the plan on track and negotiating with authorities in a harmonious manner. At the workshop, regardless age and gender, literally everyone was provided the opportunity to and able to propose ideas freely. The outcomes from this are resulting in the current situation [of the group relocation project]. However, the information sessions on the coastal levee mostly adopted residents' voices in a biased way, although authorities held the sessions several times. Shinkokai leaders also held small-scaled discussion sessions at the sub-areas of Hama, Machi and Zai once per sub-area. These discussion sessions in fact simply followed the blueprint given by authorities and aimed to achieve it... The facilitators and authorities one-sidedly presented and put pressure on people who suggested careful handling of the matter... I think that if the ideas were divided, that's the real start of discussion. It would have been better if we could invite experts, examine the matter from different angles and consider the third plan. But it remained as dichotomy between the two. The awkwardness generated the conflict between factions of for and against. [Resident in Koizumi (2015)]

5.1.4 Local governance

Trust in governments declined but not completely

Interviewees often noted how their trust in government decreased, due to its poor response to local residents in Koizumi immediately following the disaster and in the longer-term recovery and rebuilding process. For example, the local government didn't show up in Koizumi for several months after the tsunami and did not communicate well with the residents about

development permission for group and/or individual relocation projects. Ministers and Members of the national government/parliament visited Koizumi shortly after the tsunami but didn't mention the group relocation policy. Some interviewees thought that they came with no vision, no concrete idea – and offered no certainty. Such responses generated uncertainty in the local situation, at least until residents found information on the group relocation policy by themselves, and as a result, residents' trust in government deteriorated. Interviewees commonly considered that the Machi group relocation project was led and driven by the community with supporting groups and *followed* by the government. However, this doesn't mean that Koizumi residents are totally against the government. For example, many interviewees recognised that Kesennuma City Office had worked extremely hard to progress the recovery, including a number of group relocation projects in the City.

Kesennuma City Officers came [to Koizumi] as late as August [2011]. I thought this might be a blunt way to say but asked them "Was your visit delayed until now, because the main bridge was not available?". They said "Yes." I was very disappointed. Koizumi is part of Motoyoshi Town, which is part of Kesennuma City. I wondered that [the City Office] took care of other areas of the City [first] and this area [was left until] August. The main bridge was restored just before the City Officers came here in August. However, others such as people from outside and the volunteers came here for us taking alternative Nusakake Road despite the lack of the main bridge. [Resident of Koizumi 2015]

The first [attempt of securing a group relocation site] was [made] in around October 2011. The second one was done in January 2012. The first attempt didn't go well because of road matters. Then, I thought again and did it by myself without asking others. I'm a local, thus know the owners of the lands. So, I thought that this land was owned by the three holders and asked them [to offer the land]. They said "Yes, please." But, the City Office didn't contact the landowners for a long time. [The owners said that] they heard nothing [from the City Office... The process was congested [at the City Office for some reason]. Perhaps there was not enough personnel... When the land-use planning company of my group relocation site contacted [the land owners], apparently no contact had been made by the City. The company asked [the owners] "Please let us access the mountain for measuring", but no mails or calls arrived from the City Office. These land owners would have felt settled if only a phone call to tell them "We will gratefully use your land" or something... The City Office made a contact in spring this year (2013) with a letter to check boundaries. It's been more than a year. The landowners didn't hear anything until then... Our group relocation project involved 11

households as of January 2012. Then [I] submitted the documents to the City in March. Even when I submitted it, [I heard] nothing from the City ... It was frustrating. Perhaps the City Office was waiting all the 38¹³ places [of group relocation projects in the City] to settle [with their locations] – which community goes to where. Koizumi made a quick progress, [but the City aimed all the 38 communities] to start at the same timing. I guess so. That's probably why the officer [at the City Office] said that some communities haven't achieved agreement with the landowners and the land-use [section of the City]. [Resident of Koizumi 2013]

Interviewee 1: Considering the number of disaster victims, the national government must have known that there's a policy scheme of group relocation. Information on the scheme should have been shared more [effectively] through media or something.

Interviewee 2: I got to know [about the scheme] for the first time when [name of a member of KTG] found and brought it to us.

Interviewee 3: The Democratic Party was in power at that time; leaders of the Party only visited here sometimes.

Interviewee 1: We would have felt relieved if the members of the national parliament explained us that there's the group relocation scheme during their visits. Afterwards we had [some officers of] urban planning [section of the City Office?] with explanation on the scheme. It was less than two months after the disaster; we had no idea at that time... the members of the national parliament should have talked to us something like "Let's work on recovery with hope as there's this scheme available." They could also make effort to offer some support funds no matter if the amount was small. They just came here to promote themselves.

Interviewee 3: Ministers also came here, but didn't say anything like "Let's do it with the group relocation scheme".

Interviewee 2: Perhaps they didn't have the knowledge on the scheme, did they? If so they were at the same level as us. They need to study more.

[**Interviewer:** Does it mean that they didn't know what was needed?]

Interviewee 3: I think so. Perhaps, not only residents but also the national MPs were not aware of the project scheme.

Interviewee 2: For national MPs, it may have been as if "Where is Koizumi in Miyagi Prefecture?" because they could not focus on here only considering the broad areas across Japan. [KTG members (2013)]

¹³ There were 51 policy-based group relocation projects in Kesenuma City. Of which, 38 projects were community led, while the remaining 13 were the government led (newly introduced since the 2011 event) (Ishimaru, 2013). This interviewee supposedly mentioned the community-led projects in the city.

The independent nature of Koizumi community's action may have also been influenced by the existing political/jurisdictional situation of the town. Koizumi used to be a part of Motoyoshi Town. Motoyoshi Town merged with Kesennuma City in 2008. Koizumi then politically became one of many fringe parts of Kesennuma. Thus people in Koizumi retained a strong sense of locality. In addition, according to a City Office interviewee, local government officials look after local matters but are not necessarily the *locals*; they are not always familiar with local matters. This may have exacerbated the lack of understanding and communication and caused frustration among the local residents. Hence, the local residents in Koizumi became motivated themselves realising that they could not be reliant on others to achieve what they needed.

I spoke about an issue of bedding shortage at the discussion, which three council members of Kesennuma City attended, because no one raised their hands. I was feeling nervous to speak out in front of everyone. The issue was that the number of bedding sets were different depending on the timing of moving-in to the emergency housing... Additional bedding sets were eventually provided in February, but we ended up arranging bedding by ourselves beforehand as it was cold... However, I felt that someone has to raise a voice to achieve something without being shy... I didn't proactively propose my opinions on this and that before [the disaster]. [Resident of Koizumi (2015)]

There is another political issue in Koizumi district. Some interviewees stated that the local City council member and some Shinkokai leaders played a key role in prompting the *quick consensus formation* for the levee construction in Koizumi along with the supporters. According to some interviewees, the council member and the leaders put pressure on the opponents in many ways. Although the exact agenda to support the levee construction is unknown, the interviewees were disappointed that the council member took one side instead of balancing or carefully examining all the voices of local residents.

The aforementioned amalgamations may have meant that Koizumi was not as politically prioritised as it had been in the past. Therefore, it may be similarly difficult for the council member to bring up something potentially controversial against the top-down initiative as a

representative of a small village. However, the interviewees felt that their council member should deliver the voice of the local people fully, not partially.

We established the Group to co-study Koizumi Bay and the Tsuya River basin [the local river that flows through Koizumi to the ocean]. We asked our advocates to provide their signatures when submitting a petition to the Kesenuma Civil Work Office to ask [government] to think carefully. A lady who was involved in the petition was reproved by a board member of the Shinkokai of her area. There are lots of troubles. One of the members of this co-study group was a Shinkokai leader. The leader was heavily criticised in his area and forced to resign from the position. Some members of the group went to Tokyo to lobby. The participants' name list was passed onto the supporters [of levee construction]. Such privacy information was leaked by the Kesenuma Civil Work Office. There are countless numbers [of troubles]. [Resident of Koizumi (2015)]

The city council member involved and prompted Shinkokai-s to support [levee construction]. Therefore, even if we raise our voice, the council member made us shut up. [The situation was] as if there would be no recovery of Koizumi unless the coastal levee is built. Our opinion was dealt as simply wrong, while it should be right in a way... However, the council member rumoured that the group relocation wouldn't go ahead unless the levee project goes ahead; everyone didn't want it [delayed] either. It's like blackmail... I put my name when [we] submitted a formal objection to the City. It leaked out completely to the council member. The council member called me even during my business trip. I didn't answer because I knew what I would be told. According to a friend, apparently the call was to make me dismiss [the objection]. I only emailed the council member the opinion of our side. Well, I don't know [what to say], because the definition of justice varies by individual. [Resident of Koizumi (2015)]

Outsiders and insiders – but it's not simple

Policies for the major mitigation measures both for the group relocation and levee construction in Koizumi were designed by governments, who are outsiders. The local people, as insiders, are the recipients of not only the benefits but also the shortcomings of these policies. However, the local people themselves can also affect the outcomes in various ways. For example, local residents in Koizumi practise their group relocation within the designed policy. Despite the limitations of the policy, local residents and KTG work together to build consensus through a number of workshops that they organised. In comparison, although it was also local residents who apparently took advantage of the levee plan against other

residents, the levee plan has a greater top-down character than the group relocation. Therefore, the relationships between and within each stakeholder party as well as the ways that these countermeasures are introduced and discussed greatly affected disaster recovery at the local scale.

Governance changes brought by society and disaster – what should change, what should remain?

Shinkokai structure is one of the local features of Motoyoshi Town, hence of Koizumi as well. The community is proud of this local governance structure. However, it is also true that the traditional local governance has its limitations. Various social trends such as depopulation are impacting the system.

Many interviewees felt that the local management system needed updating to tackle the challenges brought by the disaster and societal changes such as aging and generation turnover. According to a Kesenuma City Officer, the local government had reviewed their land-use planning legislation and economic/industrial strategies not only to recover from the disaster impact but also to maximise the momentum against ongoing social issues such as depopulation. In terms of disaster impacts, interviewees often noted that some residents, particularly the elderly, found it too difficult physically and financially to return to their previous livelihood such as agricultural practice after four years. These cases significantly impacted their recovery particularly at a household level. As a broader issue, the young population has been declining in Koizumi following the general trend in rural areas in Japan. The youth often move to major cities for tertiary education and employment opportunities and may not come back for a long time. Moreover, younger generations in town have busy life-styles with inflexible schedules, often working as corporate employees in shifts rather than being self-employed as in full-time farming, etc. In a way they trust other generations, but also easily rely on their older family members such as parents to work on community matters.

Shinkokai structure has developed in Motoyoshi Town since its introduction in May 1980 (Motoyoshi Town, 1982). Each Shinkokai area was designated by the pre-disaster residential location. Jichikai system was newly established after the 2011 tsunami, because most

residents no longer physically live in the Shinkokai-designated areas. Each Jichikai area was based on the current emergency housing location to manage each emergency housing estate. Their co-existence was generating confusion in disaster recovery, because neighbourhoods and interactions in Koizumi have changed over the four years. The Shinkokai system did not function well for a while after the tsunami, because many local people lost their houses and moved to emergency housing, where new interactions emerged and developed along with the Jichikai system. A series of group and individual relocation projects also changed the locational structure of Koizumi. However, it was the Shinkokai system that everyday life in Koizumi was based on prior to the tsunami. Many interviewees stated that the Shinkokai structure would or should be re-shaped somehow to fit the new reality. The topic was expected to be re-addressed once residents resettled, as residents were too busy with their relocation in 2015.

As KTG members stated during the interview, Machizukuri (building town and community life) should be for everyone in Koizumi, because significant changes are being introduced to the community. However, the needs of those who lost their houses and those that didn't are very different. Those who lost their homes often have to deal with relocation and/or rebuilding of their houses before talking about the broad topic of Machizukuri. However, factors of Machizukuri such as trust and interaction keep changing and developing even if they do not talk about it for a while. Some residents whose homes were not lost noted that Koizumi includes not only the relocation sites but also the existing areas. To address the topic of Machizukuri in Koizumi, discussions among the entire community are needed.

Accepting and collaborative actions move the community forward, but maintaining momentum over time is challenging

Koizumi community's atmosphere seemed less open to *outsiders* in 2015 compared to 2013. In a way it is returning to their pre-disaster life style. However, simply going back to what it was before is not necessarily a positive recovery. KTG gains positive experiences on their group relocation project through collaborating with outside organisations such as governments, volunteers and academics. However, a supporting group member was concerned that Koizumi was closing again, going back to what it was before the disaster. Contemporaneously, the power balance between the KTG and Shinkokai-s is also gradually returning to the previous status. Maintaining once-gained certainties based on community trust and shared goals all the

way through recovery will also be an ongoing challenge, because recovery comprises a lot of changes that influence these certainties in many ways.

5.1.5 Lessons from the Koizumi case study:

Ties and changes contributed both positively and negatively in the recovery processes

Historical strong ties between residents of Koizumi worked in both positive and negative ways depending on the situation. During the immediate recovery phase and the Machi group relocation, residents of Koizumi often got together and developed their recovery and local life. Building upon the pre-disaster community structure, some residents filled leading roles in natural and flexible ways. However, at times strong ties in some sections of the community also helped residents form factions that limited opportunities of recovery and risk reduction both individually and collectively. Various changes to Koizumi residents' local dynamics also affected their recovery. In addition, changes at individual and household levels impacted recovery in many ways. These ties and changes demonstrated that disaster recovery would not always progress as planned.

The group relocation project and levee construction processes produced contrasting experiences for local people

The Machi-area group relocation led by the KTG maintained the clear key idea of re-building their community life together. This enabled the project to work openly and closely with the participants and others involving the public disaster housing plan in the new estate. Almost all participants interviewed appreciated the inclusive process of the project, which provided sufficient time and opportunities for discussion. In contrast, the massive levee construction plan was rushed through to achieve consensus. Many interviewees highlighted that the process is as much as or even more important for them than outcomes of the projects.

This high contrast may be related to the design of relevant policies and the nature of the projects. Although policies for both projects were issued by the national government, the main policy for the group relocation required actions from citizen's side – bottom up, while the tsunami levee construction was newly designed and implemented after the 2011 tsunami event – top down.

Interplay of power-balance and broad, societal challenges impacted recovery

Along with the changes and the projects in recovery and risk reduction, power imbalances came into play particularly at a collective level. According to interviewees, powerful actors inside and/or outside the community often exercised their power to achieve goals that marginalises less-powerful groups. In addition, other broad factors such as time and societal trends may have accelerated the unbalanced distribution of power, which further impacted residents' recovery and community life individually and collectively.

Namie

I want to return [to Namie], but previous neighbourhoods and communities won't be there. Everyone ... has evacuated and settled elsewhere individually. Frankly speaking, I think that previous communities won't be recovered even if [we] return. Therefore, people don't return... I feel terribly guilty about myself not returning. But I already know that I will not be able to return in my lifetime. Yeah. I cannot return. It's not that I don't return, but I cannot. [Resident of Namie (2015)]

From the moment of the earthquake, the unfolding disaster escalated in ways that created great uncertainty and challenges for the people of this rural town. In this sub-chapter, their experiences are considered in relation to the particular challenges of 'recovering' when the prospects of returning to one's place of belonging, to the source of one's memories and identity, has been severely compromised. The Namie experience is deeply challenging and troubling for the affected people as well as recovery agencies.

This sub-chapter examines the recovery process and outcomes of Namie community and its members brought by a devastating combination of the 2011 tsunami impacts and the ongoing radiation contamination associated with accidents at the Fukushima Daiichi Nuclear Power Plant. The sub-chapter first investigates the critical gap in the sharing of emergency information between authorities and how this affected Namie people's recovery. Secondly, it addresses how the sudden and prolonged displacements negatively impacted Namie individuals mentally and financially. The third issue explored is the changes that took place in the Namie community because of the long-term evacuation. Then narrowing the focus down, the circumstances and reasons why individuals remained in a state of uncertainty regardless of their recovery status are examined, followed by various relationships across and between the disaster-impacted and host communities. Finally, the sub-chapter looks into organisational functionality in recovery, how recovery was considered and addressed by different groups of stakeholders and how this affected the uncertainty experienced by Namie people. The concluding remarks identify the joint impacts of critical information sharing, changes in the community, and uncertainty amplified by power imbalances and hazard scale on Namie people.

5.2.1 Critical gaps in information sharing

A critical time-lag immediately after the nuclear plant accident significantly affected the recovery pathways of Namie town and people

Namie Town Office [浪江町役場] did not have information about the spread of radiation during the initial evacuation. Information about the developing meltdown and radiation fallout was treated as sensitive and strategic, with little information flow to the people directly affected. There has been widespread criticism of both national agencies and the plant operator, Tokyo Electric Power Company (TEPCO), for their non-disclosure of information relevant to community safety during the crisis (Aldrich, 2013). The Town Office found out about a series of evacuation orders issued on 11 and 12 March in media reports, rather than receiving information from TEPCO and/or the central government (Namie Town, 2016a). Many Namie residents were directed by the Town Office to evacuate to Tsushima area (Figure 23), the inland section of the town. Afterwards the Namie Town Office found out that Tsushima also had a very high level of radiation. According to the interviewees, some residents did not even know what the evacuation was for when they were directed to move to Tsushima.

Interviewee A: *I heard that Town Officers gathered at the Town Office and found the nuclear plant's issue on TV. Then, they prompted everyone to evacuate immediately over the community wireless speakers.*

Interviewee B: *[The Town Office] received no information from TEPCO apparently.*

Interviewee A: *But, TEPCO's internal investigation confirmed that [the information was] sent. [This is the] official comment.*

Interviewee B: *[But TEPCO] doesn't know who went there. There's no one who went there... It's less than 10 km between TEPCO and Namie. People who are familiar with local roads including me somehow got home despite damaged roads and collapsed bridges. Therefore, [TEPCO could have] let the staff run or cycle to send the information to Namie, even though the electricity was unavailable... Had [TEPCO] a good faith, [TEPCO] could have contacted Namie no matter what. This is what [Namie's] Mayor is angry about. [Residents of Namie (2013)]*



Figure 23: Namie Town categorised into three zones (Namie Town, 2016b)

The three categories are designated based on the radiation levels. Orange area is the ‘difficult-to-return’ zone, where return cannot be planned for now. Yellow area is the ‘restricted residence’ zone, where only day time visits are allowed. Blue area is the ‘evacuation order cancellation preparation zone’, where the evacuation order is soon-to-be lifted. Tsushima area is the northwest part of Namie Town. Red dots represent location of major facilities (see also Fukushima Prefecture, 2014).

A number of radiation-impacted local governments, including 10 cities and towns in Fukushima Prefecture, responded a competitive manner to the need for rapid evacuation of enormous numbers of people needing places to live elsewhere. This number peaked at approximately 164,000 by June 2012 (Reconstruction Agency, 2015). Namie Town officers admitted that the lack of information available to them and the need to evacuate large numbers of people at short notice created difficulties. Residents often couldn’t (and still don’t) know how long they needed to be away. Evacuees with sufficient discretionary resources and networks took the most convenient and favourable places first. This reduced chances for the *slow-starters*, who tended to be those who were already relatively vulnerable, disadvantaged or place-dependent prior to the disaster. The increasing demand for resettlement venues pushed up the price of land blocks and buildings significantly in many places accessible to the affected people. This made it even more difficult for the slow-starters to recover from disaster and re-establish their lives.

Interviewee A: *Wealthy people bought [properties] first.*

Interviewee B: *[They] bought a lot while the prices were at the bottom. Then, those who are considering whether to buy or not are the middle group. It's often said that.*

Interviewee C: *Haranomachi [in Minami-Soma] is now expensive. Land blocks are expensive too. [The price] is rising. [The market] is talking unfair advantage [of us]. It's really expensive.*

Interviewee D: *A 20-something-year-old [house] with [a land block of] 100 tsubo [approximately 330 m²] costs 30 million JPY [approximately 375 thousand AUD], or 25 million JPY [approximately AU\$313 thousand] at the cheapest. [Residents of Namie (2013)]*

Interviewees identified two main reasons why some people become slow-starters. The first is that people who had greater social capital and networks were able to start dealing with their recovery quicker than those who had less. According to one interviewee:

There are a lot of people who cannot recover by themselves, particularly the elderly residents of public housing whose only income is pension. [The top] one-thirds [of evacuees] can recover by themselves without particular support like compensation payouts. [The middle] one-third is those who might consider recovery if the issues of compensation payouts were somewhat sorted out or those who might recover with help from their sons. The remaining one-third is concerned how much longer emergency housing would be available, that is, those who cannot recover by themselves. Systems such as family members can accept the evacuees in the bottom group may be needed, as they cannot remain [forever]. However, there are families that had collapsed either before or after the disaster. Some decided not to live together because of this [situation that needs acceptance of the elderly]. Some households also split between husbands and wives. [Resident of Namie (2013)]

A second reason identified was that the uneven provision of information on the nuclear plant accident and aftermath generated significant differences in the progress of recovery. TEPCO apparently treated Futaba and Okuma Towns, where the plant located, quite differently to other affected locations, including Namie Town. Some interviewees criticised TEPCO heavily for this situation, feeling strongly that Namie and other towns on the fringes of TEPCO's focal areas were neglected.

Interviewee A: Nuclear plants are located in Okuma, Tomioka and Futaba Towns¹⁴, while those plants are not located in Namie. Therefore, we were disadvantaged a lot by TEPCO, although we are all evacuees [regardless the original locations].

Interviewee B: [We are disadvantaged] even now. Rooms at TEPCO's compensation centre are separated between [residents of] Namie and Okuma.

Interviewee C: In addition, TEPCO organised places for Okuma Town so the residents [evacuated] collectively. [However,] TEPCO was like 'evacuate outside the 30 km radius zone [centred on the Fukushima Daiichi power plant] by yourself' for Namie Town. That's why [everyone is] scattered.

Interviewee B: But Okuma and Futaba received information quickly. In April or May 2011, a real estate agent told me that TEPCO's employees got new cars in Aizuwakamatsu [an inland city of Fukushima Prefecture, where majority of Okuma residents evacuated to]. They must have known radiation levels, while we didn't know about radiation levels. In addition, TEPCO's employees were buying second-hand houses or building new houses in Aizuwakamatsu by August 2011. They must have known [everything]. [Residents of Namie (2013)]

Deteriorating relationships with TEPCO

Prior to the nuclear accident at the Fukushima Daiichi Plant, TEPCO was widely respected in the region. The company developed strong connections with local people and societies: it created employment opportunities for new graduates in the region and sponsored local activities such as educational facilities. Several interviewees stated that certain numbers of local residents in Namie (and other towns in the region) had worked or work for TEPCO and/or their group companies. However, interviewees expressed deep dissatisfaction about TEPCO's treatment of Namie residents during and after the plant accident. Namie Town officers also acknowledge the anger of local resident towards TEPCO. Prior to the accident, the town had been reassured about the safety by TEPCO and received welfare improvement subsidies, although these were significantly smaller than those for Futaba and Okuma towns. At the

¹⁴ Fukushima Daiichi Nuclear Power Plant, which caused the 2011 accident, is located on the border of Futaba and Okuma Towns. Fukushima Daini Nuclear Power Plant stands between Naraha and Tomioka Towns. These towns are lined on the coast of Fukushima Prefecture. Namie is at the far north out of these towns, then Futaba, Okuma, Tomioka and Naraha Towns are located to the south.

same time, some interviewees stated that people of Namie Town were feeling not only angry but also mixed emotions because of their previous social connections with the company.

5.2.2 Negative impacts on Namie residents' health, finance and employment caused by displaced/temporary lives

Many interviewees were traumatised by their sudden displacement

Many interviewees claimed that they were not told why and for how long they were required to evacuate. People who had strong attachments, including some interviewees, to Namie were often depressed or sick and felt that their unknown length of displacement contributed to this experience because living in Namie was irreplaceable for them. Many came back to live somewhere near Namie such as Minami-Soma (located next to Namie Town to the north), as Minami-Soma shares similar climate and atmosphere to Namie. An interviewee stated that she visits Namie Town for cleaning and maintenance of her old home. She feels attached to and responsible for her home in Namie and is frustrated that she cannot return to live there. Welfare Association staff suggested that some requests and complaints are developing further and escalating to a point beyond the association's scope of services. For example, some family members are refusing to take care of their elderly parents for nursing for fear that they may get too impatient and aggressive with parents because of excessive stress caused by their own recovery issues. Such problems used to be dealt within local communities, but neighbours who used to live and help each other are now scattered across Japan. Hence, their mutual support at a micro-local scale does not function as effectively as it once did. This has dispersed one of the key cohesive elements that supported people of Namie through difficulties and challenges in the past. According to interviewees there is no immediate prospect of rebuilding that cohesion.

[We bought] a free-standing [second-hand] house around April 2014. I'm not sure if the house meets our needs. We had stayed upstairs of an [government-funded] apartment. My late husband was physically weak and didn't like [staying upstairs]. He wanted a Japanese-style room. Perhaps being under evacuation was the worst cause, I suppose. I think that he could have lived a bit longer, but might have had various concerns. [He] could not stop drinking alcohol. Although he was told not to, his days relied on alcohol. I guess his death is somewhat related to the disaster. During our one-year stay in Shizuoka my late husband's physical health deteriorated rapidly. [He]

sometimes forgot how to get home. We came back [to the current area] three years ago. [He] somehow got his health back a bit. The place that we used to live [in Namie] had a rich natural environment. Our house was on a hill; it was just built. Attachment [to Namie] is at different levels between my late husband and myself. He was born there, went to school there, got a job, got married, worked on farming and went to work there. He could not give up [holding onto his life before the disaster], mostly because he lived his entire life there. When we bought the [second-hand] house, he briefly said “I may be able to give up finally.” Having said that he might be able to give up, it is not possible to give up, is it? No one knows except him though. When I went to Shizuoka in the early stage [of evacuation] I got a big hole in my heart, because everything was lost all at once. [I] lost neighbourhood groups, jobs and friends and was unfamiliar with [local] roads and dialects. [I felt as if] there was a hole [in my heart]. [Resident of Namie (2015)]

Evacuees’ financial status was often negatively impacted by the prolonged evacuation

Some interviewees claimed that they had been unable to secure stable jobs. Evacuees who were still struggling to settle were often not employed in stable positions due to their temporary residential status. Many of the staff employed to liaise between evacuees and the local government were themselves evacuees. Their employment status was also unstable, often working on one-year contracts. Some interviewees had been required by banks and other institutions to keep repaying the loan for their houses that had been supposed to be built in Namie, even though the construction had not started because of the disaster. However, it was critical for them to keep the loan arrangements going even though they became unemployed, because otherwise they would not be able to arrange another loan if they decided to build houses elsewhere later.

The situation was also difficult for those who retained stable jobs, particularly if they were middle-aged or older. For example, some evacuees had to keep their current jobs even if they could not live with their families, as it would be very challenging for them to sustain same levels of income with new jobs because of various factors such as the stagnated national economy.

I have my grandchild and the mother who is [my son’s] wife, but left them in Shizuoka. I live in Haranomachi now. And my son lives in Iwaki. [He] said that he wanted to live with his kids who were struggling to recover. So I told him “Quit your job.” But, then [he said] “We are already in our 50s. Who would

employ us?”. Then, I cannot say anything, can I? [My son] has to raise his kids, so [he] cannot quit his job. No one would employ him [for being relatively old]. [Resident of Namie (2013)]

My son’s family initially evacuated to Tsushima. But, the family headed to Iwaki City after catching information from friends that families with small kids should leave [the Fukushima region]. Afterwards, they moved to an evacuation centre in Hitachi, then Yokohama. My son’s wife had her aunt, who lived in Yokohama. Currently [my son] works at a flower shop. I’m wondering how he would fund his kids’ educational costs in future, because his salary is low. His kids are 11, 10 and 3-year-old. He could have been able to secure his income that could send his kids to universities if he kept working at my flower shop. [Resident of Namie (2013)]

5.2.3 Community changes while living in temporary settings

Repeated moves during early stages of evacuation significantly impacted Namie residents’ connections

Namie Town office moved to the Tsushima area on 12 March 2011, then to Nihonmatsu City on 15 March. The town office moved twice more before its current office was built in Nihonmatsu City on 1 October 2012 (Namie Town, 2016a). Residents of Namie were also transferred and scattered to a number of places, often repeatedly, during evacuation. Some residents evacuated by themselves across Japan or even overseas, while others who followed the local government were slotted into various places (e.g. 20 school facilities in Nihonmatsu from approximately March to May 2011, 200 hotels in Fukushima Prefecture from April to July 2011 and 30 sites of emergency housing units and/or apartments in Fukushima Prefecture from June 2011 onwards (Namie Town, 2016a). Many residents lost their social connections to neighbours, friends and regular contacts during this period. This loss of social capital has rendered many vulnerable people to feelings of isolation and loss of identity, exacerbating an already traumatic experience.

Interviewee A: *This is my eighth place that I have evacuated.*

Interviewee B: *For me [this place is my] twelfth.*

Interviewee A: *[We were] transferred from one place to another by the Town Office.*

[Interviewer: Is this the place that you have spent the longest time since your evacuation started?]

Interviewee A and B: Yes.

Interviewee B: *[The length of stay] varied. There's a place I spent two days, another place I stayed for one week and so on.*

Interviewee A: *[We moved frequently] particularly the initial stage, immediately after the disaster onset.*

Interviewee B: *I didn't know where to go at all. [Residents of Namie (2013)]*

Communities change and emerge over the long waiting time

New communities were emerging in each evacuation area, such as the emergency housing estates and/or government-subsidised apartments. Some residents started feeling more at home at their emergency housing than they would at their houses in Namie. This was mostly because they shared a very difficult time under evacuation after being transferred and scattered many times. They were finally establishing their new communities at their current locations. However, some expressed concern that these communities would be destroyed again if they could not move all together next time.

Welfare Association staff were also concerned about the potential restructuring of emerging communities and social bonds between evacuees. At the same time, after four years, evacuees with resources and energy who could play leading roles moved out from emergency housing as mentioned above, while remaining residents are often the more vulnerable. As a result, this may be ghettoising vulnerable evacuees into emergency housing locations and exacerbating their vulnerability and the difficulty of shared recovery. At the same time, leaders of Jichikais [自治会] (neighbourhood associations established for evacuees at emergency housing estates and government-subsidised apartments) are increasingly expected to work on various self-help tasks socially and politically. Therefore, it is becoming more difficult in many ways to maintain community lives at emergency housing.

Interviewee A: *We're concerned that [further] relocation will cause collapse of communities again. In addition, establishing Jichikai-s at emergency housing sites is becoming more difficult [than ever], because people with*

potential [to play the role of leaders] are increasingly moving out for recovery; many vulnerable people remain.

Interviewee B: *The role of Jichikai-s [and their leaders] should be recognised as general organisers. Making it too formal tends to cause too many things (that increase their workloads).*

Interviewee A: *Jichikai-leaders' workloads have become too large. For example, they receive so many phone calls every day. Governments should recognise this situation and reduce the leaders' workloads. For example, distribution of the Town's newsletters can be delegated to [an NPO's name]. The situation may become extremely serious in the next fiscal year unless the leaders' workloads were reduced even for a little bit. [Namie Welfare Association staff (2015)]*

Evacuees' needs are, of course, also changing over time. Welfare Association staff recalled that types of the complaints and requests raised by the evacuees had changed over time – from physical complaints such as noises and spaces at emergency housing to non-physical requests such as useful local information for everyday life. Some residents appreciated the convenient location of their emergency housing estate. However, the evacuees were also concerned whether they could leave the place when they needed to (whether they would return or go elsewhere), once they had got used to the convenience at the current evacuation sites.

Well, it will be very difficult [for us] later, you know, when we have to leave. Yeah. It is very convenient [here]. Therefore, we all are saying that it would be great if [disaster public housing] were built here. [Resident of Namie (2013)]

5.2.4 Moving out to move on, but it's not the goal yet

A long waiting time without a clear direction was impeding residents' recovery as a community

The majority of the interviewed evacuees claimed that governments should have made political decisions and directions on either returning and/or relocation earlier in the evacuation process – within a year or so after the onset of the disaster. These interviewees anticipated that the longer the evacuation period lasted, the less likely the returning population would become a strong and viable community, because evacuees and their family

members would increasingly find jobs and schools elsewhere and settle there. In terms of residence, many evacuees were giving up on waiting and looking for places to live in other places in 2013. Local government officials interviewed also knew that evacuees need clear directions from the government as a supportive push for their decision to *move on*. These residents are realistic and know that they are not going to return anytime soon. Furthermore, some evacuees who used to be determined to return have started changing their minds, because the evacuation is going on for too long. They cannot decide, because they don't know when or if they can return. They often cannot help thinking about it and get depressed, because there is no answer available. An interviewee stated that she is feeling guilty because realistically she cannot return.

Well, I want to return [to Namie], but previous neighbourhoods and communities won't be there. Everyone... has evacuated and settled elsewhere individually. Frankly speaking, I think that previous communities won't be recovered even if [we] return. Therefore, people don't return. Even if they want to return, they cannot. Yeah. This is the biggest issue, I suppose... The number [of those who are eager to return] gets smaller as the evacuation goes on... It is uncertain how many people would return to Namie, thus whether the Town can remain viable as a town or not. There are some people who will return and do business such as Lawson [convenience store] and petrol stations. I respect them... I feel terribly guilty about myself not returning. But I already know that I will not be able to return in my lifetime. Yeah. I cannot return. It's not that I don't return, but I cannot. [Resident of Namie (2015)]

Although some residents are moving out from emergency housing or apartments, their recovery is not over

An interviewee decided to settle in Minami-Soma in 2013, because her husband who spent his entire life in Namie became unwell after the series of sudden changes since March 2011. Another resident also decided to build a house in Minami-Soma, but is not sure if it will be the permanent place as her son who lives elsewhere may suggest her to come and live together later on. Another evacuee's family, who bought an apartment unit in Chiba (a city near Tokyo), would like to return to Namie and live together *someday*. But it was still a difficult topic to talk about in 2015. Their house in Namie was not damaged by the earthquake or tsunami, but the community was destroyed by radiation. This evacuee's father used to work for TEPCO that caused the accident. He is struggling to define his identity in this disaster context.

I would be able to describe myself as a disaster victim if I was in the situation such as my house was damaged by the earthquake. But I am institutionally recognised and categorised as a disaster victim because of unclear social effects, instead of radiation or something. So, it's not very clear to me. I understand that I cannot return. But there are also people cannot return [because of many other cases or reasons]... Well, I feel guilty that my father worked for TEPCO – only about the fact that he worked for [TEPCO]. It doesn't mean I hate him or anything. But, frankly speaking, I cannot tell what other people of Fukushima think down inside their minds – for example, as if, “You are in fact TEPCO” or “You are TEPCO's son”. I don't think I can be completely open about this matter to public, except with some people. [I] cannot tell what people actually think when [they] don't say it. When I talk, I think – who am I? This issue has always been difficult. It involves everything including my history and this situation. I wonder what actually it is... I will deal with this issue all my life until I find [the answer]. I suppose this will somewhat characterise myself. [Resident of Namie (2015)]

Another interviewee in Minami-Soma lost her husband in 2014. She keeps herself busy with Jichikai jobs to forget about the sadness and is often told by others that she is energetic. However, she confessed that she is still in a state of deep sadness. An NGO staffer stated that although some evacuees with resources purchase land blocks and houses to move out from the emergency houses or apartments, this is still an interim decision in their recovery and does not mean they have recovered.

When I met you [the researcher] last time [in 2013] I was living in a government-funded apartment. Then, I bought a second-hand house and live there now, because my late husband lost his physical health and wanted to settle in a house. However, only after a bit less than six months of moving in, he passed away at the end of October last year [2014]. It has passed the 100-day-mark [since his death]. No I'm alone. My son works in Iwaki City and his wife and child live in Shizuoka. At the moment my son commutes to work from [my] house and goes back to his apartment in Iwaki over weekends. So, this eases my feeling to some extent. However, I easily shed tears watching TV. Perhaps the feeling gets stronger because of this kind of situation [under prolonged evacuation]. If I live with my family members in a normal fashion, I might not feel so sad ... I feel sad when I'm by myself. Therefore, my life has changed dramatically since last time [I met you in 2013]. [Resident of Namie (2015)]

Remaining at emergency housing (both emergency housing and subsidised apartments)

Other evacuees who cannot find ways to move out from their current situations and move on socially and/or financially are also struggling. They anticipated their lives will remain tentative forever, because they had already moved a number of times only to find themselves not fitting in well because of the stigma that attached to their identification as evacuees. They were often not feeling settled or accepted anywhere. Even if they bought land and were able to build a house, they would consider it as just another tentative phase for them.

Evacuees [of Namie Town] have some ill feelings against each other between their original areas of coastal, central and inland, although we are all similarly under evacuation... The town is divided by the different numbers of years that are estimated to take before returning. Based on these differences, amounts of compensation money [for the residents' properties in Namie Town] also vary... Such ill feelings exist even in our areas, thus of course in Naka-dori and Aizu regions. Wherever we go, there is no place for us to stay. We have no place to return. We are looked at as if we just fool around without working... There's no place to relax and settle, because everyone including kids and the elderly is looked in such a way... So, it will be an uncertain life for years from now on as well. It will definitely [be like that] wherever we go... If I built a house and tell others that I'm from Namie, their attitude completely changes. Their smile immediately disappears [once they have found that I'm from Namie]. It is shocking. So, we cannot go anywhere. [Resident of Namie (2013)]

According to a Welfare Association staff member, evacuees who live in emergency housing often expressed increasing concerns over their residential status, comparing themselves against others who purchase houses and move out. The more vulnerable residents who have no choice but to stay in emergency housing and subsidised apartments are concerned about how much longer their current accommodations will remain available until public disaster houses become ready for them to move in.

5.2.5 Evacuees and host communities

Different types of interaction between evacuees and host communities

Fukushima Prefecture has three regions: Hama-dori, Naka-dori and Aizu (Figure 24), each with its own distinct culture and climate. Many evacuees spoke of difficult relationships with people in the host communities they found themselves living in. Bullies reportedly continued

to cause problems in some host communities. Interviewees in Minami-Soma heard that other evacuees of Namie were treated badly or bullied by other host community members. Another evacuee found that his relationship with a long-term friend who lived in Odaka, Minami-Soma, was undermined by tensions that developed between them because of differences in their understanding about how their communities had been impacted by tsunami and radiation. Because of the difference in damage and associated supports, the Namie evacuee and his friend from Odaka could not understand each other's situations and fell out. At the same time, other interviewees pointed out that expressing and exercising appreciation is also important for them to stay in the host communities, instead of fighting with host communities. However, they also understand that not everyone is capable of doing so when they are heavily depressed and deeply troubled by their situation.

Conflicts between members of host communities and Namie residents exist. But the way that a person receives such situations is also important. I think that this is the biggest issue – how to receive and handle the situation. If someone told me that he/she received unpleasant words, I would suggest the person that “Why don’t you behave or respond like this [and take it easy]?”... Perhaps it is the best [way]... But I also understand that those who easily get hurt get hurt. [Resident of Namie (2015)]

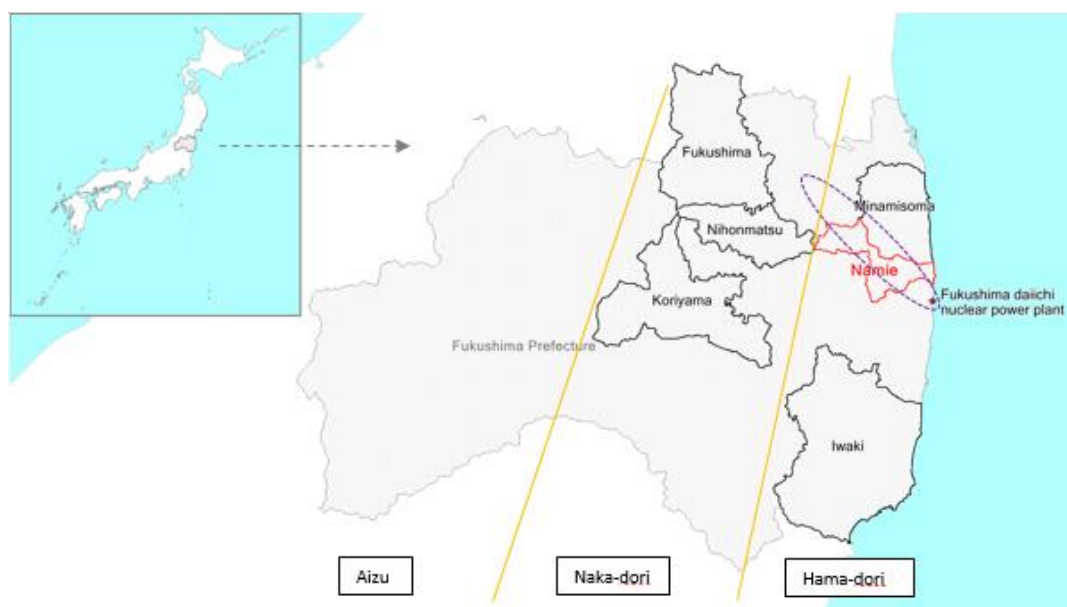


Figure 24: Fukushima Prefecture including Namie Town and Fukushima, Koriyama, Nihonmatsu, Minami-Soma and Iwaki Cities that large numbers of evacuees from Namie Town currently live. Yellow lines show rough boundaries between Hama-dori, Naka-dori and Aizu regions, purple dotted circle represent the section with relatively high levels of radiation (Institute for Information Design Japan, 2016). (See <http://jciiv.iidj.net/map/EN>)

On the other hand, Kori Chamber of Commerce established Kuwanami-Shoten [桑浪笑店], a small café/pub, near by the emergency housing estate in Kori Town (located next to Fukushima City to the northeast). People of both Kori Town and the emergency housing have been enjoying the place since 2012. This harmonious partnership seems ongoing considering the provision of disaster public housing in Kori and has enabled the development of connections that support those involved as both evacuees and hosts. Residents of Sasaya-Tobu emergency housing (located in Fukushima City) are also developing trustful relationships with their host community, which is getting stronger as time goes. They often hold joint social events. Both people of Sasaya-Tobu emergency housing and the host community did not know what they could do initially, but knew that they should do something. The host community addressed the emergency housing first and their interaction started. The leaders of the host community association stated that the interaction between the emergency housing and the host community is based on simply caring for each other instead of bickering about 'who's got what'. In addition, arrivals of evacuees in these areas often met the host communities' needs as well as their own.

Interviewee A: *At first the feeling that we want to do something for the people in difficult circumstances was strong. Although I still have such feeling, I see them as friends and buddies as we've got to know each other to a certain extent.*

Interviewee B: *They are disaster victims, but are not necessarily struggling in their daily lives [financially]. They've got damage to their housing and psychological aspects though.*

Interviewee A: *We don't have [much] money to do something for them.*

Interviewee B: *[There's no point of] criticising that evacuees are receiving compensation payouts and so on. People here don't care about it very much. It's good as long as we can play and interact, and people there [at emergency housing] have fun. We are having fun, because we do what we are good at to play. We do [activities] without paying too much attention to them there. There's no particular issue. They don't mind too much, do they? We don't feel awkward very much... I had visited Namie several times, because my late husband had been there [for work]. Prices were high there, because TEPCO people were there [for work] in Hama-dori. Before the disaster, rental rates were at the same level as those in Tokyo. My late husband lived in a company-funded accommodation, because rental rates*

[there] were more expensive than those in Fukushima City. Therefore, I suppose that Namie people's living standards were relatively high. They must find it difficult here. But, we don't mind too much and remain friendly [to each other]. We never talked about such issues [on conflicts]. [Residents of a host community (2015)]

Hints and potential factors causing conflicts and/or harmonies between evacuees and host communities can be identified in the above examples. Firstly, the agreements and/or disagreements could occur not only between disaster victims and non-victims but also among victims in different situations. Secondly, disaster victims can develop harmonious relationships with non-impacted communities by appreciation, although it is not always easy. Thirdly, non-impacted people also can achieve harmonious relationships with disaster victims by caring for each other. These actions may affect positively and/or negatively not only on other parties but also within each group. The common factors that can be seen here are the differences in situations, levels of understanding and approaches taken. These points will be further discussed in the chapter 6.

5.2.6 Organisational strategies and challenges in working on Namie's recovery

Working as a group is based on and develops mutual understanding

An interviewee in Minami-Soma stated that recovery could not be achieved in isolation by oneself. Therefore, securing good communication with others is very important. A Jichikai-leader in Minami-Soma also pointed out the importance of gathering together. She worked passionately on getting people together, where they could share their emotions and experiences with each other. Members of Namie Junior Chamber (hereafter JC) also emphasised the significance of working on recovery as a group, because they were able to understand each other's situation and feel that they are not alone.

I keep going because we have a same feeling with everyone else [from Namie]. I make myself [and my life] busy to somewhat distract myself [from sadness]. But I think everyone else has the same feeling. Therefore, I'd like to reduce their stress. I hold Jichikai meetings. I also hold Karaoke seminars hiring this coffee shop. I started [Karaoke seminars] at home too. Gathering to have chat together is the best healing... I'm sorry to tell [you] this, but there are things that only people who have been under evacuation can

understand. Perhaps these feelings are not understandable [by others]. I cannot explain. I feel sad, frustrated, bitter, lonely and what else, crying and tough in an all-mixed way. [Resident of Namie (2015)]

Trustful relationships between people as well as organisations are built on experience and mutual understanding

In 2013 a Welfare Association staff member stated that collaboration between the Welfare Association and other government departments and non-government organisations improved over two years. There had been a lot of inefficiency in handling various matters at first (e.g. not knowing who to speak to etc.), but it had become much smoother by 2015. Psychological gaps between Namie evacuees and the welfare staff, particularly those who were not from Namie (i.e. non-evacuees), were also reduced after taking sufficient time and efforts in communication. In addition, Namie JC accepted the support offered by Nishinomiya JC particularly because of their good understating of the situation and needs of a disaster-impacted region. Nishinomiya is a city in the western Japan that was heavily impacted by the Great Hanshin Earthquake in 1995.

Interviewee A: *Nishinomiya JC was at risk of extinction because of the damage caused by the Great Hanshin earthquake [in 1995]. But Nishinomiya JC was saved by supports offered from all over Japan. After the 2011 Tohoku earthquake and tsunami Namie JC and Minami-Futaba JC fell into the similar condition [as Nishinomiya JC in 1995] ...*

Interviewee B: *[We received] many phone calls that offered material and human support after the disaster onset... Among those dozens of phone calls, only Nishinomiya JC asked us “You’ve already got such supports enough, haven’t you?” and offered us a support “Please come and visit Nishinomiya with families of Namie Town”. Nishinomiya JC provided us an opportunity that we just go and have fun at the Universal Studios Japan [an amusement park in Osaka].*

Interviewee C: *Nishinomiya JC experienced the earthquake disaster like us. Therefore, they can understand how we feel in which stage.*

Interviewee B: *We often receive phone calls [from people] asking us “for the disaster-impacted areas”. But, their arrivals in fact increases our workloads such as the number of staff to attend... Whereas, Nishinomiya JC’s approach in their support was to take our families, fund air fares and provide opportunity for the families to refresh from stress and fatigue caused by the disaster. [Namie JC members (2015)]*

Utilising the status as an organisation is effective but challenging

A Jichikai leader recalled that he tried to gather residential information to establish the emergency housing Jichikai. However, he was rejected by the local government because of privacy protection of personal information, which he thought was inappropriate and even nonsensical in such an emergency situation. He collected the necessary information by himself and established the first emergency housing Jichikai for Namie evacuees in July 2011. His requests on emergency housing conditions as an individual had all been rejected. However, once he became the Jichikai leader almost all issues raised were addressed by the local government. Establishment of the Jichikai structure may increase validity for the local authority to recognise issues raised as more *community-based* rather than *individually generated*.

I submitted requests on the issues of emergency housing in a formal written format to the Town Office. At first, when I submitted the requests as an individual, none were addressed. When I used the name as Jichikai preparation office, one third of the requests were addressed. Once I had become the Jichikai leader, almost all requests were addressed. [Resident of Namie (2013)]

Meanwhile, there is difficulty in maintaining a group as an official organisation when recovery is surrounded by prolonged uncertainty. For example, between 2013 and 2015 a citizen-based NGO was struggling to retain the number of staff, which dropped from 10 to 3. The main reasons for this may be that young staff, i.e. where evacuees cannot settle in the nearby area for their long-term recovery, have not much time to spare for the NGO activities. Prolonged evacuation without certainty discourages them to keep working, and budget for salaries is often not available. Therefore, even if the NGO won project grants, they often could not work on the projects because of the shortage of staff.

Further challenges brought by dual self-administrative systems

The *Gyoseiku* system is a neighbourhood self-administrative structure (similar to the Shinkokai system in Koizumi). The *Gyoseiku* system based on political jurisdiction boundaries was hardly functioning and the members i.e. residents in the area were scattered nationwide. Therefore, the existing system of *Gyoseiku* often made it difficult to change something or introduce new

schemes for recovery in the area. That is, achieving consensus formation was very difficult as these members do not necessarily intend to return to Namie. In the meantime, communication between residents was developing based on the Jichikai network, i.e. residents' current locations. However, the local government cannot ignore the existing Gyoseiku system, because it is the system that was politically recognised in the pre-disaster time for a long time. This brings about a complicated situation that two self-administration systems exist at the same time, while none of them is physically present in the town.

5.2.7 Mismatching directions and confusion between governments, supporting groups and residents

Goals are not shared between governments, supporting groups and residents

A big uncertainty remains over Fukushima Prefecture, regarding the entire situation of post-nuclear accident recovery. A number of groups including residents, governments and NGOs are working on recovery, but they appear to be working more individually than holistically. Namie Town Office works hard aiming to improve the situation inside Namie Town, which has been taking time and is yet to be achieved. In this sense the government focuses on the future. However, demands from the evacuees are often about *now* – their current situation. Therefore, some Namie Town officers stated in their interviews that they get confused at times if they are doing a *right thing* – whether they should work for either the people or the place, or for both, and how this should be done. Another Namie Town official admitted that continuous changes in recovery procedures and systems made it difficult with respect to whether or not the government and community can follow the vision proposed by a particular program or activity in spite of the changes. This never-ending cycle comes back to the evacuees' question on the stance of national, prefectural and local governments over their views not being clear and that evacuees' focus on their current lives was disregarded because of the lack of certainty about direction.

Political power-balance affects relationship between national and local governments

A citizen-based NGO staff member was concerned that the national government would increase its power in recovery to the detriment of evacuees. For example, the national government plans to cut off TEPCO's compensation for psychological damage one year after lifting the evacuation order affecting Namie and other relevant areas. The decision would be

based on the discussion between the local and the national governments, but it is the national government who holds the budget not only for disaster recovery but also for many other expense items such as major construction and local/regional developments whether or not these are relevant to disaster management. The NGO member identified uncertainty as the most difficult issue of affecting Namie's recovery, because local people's recovery and re-establishment of lives are affected by factors that are beyond their control such as the environmental condition that brought radiation to Namie and/or the decisions and intentions of authorities in power at the time.

Being uncertain is really difficult. [Interviewer: Is it the most difficult point overall?] Yes, because we will have to move depending on the way that wind blows. [Resident of Namie (2015)]

Concerns over quick recovery

During the 2015 fieldwork, interviewees who did not intend to return seemed to be struggling from a lack of support for their visions for sustainable futures. Other interviewees, however, whose focus is on returning, started seeing gradual but visible progress of inner-town recovery such as fixed roads and re-opened businesses. Their view is in line with governments' current main initiative such as repair constructions, commercial activities and agricultural projects in the inner-town areas where returning is still an option. However, an NGO member was concerned about this progress that governments (not only Namie Town Office but also national and prefectural governments) are rushing to achieve visible, physical recovery and wish to send the residents back as quickly as possible regardless of the discrepancies in various recovery efforts. Machizukuri, the concept of building their town *and* community life, may be neglected in a way, because Machizukuri often takes a long time to work and the outcomes are not always as visible and/or countable as physical recovery.

The Town's survey showed that 80% of residents would not be able to return in immediate future. Following this we have been talking and asking the Town Office to enhance out-of-town communities, but the Town Office does not have this intent. Perhaps the national government has established an idea 'It's safe, so go back' in their returning policy. [There] is that thus out-of-town communities are unnecessary. However, those 80% cannot return immediately in reality and have to consider re-construction of their lives at

their places of evacuation. Therefore, what has to be done immediately should be support for reconstruction of lives and Machizukuri. However, the current situation is that only buildings such as [disaster] recovery housing are being provided, while nothing is considered for communities... Maintenance of community environment is needed so that the scattered Namie residents can easily access their communities... Such places are needed in many places, but the way to achieve it is still a challenge. Although proposals can be made, making these proposals visible is difficult. [Resident of Namie (2015)]

Changes occur and affect recovery. However, is this situation of Namie Town a shift or misinterpretation – returning and/or establishing out-of-town communities?

While governments focus on returning, the citizen-based Machizukuri NGO Shinmachi Namie asserts the importance of support for reconstruction of lives and communities. However, neither of them has presented a clear, concrete vision of what, when and how their envisioned futures might be achieved. As of 2013 Namie Town Council had a recovery plan, which prioritised reconstruction of immediate life/livelihood under evacuation over concluding whether the residents return to the town or not (Namie Town, 2012). The Mayor of Namie decided to remain outside the town for at least six years after the nuclear plant accident regardless of the designated categories of radiation levels. This decision was appreciated by the interviewees that they felt less divided. The town also shared the concept of out-of-town community with the evacuees in the recovery plan and website. This concept was designed to support the livelihood reconstruction, which is an important part of recovery, utilising existing resources and facilities mainly in Nihonmatsu, Minami-Soma and Iwaki Cities until Namie Town gets ready for the residents to return (Namie Town, 2012).

Namie Town prioritises reconstruction of individuals' daily lives in its recovery vision and plans. [Namie Town] aims at regeneration of hometown, which the residents value the most, appreciating individual decisions whether to return or not.

However, it takes certain time to reduce the radiation dosage, maintain infrastructure in the town, re-open businesses and re-start services for daily lives aiming at regeneration of hometown in low-radiation areas.

To secure temporary places to live until the daily lives in the hometown is restarted or new bases of lives are found, [Namie Town] will quickly organise out-of-town communities mainly utilising disaster recovery housing by the end of emergency housing occupancy [by March 2014].

[Namie Town] endeavours to improve [residents'] daily lives under evacuation as much as possible. Careful and ongoing discussion with host local governments is essential to gain understanding and support from the host governments and their residents, and create safe environment for living. [Namie Town Recovery Plan, October 2012, P.43]

The recovery plan has somehow been prepared ... The plan prioritises rebuilding of everyday life instead of debating whether to return or not. [Namie Town official (2013)]

However, in 2015, the local and national governments were apparently promoting the return policy based on their view that small but previously populated areas of Namie Town would be safe to live in by 2017. A member of the NGO Shinmachi Namie pointed out that 80% of the recent government survey respondents said that they would or could not return anytime soon for various reasons such as safety and availability of social services. However, a local government officer interpreted this survey result in a different way that the 80% of not-returning did not necessarily mean giving up on the town. The officer explained during the interview that building out-of-town communities in other cities and towns would be extremely difficult in reality. Establishing facilities in other cities and towns would have a lot of bureaucratic hurdles (tax, facilities, etc.), although non-physical aspects such as communication and social ties could be maintained. Meanwhile the Town Office should keep working on the inner-town matters, as they currently aim to return by March 2017. As at July 2016, the town aims to return by March 2017; the forecast will be updated in autumn 2016 (Fukushima Minyu Shimbun, 2016, published 31 March).

Some interviewees, mainly those who did not intend to return, stated during the 2015 fieldwork that they were too exhausted to raise opinions or take actions for their recovery because of the ongoing and prolonged uncertainty. Another stated that Namie residents should be centre of the discussion on Machizukuri, but their presence is already declining after four years. This interviewee also pointed out that witnessing arrogance in some victims' (i.e. Namie residents) behaviours such as too much focus on compensation money puts other residents off from working on rebuilding community life together. Meanwhile, many evacuees are already re-establishing their everyday lives and/or livelihoods elsewhere. Some

interviewees value the new relationships and/or life-styles established during the evacuation at emergency housing estates with their host communities. They also stated that it would not be practical to return unless safety issues associated with the nuclear accident are sorted *properly* and essential infrastructure such as utilities, schools, hospitals, employments and businesses is restored.

At the same time, some other evacuees and support groups do not agree with the idea of establishing out-of-town community. They consider that residents of out-of-town communities should be integrated within the host communities. A member of an NGO different from the Machizukuri NPO stated that Namie's situation is such that it is still possible to return, even though not completely. Thus, it is natural, particularly for the Town Office, to focus on the inner-town matters, because these matters belong to the place where the town should be. The same staff member stated that people who live (or will live) outside Namie Town should be integrated in the host communities while they are there instead of establishing their satellite communities of Namie. This paradox presents evacuees, hosts and recovery agencies with a challenge in maintaining momentum towards the return to Namie, retaining a sense of belonging and connection between a wide range of evacuees, and facilitating integration of Namie evacuees into their host communities, even anticipating that many will remain in those communities over a long period, perhaps even permanently.

Disagreement between authorities and residents over housing development plans

There seemed to be some confusion in Namie Town Office's responses regarding residential and associated developments. According to one town officer, Namie Town approved Namie residents to move into the public disaster housing provided by Kori Town. There was also extension plans for more public disaster housing on the same site. However, Namie Town Office did not approve an extensive residential development plan, which was a non-governmental project, but endorsed by Fukushima City. Some interviewees, who were promoting the development plan, conceded the town office's stance to prompt residents to return, but did not want to return before the many issues and challenges were sorted. The reasons for these different decisions being made by Namie town office are still unclear. Possible factors that contributed to the difference in decisions were the driving actors of the projects (either governments or others), scale of the projects (about 20 houses in Kori, 400

blocks in Fukushima) and/or items that they were dealing with (either public housing or land blocks).

Namie Town doesn't decide whether to return or not. The Town doesn't even know when [we] will return. The place for relocation hasn't been settled either. The Mayor of Fukushima City secured 45 ha of land and offered the land to Namie Town on a priority basis... I don't understand why [thy Mayor] doesn't say "Yes, please". The site has schools, hospitals and shops nearby and is on a very convenient location. It might be because the potential residents would not return to Namie afterwards. The NPO [Shinmachi-Namie] found the land... The Mayor doesn't articulate the reason why he doesn't say "Yes, please". We suppose that it may be because the National government will not give money [to Namie Town] if no one is returning. [A key member of the NPO] applied for a meeting [with the Mayor] but failed. [Resident of Namie (2015)]

Some interviewees claimed that Namie Town Office put pressure on Namie residents who attempted to invite commercial development near the public housing site in Nihonmatsu City. The public housing construction in Nihonmatsu is one of the locations, which Namie Town Office designed for *its* out-of-town community plans. According to a resident interviewee, the project in Nihonmatsu is progressing more quickly than in other locations mainly for two reasons: first, the public housing plan matches with Nihonmatsu City's need to revitalise its Adachi area and secondly, the buildings can be used to accommodate students of Fukushima University located near the area after Namie residents move out. This public housing project is expected to provide approximately 200 units (Fukushima Prefecture, 2016). The Machizukuri NGO prepared a development plan with businesses and academics to provide commercial and welfare convenience for the residents. However, Namie Town office did not want the commercial development to go ahead.

Frankly speaking, [governments] do nothing. Their scenario is that they just build disaster public housing and that's it. [NGO] Shinmachi-Namie considers Machizukuri with out-of-town communities. I also attend the meetings. 200 units of disaster public housing will be built near the Adachi sport ground [in Nihonmatsu City]. There is another private land block nearby. We had workshop to create an out-of-town community utilising the private land near the disaster public housing. We planned to submit a request to the Town on the following day. But, on the day of submission, the Deputy Mayor told us

not to do it and blocked the submission. I don't know the reason why... [Our impression on the Town Office] may be affected... If we simply receive disaster public housing and live there, we would have to build up our communities again from scratch. It would be good if we could move in based on the community structure of the current emergency housing. But drawing will be required if there were many applications. Then, the residents come from everywhere; communities have to be rebuilt again. [Resident of Namie (2015)]

Governments, residents and supporting groups have to work together in a practical sense

In 2013 a member of NGO Shinmachi Namie said in an interview that collaboration between the NGO and Namie Town Office was not going well. The NGO did not intend to fight with the government, but aimed to provide better lives for evacuees, which was one of the Town Office's intentions as well (Namie Town, 2012). The communication between the NGO and Namie Town Office apparently still had not improved when fieldwork was undertaken in 2015, although the aforementioned NGO member emphasised that both parties had to come together to try and better understand each other's perspectives on disaster recovery.

However, a member of another community organisation was concerned that the significant lack of shared understanding had already brought the Machizukuri NGO to a point of no return in its relationships with the Town Office. The staff member also stated that concrete discussion and corresponding actions on out-of-town communities should have been implemented much earlier – three or four years ago, because post-disaster situations keep changing significantly.

[The Machizukuri NGO Shinmachi Namie] should discuss their role in the promotion of out-of-town communities with the Town Office very closely. Gathering by themselves to instruct that the Town Office should perform in a certain way may not be well accepted... The situation of recovery keeps changing even now. Therefore, associated services needed are also changing... In the middle of the changes... bringing a big development project in Fukushima city is not really [acceptable]. If the development plan was in line with the Town's policy, tasks that one should do could be discussed. However, the Town doesn't consider such plan at all... Discussion [on out-of-town communities] should have been done there or four years ago. [Resident of Namie (2015)]

Discussion on the importance of retaining and/or improving Namie residents' networks and community life during evacuation has been led by various groups. Machizukuri NGO Shinmachi Namie have been working on this issue with Jichikai-s, residents, businesses and academics. The NGO's proposals are based on the consensus formed by these participants. However, the involvement of Namie Town office is not as close as other participants. This means that it is not clear if the NGO and the Town Office can work together. Considering the current mismatches in the recovery objectives and policy directions as discussed earlier in this sub-chapter, they may have been simply *liaising* instead of *collaborating*.

The situation of Namie Town (and one might anticipate in other cases across Fukushima Prefecture) is that many policies are neither available nor applicable in particular settings and it may be extremely difficult to work towards a coherent and lasting recovery, because most of the various initiatives in Namie (and Fukushima in general) do not have legal precedents to refer to. That is, there is almost no guidance to follow that would allow agencies and organisations to guarantee achievement of proposed outcomes, nor mechanisms to hold them accountable to evacuees for these initiatives. This adds another difficulty in recovery on top of the issues caused by the current inability to live in the area. Therefore, it is particularly important that all parties related to the local recovery be practically involved. Disaster recovery should be done and driven for and by the local people impacted. Authorities and citizens have to work together on recovery.

5.2.8 Lessons from the Namie case study:

Uneven provision of critical information magnified negative impacts on Namie residents' recovery

TEPCO's and the national government's uneven provision of critical information during and after the disaster onset not only reduced Namie residents' trust in TEPCO and the national government, but also delayed Namie people's evacuation from the impacted area. Such initial delays pushed Namie residents into a further disadvantaged position in terms of their long-term recovery in many ways.

Along with the uneven information and support provided, Namie residents experienced widening gaps between them in the progress of recovery at individual and household levels. Such deterioration in the gaps further exacerbated the position of the vulnerable. Some of the less-vulnerable groups were able to move forward, however, they are still in one of many phases of an overwhelmingly long and unknown path to recovery.

Community formation has been impacted by repeated and prolonged transfers

Repeated and prolonged transfers caused upheaval in community lives and increasing fatigue to the evacuees in many ways. The nuclear accident and the aftermath that destroyed previous communities have diminished local people's capacity not only to recover but also to maintain daily lives with their communities.

The repeated moving also generated a number of emerging communities within and around Namie residents over the five years of waiting time since 2011 particularly at current locations if they had stayed there for a long time. This waiting is ongoing. While many residents interviewed found a strong sense of belonging in their new communities, retaining and developing these communities was not the focus of the authorities any more.

Uncertainty was exacerbated by power imbalances and unprecedented scale of disaster

The prolonged and ongoing uncertainty that many Namie residents were suffering from was often formed by uneven distribution of information and opportunities. Powerful parties such as governments controlled the distribution and the availability of those, and eventually pushed vulnerable groups into more vulnerable situations. Although the unprecedented scale of the series of hazards and disasters in Fukushima raised an extreme difficulty for each stakeholder to present concrete visions and directions, it was clear that many local residents suffered from this lack of clarity.

The important interconnectedness of local residents' daily lives and disaster recovery has not been well addressed in some major aspects of Namie Town's recovery and risk reduction responses. This can be seen in the current situation with conflicting recovery visions between governments, supporting groups and residents.

It is critical to examine the mechanism and factors of the issues over the five years identified in this sub-chapter to consider effective and acceptable approaches for all stakeholders in disaster recovery centred on the local residents, particularly those who were impacted by hazards.

6: Post-Disaster Recovery in Australia and Japan

Research aims stated in the introduction:

1. *Identify what socio-cultural, political-economic and contextual factors facilitate and/or impede disaster recovery at a local scale along with the similarities and/or differences between the case studies;*
2. *Better understand the structure and functionality of human- and power-relations in each case study area and identify the associated vulnerability and resilience; and*
3. *Explore wider relevance of insights from the case studies and integrative discussions.*

The four cases examined in this research present a wide range of circumstances in which local communities have pursued disaster recovery with support from a variety of sources. The purpose of the research was to explore how various contextual factors and the interrelationships between them affect local recovery, and what similarities and differences might be recognised between such settings and circumstances. To this point, the thesis has provided an in-depth exploration of each case. Here this chapter distils these insights, to identify the similarities and differences between the different study areas and seek to draw generalised conclusions about disaster recovery at a local level as listed in Table 7. Then the chapter discusses the salient findings in terms of the wider literature and the implications for policy and practice.

Table 7: Differences and similarities identified in the case studies

		St George	Grantham	Koizumi	Namie
Differences	Experienced hazard impacts/damages	<i>Normal</i> riverine flood impacts on small percentages of houses with no fatalities	Localised but intense flash flood impacts with 12 deaths	Devastating tsunami impacts with 40 deaths as part of national-level extensive damage	Unprecedented radiation impacts with 21000 evacuated as part of extensive damage regionally
	Future risk and ongoing hazards	High recurrence probability, the flood-impacted largely excluded from the principal mitigation measure (flood levee)	Low recurrence probability, the flood-impacted targeted by the principal mitigation measure (land-swap)	Low recurrence probability, the tsunami impacted targeted by the principal mitigation measures (relocation and tsunami levee)	Ongoing hazard without definitive solutions or mitigation practices leaving an overwhelming uncertainty
	Policies and political structures	New mitigation policy established mostly providing protection for the non or less impacted but largely neglecting the most impacted who are located on land known to be at high flood risk	New mitigation policy established missing alternative options for some of the flood-impacted	Relocation: Existing policy available centred on bottom-up proactive community involvement Tsunami levee: New mitigation policy established and implemented with top-down approach	No definitive solutions, new policies having an increasing top-down approach and retaining overwhelming uncertainty
Similarities	Presence/influence of changes	Impacts from emerging individual health problems Poor-quality services provided Depopulation and aging society Historical changes in political structures Recent transitions in political power-balance			
	Less attention to community recovery	Authorities too focused on material reconstruction Not outsiders but local community members who live with processes and consequences Risk of complacency in future Outcomes prioritised over processes damaging community development and its members			
	Influence of human/power-relations	Unbalanced human power-relations neglecting recovery process Self-imposed silence of the non or less impacted protecting <i>vested interests</i>			
	Patronising and hostile approaches	Little fostering of community participation in the process leading to a breakdown in relationships and a lack of community centredness in the process			

6.1 Differences

The four cases encompass differences in the types of hazards that produced the disasters and the scale and scope of the disaster events, as well as a range of socio-cultural, political-economic and material circumstances. These differences allow consideration of a range of issues that influence community recovery, including the geospatial scale and intensity of the hazard impacts, continuity and forecasted probability of hazards, and policies and political structures. These aspects are discussed in turn below.

Relationship between underlying vulnerability and the disaster impacts and recovery process

Comparing the four case studies, this research witnessed that, in general, greater disaster impacts on a community often attracted more outside attention from a wide range of public agencies and non-government authorities and, as a result, more support and recovery opportunities for the victims. However, impacts at the level of individuals in the community cannot be simply aggregated to produce or explain the impacts that are experienced at the community level. The converse is also true that community-scale impacts be disaggregated to explain impacts experienced by individuals (Downes et al., 2013, Eakin and Wehbe, 2009, Miller et al., 2010). Hazard impacts are felt disproportionately due to a wide range of socio-cultural, political-economic and contextual factors that also allow, or inhibit, communities to recover, particularly when power is unevenly distributed within it (Norris et al., 2008, Patterson et al., 2010). By way of example, vulnerability of flood-impacted individuals in St George should not be simply considered as of lesser importance than that of flood-impacted individuals in Grantham, despite the difference in the hazard impacts and death tolls between these two places.

St George's flood events incurred no fatalities. The number of flood-impacted households was around 50 out of the town's total of 643 households (Australian Bureau of Statistics, 2012). Therefore, many community members, particularly the non- or less-impacted, considered the series of events and subsequent recovery as relatively *minor* issues, represented by some interviewees' comments of *It's nothing compared with the tragedy in Grantham*. This often made the flood- and aftermath-impacted residents feel that their hardships were downplayed

or misunderstood by other community members. In terms of governance, the localised scale of the event enabled the BSC to respond to the disaster events with suppressive political power. At the same time, the inland, small-scale BSC had a limited capacity to work on disaster management and had to depend on contributions, support and expertise from outside, such as from the powerful State government and cotton farming sectors. Such dependency on these external groups may have prompted the BSC to follow and prioritise the views of those *supporters* in a top-down manner rather than evenly incorporating local residents' views. This meant that recovery and risk reduction opportunities were distributed unevenly and not transparently.

In Grantham, the tragic impacts of the rapid flash flooding that led to 12 deaths and the loss of a number of houses and critical infrastructure traumatised local community members. The LVRC's political efforts gained strategic large-scale support from the general public and the Federal government for their land-swap scheme. This enabled the LVRC to overturn the State government's initial disagreement of the scheme and complete its land-swap project, which was materially and financially successful for the LVRC. However, the LVRC's lack of alternatives and its rapid decision-making and implementation missed an opportunity to ensure a wide range of participation and neglected a group of people who did not, or could not, participate in the land-swap scheme. Due to intense and prolonged public attention and various negative issues and challenges on the ground from some local residents, a distrustful impression of the LVRC formed in some quarters as the regional council claimed credit for a successful recovery. This unequitable result, and that some of those left behind are now more vulnerable than before the flood, remains largely unknown and unpublished in most official accounts of the Grantham floods. Grantham community had already been in some decades of decline prior to the 2011 flooding. To compound the issues, a small number of local residents also reportedly attempted to use the public attention to contest other key local initiatives. This mixture of issues repeatedly confused and exhausted many Grantham community members and impeded community development in disaster recovery.

The extensive tsunami damage across Japan's Tohoku region caused the loss of 15,894 of human lives and 2,557 people missing (as of 9 September 2016 – National Police Agency, 2016)

with approximately 561 km² of inundation (Geospatial Information Authority of Japan, 2011). Although communities, such as Koizumi, had pre-existing tight-knit human relationships and social structures that aided the recovery process, the scale of the disaster presented an extreme logistical challenge. Material and locational limitations in its capacity to provide emergency temporary housing units, together with the uneven capacity to identify and allocate these units, created conflicts between residents of Koizumi. This experience was embedded in some community members' minds and may hinder further development of shared community resilience in the long term.

The large scale of the damage to the Tohoku region also affected the progress of group relocation projects in Koizumi (and other areas) due to the large number of projects for each local government to look after during the post-disaster period. For example, Kesenuma City dealt with 51 group relocation projects (Ishimaru, 2013). Securing viable and available relocation sites in the mountainous Tohoku region, and competing with hundreds of other communities, was a complex challenge for the affected communities, the local governments and national and regional agencies. The rapid increase in the price of land, building materials and labour due to high demand added financial challenges to the logistical, emotional and practical issues involved in local residents' recovery.

The unprecedented level of radiation impacts in the Fukushima region also presented considerable challenges to the national and local governments as well as the local residents. The extreme level of the intensity and extent of radiation surpassed the national government and TEPCO's capacity to deal with it. This incapacity contributed to these authorities' uneven distribution of information and opportunities. People of Namie Town were left in danger and their evacuation and initial recovery delayed due to the lack of transparency by Government and TEPCO about the radiation risk. The Town's population of 21,000 made it difficult to collectively evacuate in a single place when it finally took place. The same temporal and quantitative challenges occurred in securing places for temporary and/or permanent houses and land-blocks, pushing vulnerable groups into more vulnerable positions. At the same time, the radiation issue is expected to linger in some areas in and around Namie Town for decades. Fukushima, particularly Namie and its surrounding towns, was stigmatised by the

unprecedented and extensive radiation issues. Despite the area receiving overwhelming media attention and the extensive political pressure brought to bear on their circumstances, no clear solution was found.

The scale of hazards and impacts are considerably different between the cases. The difference enabled and impeded respective authorities' recovery efforts in different ways. The ways that the tasks, challenges and achievements faced in their recovery efforts were further influenced by the underlying and emerging social, political and financial factors. Quarantelli (1999) has earlier highlighted the point that consideration of recovery should not just focus on the obvious and direct damages but also other less obvious effects that will also influence the recovery.

Future risk – the balance of likelihood, consequences and uncertainty

The four case studies have also demonstrated that different levels of hazard recurrence probability and duration of disaster impacts influence the vulnerability and resilience of the disaster-impacted residents and their subsequent recovery and risk mitigation measures in different ways. As stated above, individual vulnerability cannot be considered proportionally between different scales (Downes et al., 2013, Eakin and Wehbe, 2009, Miller et al., 2010). The recovery and risk mitigation measures taken in St George (flood levee), Grantham (land-swap) and Koizumi (relocation and tsunami levee) commonly considered large-scale scenarios that may widely impact the community. In St George's case, the vulnerability of flood-impacted homeowners remained, or even perhaps increased as many of them were excluded from the wide-focused solutions. The low-impact (at a community scale) but high-probability of riverine flooding at this location without provision of balanced recovery and risk reduction measures continues to torment those disaster-impacted residents. Whereas Grantham and Koizumi's hazard characteristics were generally opposite from St George's (i.e. high-consequence at a community scale but low-probability), and the measures were mainly offered to the impacted residents putting aside participation and eligibility issues. As for the radiation issue in Fukushima, residents of Namie Town continued to suffer from the ongoing radiation impacts, lack of action and overwhelming uncertainty.

The mitigation measures in St George were implemented in exchange for the future safety of the majority of the town that was little impacted in the more recent series of floods. St George had seen three flood events in consecutive years; many of the flood victims, who lived in one small area, were repeatedly impacted by flood water. This repetitive flooding exacerbated the social, mental, physical and material vulnerability of the flood-impacted residents. As the floodwater impacts largely followed the shape and elevation of the town (possibly with some variations arising from the agricultural developments), a similar scenario is likely to reoccur during future events. Understandably, the flood-impacted residents were concerned about the recurrence of the hazard damage on top of that already experienced. However, most of their houses were excluded from the BSC's permanent flood levee protection – the principal risk mitigation initiative of the town for the majority. The BSC provided mitigation funds for *some* of the flood-impacted and levee-excluded residents, but the funds did not adequately compensate the improved safety for the majority. As a result the levee-excluded residents' already-damaged material and social vulnerability was not reduced but was possibly further exacerbated by the council levee. Although the BSC's hydrological study indicated no major difference in flood water height to the majority of the town between scenarios with and without the council levee (together with the agricultural developments on the other side of the river), the flood-impacted residents' future flood risk may have increased, or at least has not been reduced, in both a relative and absolute sense.

The uncertainty due to the ongoing radiation contamination and the critical lack of obvious solutions have prevented Namie people from reducing their vulnerability. The combination of earthquake, tsunami and radiation brought different impacts to different areas of Namie Town. Strong levels of radiation remain in large parts of town without definitive solutions. The local residents' vulnerability was exacerbated during the prolonged evacuation that did not allow them to physically live in their town. Gaps between the relative levels of vulnerability between Namie residents widened. While some less-vulnerable residents were able to utilise their human, social and financial capacities to permanently or semi-permanently relocate and begin re-establishing their lives, many others did not have the means to do so. This increase in vulnerability has considerably impeded the residents from returning to the town, and their inability to return further increases their vulnerability both as individuals and as a community. Authorities focused on material rehabilitation of the town with decontamination and

reconstruction rather than dealing with ongoing human and social impacts. This leaves many Namie residents in vulnerable positions.

While authorities' recovery and risk reduction efforts in Grantham and Koizumi (Tohoku region in general) primarily addressed the disaster-impacted community members, those in St George did not or at least down-played the situation of many of the flooded. Danger has remained in Namie because of the lack of definitive solutions against the ongoing radiation hazard. As a result, the disaster-impacted residents' vulnerability in these two cases, St George and Namie, have deteriorated not only from the experience but also from the forecasted or ongoing nature of the hazard. In this sense, the disaster impacted residents of St George and Namie can be considered as further disadvantaged in recovery than those of Grantham and Koizumi, because recovery should enable disaster-impacted citizens to be more resilient to future events (Wisner et al., 2004).

Differences in policies and political structures affected vulnerability and resilience in different ways

In some instances, policies to initiate recovery and risk reduction measures in the case study areas were newly established to deal with the post-disaster situation. Temporal and financial pressures were often applied in the establishment and implementation of new policies and measures in order to avoid a hiatus period. In some cases, this pressure positively prompted local governments to secure necessary funds for their recovery and mitigation plans through negotiations with higher-level governments. The LVRC in particular overcame bureaucratic power-struggles caused by hierarchical political crashes and won the opportunity to realise the land-swap project. However, such pressure may also have negatively accelerated limitations in the operational time and associated funding availability. In all of the case studies considered here, the relevant authorities often adopted a top-down approach and attitude of *getting things done*. This was well reflected in the introduction and implementation of the flood levee construction and mitigation funding in St George, the land-swap in Grantham and the tsunami-levee construction in Koizumi.

In St George the BSC designed and rolled out risk reduction policies for the levee construction and the funding for mitigation, following the idea that levee construction was *popular* in the political world at the time. As a result, the BSC put a lot of effort into risk reduction with levee construction and mitigation measures, but, according to community members, put little effort into addressing the recovery of the flood-impacted residents and incorporating their voices and views in decision-making. Similarly, the LVRC promoted its innovative land-swap policy without providing other support opportunities that might have led to increased participation in the land-swap. Despite the wide appreciation for the idea of relocation, and some associated services offered, the LVRC's unbalanced promotion of its project left some vulnerable, possibly the most vulnerable, residents in the hazardous area. The tsunami levee construction in the Tohoku region including Koizumi was also based on the conventional top-down approach. This political approach together with various interests and societal changes indirectly pushed the consensus-formation process for a *quick* conclusion, marginalising less powerful opponents in the community. In all these cases, hazard-impacted residents, particularly the most vulnerable groups, felt that they were victimised in the exercise of political power imbalance.

On the other hand, some policies, such as those related to emergency houses and group relocation options, were already available before the disaster occurred. Therefore, in Tohoku, the emergency houses were deployed relatively quickly in accordance with the existing policy, although the unexpected long-term use of units brought challenges such as the short durable life of emergency housing materials. As for group relocation, the local residents of Koizumi and authorities involved were able to adopt existing policies and learnings from various experts and related cases. In addition, the group relocation policy required decision-making and actions by the participants throughout the process. This enabled the community members to drive the group relocation project as an active player. These factors helped the stakeholders of Koizumi co-plan the general processes of the recovery and risk reduction at the local scale, although there were challenges in dealing with pre-fixed conditions such as limitations on block size. Nevertheless, the active and open participation of the community members and beyond throughout the entire process enabled the inclusion of all groups, so that no particular group was victimised.

Another notable difference in policy setting is that although new policies and measures were being introduced and implemented, the uncertainty cannot be resolved in the Fukushima region including Namie Town because of the ongoing radiation hazard that might take decades to resolve. In pursuing this, a series of policies relating to compensation payouts and long-term evacuation have been designed and implemented by national and local governments. However, these policies will only remain effective for a limited and unknown period of time based on the ongoing presence of the radiation hazard. The top-down nature of these policies to *handle* the situation and the contradictory outcomes of an indefinite length of time are impeding disaster recovery at the local scale. Local residents feel that they were left behind the high-level power-balance and decision-making process, which in a way increased the uncertainty. Therefore, in this case the recovery has struggled not only with the lack of policies to begin with but also with the ineffectiveness of the policies and political structures with the result that many residents feel abandoned.

6.2 Similarities

Despite the differences elaborated above, some interesting and important similarities emerged across the case study areas. These illuminate inevitable involvement of various changes in recovery, unbalanced attention given between community recovery and infrastructure reconstruction, critical presence and influence of human- and power-relations, and neglect of recovery processes over outcomes. These aspects are discussed in detail in the following sub-sections.

'Changes' at micro and macro scales affected recovery

Local residents in different hazardous circumstances among the study areas commonly experienced different types of *changes* in the post-disaster periods. Despite the effort of authorities to plan recovery procedures, disaster recovery rarely goes as planned because individual and community circumstances are unique, and the changes that occur as both the disaster and recovery unfold inevitably affect recovery and risk reduction at any point of time (Birkmann et al., 2010, Rubin, 1985, Wisner et al., 2004).

For example, a flood-impacted senior resident in Grantham experienced severe mental illness in the early stage of recovery. This, together with his previous health record made it particularly difficult for him to find a stable job to financially support his recovery and participation in the land-swap scheme. In Koizumi, at least three members of the KTG suffered strokes over the five years since the 2011 disaster with different levels of aftereffects. They were all middle-aged (approximately in their 40s to 50s) male householders, who had worked hard for their individual and community recovery and risk reduction. Understandably, these temporary and/or semi-permanent disruptions to their health have heavily impacted their recovery plans and actions in many ways.

In Namie, the husband of a senior female evacuee passed away shortly after the couple moved out of the temporary emergency housing arrangement and secured a house in a nearby city in 2014. Although she worked vigorously on sustaining the community ties between Namie residents and beyond, the shock appeared to push her to the edge of a personal breakdown. This may have greatly affected both her and the community's recovery. Other issues in the material, reconstructive aspect also affected the recovery of local residents. For example, the recovery of some residents in Grantham was heavily impacted by faulty and incomplete work undertaken on new houses. As the builders abandoned the work without completing it and also did not return any payments the residents had to bear an unexpected financial, temporal and emotional burdens.

Other broad societal changes occurring prior to the disaster such as depopulation, aging and restructuring also impacted disaster recovery at the local scale in many ways. For example, depopulation, in parallel with accelerating aging, is a serious issue in rural areas in Japan and which particularly affected the recovery in Koizumi. The well-progressed Machi group relocation project faced these issues at its new inland location, which exacerbated local residents', particularly the elderly and children's, access to critical infrastructure and services such as shops, hospitals and schools, because they did not own private motor vehicles. How to successfully hand over the key local initiative as movers and shakers on to decreasing younger generations was another challenge in Koizumi. This challenge increased its importance together with another relevant challenge of maintaining the momentum gained

through disaster recovery. Whittaker et al. (2012) also point out that depopulation, together with other factors, increased the vulnerability of the local people to bushfire hazard in the Wulgulmerang district, a rural district in Australia despite their close human connections. Depopulation in this area caused socio-economic decline; the decline in productivity jeopardised the community's presence and access to services. In relation to bushfire risk this meant that there were not enough able bodied volunteers to man fire stations and little attention to risk reduction in the area (Whittaker et al., 2012).

Changes in the broader socio-political structure and its rationalisation commonly impacted the study areas. For example, Koizumi had become a small, rural section of Kesenuma City in September 2009 through the nation-wide series of municipal amalgamations (Ministry of Internal Affairs and Communications, 2016). This change of position may have affected the level of communication and interaction as well as the political power-balance between the Koizumi community and higher-level authorities. Similarly, according to some residents, the recent local government restructuring and amalgamations in Queensland reportedly impeded the effectiveness of local voices in St George. Stopping divisional voting, historical decrease in the number of the councillors and changes in their balance between work and salary may have distanced the BSC from local voices over time. Increasing political and financial pressure for local politicians of these cases to pursue further *cost-benefit efficiency* may have influenced them to prioritise the quick and visible achievements in risk reduction measures over wider and more targeted community recovery efforts.

Changes in the political power-balance also affected the recovery of Namie Town. The national government increased its presence in planning and implementing recovery and risk reduction measures in the affected areas over time with its financial and political power. Such power is needed to develop and maintain recovery and risk reduction for decades against the enormous scale of the radiation disaster; typically local governments are ill equipped with sufficient political power and resources of money, people and expertise. This can be seen in the national government's increasing focus on lifting the series of evacuation orders. This power-relations may have pushed Namie Town Office to follow or at least accept the national government's agenda despite community members' strong reluctance to return. In these

cases, local community members often had to find and secure their own ways to recover whilst facing and experiencing these changes, which were often frequent and ongoing.

Infrastructure reconstruction favoured over social community recovery

Although many local residents in the study areas commonly experienced uncertainties in the post-disaster periods, they felt that it was the lack of attention in the responses and efforts provided and/or not provided by authorities that was the real challenge. Some stated that *the aftermath was worse than the trigger hazard events themselves*. This indicates the critical lack of attention to, and the subsequent downplaying of the importance of, the local sociality – the everyday social relations in the lives of local residents as a significant element in community recovery. In some cases, this inattention even exacerbated the difficulties facing the disaster-affected people. Authorities tend to emphasise visible and material reconstruction and risk reduction in the name of safety improvement, which is indeed one of the major aspects of disaster recovery. However, commonly and in the case of study areas, the excessive focus on reconstruction and risk reduction measures was felt by many of the research participants to have taken priority over the human-social side of recovery and associated community development.

Such an uneven focus on reconstruction and risk reduction measures may have introduced two major risks into the disaster-affected communities. Firstly, not only positive but also negative consequences of these measures will remain in the local area for many years or generations to come. In St George, the large dirt-structured mounds of the BSC's flood levee will remain in the town physically dividing the community and considerably obstructing some residents' properties. In Koizumi, the massive 14.7 m-high concrete tsunami levee will dramatically change the lives of the local people who are connected to the sea in many ways. In both cases, expertise was brought in from outside and rolled out in a top-down manner. In the processes of decision-making and implementation, these authorities' responses critically lacked understanding and/or input from local residents, whose lives would be severely impacted by these material structures. In addition, such installation of expertise without local inputs may generate and develop greater complacency in the area over time. This risk is also pointed out by Smith (2000) as the *levee paradox* that the greater structural protection provided (e.g. flood levees) also leads to apathy about the hazard and even greater damage

when the protection is breached. Furthermore, in these cases not only the outcomes but also the processes damaged the communities. In Grantham, the LVRC's exclusive focus on the land-swap missed opportunities to assist those who did not or could not participate in the program. For some this created physical divisions between people who moved up on the hill and those who remained on the lower ground, widening the human-social gaps between them. Although limitations in the local authorities' capacities may need to be considered, all these instances demonstrated the lack of holistic understanding of disaster recovery at a local scale. As a result, improvement of hazard exposure for some may exacerbate other aspects of vulnerability of others, particularly the most vulnerable, in the community.

Secondly, the strong focus on the material reconstruction and risk reduction measures can lead to the exclusion of local disaster-impacted residents from the *local* recovery. This may result in the situation where the disaster-impacted community members are excluded from the (re)development of the community. Possekel (1999) warns of the paradoxical risk that the neglect of local social effects may bring negative outcomes to the locals even if the reconstruction is economically successful. Mori (2011a) exemplifies this issue following the 1993 tsunami disaster in Okushiri Island, Japan, where the material reconstruction gave little consideration of community (re)development in recovery and resulted in a reduction in the community and its inhabitants. Such imbalances should be overcome by consideration of both material and non-materials aspects, both which are essential to achieve sustainable development of a community (Ahrens and Rudolph, 2006). In St George, the BSC's flood levee was designed and constructed to protect the majority of the town's population but clearly excluded some 50 houses, many of which had already been inundated by previous floods. In addition, some residents stated that they were traumatised by the BSC's forcible levee construction process. These relatively small numbers of *levee-impacted* residents felt that they were disregarded, possibly because their presence was not considered as substantial in the overall population of the town. In Grantham, many land blocks at the new estate displayed 'for sale' signs during my follow-up visits in 2015 and 2016. Although the land-swap participants were fully entitled to sell once the swap was completed, this flexibility may have led to the loss of a certain number of the flood-impacted community members from the community's (re)development. In Namie Town, approximately 48% of the recent government survey respondents said that they were determined not to return and 32% said that they were

undecided for various reasons (Reconstruction Authority et al., 2016). However, the local and national governments increasingly focused on prompting the residents to return once the evacuation order is lifted (possibly in 2017). Namie Town foresees its *re-starting* population of 5,000 comprising 4,000 previous residents and 1,000 construction workers compared with its previous population of 21,000 (Namie Town, 2016d). While it is indeed essential to rebuild the town with certain numbers of original residents, about 17,000 who remain outside Namie Town will be left aside. This may result in considerable neglect of the disaster-impacted residents' recovery as *community members*. All these case studies demonstrate that the fundamentally important question in respect of disaster recovery is – *whose recovery is it?*

Human- and power-relations commonly evolved and impacted vulnerability and resilience

Power imbalances were often identified in each of the case studies. Such power-imbalances often led to unevenly distributed benefits, burdens and controls in a community and beyond. People with power and various political, social, and financial agendas often marginalised the less powerful. Authorities often exercise their power with top-down approaches failing to communicate with or even excluding disaster-impacted citizens, which eventually increase people's vulnerability (Browne, 2013, Cannon, 2015). Bankoff et al. (2015) point out the typical risk of marginalisation of disadvantaged groups in a community based on power imbalances (see also Cannon, 2015). Hsu (2016a) also identifies the risk of power imbalances in disaster recovery when experts from outside of the 2009 Typhoon impacted indigenous area in Taiwan not only brought technical advantages but also alienated, or even marginalised, the local residents from recovery process. Such actions in the study areas prompted some powerful actors to exercise their power as a means of retaining or enhancing their status, even to the extent of neglecting the recovery process.

In St George, the BSC's and cotton farmers' approach intimidated and effectively suppressed questions and objections from other stakeholders. This silenced the voices of those most affected and accelerated a series of poorly considered, and perhaps even allegedly unethical recovery and risk reduction responses. According to some interviewees, the patronising approaches taken by the LVRC and relevant agencies such as the police during the lockout operation in Grantham generated frustration with and distrust of the authorities. Although the lockout itself may have been designed to secure citizens from secondary damages such as

physical injury and PTSD¹⁵ caused by witnessing human bodies, those local residents were traumatised by the authorities' patronising attitude due to a lack of communication and inclusiveness. Later in the Grantham recovery process residents believed that they were then punished, as a result of contesting the power in the local governance, through the subsequent sudden closure of the community recovery centre. Similarly in Japan, the political trend that started promoting the potentially forthcoming return to Namie Town (and other surrounding areas) was pressuring Namie residents and neglecting or even rejecting alternative pathways. In Koizumi, it was not only the authorities but also some residents that pushed for and supported the top-down national level decision of the tsunami levee construction without sufficient discussion about potential consequences and/or adjustments of the construction. Such excessive focus on display and/or retention of power meant that the recovery process lost the fundamental objective of supporting the impacted residents. This resulted in a delay of the disaster recovery at the local scale instead of facilitating it and it increased the vulnerability of some residents who were targeted and/or impacted by these actions.

Another notable factor that impacted recovery at the micro-local scale was the self-imposed silence of the majority of community members. In St George, for example, the majority of the town's population were, or at least thought of themselves, as less- or non-impacted by the floods, countermeasures, processes and/or outcomes. As some interviewees stated, this meant that a large number of community members often hesitated to question and take actions against the situation. This may have reflected people's fear of not only submitting oneself to the various types of pressure described earlier but also collectively placing their secured convenient lives and livelihoods at risk. This is similar to the situation in Koizumi. The majority of community members stated that they were hesitant to step in, while the powerful and influential community members, who together with local authorities marginalised their opponents and pressured them to support the construction of the tsunami levee. According to the interviewees, the majority, particularly many of the group relocation participants, were concerned that their achievements in recovery might be delayed and/or jeopardised if they objected to the plans and proposals coming from larger institutions with more political power.

¹⁵ PTSD stands for Post-Traumatic Stress Disorder.

In both cases, the uneven exercise of power retained or even strengthened pre-existing and emergent divisions in each community.

Patronising and/or hostile approaches damaged the processes of recovery and risk reduction

The measurement of recovery against objectives, recorded in terms of specific metrics such as number of housing units, kilometres of roads or number of bridges constructed, often takes priority in reporting and assessing disaster recovery. In the case study areas, individuals and communities experienced the processes of recovery and risk reduction in different ways. In many cases, major recovery and risk reduction initiatives were conceived, delivered and managed by authorities with their own objectives, priorities and measures of success. Plans and directions of the levee construction in St George and Koizumi and the land-swap in Grantham were displayed to the local residents, although opportunities to influence the delivery of those plans was generally limited. For the residents of Namie, however, the local circumstances of dislocation meant that they did not get an opportunity to view and comment on proposed responses, planned outcomes and alternative solutions. Regardless of the different levels of clarity of information, all these processes were pushed by authorities with a mindset that *they* would reduce risks *for* the local people. This is despite the fact that work on previous case studies and the wider literature tells us that best practice is actually to mobilise key capacity and expertise to work on risk reduction *with* the local people (Aguirre, 1994, Ahrens and Rudolph, 2006, Berke et al., 1993, Haynes et al., 2008b, Howitt et al., 2012, Norris et al., 2008, Pearce, 2003, Rich et al., 1995, Tompkins and Adger, 2004). However, in approaching the task of recovery and reconstruction in a non-community centred way, authorities in the case studies often prioritised their views over the community and its members whether consciously or sub-consciously. Possekel (1999) claims that disaster management of the Montserrat volcanic disaster was predominantly occupied by relevant authorities and agencies downplaying the ability of local people as mere victims despite of their strong willingness to contribute to the reconstruction process. The case studies presented here also demonstrate why and how recovery and risk reduction objectives were generated, developed and implemented with little reference to locally affected people. Disaster-impacted groups, are at best relegated to being a passive audience for whom solutions were generally displayed and announced but certainly not discussed collaboratively

with the local residents. This resulted in neglecting the view as a community – *whose recovery is it?*

At the same time, the risk of overstating the importance of just one side of recovery and risk reduction efforts seems to exist not only within the discourses of disaster response authorities but also in that of other stakeholders, including residents. Polarised views and objectives caused clashes between stakeholders in the case study locations, where players consciously or subconsciously manipulated the objectives, processes and actions. In St George, the residents' flood committee was formed by some of the flood-impacted residents to prompt a response from the BSC, who had not communicated their plans on disaster recovery and risk reduction. However, the committee's approach was interpreted as an *anti-council threat* by the BSC. Likewise, the LVRC and the resident-driven community recovery centre collaborated well in the initial phase of recovery, but later the relationship between these two key actors became one of rivalry and power control. The LVRC eventually forcibly closed the recovery centre in a display of 'who's in charge' despite the ongoing needs of the flood victims. The recovery stakeholders of Namie Town such as the Town Office and community groups also focused too much on their individual visions and agendas without compromising and/or integrating them. This, together with the long-lasting radiation issue, kept these groups and initiatives separated, losing chances to find ways to collectively tackle the uncertain situation. All these clashes were caused by the manipulation of their objectives, processes and actions, shifting the focus from recovery to rivalry. Such conflicting situations commonly diminished the opportunities to achieve *shared* aims, discussions and achievements in recovery.

6.3 Wider relevance of this study

The first half of this chapter identified and outlined a number of critical similarities and differences that affected the recovery of the disaster-impacted communities. This section now explores the potential for wider relevance of these findings for policy and practice in relation to disaster recovery and risk reduction at a micro-local scale.

Ordinary factors can be the key to causality of vulnerability and resilience

The findings discussed in the 'differences' section mainly indicate consequential aspects of hazard impacts and mitigation measures. Whereas the findings discussed in the 'similarities' section highlight causal, fundamental and underlying aspects of the issues experienced by the disaster-impacted community members of this study. Differences in hazard impacts, future likelihoods and consequences as well as the associated mitigation measures further influenced the impacted-residents' underlying vulnerabilities in the study areas. Differences in policies and political structures also shaped vulnerability and resilience in these areas in various ways. These differences, as *outcomes* that were snapshotted at certain points of recovery, display the impacts of and responses to the hazard-derived, visual and/or countable damages, which often easily attract public attention as representation of vulnerability and resilience (Schneider, 2002). Contrary, the dynamism of various changes and ongoing human- and power-relations in the recovery processes commonly affected the recovery of the case study communities. In particular, the lack of engagement with these dynamic and continuous factors accelerated the development of vulnerability. These dynamic and continuous aspects commonly identified in the study areas illuminate the *causes* and development of vulnerability and/or resilience, i.e. why and how the hazard-impacted people suffered further or coped well with the recovery process.

The characteristic aspects of disaster recovery that focus on the visible factors such as hazard scales, numbers for finance and material structures may easily attract attention from outside the disaster-impacted communities and from the non- or less-impacted community members because of the *convenience* and outward prevalence of these aspects. However, an unevenly strong focus on such aspects may place disaster management at risk of overlooking or downplaying the critical essence of local vulnerability and resilience in disaster recovery due to their dynamic, ordinary and intangible nature. This issue fits the concern stated in the wider literature that the importance of the dynamism and continuity of vulnerability and resilience are often ignored (Handmer, 2003, Pelling, 2012, Wisner et al., 2004). Most of these causal factors, such as broad societal changes, human- and power-relations, already existed in the pre-disaster time and influenced differential levels of vulnerability (Hsu, 2016a, Jordan and Javernick-Will, 2012). Even if these factors did not pre-exist, they were derived during the disaster recovery and risk reduction processes following the disaster. Furthermore, existence of these causal factors may have been known but overlooked or neglected by the community

and its members themselves precisely because they seem too ordinary and are easily taken for granted rather than valued and nurtured by deliberate action. For example, some already had but did not notice the value of their local sociality for a long time, or others were aware of unevenness in the community but did nothing about it, because communities often consist of the mixture of meaningful co-habitation and uneven practices (Cannon, 2008). Although it can be controversial to address some of these factors, particularly when going against the status quo, seeking *solutions* without acknowledging these ordinary but critical factors may jeopardise the continuous (re)development of the town and its sociality in which the community and its members have to be centred. Addressing the causal factors of vulnerability is the only way to lead disaster recovery to sustainable development of communities (Wisner et al., 2004).

Material and non-material aspects need to be addressed carefully in recovery

There is a strong need for integrated consideration of, and engagement with, stakeholders early in recovery planning process and beyond (Aguirre, 1994, Ahrens and Rudolph, 2006, Berke et al., 1993, Howitt et al., 2012, Norris et al., 2008, Pearce, 2003, Rich et al., 1995, Tompkins and Adger, 2004). For disaster-impacted local people, recovery needs to consider not only the material characteristics of the hazards, damage and responses but also the relationships with and implications for non-material factors such as social, cultural, political, financial and contextual aspects of disaster and recovery as well as the dynamism of the combinations of these (Ahrens and Rudolph, 2006, Geis, 2000, Shaw, 2014). All stakeholders should be involved, in some capacity, in what is referred to in Japanese as ‘Machizukuri’ – building the town and community life – as active players, and planning must carefully address both the (re)development of the town as a material form and also the more intangible community life, because these two objectives co-exist. Possekel (1999) highlights that recovery and risk mitigation measures become effective only when the community and its members sufficiently understand, collaborate and accept these measures through the development processes. To do so, the stakeholders such as authorities, experts and residents have to acknowledge different perspectives of visions, responsibilities and capacities (Quarantelli, 1999), which are interrelated with vulnerability and resilience of the disaster-impacted communities and their members (Ingram et al., 2006, Rubin, 1985, UNISDR, 2009, Wisner et al., 2004). This helps the community and its members as well as other stakeholders

address the local vulnerability and maintain or even increase their resilience (Ahrens and Rudolph, 2006, Johnston et al., 2012, Olshansky et al., 2006).

Rights and responsibilities of centring community members in recovery and community development

In particular, expert agencies and authorities need to avoid assuming that they are in charge of controlling community members in any stage of the disaster management, because decentralisation of decision-making power helps disaster management increase its responsiveness to dynamic local needs (Ahrens and Rudolph, 2006, Waugh and Streib, 2006). Although there may be some situations where strict rules need to be applied, such as mandatory evacuations, authorities' work should not be executed based on the idea of controlling the disaster impacted community. Expert agencies' and authorities' task is to serve the disaster-impacted community in its recovery, and recovery (or any actions/stages of risk reduction) inevitably requires an approach where the community are put at the centre and their voices, views and needs heard and accounted for. Ideally, community members should be proactively involved, through volunteerism and a shared approach to the responsibilities of recovery and risk reduction. This is backed by Haalboom and Natcher's (2012) argument that neglect of local knowledge and experiences and imposition of external values and expertise by authorities tend to hinder local communities' autonomy and capacity in disaster recovery (see also Bird et al., 2009, Howitt et al., 2012). Expertise is mobilised to work *with* community members rather than working *for* them. Community members (both powerful and less-powerful) have to take responsibility for their lives in the community as active members instead of leaving decisions to, or manipulating decisions by, authorities. This is critical to address their needs, issues and responsibilities clearly and correctly in their recovery and risk reduction, and develops associated measures that are socio-politically necessary and acceptable (Aguirre, 1994, Ahrens and Rudolph, 2006, Berke et al., 1993, Howitt et al., 2012, Norris et al., 2008, Pearce, 2003, Rich et al., 1995, Tompkins and Adger, 2004). As the group relocation case in Koizumi demonstrated, engagement with the communities requires substantial time, resources and efforts, as well as skills, values and understanding that were, reportedly, less or little recognised as necessary for reconstruction and mitigation measures in other case studies. However, the community may need significant support in order to effectively participate in decision-making processes. This investment in building community capacity requires time and resourcing, which is difficult during the often-chaotic time

following a disaster. This once again points to the need to work with communities to reduce risks and build capacity well ahead of a disaster. Actively involving community members in participatory decision-making processes in pre-disaster times help them familiarise and understand the processes in stressful post-disaster times (Johnston et al., 2012). Paton et al. (2014) point out the importance of better understanding the ways that local communities develop both in pre- and post-disaster times and incorporating the understanding to policy and practice. This research has shown that one of the key markers of resilience and recovery is people's shared capacity to avoid both relying on and taking advantage of the recovery process itself.

Dynamic, disproportionate and uneven changes and uncertainties in disaster recovery need flexibility to maintain sustainability in the recovery processes

Local recovery has to be flexible in many ways, because responsibilities, actions and challenges required for local recovery often occur in an uneven and non-sequential manner (Berke et al., 1993, Rubin et al., 1985). Changes and uncertainties emerge and develop at many points of time and at a variety of scales during recovery. As these changes and uncertainties occur and become apparent they influence vulnerability and resilience of a community and its members (Birkmann et al., 2010). It is therefore essential for all stakeholders to understand that recovery does not often proceed as planned (Olshansky et al., 2006, Waugh and Streib, 2006). Possekkel (1999) also points out that a wide range of factors influence form dynamism and uncertainty, which affect stakeholders' decision-making in a non-linear manner. Capacity to accept or at least prepare for the possibility of such changes and uncertainties will assist the community, particularly those who play key roles, embrace the changeable and uncertain situations with flexible ways of thinking and actions. This fits the argument of Birkmann et al. (2010) that capturing dynamic and diversified processes of changes is essential to increase understanding of vulnerability and resilience at a local scale. This acceptance of changes and uncertainty while attending closely to the diversity of voices and experiences on the ground will help the stakeholders, particularly key community members and groups, clarify just what recovery means to them.

Interviewee 1: *The point is 'What do you want to do?' and 'What do you do now [at each point of disaster recovery]?' . [The answer] will come up naturally by following these questions rather than thinking about what the*

'good' things to do are [in advance]. It may be difficult to understand unless you are in such situation. But it will come up for sure. Everyone has a feeling that she or he wants to do something. [The critical point is] Whether you do it or not.

Interviewee 2: *It is overwhelming shortly after the disaster onset. However, it should be emphasised that whether being able to think about the situation at each point of, for example, after one year or two years of the disaster or not is critical. [KTG members 2013]*

The adaptability of policies and political structures is also an important factor in pursuing flexibility in disaster recovery. While some aspects of the case studies, such as the group relocation in Koizumi, already had relevant policies in place, many other cases including the construction of levees in St George and Koizumi as well as the land-swap in Grantham had to design and establish new policies. Furthermore, many aspects of recovery in Namie continued suffering due to a lack of effective policies. Olshansky et al. (2012) state that additional capacity is required for governments as policy makers to adjust to disaster circumstances that are typically large-scale and dynamic (see also Waugh and Streib, 2006). Adding to their work, this study has identified a further risk that post-disaster establishment of policies made under time constraints and pressure often contributed to the implementation of top-down recovery and risk reduction approaches for quick achievements. In addition, political structures should also be equipped with the capacity and flexibility to mobilise necessary resources and expertise to where they are most needed to support the disaster-impacted citizens instead of top-down decision-making at odds with local needs. This follows Waugh and Streib's (2006) argument that disaster management needs a comprehensive and flexible mobilisation of expertise, resources and services from all levels and groups of the stakeholders to meet the local needs.

Community-scale recovery should be based on recognising local sociality instead of exercising power

The recovery process must be community-centred, with the community driving the recovery and risk reduction at the local scale, because they, instead of other powerful actors, are the ones that will live with the processes and outcomes of the recovery and risk reduction. It is important that recovery efforts should be guidance and assistance so that the disaster-impacted community members can regain *their* strengths and resources to live (Mooney et

al., 2011). Active involvement of local communities and their members helps them define and embrace their own needs, issues and responsibilities – their local sociality (Aguirre, 1994, Ahrens and Rudolph, 2006, Berke et al., 1993, Howitt et al., 2012, Norris et al., 2008, Pearce, 2003, Possekkel, 1999, Rich et al., 1995, Tompkins and Adger, 2004). Possekkel (1999) exemplifies this effect that the active community involvement can prompt extensive discussions on basic values and objectives, which the members of the community can tailor to the new environment – *their* post-disaster lives. This collectively develops local resilience where interactions between individual and community scales in recovery processes are key (Downes et al., 2013, Jordan and Javernick-Will, 2012, Norris et al., 2008). In pursuing this active community involvement, respect for the local participants and stakeholders, and then development of trust with them have to be in place to begin with (Wisner et al., 2004).

It is also important to recognise that the risk of potential biases and power-relations often exist not only outside but also inside the community, because communities are not necessarily benign and often contain inequities embedded within (Cannon, 2008). Disagreements, as clashes of cultures, often occur between community members who are boosted by power-relations and socio-cultural inequities and result in increasing disadvantaged people's vulnerability (Bankoff et al., 2015, Cannon, 2015). Contests and clashes of the stakeholders over power tend to push the wider community aims and efforts towards recovery further away. As a broader example, the military conflicts that existed prior to the disaster in Sri Lanka also contested over aid resources and associated distribution process, which impeded the recovery from the 2004 Indian Ocean Tsunami (Birkmann et al., 2010). Gaillard et al. (2008) also highlighted that although the 2004 tsunami event catalysed the peace process in Aceh, Indonesia, in the short-term, the lack of address to the underlying political and economic issues in the reconstruction slowed the both processes down in the long term. This risk should be reduced by encouraging participation and contribution of all stakeholders well ahead of a disaster, including other community members and supporting the development of town and community lives based on the voices of the community members instead of top-down approaches. This minimises the risk of manipulation of recovery processes/outcomes based on uneven preferences and/or agendas (Lindell and Prater, 2003, Pearce, 2003) and facilitates a well-balanced relationship between all stakeholders in recovery (Berke et al., 1993, Davidson et al., 2007).

Community-scale resilience creates capacity to respond differently and effectively to the challenges of post-disaster recovery

Considering the wider relevance of the above discussion, various important pointers to the requirements for local recovery can be identified in the Machi group relocation project in Koizumi. That community-led project effectively incorporated and transformed various risks into opportunities by sharing and developing ideas and experiences with approaches and processes that minimised the risk of power-related malfunctions and clashes within the community and beyond. This precisely follows the important argument of existing studies that embracing and maximising changes can strengthen local resilience and capacities through disaster recovery (Berke et al., 1993, Birkmann et al., 2010, Ingram et al., 2006, Paton and Johnston, 2006, Wisner et al., 2004). In parallel with these aspects, this project was also surrounded by supplementing factors that functioned positively for the case, of which notable ones were:

- The group relocation policy fundamentally required autonomous actions from the community side;
- The KTG were naturally formed by a group of key community members to drive the project of recovery and risk reduction based on a high level of existing trust;
- The Koizumi community historically maintained its structure that supported the KTG;
- The KTG not only maximised the internal ability of the community but also accepted its limited capacity inviting supports from outsiders such as authorities and experts; and
- The participants applied sufficient time and discussion to achieve the most optimal recovery and risk reduction for/by/with their community.

The project was not perfect in every single aspect of recovery and faced various issues and challenges such as a long time taken that influenced participation rate as well as various changes in circumstances. However, it certainly highlighted the increased capacity of a disaster-impacted community and its members that drove the recovery and risk reduction acknowledging the fundamental notion that *whose recovery is it?*

Local sociality facilitates and continues with recovery and risk reduction

The increased capacity of a recovering community and its members suggests an important point that acknowledging local sociality facilitates recovery and risk reduction, although this was often missing in the common strategies put in place after disasters and there was poor recognition of *community* in recovery and risk reduction efforts (Possekel, 1999). In these cases, stakeholders with power tended to allocate low priority to, or even avoid acknowledging, the disaster-impacted local community and its sociality in disaster recovery and risk reduction (Possekel, 1999). Authorities tend to neglect local communities and impose mainstream values for disaster recovery (Bird et al., 2009, Haalboom and Natcher, 2012, Haynes et al., 2008b, Howitt et al., 2012). General public pays little attention to the long-term recovery of local sociality (Schneider, 2002). Although this study does not particularly target general public for interview and other data collection activities, a flood-impacted interviewee in Grantham sharply described the lack of understanding that *if you haven't moved on, it's your problem*. In these situations, engagement with *community* may be considered as a blocking or even a meaningless factor of recovery in disaster responses. However, the time, resources and efforts mobilised for community engagement in fact develop a best understanding of the community as a critical foundation, which should be the fundamental, quality driving force of disaster recovery and risk reduction. Local sociality should be well involved and valued in disaster recovery processes through meaningful interactions, collaborations and consultations with all community-wide stakeholders (Ahrens and Rudolph, 2006, Shaw, 2014, Wisner et al., 2004). Therefore, community engagement to acknowledge local sociality is not an impeding but an essential factor to develop local disaster recovery.

Furthermore, local sociality never ends. There should not be a single point of completion in the processes of community engagement in the recovery process. A community has a potential to develop its recovery and risk reduction slowly but firmly. This goes on indefinitely as long as the community exists, although there may be influences of power-imbalances, changes and uncertainties that jointly affect the processes and outcomes. These influential factors themselves also develop interacting with the society in continuous, dynamic and holistic ways (Birkmann et al., 2010). Therefore, these influences remain in one form or another indefinitely, so does local sociality. Continuity and development of complex, implicit but critical causes and processes of vulnerability and resilience have to be recognised and understood, because vulnerability and resilience are dynamic (Handmer, 2003, Pelling, 2012,

Wisner et al., 2004). This demonstrates that seeking the end point may be meaningless in local recovery and risk reduction, although some milestones or signs of recovery in the community and its members can be identified along the way.

In this aspect the sociality of Namie Town and its residents is particularly at risk of vanishing, because the existence of the community life has considerably faded over the five years of overwhelming uncertainties without effective responses. Weber and Peek (2012) identified the loss of local culture and networks as the common difficulties that the residents of New Orleans displaced by the 2005 Hurricane Katrina faced. Possekel (1999) calls for a careful consideration of the balance between the outside opportunities for those who are displaced and the time taken for reconstruction of the hazard impacted area. This is because the dislocated population often become reluctant to return after a long time, thus the town misses its critical constituents, who are necessary for the redevelopment (Possekel, 1999). Although the material and physical aspects of the recovery progress and mark points of achievements, the local sociality may not be there by then because of the long-term absence and/or neglect of the community members who are the bearers of the sociality. This potential situation highlights the argument of Shaw (2014) that both material and social aspects should be achieved in local disaster recovery and risk reduction (see also Ahrens and Rudolph, 2006, Geis, 2000).

6.4 Concluding remarks

The discussions drawn from the integration of the four case studies have highlighted the importance of addressing ordinary yet critical factors of the issues that create and influence vulnerability and resilience in disaster recovery at a micro-local scale. Firstly, this chapter has identified and synthesised a number of important differences and similarities that affected the recovery of the disaster-impacted case study communities. Then this chapter has explored and discussed the findings in relation to the wider literature and the broader applicability of these for policy and practice in relation to disaster recovery and risk reduction.

The differences mainly identified *effects* in local recovery based on material impacts from hazards and policies. These effects are often area and event specific, which may largely require case-by-case understanding of hazard characteristics and policy settings. On the other hand, the similarities recognised the critical commonality of *causal factors* – human-relations and strong influences of changeability and power-relations in disaster recovery. These factors dynamically affect the vulnerability of a community and its members often in disproportional ways. This highlighted the importance of the processes in recovery. As the power-imbalances and changes developed in the processes, the most important notion of recovery – *whose recovery is it?* – often fell off from the recovery itself. The commonality of these issues between study areas indicates universal potentials to better understand disaster recovery at a local scale.

Outsiders were less aware of or less focused on these causal factors, because these were often intangible. Many of the interviewed community members considered these factors as too ordinary, because these human- and power-relations are deeply embedded in the community. Despite their less-noticeable, intangible and ordinary nature, these relations represent the important part of dynamic, continuous social locality. The St George community will continue to exist regardless of the completion of the levee construction; the Grantham community will keep striving for their community development incorporating the outcomes brought by the land-swap; the Koizumi community will explore their future along with the combined effects of group relocation, tsunami levee and broader societal changes; the Namie community will develop its presence as a new and very different community through the overwhelming uncertainty. This very continuity is the key element that the hazard-impacted members of the case study communities longed for but missed in their recovery. The importance of local sociality may have increased in necessity in the study areas during the recovery process, because the disaster took it from the impacted community and/or their impacted members; disaster management overlooked or downplayed it; and associated recovery efforts damaged it.

7. Conclusion

This study adopted the constructivist grounded theory approach to address and acknowledge critical insights under the surface. This research attained a better understanding of the four disaster-impacted communities and their members and identified ways to improve the effectiveness of management sector policies and practice.

This study explored its research aims, theoretical framework and discussion with a combined input from a series of fieldwork campaigns and literature review. Investigating the four case studies indicated that local communities and their inhabitants placed a high value on local sociality defined in this thesis as local people's everyday life within their communities and how it was affected by disaster and the recovery processes. Differences identified between the communities illuminated the visible and tangible components of disaster recovery. Such differences are easily noticeable and measurable by outsiders. On the other hand, the common features highlighted underlying social factors such as the unevenness of recovery processes and outcomes as well as associated power imbalances. These underlying factors often attract little attention from outsiders or even from lesser-impacted community members. This is because these factors together with their dynamism and interconnectedness are *hidden* and often result in official recovery efforts that prioritise material recovery over social, community-based recovery. This may push the vulnerable into more vulnerable positions. The aims that this study achieved are elaborated as follows.

1. *Identify what socio-cultural, political-economic and contextual factors facilitate and/or impede disaster recovery at a local scale along with the similarities and/or differences between the case studies*

The thesis identified various facilitating and/or impeding factors of recovery. While differences of these factors between the case studies represented countable and/or measurable aspects of disaster and responses, similarities highlighted intangible and/or invisible aspects of those. These factors were often found to be interconnected and multifaceted. For example, in St George, the strong political power of the BSC, which was also

under pressure from higher-level governments, impeded recovery and risk reduction of those who were flooded, even though it facilitated risk reduction of the majority of the town, who were mostly non-flooded. In Grantham, the economic aspect was one of the major factors that enabled or disabled different groups of residents to participate in the land-swap project. Prolonged public attention prompted the economic progress of the project, but exhausted many residents and negatively affected the community development. In Koizumi, strong-ties between community members facilitated the community involvement in the Machi-area group relocation, but impeded it in the levee construction. In Namie, the context where a large number of people were simultaneously and persistently impacted by the nuclear disaster impeded recovery at a local scale. As for cultural factors, this thesis did not identify many transnational aspects of culture, but did explore culture of different groups that socially and politically existed within each local setting. This will be elaborated in the next section.

2. Better understand the structure and functionality of human- and power-relations in each case study area and identify the associated vulnerability and resilience

As the thesis further looked into the facilitating and/or impeding factors of recovery in each study area, the importance of human- and power-relations to those factors emerged. These human- and power-relations showed not only different levels of intensity and extent but also those of dynamism and interconnectedness, which all influenced vulnerability and resilience at a local scale. The strong economic contribution of the cotton farming sector heavily influenced imbalance of power in St George. This led most community members including the BSC to a collective silence that neglected or even exacerbated the vulnerable situation of less powerful members. The LVRC terminated the community recovery centre exercising its political power. Even if this action was intended to boost resilience of the flood-impacted residents instead of keeping them in a *slow* recovery, the forcible closure of the centre reduced opportunities for the vulnerable to recover and nurture their resilience. This also diminished the chance for the entire community, including both the council and the residents, to recognise and work together as a community on *their* issues of vulnerability and resilience. The Machi group relocation in Koizumi effectively utilised human-relations and maintained power-balance so no particular group was disadvantaged. However, the levee construction was pushed through based on power imbalance, which socially marginalised some opposing residents. Vulnerability of Namie residents were increasingly influenced by the top-down

political agendas. Local communities were destroyed and residents were often unable to make decisions or even envision their recovery and future. This deteriorated the lives of local people, particularly the most vulnerable, keeping them in an ongoing and overwhelming uncertainty with temporary, ad-hoc or sometimes even ineffective responses. It is important to note that power imbalance is not only caused and/or exercised by particular stakeholders such as governments and big businesses but also by community members themselves, although it is the vulnerable who are universally disadvantaged the most.

3. Explore wider relevance of insights from the case studies and integrative discussions

With the findings described above, this thesis drew out some important insights and their wider relevance to policy and practice. *Ordinary* social factors such as human-relations, associated sociality and their relationships are the key to address vulnerability and resilience at a local scale. These factors and relationships are often unnoticed not only by outsiders but also by community members themselves, because these are often hidden from outside and/or embedded locally. This is the core of local sociality that disaster-impacted people valued and were influenced in recovery. To address this, community members should be at the centre of recovery, rather than ignored or controlled, so the members understand *their* needs, issues and responsibilities in recovery and beyond. This is essential, because it is the community members who live there. In this regard, the community-led relocation project in Koizumi well demonstrated positive outcomes in many aspects, such as communication, collaboration, and power-relations, to consider future measures, although challenges also emerged and existed. This thesis also identified further difficulties in some cases, such as Namie, where local people were displaced for an indefinite time and left in an extensive uncertainty. However, this explains another reason why centring community members is important, because it is their lives and locality at stake.

Power imbalances were a feature across all four study areas. The dynamic and interconnected nature of unequal power means that fundamental solutions cannot be addressed if the less powerful are ignored. Rather the community has to be examined holistically. In the case of Grantham, for example, although the council's land-swap was effective in eliminating further

risk of flash flooding for those who moved, the process traumatised some community members.

This is not to downplay the importance of material recovery, because local sociality comprises both the differences and similarities identified in this study. The salient findings suggest that it is critical that disaster recovery processes take into consideration the following critical points: the need

- to balance both material and non-material aspects of the recovery with consideration of human- and power-relations;
- to be flexible and embrace uncertainties in disaster recovery centring the disaster-impacted citizens; and
- to acknowledge continuous and dynamic local sociality that influences vulnerability and nurtures resilience of the community and its members.

The considerations above address vulnerability and resilience through an understanding of local sociality. Better understanding of these observations answers the important notion of *whose recovery is it?* The results of this study show that:

- It is the disaster-impacted community members that recover in and with the community.
- It is the impacted community and its members that constitute their local sociality.
- It is the local sociality – the value of everyday life and human interactions in and with the community – that characterises the impacted community and allows its members to continue *their* recovery.

The underlying impediments to disaster recovery at a local level also call for further research. Too much disaster management focuses on hazard type and scale of the impacts, the location, and/or the state of political, industrial, financial development. Other more every day human

and social factors may not be so easily rectified, because these are often not only dynamic and interconnected but also deeply embedded within the community. Nonetheless these factors are real, whether or not they are recognised by the community members and outsiders. Acknowledging, addressing and listening to the local community and its individual members should be the foundation for emergency management if it is to be more effective (Wisner et al., 2004).

Future research should examine the ways to apply the findings of the study to disaster risk reduction. To do so, broader surrounding aspects such as relevant policy structures, social settings and cultural-ideological differences need to be considered. At the same time, future study into the four cases of this thesis is needed to further investigate and enhance understanding of local disaster recovery in a longitudinal manner through ongoing regular visits. Sufficient understanding of the local sociality of communities and their members will generate possibilities not only to reflect upon what happened in the past but also to create opportunities to develop the ways to address vulnerability, nurture resilience and reduce risk.

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Appendices

Appendix 1: Ethics approval



Tetsuya Okada <tetsuya.okada@mq.edu.au>

Approved- Ethics application- Magill (Ref No: 5201300144)

5 messages

Ethics Secretariat <ethics.secretariat@mq.edu.au>
To: Dr Christina Magill <christina.magill@mq.edu.au>
Cc: Mr Tetsuya Okada <tetsuya.okada@students.mq.edu.au>, Dr Katharine Haynes <haynes.katharine@gmail.com>, Dr Deanne Bird <deanne.bird@gmail.com>

12 April 2013 14:39

Dear Dr Magill

Re: "Post-disaster recovery following recent natural hazard events and risk reduction measures in Australia and Japan" (Ethics Ref: 5201300144)

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Dr Christina Magill
Dr Deanne Bird
Dr Katharine Haynes
Mr Tetsuya Okada

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 12 April 2014
Progress Report 2 Due: 12 April 2015
Progress Report 3 Due: 12 April 2016
Progress Report 4 Due: 12 April 2017
Final Report Due: 12 April 2018

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy/>

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee

Appendix 2: Japanese 2013 fieldwork result table

Categories	Tohoku (Koizumi)	Fukushima (Namie)
Community	<ul style="list-style-type: none"> – Interaction changed <ul style="list-style-type: none"> • Within community • Cruel words (what item you got etc) – Community: stay or leave? <ul style="list-style-type: none"> • How? • Why? – Community structure <ul style="list-style-type: none"> • Before / After event • Future – getting visible • Generational gaps? • Scattered (locally) 	<ul style="list-style-type: none"> – Interaction <ul style="list-style-type: none"> • With communities in havens • Cruel words (you got money etc) • Gathering not easy – Community: stay or leave? <ul style="list-style-type: none"> • How? • Why? – population draining • Cannot decide – uncertainty – Community structure <ul style="list-style-type: none"> • Before / After event • Future – uncertain • Generational gaps? • Scattered (extensive)
Daily life	<ul style="list-style-type: none"> – Emergency housing – Group relocation – School for kids – Stress (mostly eased) – Hope & motivation rising 	<ul style="list-style-type: none"> – Employment: unsettled – Workload – School for kids – Properties – Stress (ongoing) – Motivation falling
History, culture	<ul style="list-style-type: none"> – A lot to do with community's future (Group relocation etc) 	<ul style="list-style-type: none"> – It must be important but is too uncertain to talk about it now (No concrete vision etc)
Money	<ul style="list-style-type: none"> – Funding support <ul style="list-style-type: none"> • Business • Group relocation (land dev.) – Insurance – Bank loans – "Concession" issues 	<ul style="list-style-type: none"> – Compensation <ul style="list-style-type: none"> • Properties • Mental • Business – Money ≠ Livelihood
Support measures	<ul style="list-style-type: none"> – Relocation policy <ul style="list-style-type: none"> • Limitations • Waiting time vs participation • Update needed – Storm surge levee <ul style="list-style-type: none"> • Less topical than relocation – Council & Government <ul style="list-style-type: none"> • Communication not good 	<ul style="list-style-type: none"> – Uncertainty – Compensation (money) – Community rebuilding plans <ul style="list-style-type: none"> • Satellite communities (maybe) • Tentative communities – Council & government <ul style="list-style-type: none"> • Flexibility needed
Time	<ul style="list-style-type: none"> – Group relocation <ul style="list-style-type: none"> • Waiting time: participation falls • More visible now: hope, vision • Timing: land procurement etc 	<ul style="list-style-type: none"> – Now & future: uncertain <ul style="list-style-type: none"> • Exhaustion • Population draining (cannot wait any longer) • Not feeling settled

Appendix 3: Japanese 2015 fieldwork result table

North Tohoku – Kesenuma (Mostly Koizumi)

Categories	Tohoku (Mostly Koizumi) 2013	Tohoku (Mostly Koizumi) 2015
Community	<ul style="list-style-type: none"> – Interaction changed <ul style="list-style-type: none"> • Within community • Cruel words in early days (what item you got etc) – Community: stay or leave? <ul style="list-style-type: none"> • How? • Why? – Community structure <ul style="list-style-type: none"> • Before / After event • Future – getting visible • Generational gaps? • Scattered (locally) 	<ul style="list-style-type: none"> – Interaction changed <ul style="list-style-type: none"> • Within community: Not many changes were stated, but it is reportedly a bit more closed now? Storm surge levee issue also rose. Some were disappointed as the levee issue divided the community into <i>for and against</i>. That lack of gathering venues is an ongoing issue too. • Cruel words in early days (what item you got etc): Those who got hurt still remember but try not to <i>visualise</i> such trauma. – Community: stay or leave? <ul style="list-style-type: none"> • How?: Basically the same as 2013 but some made changes for various reasons such as family and finance. Because of the long waiting time, some decided not to participate the group relocation. • Why?: Same as above. – Community structure <ul style="list-style-type: none"> • Before / After event: Koizumi Future Group took initiative immediately after the event which was innovative. However the existing Local Promotion Groups are recovering its presence. • Future – getting visible: Most research participants were focusing on their individual issues / plans at the moment. They often stated that future community matters would be dealt once they have settled in new houses. • Generational gaps?: This relates to the Local Promotion Groups. Some older generation seemed to be ready for succession but younger ones were less active? • Scattered (locally): Mostly the participants were happy to be

		<p>in the new estate with others. But some issues (eg. cruel words in early days) may exist. Some were concerned how <i>newly scattered communities</i> across Koizumi would form Koizumi again.</p>
Daily life	<ul style="list-style-type: none"> – Emergency housing – Group relocation – School for kids – Stress (mostly eased) – Hope & motivation rising 	<ul style="list-style-type: none"> – Emergency housing: Roughly half(?) of the units were empty. Residents often moved to their family members’ or built new houses individually. – Group relocation: As some changed their decisions on the way, the number of participants further decreased, which was an issue. This was often caused by time and finance. – School for kids: This also affected their floor plans or choices of residence (eg free-standing house or public housing) due to time and finance again. – Stress (mostly eased): However some residents in their 50s had stroke within a year. Although the link between their health and disaster/hardships afterwards is unknown, this will add a big pressure to their families. This shows that recovery doesn’t always go as planned. – Hope & motivation rising: Increase in these aspects was visible, as the new estate would be available soon – after 4 year of waiting.
History, culture	<ul style="list-style-type: none"> – A lot to do with community’s future (Group relocation etc) 	<ul style="list-style-type: none"> – A lot to do with community’s future (Group relocation etc): Related to the generational matter and locational matter listed above, the history and culture of Koizumi might change. In addition, general issues surrounding rural communities are also affecting Koizumi.
Money	<ul style="list-style-type: none"> – Funding support <ul style="list-style-type: none"> • Business • Group relocation (land dev.) – Insurance – Bank loans – “Concession” issues 	<ul style="list-style-type: none"> – Funding support <ul style="list-style-type: none"> • Business • Group relocation (land dev.): This maximised the opportunities for some residents to take part in the scheme. – Insurance

		<ul style="list-style-type: none"> – Bank loans: This was arising as a new issue, although it was sort of predicted in 2013. This time, the issue was becoming more concrete because they were much closer to the actual construction of houses. In the 4 years of waiting, various costs such as materials and workforce increased a lot. Banks were often more strict about lending money than what residents expected. In addition, time also changed the individual family situations (eg young generation left house etc). – “Concession” issues: Some suspected the construction industry in general such as house building (collusion) and storm surge levee (right hunting).
Support measures	<ul style="list-style-type: none"> – Relocation policy <ul style="list-style-type: none"> • Limitations • Waiting time vs participation • Update needed – Storm surge levee <ul style="list-style-type: none"> • Less topical than relocation – Council & Government <ul style="list-style-type: none"> • Communication not good 	<ul style="list-style-type: none"> – Relocation policy <ul style="list-style-type: none"> • Limitations: The Future Group made tremendous efforts to deal with the policy limitations. • Waiting time vs participation: It was an issue as stated above. • Update needed: It was needed in many ways such as standards for emergency housings and the red tape. – Storm surge levee <ul style="list-style-type: none"> • Less topical than relocation: However, some mentioned that the process of this issue disappointed them as members of the community. – Council & Government <ul style="list-style-type: none"> • Communication not good: Some stated that the communication was not excellent due to various factors such as power balance, depending on subject matters and levels of proactivity.
Time	<ul style="list-style-type: none"> – Group relocation <ul style="list-style-type: none"> • Waiting time: participation falls • More visible now: hope, vision • Timing: land procurement etc 	<ul style="list-style-type: none"> – Group relocation <ul style="list-style-type: none"> • Waiting time: participation falls: It fell further as described above. • More visible now: hope, vision: The visibility increased the hope and vision. However, issues (financial etc) got concretised too.

		<ul style="list-style-type: none">• Timing: land procurement etc
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Fukushima – mostly Namie Town

Categories	Fukushima (Mostly Namie) 2013	Fukushima (Mostly Namie) 2015
Community	<ul style="list-style-type: none"> – Interaction <ul style="list-style-type: none"> • With communities in havens • Cruel words (you got money etc) • Gathering not easy – Community: stay or leave? <ul style="list-style-type: none"> • How? • Why? – population draining • Cannot decide – uncertainty – Community structure <ul style="list-style-type: none"> • Before / After event • Future – uncertain • Generational gaps? • Scattered (extensive) 	<ul style="list-style-type: none"> – Interaction <ul style="list-style-type: none"> • With communities in havens: The interaction changed. It is often difficult between emergency housings and apartments (deemed EHs), evacuated people and communities that accept them, and even within individual groups. • Cruel words (you got money etc): Some stated that such attitude still existed in 2015. However, some positive interaction between evacuated people and communities that accepted them were seen. In addition, some evacuees also stated that it might depend on <i>how you took those words and made actions according to them.</i> • Gathering not easy: This is a big ongoing issue for residents, the junior chamber, NGO and even for the Welfare Association. – Community: stay or leave? <ul style="list-style-type: none"> • How?: The sequel questionnaire surveys show that more residents leave or considering to leave. It may be true for some cases. However, it is not that simple. Their written answers do not always synchronise with what they really think or do. Some stated that <i>questionnaires often limit how they answer.</i> • Why? – population draining: Family, Employment, School, Time, Finance etc. • Cannot decide – uncertainty: This is still a big issue. – Community structure <ul style="list-style-type: none"> • Before / After event: It is complicated. Some stated that while everyone was scattered, existing Local Promotion groups retained a practical power to decide things for

		<p>future. The local government cannot ignore this either.</p> <ul style="list-style-type: none"> • Future – uncertain: In addition to the uncertainty, the governmental vision seems to be shifting from <i>establishing outside-town communities to returning</i>. Some residents such as NGOs find it difficult being in dilemma between local government and residents. Some signs of potential conflicts were indicated. • Generational gaps?: In terms of the generational matter (eg different levels of proactivity) and locational matter listed above, the history and culture of Namie might change. In addition, general issues surrounding rural communities are also affecting Namie. This is similar to the situation in Koizumi. • Scattered (extensive): Same as above.
Daily life	<ul style="list-style-type: none"> – Employment: unsettled – Workload – School for kids – Properties – Stress (ongoing) – Motivation falling 	<ul style="list-style-type: none"> – Employment: unsettled: Ongoing. Some NGOs were trying to establish an agricultural scheme that residents of Namie particularly vulnerable ones could find motivation in life, working with the local government. – Workload: Still very large. Some junior chamber members stated that they had to drive long distances more frequently so that they could attend meetings etc. It is dangerous, but they feel that it is inevitable for re-developing the community. – School for kids: This is one of reasons that the residents move out. In addition, it will be hard to move out again once the kids settled in the haven environment, which is supposed to be temporal. – Properties: A lot of properties in Namie were left as they were at the point when they evacuated in 2011. Tetsuya finds it very difficult to translate the shock from witnessing the town in 2015 into

		<p>words. It's not only sad or eerie but also incomprehensible (his head understands it but his feeling cannot catch up with the reality??).</p> <ul style="list-style-type: none"> – Stress (ongoing): Many research participants expressed that they were mentally affected by <i>the disaster</i> (including the various aftermaths). Some said that they kept themselves busy so that they could think about something else. – Motivation falling: Many research participants mentioned the general fatigue in them and the community, because of time, uncertainty etc.
History, culture	<ul style="list-style-type: none"> – It must be important but is too uncertain to talk about it now (No concrete vision etc) 	<ul style="list-style-type: none"> – It must be important but is too uncertain to talk about it now (No concrete vision etc): This situation seemed ongoing.
Money	<ul style="list-style-type: none"> – Compensation <ul style="list-style-type: none"> • Properties • Mental • Business – Money ≠ Livelihood 	<ul style="list-style-type: none"> – Compensation: This didn't change much. A researcher in Tokyo pointed out that self-recognition of the residents often shifted from <i>disaster victims</i> to <i>criminal victims</i>. This is in line with some residents' comments in the interviews. <ul style="list-style-type: none"> • Properties • Mental • Business – Money ≠ Livelihood: This is supposed to be under discussion – regardless the progress. However, the next step from “Money ≠ Livelihood” is still unclear.
Support measures	<ul style="list-style-type: none"> – Uncertainty – Compensation (money) – Community rebuilding plans <ul style="list-style-type: none"> • Satellite communities (maybe) • Tentative communities – Council & government <ul style="list-style-type: none"> • Flexibility needed 	<ul style="list-style-type: none"> – Uncertainty: No existing law. No precedence. – Compensation (money): This is still distributed. However, if the returning was realised, the compensation would be stopped at some point (see interview). – Community rebuilding plans: The idea of satellite communities toned down. The idea of tentative communities was still there. However, the local government, perhaps with a strong backup from the central government, seemed to be shifting their focus from the tentative community to returning. For example, public housing projects that became available

		<p><i>outside</i> the prefectural and / or the central governments' initiative were left <i>on hold</i> by the local government. It seemed that this shift had not been explained or discussed well with residents or NGOs.</p> <ul style="list-style-type: none"> • Satellite communities (maybe) • Tentative communities <p>– Council & government</p> <ul style="list-style-type: none"> • Flexibility needed: Transparency may be also needed.
Time	<p>– Now & future: uncertain</p> <ul style="list-style-type: none"> • Exhaustion • Population draining (cannot wait any longer) • Not feeling settled 	<p>– Now & future: uncertain</p> <ul style="list-style-type: none"> • Exhaustion: Many research participants were concerned if they were forgotten or considered as if things went well. • Population draining (cannot wait any longer) • Not feeling settled

Appendix 4: Ethics approval (amendment)



Office of the Deputy Vice-Chancellor (Research)
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19 August 2014

Dr Katherine Haynes
Department of Environment and Geography
Faculty of Science
Macquarie University
NSW 2109

Dear Dr Haynes

Re: Post-disaster recovery following recent natural hazard events and risk reduction measures in Australia and Japan (Ref: 5201300144)

Thank you for your amendment request. Your amendment request was reviewed by the Executive of the Human Research Ethics Committee (HREC) (Human Sciences and Humanities) at its meeting on 19th August 2014. Ethical approval has been granted to the following amendments:

1. The addition of a questionnaire survey.
2. An increase in the total number of participants recruited for the study. The sample size for the questionnaire survey in each study area (St George and the Lockyer Valley in Queensland) will be 30-40 participants.

The following documentation submitted with your amendment request has been reviewed and approved by the Executive of the HREC (Human Sciences and Humanities):

Documents reviewed	Version no.	Date
Macquarie University HREC Request for Amendment Form	2.0	Jan 2014
Correspondence from Mr Okada		13 Aug 2014
Letter to residents (Lockyer Valley)		
Letter to residents (St George)		
Questionnaire survey (Lockyer Valley)		
Questionnaire survey (St George)		

Please ensure that all documentation has a version number and date in future correspondence with the Committee.

Please do not hesitate to contact the Ethics Secretariat should you have any questions regarding your ethics application.

The HREC (Human Sciences and Humanities) wishes you every success in your research.

Yours sincerely



Dr Karolyn White

Director, Research Ethics & Integrity

Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007) (the National Statement) and the CPMP/ICH Note for Guidance on Good Clinical Practice.

Appendix 5: Questionnaires

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Welcome

You are invited to participate in a study looking at post-disaster recovery following recent natural hazard events in Australia and Japan. This study is focusing on four case study locations: the community of St George and the Lockyer Valley region in Queensland, Australia, and the North Tohoku and Fukushima regions in Japan.

This questionnaire survey, which is aimed at people who live or work in and around the community of St George, forms a part of this research.

The study is primarily being conducted by Tetsuya Okada to fulfil the requirements of a doctoral degree under the supervision of Drs Katharine Haynes, Deanne Bird and Christina Magill, from Macquarie University.

The questionnaire will take approximately 20 – 25 minutes to complete and it would be greatly appreciated if you could provide your views and opinions.

Participation is voluntary and all information or personal details gathered in the course of the study are confidential. No individual will be identified in any publication of the results and you are welcome to request access to publications arising from this research.

Your completion of the online questionnaire will be regarded as a consent to participate in the research project. However, you are free to withdraw from further participation in the research at any time without having to give a reason and without consequence.

A phone line service giving qualified health advice "13 HEALTH (13 43 25 84)", is provided by Queensland Health and available for flood-affected community members, if necessary. The line is available 24 hours a day, 7 days a week.

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (Call 02 9850 7854 or email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

If you have any questions or comments about the research, please email tetsuya.okada@mq.edu.au or call 02 9850 9683.

Demographic questions

***1. What is your age category?**

- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70 or older

***2. Please indicate your gender**

- Male
- Female

***3. What is the composition of your household?**

- Couple with children or other dependents
- One adult with children or other dependents
- Couple without children or other dependents
- One person household
- Shared house with other adults
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Demographic questions (continued)

***4. Where were you living at the time of the 2012 flood (7 February 2012)?**

- St George (urban)
- Outside St George (urban) within the Balonne Shire
- Outside the Balonne Shire

***5. Where are you currently living?**

- St George (urban)
- Outside St George (urban) within the Balonne Shire
- Outside the Balonne Shire

***6. How long have / had you lived in St George?**

- Never
- 0-2 years (I moved into St George after the 2012 flood)
- 2-5 years (I moved into St George before the 2012 flood)
- 5-10 years
- 10-30 years
- 30+ years

***7. How long have you lived in the Balonne Shire?**

- Never
- 0-2 years (I moved into the Balonne Shire after the 2012 flood)
- 2-5 years (I moved into the Balonne Shire before the 2012 flood)
- 5-10 years
- 10-30 years
- 30+ years

(Hard copy) Post-disaster recovery in Australia and Japan: St George

***8. Please indicate which of the following most accurately describes your plan for the future?**

- I plan to live where I am for many years
- I plan to move elsewhere in this town in the coming years
- I plan to move to another town in the Balonne Shire in the coming years
- I plan to move to another town outside the Balonne Shire in the coming years
- Undecided / I don't know
- Other (please specify)

Demographic questions (continued)

***9. Which of the following best describes your current occupation?**

- Building construction
- Civil engineering
- Community and social service
- Education
- Farming, fishing, and forestry
- Finance
- Government
- Hospitality
- Legal
- Logistics and transportation
- Medical and health care
- Retail
- Retired / pensioner
- Looking after house / family at home
- Student
- Unemployed
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: St George

***10. What is the approximate average annual income of your household?**

- \$0-\$25,000
- \$25,001-\$50,000
- \$50,001-\$75,000
- \$75,001-\$100,000
- \$100,001-\$125,000
- \$125,001-\$150,000
- \$150,001-\$175,000
- \$175,001-\$200,000
- \$200,001+
- I don't know
- I prefer not to answer

***11. Have you worked on community recovery after the 2012 flood as a part of the following groups / organisations? (Please tick all that apply)**

	Paid	Voluntary
Balonne Shire Council	<input type="checkbox"/>	<input type="checkbox"/>
Care Balonne (Flood Recovery Support)	<input type="checkbox"/>	<input type="checkbox"/>
St George Residents Flood Committee	<input type="checkbox"/>	<input type="checkbox"/>
I did not work on community recovery as a part of any groups / organisations	<input type="checkbox"/>	<input type="checkbox"/>

Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Flood damage and insurance

*** 12. Please indicate your house and property* ownership status prior to the 2012 flood.**

[*Property here means land or buildings other than residential houses (for example: farm, shed, etc)]

	I owned a house / property in St George (urban)	I owned a house / property outside St George (urban) within the Balonne Shire	I was renting a house / property in St George (urban)	I was renting a house / property outside St George (urban) within the Balonne Shire	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Among the 2010, 2011 and 2012 floods, from which event did you sustain the most severe damage to the following items of yours?

	2010	2011	2012	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 14. To what extent were the following items of yours damaged by the floods selected for the previous question?**

	Not damaged	Slightly damaged	Half damaged	Mostly damaged	Completely damaged / destroyed	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Flood damage and insurance (continued)

*** 15. Please indicate which of the following statements most accurately describes your knowledge of your insurance cover prior to the flood that caused the most severe damage?**

	I knew my insurance would cover me for all types of flood, and it did	I thought my insurance would cover me for all types of flood, but it didn't	I knew my insurance covered me for storm flood only (that is, I knew that I was not covered for river flood)	I knew I did not have any insurance cover at the time of the flood	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

*** 16. To what extent was the most severe damage to the following items of yours covered by insurance?**

	Not covered at all	Slightly covered	Half covered	Mostly covered	Completely covered	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Flood damage and insurance (continued)

*** 17. Have you taken, or how likely are you to take, any of the following actions as a result of the 2010-12 floods?**

	Not at all likely	Unlikely	Undecided	Likely	Very likely	Already done / applied	N/A
Raising house	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relocation to another place within St George	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relocation to another town	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private flood mitigation (eg. building flood-proof fences around home)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

*** 18. Which types of insurance do you currently have for the following items of yours?**

	Insurance that covers all types of flood	Insurance that only covers storm flood (does not cover riverine flood)	I do not have flood insurance	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Hard copy) Post-disaster recovery in Australia and Japan: St George

19. If you answered "I do not have insurance" for any of the items listed in the previous question, please select the reasons why you do not have flood insurance now? (Please tick all that apply)

- I have relocated and am no longer at risk to flood
- I have not moved but do not think my house will be flooded
- I am financially constrained because of the flood recovery (such as raising house, self-mitigation, repair)
- I could not find companies that will insure my house / property
- Insurance premiums rose too much after the 2010-12 floods
- I do not trust insurance companies any more due to troubles with them after the 2010-12 floods
- I have never trusted insurance companies
- I expect that the government will provide support funding again
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: up to about two months after the event

***20. To what extent do you agree with the following statements regarding the actions taken by the Balonne Shire Council for the two months immediately after the 2012 flood?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The council officers were considerate and approachable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The council officers shared information with the community sufficiently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The council officers responded to the issues quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comment on how you think the performance of the council could improve, if at all.

***21. To what extent do you agree with the following statements regarding the actions taken by the local police for the two months immediately after the 2012 flood?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The police officers were considerate and approachable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The police officers shared information with the community sufficiently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The police officers responded to the issues quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comment on how you think the performance of the local police could improve, if at all.

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: up to the present – adaptation and risk reduction

*** 22. Please indicate your current house ownership status.**

- I own a house in St George (urban)
- I own a house near St George but outside the urban area
- I own a house outside St George within the Balonne Shire
- I do not own a house in the above locations

*** 23. Is your house protected by the council's flood levee that has been established after the 2012 flood?**

- Yes
- No

*** 24. Have you participated in the community consultations held from March 2013 onwards about the hydrological study, the levee plan and the support options such as voluntary house raising, relocation and private flood mitigation for the St George Flood Investigation Area?**

- Yes
- No

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: up to the present – adaptation and risk reduction (continued)

***25. Have you applied for any of the support options such as voluntary house raising, relocation and private flood mitigation for the St George Flood Investigation Area?**

- Raising house
- Relocation
- Private flood mitigation (eg. building flood-proof fences around home)
- No. Because my house is protected by the council's flood levee.
- No. Because my house is located outside the St George Flood Investigation Area.
- None of the above
- Other (please specify)

26. If you answered "None of the above" for the previous question, please explain why you did not apply for any of the options.

***27. Do you know about the Temporal Local Planning Instrument (TLPI) that became effective for the St George Flood Hazard Area since August 2012?**

- Yes
- No

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: up to the present – adaptation and risk reduction (continued)

*** 28. To what extent do you agree with the following statements about the council's flood levee establishment in St George?**

(Please answer regardless of the location of your house)

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree	N/A
The flood levee project has reduced the flood risk significantly for those who are protected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The flood levee project was designed to benefit all residents in St George as evenly as possible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The flood levee project does not put financial burden on those who are protected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

*** 29. To what extent do you agree with the following statements regarding the process of the council's flood levee project in St George?**

(Please answer regardless of the location of your house)

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The communication taken by the council during the flood levee project was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The attitude taken by the council during the flood levee project was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The timing of introducing the flood levee project (March 2013) was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The speed at which the flood levee project was rolled out was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: up to the present – adaptation and risk reduction (continued)

*** 30. To what extent do you agree with the following statements about the support options for the St George Flood Investigation Area, such as voluntary house raising, relocation and private flood mitigation?**

(Please answer regardless of the location of your house)

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree	N/A
The support options have reduced the flood risk significantly for those who applied	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The support options were designed to benefit all residents in St George as evenly as possible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The support options are relatively affordable to participate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

*** 31. To what extent do you agree with the following statements regarding the process of the support options for the St George Flood Investigation Area, such as voluntary house raising, relocation and private flood mitigation?**

(Please answer regardless of the location of your house)

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The communication taken by the council regarding the support options was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The attitude taken by the council regarding the support options was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The timings of introducing the support options (March 2013) was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The speed at which the support options were rolled out was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: up to the present – adaptation and risk reduction (continued)

***32. Do you know about the St George Residents' Flood Committee?**

- Yes
 No (Please go to Q35)

***33. To What extent do you agree with the following statements regarding the St George Residents' Flood Committee?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The Residents' Flood Committee met the needs of the flood-impacted residents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Residents' Flood Committee worked well for the interest of all residents in St George	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of communication taken by the Residents' Flood Committee was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attitude taken by the Residents' Flood Committee was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The timing of commencing the Residents' Flood Committee (February 2013) was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

(Hard copy) Post-disaster recovery in Australia and Japan: St George

***34. To what extent do you think the Balonne Shire Council, St George residents and the St George Residents' Flood Committee collaborated effectively on the recovery?**

	Very Ineffectively	Ineffectively	I'm not sure	Effectively	Very effectively
Council and St George residents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
St George residents and the residents' flood committee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The residents' flood committee and council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What factors do you think influenced, either negatively or positively, the working relationship between these groups?

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: Outcomes – flood risk perception

***35. How do you perceive your current risk to floods in terms of 1) where your house is positioned and 2) the community in general (that is, when you visit local shops, schools, place of employment and access roads to your property, etc)?**

	Very high	High	Medium	Low	Very low	No risk
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***36. How, if at all, is this different to your perception of risk prior to the 2010-12 floods?**

	It has significantly increased following the 2010-12 floods	It has increased following the 2010-12 floods	It has not changed following the 2010-12 floods	It has decreased following the 2010-12 floods	It has significantly decreased following the 2010-12 floods
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***37. Please indicate what factors influenced your response to the previous question. (Please tick all that apply)**

- Flood levee (established by council)
- House raising
- Relocation
- Self-mitigation (building flood-proof fences around your home etc)
- Insurance availability
- Relationships with your family / friends
- Relationships with other residents in the community
- Relationship with the council
- Financial status
- I don't know
- Other (please specify)

Recovery: Outcomes – flood risk perception (continued)

***38. Which of the following statements most accurately describes your opinion on the private levees on the agricultural side of the Balonne River?**

- I believe that the private flood levees do not affect flood risk to my community
- The private flood levees might affect flood risk to my community, but do not need to be investigated
- The private flood levees might affect flood risk to my community, and need to be investigated
- I believe that the private flood levees affect flood risk to my community
- I am not sure / have no opinion on whether or not the private flood levees affect flood risk in my community

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: Outcomes – community resilience and quality of life

***39. In which way have the following aspects of your life been impacted by the 2010-12 flood events (apart from the associated recovery actions)?**

	Very negative	Negative	No change	Positive	Very positive
Relationships with family / friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationships with others in the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship with the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trust in the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial status	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
General happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***40. In which way have the following aspects of your life been impacted by the council's mitigation actions such as the levee establishment after the 2010-12 floods?**

	Very negative	Negative	No change	Positive	Very positive
Relationships with family / friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationships with others in the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship with the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trust in the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial status	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
General happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Recovery: Outcomes – community resilience and quality of life (continued)

***41. To what extent do you agree with the following statements regarding the long-term impact of the 2010-12 flood events (apart from the associated recovery actions)?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The whole community of St George has become closer and more united	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social divisions within the community have decreased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The local economy has become more vibrant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comments if desired

***42. To what extent do you agree with the following statements regarding the long-term impact of the council's mitigation actions such as the levee establishment after the 2010-12 floods?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The whole community of St George has become closer and more united	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social divisions within the community have decreased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The local economy has become more vibrant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comments if desired

43. What, if anything, do you think needs to be done to increase the economic and social viability of St George along with reducing future flood risk in the area?

(Hard copy) Post-disaster recovery in Australia and Japan: St George

Thanks, you have completed the questionnaire

44. Is there anything else you would like to add?

45. This is end of the questionnaire.

Thank you for taking time to provide us with your views and opinions.

If you are interested in participating in further opportunities in this research and / or being offered a copy of any resulting publications electronically upon completion of this research, please provide your email address below. This information will be stored separately to your answers for the previous questions.

A phone line service giving qualified health advice "13 HEALTH (13 43 25 84)", is provided by Queensland Health and available for flood-affected community members, if necessary. The line is available 24 hours a day, 7 days a week.

If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (Call 02 9850 7854 or email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

If you have any questions or comments about the research, please email tetsuya.okada@mq.edu.au or call 02 9850 9683.

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Welcome

You are invited to participate in a study looking at post-disaster recovery following recent natural hazard events in Australia and Japan. This study is focusing on four case study locations: the Lockyer Valley region and St George in Queensland, Australia, and the North Tohoku and Fukushima regions in Japan.

This questionnaire survey, which is aimed at people who live or work in and around the Lockyer Valley region, forms a part of this research.

The study is primarily being conducted by Tetsuya Okada to fulfil the requirements of a doctoral degree under the supervision of Drs Katharine Haynes, Deanne Bird and Christina Magill from Macquarie University.

The questionnaire will take approximately 20 – 25 minutes to complete and it would be greatly appreciated if you could provide your views and opinions.

Participation is voluntary and all information or personal details gathered in the course of the study are confidential. No individual will be identified in any publication of the results and you are welcome to request access to publications arising from this research.

Your completion of the online questionnaire will be regarded as consent to participate in the research project. However, you are free to withdraw from further participation in the research at any time without having to give a reason and without consequence.

A phone line service giving qualified health advice "13 HEALTH (13 43 25 84)", is provided by Queensland Health and available for flood-affected community members, if necessary. The line is available 24 hours a day, 7 days a week.

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (Call 02 9850 7854 or email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

If you have any questions or comments about the research, please email tetsuya.okada@mq.edu.au or call 02 9850 9683.

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Demographic questions

***1. Which is your age category?**

- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70 or older

***2. Please indicate your gender**

- Male
- Female

***3. What is the composition of your household?**

- Couple with children or other dependents
- One adult with children or other dependents
- Couple without children or other dependents
- One person household
- Shared house with other adults
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Demographic questions (continued)

***4. Where were you living at the time of the 2011 flood (10 January 2011)?**

- Grantham
- Outside Grantham within the Lockyer Valley
- Outside the Lockyer Valley

***5. Where are you currently living?**

- Grantham
- Outside Grantham within the Lockyer Valley
- Outside the Lockyer Valley

***6. How long have / had you lived in Grantham?**

- Never
- 0-3 years (I moved into Grantham after the 2011 flood)
- 3-5 years (I moved into Grantham before the 2011 flood)
- 5-10 years
- 10-30 years
- 30+ years

***7. How long have you lived in the Lockyer Valley?**

- Never
- 0-3 years (I moved into the Lockyer Valley after the 2011 flood)
- 3-5 years (I moved into the Lockyer Valley before the 2011 flood)
- 5-10 years
- 10-30 years
- 30+ years

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

***8. Please indicate which of the following most accurately describes your plan for the future.**

- I plan to live where I am for many years
- I plan to move elsewhere in this town in the coming years
- I plan to move to another town in the Lockyer Valley in the coming years
- I plan to move to another town outside the Lockyer Valley in the coming years
- Undecided / I don't know
- Other (please specify)

Demographic questions (continued)

***9. Which of the following best describes your current occupation?**

- Building construction
- Civil engineering
- Community and social service
- Education
- Farming, fishing, and forestry
- Finance
- Government
- Hospitality
- Legal
- Logistics and transportation
- Medical and health care
- Retail
- Retired / pensioner
- Looking after house / family at home
- Student
- Unemployed
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

***10. What is your approximate average annual household income?**

- \$0-\$25,000
- \$25,001-\$50,000
- \$50,001-\$75,000
- \$75,001-\$100,000
- \$100,001-\$125,000
- \$125,001-\$150,000
- \$150,001-\$175,000
- \$175,001-\$200,000
- \$200,001+
- I don't know
- I prefer not to answer

***11. Have you worked on community recovery after the 2011 flood as a part of the following groups / organisations? (Please tick all that apply)**

	Paid	Voluntary
Lockyer Valley Regional Council	<input type="checkbox"/>	<input type="checkbox"/>
OZ Care	<input type="checkbox"/>	<input type="checkbox"/>
Community Recovery Centre (operated until June 2012)	<input type="checkbox"/>	<input type="checkbox"/>
I did not work on community recovery as a part of any groups / organisations	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)		

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Flood damage and insurance

*** 12. Please indicate your house and property* ownership status prior to the 2011 flood.**

[*Property here means land or buildings other than residential houses (for example: farm, shed, etc)]

	I owned a house / property in Grantham	I owned a house / property outside Grantham within the Lockyer Valley	I was renting a house / property in Grantham	I was renting a house / property outside Grantham within the Lockyer Valley	N/A
--	-------------------------------------------	--------------------------------------------------------------------------------	-------------------------------------------------	--------------------------------------------------------------------------------------	-----

House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 13. To what extent were the following items of yours damaged by the 2011 flood?**

	Not damaged	Slightly damaged	Half damaged	Mostly damaged	Completely damaged / destroyed	N/A
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House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 14. Please indicate which of the following most accurately describes your knowledge of your insurance cover prior to the 2011 flood event?**

	I knew my insurance would cover me for all types of flood, and it did	I thought my insurance would cover me for all types of flood, but it didn't	I knew my insurance covered me for storm flood only (that is, I knew that I was not covered for river flood)	I knew I did not have any insurance cover at the time of the flood	N/A
--	--------------------------------------------------------------------------------	--------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------	-----

House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Flood damage and insurance (continued)

*** 15. To what extent was the damage to the following items of yours covered by insurance?**

	Not covered at all	Slightly covered	Half covered	Mostly covered	Completely covered	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 16. Have you taken, or how likely are you to take, any of the following actions as a result of the 2011 flood?**

	Not at all likely	Unlikely	Undecided	Likely	Very likely	Already done / applied	N/A
Raising house	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relocation to the new estate in Grantham (land-swap)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relocation to another town	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private flood mitigation (e.g. building flood-proof fences around home)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Flood damage and insurance (continued)

*** 17. Which types of insurance do you currently have for the following items of yours?**

	Insurance that covers all types of flood	Insurance that only covers storm flood (does not cover riverine flood)	I do not have flood insurance	N/A
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Property (eg. farm, shed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Belongings (eg. furniture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. If you answered "I do not have flood insurance" for any of the items listed in the previous question, please select the reasons why you do not have flood insurance now. (Please tick all that apply)

- I have relocated and am therefore no longer at risk to flood
- I have not moved but do not think my house will be flooded
- I am financially constrained because of the flood recovery (such as raising house, self-mitigation, repair)
- I could not find companies that will insure my house / property
- Insurance premiums rose too much after the 2011 flood
- I do not trust insurance companies any more due to troubles with them after the 2011 flood
- I have never trusted insurance companies
- I expect that the government will provide support funding again
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: up to about two months after the event

***19. To what extent do you agree with the following statements regarding the actions taken by the Lockyer Valley Regional Council for the two months immediately after the 2011 flood?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The council officers were considerate and approachable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The council officers shared information with the community sufficiently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The council officers responded to the issues quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comment on how you think the performance of the council could improve, if at all.

***20. To what extent do you agree with the following statements regarding the actions taken by the local police for the two months immediately after the 2011 flood?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The police officers were considerate and approachable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The police officers shared information with the community sufficiently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The police officers responded to the issues quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comment on how you think the performance of the local police could improve, if at all.

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: up to the present – adaptation and risk reduction

***21. Please indicate your current house ownership status.**

- I own a house in the new estate of Grantham
- I own a house in Grantham, but not in the new estate
- I own a house outside Grantham within the Lockyer Valley
- I do not own a house in the above locations

***22. Was / is your house entitled to the land-swap project following the 2011 flood due to the damage-level sustained and / or the house location?**

- Yes
- No

***23. Have you participated in community consultations about the land-swap and other recovery measures following the 2011 flood?**

- Yes
- No

***24. Did you participate, or have you applied to participate in, the land-swap project?**

- Yes (Please go to Q26)
- No

***25. Please select the reasons why you did not participate in the land-swap project.
(Please tick all that apply)**

- I did not want to move to a new place
- I did not want to live close to other houses
- I did not want to live far from my farm which is on the floodplain
- I did not think social services in the new estate would be as convenient as that in my current place
- I wanted to participate in the land-swap but I could not afford to
- I wanted to participate in the land-swap but did not get an offer I was happy with
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: up to the present – adaptation and risk reduction (continued)

***26. To what extent do you agree with the following statements about the land-swap in Grantham?**

(Please answer regardless of the status of your participation)

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree	N/A
The land-swap project has reduced the flood risk significantly for those who participated in the project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The land-swap project was designed to benefit all residents in Grantham as evenly as possible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The land-swap project was relatively affordable to participate in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

***27. To what extent do you agree with the following statements regarding the process of the land-swap project in Grantham?**

(Please answer regardless of the status of your participation)

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The level of communication taken by the council during the land-swap was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The attitude taken by the council during the land-swap was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The timing of introducing the land-swap project (March 2012) was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The speed at which the project was rolled out was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: up to the present – adaptation and risk reduction (continued)

***28. How often did you visit / use the community-operated recovery centre in each of the following time periods since the 2011 flood?**

	Not at all	About once a month	About once a week	About every 2-3 days	Almost everyday	Multiple times a day
From the 2011 flood onset to after a month	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
From a month to two months after the 2011 flood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
From two months to six months after the 2011 flood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
From six months to a year after the 2011 flood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
From a year after the 2011 flood to June 2012 (when the center ceased)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***29. Which of the following aspects do you think the community-operated recovery centre was most effective for? (Please tick all that apply)**

- Having meals and / or shower
- Managing donated goods and funds
- Collecting / sharing information
- Seeking advice for recovery
- Delivering a collective voice to the council
- Raising awareness in the community / public about the flood damage and the recovery needs
- Interacting with other community members
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

***30. To What extent do you agree with the following statements regarding the community-operated recovery centre?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The recovery centre met the needs of the flood-impacted residents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The recovery centre worked well for the interest of all residents in Grantham	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of communication taken by the recovery centre was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attitude taken by the recovery centre was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The closure of the recovery centre (June 2012) was appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain the reasons why you agree or disagree with the above statements.

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: up to the present – adaptation and risk reduction (continued)

***31. To what extent do you think the Lockyer Valley Regional Council, Grantham residents and the community-operated recovery centre collaborated effectively on the recovery?**

	Very ineffectively	Ineffectively	Neither effectively nor ineffectively	Effectively	Very effectively
Council and Grantham residents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grantham residents and recovery centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recovery centre and council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What factors do you think influenced, either negatively or positively, the working relationship between these groups?

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: Outcomes – flood risk perception

*** 32. How do you perceive your current risk to floods in terms of 1) where your house is positioned and 2) the community in general (that is, when you visit local shops, schools, place of employment and access roads to your property, etc)?**

	Very high	High	Medium	Low	Very low	No risk
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 33. How, if at all, is this different to your perception of risk prior to the 2011 flood?**

	It has significantly increased following the 2011 flood	It has increased following the 2011 flood	It has not changed following the 2011 flood	It has decreased following the 2011 flood	It has significantly decreased following the 2011 flood
House	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 34. Please indicate what factors influenced your answer to the previous question.**

(Please tick all that apply)

- Land-swap
- House raising
- Relocation (other than land-swap)
- Self-mitigation (Building flood-proof fences around your home etc)
- Insurance availability
- Relationships with family / friends
- Relationships with other residents in the community
- Relationship with the council
- Financial status
- I don't know
- Other (please specify)

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: Outcomes – community resilience and quality of life

***35. In which way have the following aspects of your life been impacted by the 2011 flood event (apart from the associated recovery actions)?**

	Very negative	Negative	No change	Positive	Very positive
Relationships with family / friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationships with other residents in the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship with the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trust in the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial status	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
General happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***36. In which way has your life been impacted by the mitigation actions taken by the council, such as the land-swap project and other recovery measures, after the 2011 flood?**

	Very negative	Negative	No change	Positive	Very positive
Relationships with family / friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationships with others in the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship with the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trust in the council	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial status	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
General happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Recovery: Outcomes – community resilience and quality of life (continued)

***37. To what extent do you agree with the following statements regarding the long-term impact of the 2011 flood event (apart from the associated recovery actions)?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The whole community has become closer and more united	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social divisions within the community have decreased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The local economy has become more vibrant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comments if desired

***38. To what extent do you agree with the following statements regarding the long-term impact of the mitigation actions taken by the council, such as the land-swap project, after the 2011 flood?**

	Strongly disagree	Disagree	I'm not sure	Agree	Strongly agree
The whole community has become closer and more united	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social divisions within the community have decreased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The local economy has become more vibrant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide comments if desired

39. What, if anything, do you think needs to be done to increase the economic and social viability of Grantham along with reducing future flood risk in the area?

(Hard copy) Post-disaster recovery in Australia and Japan: Lockyer Valley

Thanks, you have completed the questionnaire

40. Is there anything else you would like to add?

41. This is end of the questionnaire.

Thank you for taking time to provide us with your views and opinions.

If you are interested in participating in further opportunities in this research and / or being offered a copy of any resulting publications electronically upon completion of this research, please provide your email address below. This information will be stored separately to your answers for the previous questions.

A phone line service giving qualified health advice "13 HEALTH (13 43 25 84)", is provided by Queensland Health and available for flood-affected community members, if necessary. The line is available 24 hours a day, 7 days a week.

If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (Call 02 9850 7854 or email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

If you have any questions or comments about the research, please email tetsuya.okada@mq.edu.au or call 02 9850 9683.

Appendix 6: Information and Consent forms



Department of Environment and Geography
Faculty of Science
MACQUARIE UNIVERSITY NSW 2109
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Supervisors:
Dr Christina Magill
Dr Katharine Haynes
Dr Deanne Bird

Information and Consent Form

Re: Your participation in the project:

Post-disaster recovery following recent natural hazard events and risk reduction measures in Australia and Japan

You are invited to participate in a study looking into post-disaster recovery following recent natural hazard events and consequent risk reduction measures. The purpose of the study is to examine the human and societal aspects of disaster recovery and future risk reduction. In particular, the study will explore socio-cultural differences between two countries – Australia and Japan. Four case study areas that are in post-event recovery phases are being investigated: the Southeast and Southwest regions in Queensland, Australia, and the North Tohoku region and Fukushima region, Japan.

The study is being undertaken by a group of researchers, from Risk Frontiers, Faculty of Science, Macquarie University, NSW 2109; Tel: 02 9850 9683, Fax: 02 9850 9394.

Chief investigator:

Dr Christina Magill (email: christina.magill@mq.edu.au)

Co-investigators:

Tetsuya Okada (email: tetsuya.okada@mq.edu.au)

Dr Katharine Haynes (email: haynes.katharine@gmail.com)

Dr Deanne Bird (email: deanne.bird@gmail.com)

The study will be primarily conducted by Tetsuya Okada, to fulfil the requirements of a doctoral degree under the supervision of Dr Christina Magill, Dr Katharine Haynes and Dr Deanne Bird.

If you decide to participate, you will be asked to join an open discussion with at least one of the researchers listed above. The discussion will be held at a time and place convenient to you and arranged in advance. Your participation is completely voluntary with an estimated duration of approximately one hour, which can be adjusted to meet your convenience. The information to be obtained is regarding your experiences and thoughts on post-disaster measures following the 2010-



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ご案内文および同意書

プロジェクトへのご参加について:

日本およびオーストラリアにおける近年の災害後復興とリスク軽減策

近年の災害後復興とそれに伴うリスク軽減策を考える研究へのご参加に関し、ご案内させていただきます。この研究は、災害からの復興そして今後の被害の軽減における人的・社会的側面を学ぶことを目的としています。特に、オーストラリアと日本という二国間の社会的・文化的な違いを詳しく研究する予定です。災害復興期にある事例研究地4ヶ所: オーストラリア・クイーンズランド州の南東地方と南西地方、日本の東北地方北部そして福島地方を研究対象地とさせていただきます。

研究活動は下記の研究者グループにより実施いたします。各研究者の所属は、マッコーリー大学理学部リスク・フロンティアーズ (Risk Frontiers, Faculty of Science, Macquarie University, NSW 2109)、電話: +61(0)2 9850 9683、Fax: +61 (0)2 9850 9394 です。

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この研究は、博士号課程における必要科目の修得に向け岡田哲弥が主として取組み、クリスティーナ・マギル博士、キャサリン・ヘインズ博士、ディアン・バード博士の監督の下で実施されます。

ご参加いただける場合には、上記の研究者のうち少なくとも1名との会話形式でのインタビューへご出席をお願いすることとなります。インタビューは皆様のご都合にあった時間と場所を事前に設定し、そのうえで実施させていただきます。ご参加は完全任意制で、所要時間

は約1時間、これも皆様のご都合にあわせて調整させていただきます。インタビューでは、2011年の東日本大震災の災害後対策に関し、皆様のご経験やお考えについてお話を伺います。インタビューはお話いただいた内容の正確性を維持するべくデジタル録音をさせていただきますが、録音内容は上記研究者のみが使用させていただきます。

研究活動中にご提供いただいた全ての情報・個人情報の秘密は守られます。皆様ご希望になる場合を除いて、研究結果に基づくいかなる発表・出版物においても個人の特定がなされることはありません。本研究の完了後、ご希望に応じて研究後の発表・出版物の写しを電子配信または郵送でお送りいたします。

本研究へのご参加は完全任意制です。皆様のご参加は強制されるものではなく、ご参加いただく場合も皆様は全ての時点において自由にご辞退いただくことができ、辞退の理由を提示する必要はなく、辞退による影響も受けることはありません。

必要に応じて、震災により被災された方々へ一般社団法人日本臨床心理士会・東日本大震災心理支援センターから提供されている有資格の電話相談サービス「日本臨床心理士会 電話相談 (03-3813-9990)」をご利用いただくことができます。この電話相談サービスは祝日を除く毎週月曜日と金曜日の午前9時から午後12時、そして月曜日から金曜日の午後7時から午後9時までご利用が可能です。

私（お名前： ）は上記の案内を読み（または読んでもらい）、その内容を理解し、私が尋ねた全ての質問には納得のいく回答が得られました。私はこの研究への参加に同意し、今後この研究への参加におけるどの時点でも辞退をすることができ、その辞退による影響を受けないことを理解しています。私は保管用にこの書類の写しを受け取りました。

参加者名：

参加者署名： 日付：

研究者名：岡田哲弥

研究者署名： 日付：

本研究の倫理的側面はマッコーリー大学人的研究倫理委員会による承認を受けています。本研究への皆様のご参加における全ての倫理的側面に関する苦情および不安については、研究倫理グループ（電話 (02) 9850 7854; email ethics@mq.edu.au）を通して同委員会までご連絡ください。皆様からの全ての苦情は、秘密が守られた状態で取扱い・調査を実施し、その結果を皆様へご連絡させていただきます。

(研究者用 [もしくは参加者用] 写し)