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EARTHQUAKE INSURANCE AND POST-DISASTER HOUSING IN THE CASE OF CANTERBURY EARTHQUAKES IN NEW ZEALAND

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Abstract

The Canterbury earthquake, which struck New Zealand on February 22nd, 2011 took 186 lives. Of this number, 28 were Japanese overseas students. Looking simply at the number of casualties, this may appear to have been a minor earthquake which seems incomparable with respect to other major earthquakes. However, this was one of the most violent and costly earthquakes recorded in recent years. This was also major one in a regional context. The situation was grave: this earthquake caused the collapse of the Christchurch Cathedral, a symbolic landmark of the region, and dealt a blow to local economic activities due to devastating damage throughout the city's central area. There were also ongoing aftershocks and damage to residences due to liquefaction. Now (as of August 2013), over two years after the earthquake, citizens are still troubled with uncertainty about the future, and the whole region has become exhausted. The earthquake has brought about damage to people that cannot be measured from the number of casualties alone.

This paper will discuss two aspects of disaster recovery in the earthquake-struck area in Christchurch, New Zealand that have set it apart from disaster areas in other countries: firstly the issue of national insurance, and secondly, the absence of temporary housing. According to data provided by reinsurance companies, the amount of loss compensation paid out after the Canterbury Earthquake surpasses the amount after other earthquakes worldwide—even those that caused tens of thousands of fatalities. This is due to the extremely high coverage ratio of the natural disaster insurance, which is over 90%. On the other hand, it became apparent that the time taken up by insurance-related negotiations and procedures was in fact delaying housing reconstruction. Furthermore, there is almost no temporary housing of the

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variety built in disaster areas in places such as Japan. Although provision of temporary housing is extremely limited, there is generous official aid offered to the victims. This is the particular nature of the disaster recovery after the Canterbury earthquake.

Key words: New Zealand, Canterbury Earthquakes, Christchurch, earthquake insurance, temporary accommodation

1. Introduction

New Zealand is situated on a plate boundary much like Japan, and experiences a considerable number of earthquakes. In Japan, ‘the Christchurch earthquake’ generally refers to the Christchurch earthquake that occurred on February 22nd, 2011, at 12:51am. Due to the existence of an English language school in the Canterbury Television (CTV) building that collapsed, many Asian overseas students were killed, including 28 Japanese students. Of the 186 casualties of this earthquake, 115 of them were caused by the collapse of this building. There had been daily coverage of the disaster in Japanese media, with a focus on the Japanese victims, but after the Great East Japan Earthquake struck on March 11th, reports from Christchurch received less international media attention.

Looking merely at the casualty figures, this disaster does not seem to be in the same magnitude of devastation as the Great East Japan Earthquake in Japan, or the Wenchuan earthquake in China. However, it has had a considerable societal impact due to the damage caused by liquefaction, the ongoing aftershocks, the recurrent earthquakes over M6.0, and the blow to economic activities due to the devastation of Christchurch’s city center, including the collapse of the Christchurch Cathedral, its symbolic landmark. (It has been damaged and rebuilt four times in 150 years.) Even now, in August 2013, over two years after the earthquake, the citizens are plagued by uncertainty about the future.

Residences are awaiting damage appraisal or demolition, and the whole region has become exhausted. The earthquake has brought about damage to people that cannot be measured by the number of fatalities.

This paper will investigate the characteristics of the disaster aid following the Canterbury earthquakes of 2010 and 2011, focusing first on the insurance system, and then on the absence of temporary housing. Regarding the first topic of the insurance system, owing to the extent of the loss of housing due to liquefaction in Christchurch, many see insurance as the primary issue concerning the earthquake. Although the Canterbury earthquake is not among the world’s deadliest natural disasters, it is one of the earthquakes with the highest amount of compensation paid by insurance companies. New Zealand has a well-established insurance system and housing policy in place, and shares background factors with other developed nations such as Japan. In

particular, the aging population, so the two nations' experiences with disaster recovery are relevant with respect to each other. It would be interesting to introduce the case of Canterbury earthquake to a *Japanese Journal of Disaster Recovery and Revitalization*. In the disaster areas in New Zealand, the issue of insurance is discussed as the primary issue, and it was confirmed that the damage was also covered by various insurances that do not exist in Japan.

The second focus of this essay is on the absence of temporary housing that is often built in disaster areas. Actual temporary housing could not be confirmed at first, so investigations were conducted as to their existence. I could not find any temporary housing, which can be found in disaster areas after earthquakes in other nations such as Japan or China, in the urban or suburban areas in Christchurch during my visit at the end of November 2011, or the investigation started from July 2013. There are temporary school buildings on school campuses, and there are two huge clusters of temporary buildings at the University of Canterbury, but no temporary residential housing like that found in Japan could be seen anywhere in the city. The situation surrounding temporary housing, which is different from that in Japan, will be detailed later in section 4.

2. The Canterbury earthquake

2.1. The Time and Date of the Earthquake

'The Christchurch earthquake' refers not only to the earthquake on February 22nd, 2011, which was the cause of many casualties, but to a series of earthquakes. Beginning with the Darfield earthquake on September 4th, 2010, the second large earthquake happened on February 2011, and the third on June 13th; within this period, over 7,500 aftershocks were observed.

And on December 23rd, the fourth large earthquake occurred. By this point, approximately 12,000 aftershocks had been recorded (Table 1).

2.2. Names of earthquakes

These earthquakes are known by various names, so a quick clarification is in order. This series

TABLE 1.
Main earthquakes in 2010–2011 included in the Canterbury earthquake

	9/4/2010 Saturday 4:35 AM	2/22/2011 Tuesday 12:51 AM	6/14/2011 Monday 2:20 PM	12/23/2011 Friday 1:58 PM
Epicenter	Darfield	10km southwest of Christchurch	10km southeast of Christchurch	10km northeast of Lyttelton
Magnitude	M7.1	M6.3	M6.3	M6.3
Fatalities	0	185	0	0
Injuries		6659		
Total number of aftershocks			7500+	12000
Number of collapsed buildings		1,300 commercial buildings 10,000 residences		

of earthquakes is most commonly called the Canterbury earthquake, referring to the name of the wider region. It is also known as the Christchurch earthquake, from the name of the city that suffered the most damage. There was also a lot of damage at Lyttelton, the port town in the outskirts of Christchurch where the British first landed. There, it is also referred to as the Lyttelton earthquake, although not in common use. The 2010 earthquake is also known as the Darfield earthquake after the town of Darfield, located to the west from the city of Christchurch, where the epicenter of the earthquake was.

2.3. Comparison of natural disasters worldwide based on reinsurance company data

Insurance companies are themselves insured, a system known as reinsurance. We will look at data released by Munich RE, a major reinsurance company, focusing on the number of deaths, amount of loss, and amount compensated by insurance.

First, let us look at the number of fatalities. Table 2 shows the ten deadliest natural disasters in the world between 1980 and 2012, in order of death count. The worst was the 2010 Haiti earthquake, followed by the 2004 Indian Ocean earthquake and tsunami. Other than earthquakes, the list contains other types of disasters such as the cyclone in Bangladesh, and the heat wave in Europe in 2003. Here, the New Zealand earthquake is not in the top ten. (Table 2)

Next, Table 3 shows the top 10 of the same ranking with the type of disaster narrowed down to earthquakes, or earthquakes and tsunamis. The Tohoku earthquake is in 9th place; the New Zealand earthquake is still outside the list. (Table 3)

TABLE 2.
Ten deadliest disasters in 1980–2012, in order of number of fatalities

	Type of disaster	Disaster location	Losses	Losses compensated by insurance	Number of fatalities
			Million USD		
1/12/2010	Earthquake	Haiti	8,000	200	222,570
12/26/2004	Earthquake/Tsunami	Sri Lanka/Indonesia/ Thailand/India/Bangladesh/ Myanmar/Maldives/Malaysia	11,200	1,000	220,000
5/2/2008 to 5/5/2008	Cyclone Nargis/storm	Myanmar	4,000		140,000
4/29/1991 to 4/30/1991	Tropical cyclone/storm	Bangladesh	3,000	100	139,000
10/8/2005	Earthquake	Pakistan/India/Afghanistan	5,200	5	88,000
5/12/2008	Earthquake	Sichuan, China	85,000	300	64,000
July, 2003 to Aug. 2003	Heat wave	France/Germany/Italy/ Portugal/Romania/Spain/UK	13,800	1,120	70,000
July, 2010 to Sep. 2010	Heatwave	Russia	400		55,000
6/20/1990	Earthquake	Iran	7,100	100	40,000
12/26/2003	Earthquake	Iran	500	10	26,200

Source: Created from Munich RE’s NatCastSERVICE (03/2013)

TABLE 3.
Ten deadliest natural disasters in 1980–2012 in order of number of fatalities

Date	Type of disaster	Disaster location	Losses	Losses compensated by insurance	Number of fatalities
			USD		
01/12/2013	Earthquake	Haiti	8,000	200	222,570
12/26/2004	Earthquake/Tsunami	Sri Lanka/Indonesia/ Thailand/India/Bangladesh/ Myanmar/Maldives/Malaysia	11,200	1,000	220,000
10/08/2005	Earthquake	Pakistan/India/Afghanistan	5,200	5	88,000
05/12/2008	Earthquake	Sichuan, China	85,000	300	64,000
06/20/1990	Earthquake	Iran	7,100	100	40,000
12/26/2003	Earthquake	Iran	500	10	26,200
12/07/1988	Earthquake	Armenia/Turkey	14,000		25,000
08/17/1999	Earthquake	Turkey	12,000	600	17,118
03/11/2011	Earthquake/Tsunami	Eastern Japan, Japan	210,000	40,000	15,840
01/26/2001	Earthquake	India	4,600	100	14,970

Source: Created from Munich RE's NatCastSERVICE (03/2013)

TABLE 4.
Ten costliest natural disasters in 1980–2012 in order of amount of loss

Date	Type of disaster	Disaster location	Losses	Losses compensated by insurance	Number of fatalities
			USD		
03/11/2011	Earthquake/Tsunami	Eastern Japan, Japan	210,000	40,000	15,840
01/17/1995	Earthquake	Hanshin, Japan	100,000	3,000	6,430
05/12/2008	Earthquake	Sichuan, China	85,000	300	64,000
01/17/1994	Earthquake	Northridge, California, USA	44,000	15,300	61
02/27/2010	Earthquake/Tsunami	Chile	30,000	8,000	520
10/23/2004	Earthquake	Niigata, Japan	28,000	760	46
02/22/2011	Earthquake	Christchurch, New Zealand	16,000	13,000	185
05/29/2012, 06/03/2012	Earthquake	Italy	16,000	1,600	18
12/07/1988	Earthquake	Armenia/Turkey	14,000		25,000
09/21/1999	Earthquake	Nantou County, Taiwan	14,000	750	2,415

Source: Created from Munich RE's NatCastSERVICE (03/2013)

The following Table 4 ranks disasters in order of the amount of loss instead of the number of fatalities. The Tohoku earthquake is in 1st place, and the Hanshin-Awaji earthquake is in 2nd place. In this ranking, the Christchurch earthquake is at No. 7, even with its population of 350,000. (Table 4)

Then, Table 5 orders the disasters by the amount of loss covered by insurance. The February 2011 earthquake in New Zealand is at number 3, and the September 2010 earthquake, in which

TABLE 5.
Ten costliest earthquakes out of natural disasters in 1980–2012 worldwide,
by amount of compensation for insured losses

Date	Type of disaster	Disaster location	Losses	Losses compensated by insurance	Number of fatalities
			USD		
03/11/2011	Earthquake/Tsunami	Eastern Japan, Japan	210,000	40,000	15,840
01/17/1994	Earthquake	Northridge, California, USA	44,000	15,300	61
02/22/2011	Earthquake	Christchurch, New Zealand	16,000	13,000	185
02/27/2010	Earthquake/Tsunami	Chile	30,000	8,000	520
09/04/2010	Earthquake	Canterbury, New Zealand	65,000	5,000	
01/17/1995	Earthquake	Hanshin, Japan	100,000	3,000	6,430
05/29/2012, 06/03/2012	Earthquake	Italy	16,000	1,600	18
12/26/2004	Earthquake/Tsunami	Sri Lanka/Indonesia/Thailand/ India/Bangladesh/Myanmar/ Maldives/Malaysia	11,200	1,000	220,000
10/17/1999	Earthquake	Loma Prieta, California, USA	10,000	900	68
06/13/2011	Earthquake	New Zealand	2,000	800	1

Source: Created from Munich RE's NatCastSERVICE (3/2013)

there were no fatalities, is the 5th highest in the world. The June 2011 earthquake is also in the list at No. 10, and even if we divide the series of large earthquakes in New Zealand into three earthquakes, each of them makes it into the top ten in the world. (Table 5)

The scale of natural disasters cannot be compared by the amount of insurance money that was paid. What the comparison of the reinsurance company's data in Tables 2 to 5 shows is that the number of fatalities, as well as the amount of loss which are caused by a natural disaster, is in no way proportional to the amount of compensation given for insured losses. Because each country differs as to the presence of an insurance system, its coverage ratio, and the insured objects, the amount paid by insurance varies. In general, there is very little insurance compensation in developing countries, even if the death toll is high. On the other hand, in the case of the Canterbury earthquake in New Zealand, even though the death toll is low, the amount of loss, and furthermore, the amount of compensation for the insured loss, are extremely high compared to the world average (Table 4 and 5). Insurance for large-scale natural disasters is not handled solely out of an insurance budget targeted at each country; if, as in developed countries, a sound insurance system is in place, then insurance money is gathered from all over the world through reinsurance companies.

The comparison above shows that the compensation for insured losses is far higher in New Zealand than in other countries. New Zealand's recovery strategy is characterized by its government policy that places weight on self-help (the natural disaster insurance system). This is connected to the second topic discussed in this paper, that of the absence of temporary housing.

It is clear that the support system concerning housing differs from in countries such as Japan, which favors a system centered on official aid, providing temporary housing. Although the government does not offer support by constructing and providing temporary housing for victims who lost their homes, there is a system whereby the government-owned EQC (Earthquake Commission) pays the expenses for repairing houses and buildings, and covers relocation and rental/hotel expenses for a period of time if a person's home was destroyed, if they are covered by natural disaster insurance. Although the construction of temporary housing is indeed extremely limited, that is not to say that there are no measures in place to support people reconstructing their lives.

2.4. Seeking recovery solutions after the Canterbury earthquake

The EQC mentioned above is an entity which offers relief to people who have suffered damage by natural disasters such as earthquakes, tsunamis and floods. Each individual takes out fire and natural disaster insurance through insurance companies, which pay a set monthly disaster insurance premium to the EQC (One simply takes out a content insurance policy (fire, theft, other damage etc.) and through this there is a levy that is paid to the EQC for natural disaster payment. Thus, if one has purchased contents insurance from any private provider then one is enrolled into the EQC scheme.). The EQC pays up to 100,000 dollars in the event of a disaster from the collected premium. If the repair costs exceed this amount, then each insurance company covers the shortage. The EQC will be described in more detail later in section 3.

After the earthquake in September 2010, the government newly appointed a Canterbury Earthquake Recovery Minister, and established the Canterbury Earthquake Recovery Act 2010. It was announced that the Canterbury Earthquake Recovery Fund would be established with contributions from the government and private financial institutions. The government contributed 500 million dollars. As official aid for the victims, the government provided a flat rate benefit of 1000 dollars to households evacuating temporarily due to earthquake damage, as well as fixed compensation to workers who were forced to suspend their work.

In New Zealand, there were remarkably swift and thorough relief activities conducted by government bodies and private organizations, led by the Ministry of Civil Defense Emergency Management (CDEM), and the government adopted generous recovery policies to aid the victims of the disaster (Kimura-Steven, 2012). The Red Cross, the Salvation Army and World Vision are among the key contributing non-for-profit organizations that provided support in the aftermath of the disasters. The government set up a fund in collaboration with the Red Cross, and provided fixed rent subsidies for disaster evacuees whose private dwellings or rented/investment homes were damaged. Although it may have a very limited impact, there was also a Christian charity organization called Habitat for Humanity, which sought to reconstruct, without charge, the damaged homes of those who could not receive support from the EQC due to lack of insurance (Kimura-Steven, 2012). There were also volunteer groups such as the *Student*

Volunteer Army (SVA) (Otani, 2014) and the *Farmer Volunteer Army*, set up to provide assistance with labor to clear debris and assist relocation. They helped, for example, by heading to disaster areas with tractors and shovels to remove the mud from the liquefaction-damaged property. After the natural disaster, the people of Christchurch sought to overcome the difficulties together as one, demonstrating a national trait (Kimura-Steven, 2012) that was akin to how the Japanese have tackled disaster recovery in the past.

After the February 2011 earthquake, the central government established the Canterbury Earthquake Recovery Authority (CERA) on March 29th, in order to restore Christchurch. On September 10th of the same year, a recovery strategy draft was released, appealing for opinions from the general public. A campaign called “Share an Idea”, which lasted for 6 weeks, started in May 14th, 2011 and gathered over 100,000 opinions from the public, but was met with dissatisfaction from the citizens due to the lack of disclosure of the content of the opinions, and of official explanations as to whether the opinions were being reflected in the plan (Otani, 2014).

In December 2012, CERA’s Christchurch Central Development Unit (CCDU) created the blueprint for the recovery plan. The intention of this plan was to restore to the devastated Central Business District (CBD). Although a clear vision of the newly restored Christchurch will take time to emerge, what has become clear in the course of 2012 is that the city will be considerably different from how it used to be. Many buildings and facilities will be demolished in the eastern part of the city and the CBD, which suffered a lot of damage. This means that places that formed not only landmarks and wayfinding and navigation points but also people’s life memories, in particular for the elderly, will disappear. The houses where people might have lived from previous generations, and the town where they were born and grew up in, where they married and raised children, and lived after retirement, will be lost, as will the memories attached to them, although the level of mobility in New Zealand is relatively high and people are said to be transient population. Particularly, the approximately 10,000 residences in the eastern part of the city, the Port Hills, and other areas were designated within the Red Zone, which were bought by the government, and the residents were made to move out. The government also purchased land that became unusable after the earthquake at pre-disaster prices, based on results from the rateable valuation of a property conducted in 2006. There are also many people who choose this time to move out of Christchurch altogether.

CERA has also taken various measures to offer necessary mid-and long-term support, so that victims can rebuild their lives. In deciding its policies and programs concerning the victim’s livelihood rehabilitation, it referred to the response taken after the mountain fire disaster that occurred in Victoria, Australia in 2009 (Denise Kidd, General Manager, Community Resilience, Social & Cultural Recovery, CERA, and Jane Morgan of the same program, interview, August 6th, 2013 and August 19th, 2014).

In the post-earthquake recovery process, the victims’ main interest is the issue of rebuilding their homes. Starting immediately after the earthquake in September 2010, the city of

Christchurch conducted assessments of the risk level of buildings, and CERA divided the disaster area into the red zone, orange zone, white zone and green zone, according to the damage situation. (Many of these initial assessments had to be repeated after Feb 2011 and it was discovered that assessors had made many mistakes.) The red zone is the area that suffered the most serious damage, which has been deemed unfit for living, with no hope of repairing the foundation's defects even with engineering work. It was the Christchurch earthquake that first introduced the local population to the earthquake damage known as "liquefaction". There are also areas that have been rendered uninhabitable due to liquefaction, even though the buildings are still standing. The government has further divided the areas other than the red zone, e.g. the green zone, into TC1, TC2 and TC3 zones, according to the level of damage. These categories describe how the land is expected to perform in future earthquakes, and also describe the foundation systems most likely to be required in the corresponding areas.

Technical Category 1 (TC1, grey) – future land damage from liquefaction is unlikely. You can use standard foundations for concrete slabs or timber floors.

Technical Category 2 (TC2, yellow) – minor to moderate land damage from liquefaction is possible in future significant earthquakes. You can use standard timber piled foundations for houses with lightweight cladding and roofing and suspended timber floors or enhanced concrete foundations.

Technical Category 3 (TC3, blue) – moderate to significant land damage from liquefaction is possible in future large earthquakes. Site-specific geotechnical investigation and specific engineering foundation design is required.

<http://cera.govt.nz/residential-green-zone-technical-categories/overview>

Housing and land in the designated red zone, which are difficult to repair or reconstruct, fall under the government policy to buy up houses in the area. The government offered two options to all those who applied to private insurance and EQC: sell the land and the house; or only sell the land, with the house to be repaired or rebuilt by private insurance and the EQC (Takeda, 2014). Either way, people in the red zone ultimately have no choice but to move out. TC3 has problems with the foundation; no conclusion has been reached regarding TC2, as various negotiations are still in progress due to foundations requiring reinforcement (Campbell, 2014). The land zoning changed over time with some land zoned red and then changed. Many arguments and legal challenges are ongoing. Citizens face different fates even on opposite sides of one road, with the area segmented into different zones. CERA released an estimate in June of 2011 that around 5,000 houses will be designated within the red zone. Afterwards, the number of irreparable houses and area grew, and when the survey concluded at the end of 2012, over 8,000 buildings in an area spanning 630 hectares were designated as a red zone (*The Press*, 2013: 46).

The New Zealand government has also bought up houses in the designated red zone at their

appraised values before the disaster, which totaled to a sum of 1 billion NZ dollars (*The Press*, 2013: 4). Although the majority opinion was that the purchase prices were adequate, in reality there are problems on an individual scale, such as what happens with buildings that were extended between the time of appraisal and the earthquake. Furthermore, there are in reality complex issues surrounding the EQC and insurance. Miles (2012) introduces such cases, as well as dissatisfactions from the people.

Many have pointed to the political factor as one of the factors delaying recovery. It is an important issue that Christchurch's citizens and local government are unable to formulate recovery plans on their own terms, due to the increased authority of the central government and lack of effective participatory democracy in the region before and after the earthquake. This is also related to the fact that recovery cannot be achieved with the city's financial means alone, and requires vast amounts of financial support from the entire country. Under such circumstances, citizens have voiced disapproval of the subjection to the policies of the central government in the capital, Wellington, there have been demonstrations in the city of Christchurch.

The eastern part of Christchurch, where damage was comparatively large, is an area with a comparatively low socio economic status (SES) (Campbell, 2014). The earthquake shone a brighter light on the disparity between the different areas of Christchurch, which is a social issue of the city with a clear geographic and socioeconomic divide in the city since early settlement historically. This disparity has also been a factor in the gap in the speed of rehabilitation and recovery in different areas.

The earthquake of September 4th, 2010 occurred five weeks before the election scheduled for October. The earthquake increased the popularity of Mayor Bob Parker, for whom public support had been waning, and he was re-elected over his rival candidate Jim Anderton. However, the next three years proved a difficult time for the mayor. After CERA's establishment, the chief executive Roger Sutton (appointed May 2011, but forced to resign in 2014 after being found guilty of serious misconduct) became more powerful than the mayor; the media even reported in cynicism that Gerry Brownlee, the Minister for Canterbury Earthquake Recovery, had more authority than Prime Minister John Key. All decisions came to be made in Wellington, the capital of New Zealand, and Christchurch's city council and citizens began to be dissatisfied with the disintegration of democracy, leading to demonstrations. In October 2013, Lianne Dalziel, a local Labour Party MP for Christchurch East, was elected and became the new mayor of Christchurch, a possible testament to the citizen's dissatisfaction, as well as to their hopes for restored autonomy on the road to recovery.

3. Earthquake insurance in New Zealand

The Earthquake Commission (EQC), New Zealand's earthquake insurance, was not established for the purpose of dealing with this earthquake specifically. First, I will provide an explanation

of a quick outline of how the organisation was born. New Zealand's public earthquake insurance was established in 1945 as the Earthquake and War Damage Fund—now known as the Earthquake Commission—following the earthquake that struck its capital city of Wellington in 1942. There were considerable legal changes in 1993, and the organization became a corporation owned entirely by the government. It has a history of around 60 years, and is an insurance system that cannot be found in Japan. Insurance provided by the EQC is called the EQ cover. It is automatically attached when buying house contents insurance from a private insurance company. Purchase is compulsory (Purchase of home/contents insurance is not compulsory, but entry into the EQC scheme is compulsory if you have purchased insurance), and the automatic enrolment rate is high, at 90%. When buying houses, people take out insurance from a private insurance company that combines fire insurance and natural disaster insurance (When one buys a contents policy, EQC makes up the disaster portion.). People receiving a loan from a bank must buy insurance beforehand. Unlike in Japan, there is no need to take out separate earthquake insurance, and so there is no special insurance in New Zealand for earthquakes. The insurance premium is cheaper than in Japan. Unlike the Japanese earthquake insurance system, the insured object includes land, not just buildings and household goods. The EQC serves as the reinsurance company for housing insurance.

There is an upper limit to the EQC's compensation, and the excess is covered by insurance companies. The EQC's maximum amount for housing is 100,000 NZ dollars. If housing is uninhabitable due to damage, the shortage is covered by private insurance, as this sum is not sufficient for reconstruction. Housing insurance is provided by the government-run EQC and private insurance companies. Damage to household goods due to natural disasters is also included in the EQC's insurance. The EQC's maximum compensation is 20,000 NZ dollars, and the shortage is compensated by the insurance company.

EQC accumulates the insurance premium as a natural disaster fund, and uses the fund for foreign stocks (approx. 30%), government debt (approx. 60%), and cash deposit (approx. 10%) under government monitoring; the fund balance before the 2010 Canterbury earthquake had risen to 5.6 billion NZ dollars.

In addition to managing funds for natural disaster recovery, the EQC conducts investigation, research, and education concerning natural disasters and disaster prevention measures, issues research grants, and invests in the GeoNet project, which is New Zealand's earthquake monitoring project. With the continuing aftershocks after 2010, it has become a new custom for citizens to search for information such as the seismic intensity on the GeoNet website (<http://www.geonet.org.nz/>) after each aftershock.

From the victims' perspective, the biggest issue with the EQC is that despite the system, the actual procedures take an enormous amount of time, and people are kept waiting. In the case of a natural disaster such as this, with a vast number of applications, people often do not know when the appraisers will come to assess the damage status. Even just looking at the damage from the

September 2010 earthquake, only 73,000 appraisals had been conducted between the occurrence of the earthquake and January 5th, 2011, before the earthquake in February 2011; and it has been reported that repair cost had only been paid to 24,000 of these cases (Kimura-Steven, 2012: 91). Although one of the reasons is the continuing aftershocks, there is much discontent about the waiting time for the appraisals. The EQC received over 459,000 applications, and it has only been able to process and resolve under a quarter of them by the end of 2012. It has apparently resolved 26% of the land applied for, 31% of the buildings, and 81% of the buildings' contents (*The Press*, 2013: 21). Each application contains at least two of the above three. There are also people who are negotiating with private insurance besides governmental insurance. Even after the EQC's approval, they have to wait for a long time again to negotiate with insurance companies. Furthermore, the wait for the compensation in fact comes in many steps: deciding the manner of compensation, i.e. whether the insurance company will commission a repair company, or pay out a specific amount of compensation; when the repairers commissioned by the insurance company will come, and so on. And these all add to the stress felt by those affected by the earthquakes. In New Zealand, a country with a comparatively small population to begin with, few companies enter the market, and as the number of repair companies and construction companies is also limited, there is skepticism among the victims concerning the monopolization by these limited companies. In order to make up for the shortage of workers at the construction sites, migrant workers were called in, not only from rural areas all over New Zealand, but also from the Philippines or as far as Ireland.

As 90% of the under-30 population do not own a home, only a small number apply for insurance money (*The Press*, 2013: 21), although many renters had contents insurance and would have submitted a small claim. On the other hand, the elderly are struggling with the bureaucratic processes involved in insurance application. In this sense, young people without home ownership certainly have a little more freedom. However, New Zealand's aging population issue had already been progressing since before the earthquake, including in Christchurch; if the accelerating trend of young people leaving the city after the disaster continues, then in 20 years, after 2030, it has been estimated that half of the city's population will be over 65. (*The Press*, 2013: 22);

Accommodation expenses for hotels and motels, which are not covered by the EQC's earthquake insurance, is compensated by the earthquake rider that is attached to the fire insurance for household goods. In terms of residential properties, the premium rate for the earthquake rider is uniform across the country, like the EQC's earthquake insurance. Many insurance companies use the premium rate calculated by reinsurance companies such as Munich RE and General Re. AMI, the third biggest insurer in the industry, went bankrupt due to the payments for the damage of the Canterbury earthquake.

The reinsurance market deteriorated after the terrorist attacks on the World Trade Center in New York on September 11th, 2001. For this reason, the EQC had been renewing negotiations

about reinsurance since 2002 by increasing deductibles, and adjusting the reinsurance arrangements, taking into account the reinsurance market situation and the increase level of the natural disaster fund. After the Canterbury earthquakes after 2010, the premiums in New Zealand have been under review. It has been even estimated to increase by 30% (Miles, 2012).

4. Housing for earthquake victims

4.1. Ordinary residences

After the earthquake, most victims have gone to live in ordinary housing with relatives and others, or have continued to live in damaged houses. There are some who continue to live in the designated red zone even though the supply of water and electricity have already been cut, because they have no prospects of alternative housing. Some citizens had been negotiating for an extension of the evacuation deadline, unable to leave before the set date which was July 31st, 2013. If people need to stay for a few weeks in a hotel or motel while their house is under repair, insurance compensates around 150 NZD per night for accommodation.

4.2. Temporary Accommodation Service (CETAS)

As stated in the introduction, temporary housing of the kind seen in disaster areas elsewhere in the world is not found in the disaster area in the Canterbury region. As the existence of temporary housing is generally not known, or reported in the media, even the university earthquake researchers that the author interviewed responded that there was none in the area. Interviews also revealed that around 1,000 campervans had been installed as temporary housing in an inconvenient place away from the city center, which were then ultimately taken away when only one person had moved in (Otani, 2014). People who lost their homes evacuated to the homes of friends and relatives in Christchurch or other parts of New Zealand. After the earthquake, flight tickets for Air New Zealand were provided at low prices as a part of a policy that promoted wide-area evacuation, encouraging people who were able to leave the disaster-stricken cities for other cities to do so, so as not to hinder the post-disaster work, and to escape the danger posed by aftershocks. So, encouraged to evacuate over a wide area, people moved to other cities in New Zealand, or to Australia. There were also programs that allowed University students to transfer to different Universities in New Zealand and Australia.

There was a photograph in the monthly newsletter “Canterbury Recovery Update,” published by CERA, of ‘a family living happily in the temporary housing at Linwood Park’, which finally confirmed the presence and appearance of some temporary housing. As a result, after inquiring at the Ministry of Social Development, it was discovered that there were four temporary housing villages which were located in parks. Accompanied by Ministry staff, this author visited the temporary housing, which had been built in the wooded areas in parks so large that even the Ministry staff could not find their way. It is a distance away from nearby residential areas. Each

TABLE 6.
4 temporary housing locations in Canterbury

Kaiapoi Domain: 22 units
Rawhiti Domain (New Brighton): 20 units
Linwood Park: 42 units
(The above three locations are on temporary lease from the parks)
Rangers Park (Linwood): 40 units (of which 18 are detached 2–4 bedroom houses; 22 are terraced housing with 3 bedrooms)
(Expenses: 12.5 million NZ dollars including cost of land)

Source: *The Press*, “Quake homes bring relief,” September 18th, 2013, p. A8

TABLE 7.
Rent of temporary housing

Detached two-bedroom house	282 NZD/week (22,960 yen)
Detached two-bedroom house (furnished)	355 NZD/week (28,400 yen)
Three-bedroom detached house or townhouse	353 NZD/week (28,240 yen)
Detached four-bedroom house	439 NZD/week (35,120 yen)

Source: *The Press*, “Quake homes bring relief”, September 18th, 2013, p. A8

location houses 20 to 40 units, a small number in comparison to temporary housing in Japan in terms of the number of households. They are one-story prefabricated buildings, but with sizable kitchens and bathrooms, with two or three bedrooms each. There are some units with four bedrooms. Each unit is independent, and does not share a wall with the adjacent prefabrication. Pets are allowed at all units, and each unit has a back garden, where up to two dogs can be kept. Residents can also keep cats, and there is a cat flap attached to the door. Most are unfurnished, and residents move in with their own furniture; however, a few of the units come with furniture. There were units where people could move in easily, with their own furniture still in storage. (Table 6)

The prefabricated temporary housing in Linwood Park and Rawhiti Domain were built on land leased from the park with a limit of a few years. The Kaiapoi Domain houses to the north of the city are the same. With the Rangers Park housing, the government purchased the land, and the temporary housing was under construction as at August 2013. After using the buildings as temporary housing for around two years, the plan is not only to sell the land back to the park, but to sell the buildings as residences. The average length of stay at the temporary housing is 42 days, a fact that demonstrates that temporary housing is regarded in a different way from in Japan. Furthermore, the housing is not free, but rented at market price. The rent, which is covered by insurance, is shown in Table 7.

The designs of the temporary housing built in Christchurch were modeled after the housing built after the forest fire disasters in Australia (David Griffiths, Manager of CETAS, and Quality



IMAGE 1. Temporary housing at Kaiapoi (photograph taken by the author, 08/2013)



IMAGE 2. Temporary housing at Linwood Park (photograph taken by the author, 08/2013)

Adviser Tania Ohlson, interview, 08/14/2013). However, the situations are different for the houses burnt down completely by bushfires in Australia, and the houses damaged by earthquake in New Zealand.

4.3. Development of post-disaster residences

Housing for 20,000 households are planned to be built in the suburbs by 2017. There are plans for construction of 1,000 dwellings in Rolleston (2,000 inhabitants) in the Selwyn District, and the population is estimated to rise by a few thousand (*The Press*, 2013: 140); other reports state that the planned number is as high as 4,000. Other than Selwyn District, which is in the western suburbs, there is large-scale residential development in the Waimakariri District in the northern suburbs, such as Pegasus Bay, and model houses are advertised in various places. Extensive construction of detached houses is under way, but many have expressed doubt in the urban planning, commenting on the lack of shopping centers, sports facilities, schools and so on. All of these locations are existing growth areas in Canterbury. It is difficult to differentiate between planned housing associated with disaster relocation and that which was already planned for.

At the home of an Auckland University academic, located in Rolleston in the western suburbs of Christchurch, administrative bodies had purchased the underground rights below the orchard and were conducting drainage works, as there were plans for construction of residential areas on the other side.

Pegasus Bay has been developed on a drained coastal wetland. Although the area spreads around a lake and golf courses, redevelopment is taking place in this area which suffered liquefaction damage in the earthquake. Rolleston, too, is very close to the epicenter of the September 2010 Darfield earthquake, and there are doubts whether safety had been confirmed, for example by active fault research, before commencing development.

5. Ministry of Social Development (MSD): Earthquake Support Co-ordination Service (ESCS)

The Earthquake Support Co-ordination Service (ESCS) was established by the Ministry of Social Development (MSD) after the earthquake in September 2010, and has since been conducting support programs to help rebuild lives, including housing, in cooperation with insurers. More specifically, it has engaged in five activities: the helpline (toll-free), temporary housing, Earthquake Support Coordinators, support center for homeowners in a red zone area (Avondale Earthquake Assistance Centre), and the Community Resilience Team. (Takeda, 2014) As citizens have had to deal with many processes for the first time due to the earthquake, such as earthquake insurance, the ESCS has served to provide them with information about earthquake response, and to direct them to points of contact appropriate to each situation. Rather than merely handling situations over the toll-free helpline, the Earthquake Support Coordinators act as guides to services required by the victims concerning residences or reconstruction. People affected by the earthquake can meet the Coordinators anywhere they wish, including at the evacuated home. There were around 70 ESCs at the peak of its activities, but at present (as at August 2013), the number has fallen to 40 (Maria McEntyre, ESCS Senior Regional Relationship Manager, Family & Community Services, interview, 08/08/2013). Although it has mainly offered one-to-one support (individual guidance) until now, it is seeking to shift to a one-to-the-community system. ESCS has been run by NGO employees, social workers, and people with various skills such as community development specialists. Administrative bodies have pointed out that the social workers and counseling specialists tend to become too engaged with individual cases, rather than observe the originally intended approach of directing victims to ESCS's contacts, then checking afterwards if they have managed to use the service. By constantly



IMAGE 3. Temporary Housing Application Office at the Ministry of Social Development (08/2013, photograph taken by the author)

tending to the victims and spending a long time dealing with each case, the problem is that the victims become too dependent. As mentioned earlier, the average length of stay in temporary housing is 42 days. There are occasional cases of residents staying for a year, but they are seen as problematic by administrative bodies. This was a topic of debate at the temporary housing in Kobe, one of the disaster areas of the Hanshin-Awaji earthquake. This program is a temporary post-disaster measure, set to conclude in June 2014 (as scheduled at time of interview in August 2013). This date is seen as an appropriate time for the insurance companies to take over the work that is originally theirs, rather than continue to leave it in the hands of the government.

6. Conclusion

This paper discussed two aspects of the disaster areas in Christchurch, New Zealand, based on investigations conducted there, that set them apart from disaster areas in other countries: the issue of insurance and the issue of the absence of temporary housing. Christchurch has differed from past disaster areas such as in Japan in these two points; as such, it serves as a case study that shows the importance of international comparative research. As the coverage ratio of earthquake insurance is extremely high, though not total, in New Zealand, housing reconstruction might generally be expected to proceed more smoothly than in Japan; however, in reality, due to the long wait for the appraisals, and as each step of the negotiations is complex and time-consuming, reconstruction has not been a simple process.

The New Zealand government does not actively build or provide temporary housing like the Japanese government, but it endeavors to offer other forms of official aid to victims so that they may rebuild their lives. Its official aid can be said to be deeply relevant to the concepts of “social capital” and “resilience”, keywords that have entered common use in recent research on natural disasters.

In Japan, since the 1923 Great Kanto Earthquake, restoration of disaster areas has centered on public works to sort out the urban infrastructure. This style of restoration has been termed “pre-established restoration” (Oyane, 2015). The Disaster Relief Act enacted in 1948 after World War Two, and the later Act Concerning Support for Reconstructing Livelihood of Disaster Victims (1997) after the Hanshin-Awaji Earthquake led to a uniform procedure for recovery whereby the official system prescribes the victims’ livelihood rehabilitation, from shelters to temporary housing, followed by reconstruction of residential buildings or settlement in public post-disaster housing. When the Great Sichuan earthquake occurred in China in 2008, the Chinese government issued a notice to researchers to study Japanese precedents as reference in devising measures regarding construction of temporary housing and other matters (Otani, 2009 & 2014). However, now after three and a half years since the Tohoku earthquake, the newspapers on September 11th, 2014 reported that only 10% of the planned disaster recovery residences are complete, and that more than half the victims in a survey responded that the delay in recovery is

most felt in housing issues. Under such circumstances, there have been reports that victims who do not rely on official aid, or move into shelters or temporary housing, are managing to rebuild their lives faster (Shigekawa, 2015). Even though the earthquake insurance system and housing policies in New Zealand are different from those in Japan, both countries are developed countries with an aging population. As such, it is valuable to learn from each other's experience in order to plan a desirable recovery.

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