

## **Importance of Risk Communication in Earthquake and Tsunami Disaster Preparedness: The Case of Talcahuano in the 27F, Chile**

地震津波災害におけるリスクコミュニケーションの重要性:

2010年チリ地震におけるタルカワノ市の事例

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### **1. Introduction**

At 3:34 a.m. local time on Saturday, 27 February, the south-central region of Chile was hit by a Mw 8.8 earthquake that triggered a devastating tsunami. This disaster, known in Chile as “27F”, impacted 12 million people in 900 cities and towns, causing more than US\$30 billion in losses. The death toll has reached 525 people and the missing persons were 25 people (Siembieda et al. 2012).

Nevertheless, there was little damage to the scale of the disaster. In addition, Chile realized deliberation and build back better through recovery process (Platt and So 2017). The background of such a good reconstruction is that the administration and the citizens have prepared for disaster in advance. In particular, Chile has achieved today a satisfactory set of seismic regulations and norms through the gradual improvement of seismic resistance, based on the experience gathered from numerous earthquakes (Kitano 2011; Herrmann 2013).

Among the whole of Chile, Talcahuano is evaluated as a disaster area where damage by this event could be reduced, because the seismic design codes were implemented and the residents voluntarily evacuated after feeling the temblor of the earthquake. The subsequent restoration have also been successful in

this city. So far the recovery process from the 27F and the efforts after the disaster have been studied in some detail. However, the analysis on the impact of disaster preparedness for this event is limited.

### **2. Objective**

This research aims to clarify the importance of risk communication in order to produce an intended effect of disaster preparedness at the event of a disaster. By effectively performing disaster countermeasures, quick recovery from disaster damage and build back better will be realized.

We examine good practices of the 27F in Talcahuano, such as prominent seismic design codes, behavior of the victims and efforts of the administration. It is necessary to consider them concerning: (1) the background of the implementation of building code, (2) the administrative disaster prevention policy, and (3) economic and social burden of people.

### **3. Methodology**

This study is a qualitative research, dependent on the case study of the 2010 Chile earthquake. In particular, in order to supplement the information from the literature and to clarify more detailed disaster preparedness, field surveys have been conducted twice in Talcahuano.

#### 4. Results

The findings of this research can be summarized as follows:

(1) As various previous researches pointed out, the implementation of prominent seismic design codes and standards contributed to the reduction of the damage caused by the 27F.

(2) The reasons behind the implementation of them are that:

1) The social status and skills of engineers and architects are very high;

2) The construction quality is inspected, and the locus of responsibility in the construction process is clear by a peer review program and some regulations;

3) Building developers have 10 years of responsibility for any damage; and

4) Every time Chile experienced a catastrophe, the design codes were revised with the support of domestic and overseas specialists.

(3) Despite the fact that most of Talcahuano's residents were unable to receive the tsunami warning at the time of the disaster, they noticed the big tremor of the earthquake themselves and decided their following actions.

(4) Talcahuano's residents consider that the earthquake and the tsunami are different disasters. Thus, although they trust the seismic performance of the structure, they do not necessarily do the performance against tsunami disasters.

(5) On the other hand, trust in earthquake insurance is low although it is associated with a mortgage loan. The implementation of outstanding earthquake resistance standards may be disincentive to earthquake insurance purchase.

#### 5. Conclusion

In terms of disaster risk communication, trust in hard infrastructure with high earthquake resistance, in local government

administration and in the community led to mitigation of damage in the event of a disaster.

Chile's long history of frequent earthquakes have revised Chilean design codes. Besides, a lot of Chilean people are proud of their sophisticated codes.

Implementation of building code not only provides relief and safety for the community but also cultivates positive attitude of affected people about recovery during the disaster event.

In conclusion, this thesis insists that the significance of risk communication and the ripple effect of implementing civil infrastructures.

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