Observations of Emergency Housing Countermeasures in Nagaoka City after Mid Niigata Pref. Earthquake

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1. Introduction

In the Great Hanshin Awaji Earthquake (1995), approximately 48,000 prefabricated temporary houses were supplied. The prefabs had many problems such as poor quality of residential environment, local community disruption and etc (Maki, 1997). After the Great Hanshin Awaji Earthquake, the Natural Land Agency reported the importance of utilization of vacancies in rent housing as emergency housing countermeasures after natural disaster (Natural Land Agency, 2000). Prefabricated temporary house is not universal countermeasures. One example in Asian countries, approximately 800 thousands victims chose rent subsidies after Taiwan Earthquake 1999 (Shao, 2001). In 2004, Japanese Natural Disaster Victims Relief Law was reformed, and a system of rent subsidies for emergency housing countermeasures after disaster was established. In Japan, the occurrences of serious earthquakes – Tokai Earthquake, Tokyo Metropolitan Earthquake, and etc – are concerned by researchers of earthquake engineering (Headquarters for Earthquake Research Promotion, 2006). In such a situation, it is not clear that the new system performs effectively when the serious earthquakes occur. This is a basic study on Japanese emergency housing countermeasures after natural disaster. In this paper, I make clear the new system of rent subsidies, and describe emergency housing countermeasures of the Mid Niigata Prefecture Earthquake that was the first case of application of New Natural Disaster Victims Relief Law.
2. Japanese Institution of Emergency Housing Countermeasures

As shown in Fig.1, there are two systems in Japanese emergency housing countermeasures. In National disaster act, the prefectural government makes agreements with related organizations, and the city government makes detailed operations (such as listing of building sites for the prefabs and vacancies in rental housing). National Disaster Act provides free housing supports such as prefabricated temporary housing, vacancy of public housing and rental housing kept by governments. Also, the act support running repairs to houses that have less damage. In Disaster Victims Relief law, the prefectural center foundation, Japanese bases of local administration, performs major part. After a city government accepts applications from victims and makes examination about it, the prefectural center foundation receives applications and gives rent subsidy (maximum 500 thousands JPY) directly to victims. Rent subsidy varies according to the conditions of household, such as housing damages, annual incomes, and the number of a household.

![Fig.1 Japanese Institution of Emergency Housing Countermeasures](image-url)
3. The Countermeasures in Nagaoka City after Mid Niigata Earthquake

In this section, Nagaoka city, which has the largest housing damage amount at Mid Niigata Earthquake, was selected to a case study for observations of emergency housing countermeasures. A part of source materials collected by field survey (5 times – 2004/11, 2004/12, 2005/1, 2006/3, 2006/8 - ) are used to describe this section.

3.1. Housing Damages in Nagaoka City

Mid Niigata Earthquake occurred in October 23, 2004. Origin time was 17:56 JST. Depth of Epicenter was 14km and magnitude was 6.8 (JMA). Maximum seismic intensity was 7 at Kawaguchi town located south of Nagaoka city. At Nagaoka city, seismic intensity 6 was observed. Because of the earthquake, 20 dead people, 301 severely injured people, and 2075 lightly injured people came into existence on Nagaoka city. Also, 1590 buildings collapsed completely, 1307 buildings were damaged strongly, and 6690 buildings were damaged. Table 1 expresses the household number suffering from the housing damages in Nagaoka city. A rate of households whose houses collapsed completely is 1.6%. A rate of households whose houses were damaged is about 10%. Many households of "half collapse" came back to their houses repaired and some households who have severe housing damages can live in other dwellings, so that the number of households who lose their houses is considered approximately 2,000 to 3,000. For the part of these households, governments make emergency housing countermeasures.

**Tab.1 Housing Damages in Nagaoka City**

<table>
<thead>
<tr>
<th></th>
<th>all residents</th>
<th>Complete collapse</th>
<th>Large damage</th>
<th>Half collapse</th>
<th>household who lose their houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households</td>
<td>96048*</td>
<td>1537</td>
<td>1290</td>
<td>6800</td>
<td>2000～3000</td>
</tr>
<tr>
<td>Percent</td>
<td>100%</td>
<td>1.6%</td>
<td>1.3%</td>
<td>7.1%</td>
<td>2.1%～3.1%</td>
</tr>
</tbody>
</table>

*2006/7/1
left) damage of building land  
right) furniture falling

Fig2. pictures of housing damages at Nagaoka City

3.2. Countermeasures based on National Disaster Act

For the households who lose their houses, emergency housing countermeasures based on National Disaster Act was performed. 1890 units of prefabricated temporary housing shown in Fig.3 were provided. The amount of vacancy of public housing as emergency housing is only 13 because the vacancy of public housing is few in recent years. Niigata Federation of Real Estate Transaction Associations kept 280 rental houses, and 145 victims used it as emergency housing. Accordingly, countermeasures based on National Disaster Act provided about 2,000 housing support that accounts for 60% of all households who lose their houses. Soon after the earthquake, the Nagaoka city government asked the Niigata prefectural government to keep more rental houses. However, many dealers in real estate didn't like to use their dwelling as emergency housing and many construction workers used rental housing inside the city, so that it was difficult to keep more rental houses by the government and the prefabricated temporary housing were provided massively.
left) exterior of the prefabs  
right) interior of the prefabs

Fig.3 pictures of prefabricated temporary housing at Nagaoka City

3.3. Countermeasures based on Natural Disaster Victims Relief Law

As I mentioned in the introduction, Japanese Natural Disaster Victims Relief Law was reformed, and the residential support system after disaster was established in 2004. The residential support system includes rent subsidy for emergency housing. Subsidy of the residential support system varies according to the conditions of households. Table 2 indicates details of a relation between subsidy and household's conditions. If the annual income of a household is under 5 million JPY a year and there are more than two persons in the household, they can receive 3 million JPY as subsidy when their house is totally collapsed. There is a limitation that 1 million JPY has to be used as expenditure for daily life and 2 million JPY has to be used as expenditure for habitation. And rent subsidy for emergency housing is limited under 0.5 million JPY.

<table>
<thead>
<tr>
<th>annual incomes of a household</th>
<th>persons in a household</th>
<th>expenditure for daily life</th>
<th>expenditure for habitation [include (r)]</th>
<th>rent subsidy (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 5 million JPY</td>
<td>over two</td>
<td>100*(0**)</td>
<td>200*(100**)</td>
<td>50*(50**)</td>
</tr>
<tr>
<td>less than 5 million JPY</td>
<td>single</td>
<td>75 <em>(0</em>*)</td>
<td>150 <em>(75</em>*)</td>
<td>37.5* (37.5**)</td>
</tr>
<tr>
<td>5-8 million JPY(#)</td>
<td>over two</td>
<td>50* (0**)</td>
<td>100 * (50**)</td>
<td>25 * (25**)</td>
</tr>
<tr>
<td>5-8 million JPY(#)</td>
<td>Single</td>
<td>37.5 * (0**)</td>
<td>75 * (37.5**)</td>
<td>18.75 * (18.75**)</td>
</tr>
</tbody>
</table>

* when a victim’s house is complete collapsed  
** when a victim’s house has large damage
when a victim's annual income is 5-7 million JPY, households who have members in need of nursing care or over 45 years old householder can receive subsidy. Also, when a victim's annual income is 7-8 million JPY, households who have members in need of nursing care or over 60 years old householder can receive subsidy.

In Nagaoka city, 2020 households applied for the subsidy of Natural Disaster Victims Relief Law and 2.54 billion JPY was distributed until March 2006. Expenditure for daily life accounted for 55% of the total and expenditure for habitation accounted for 45% of the total. In the institution of Natural Disaster Victims Relief law, expenditure for habitation is allowed much higher than expenditure for daily life. However, it produced an effect contrary to the institution in Nagaoka city. It is considered that the institution is too strict to use residential subsidy. Also I have to point out the problem that victims need 4 months or more to wait to receive it after their application was submitted. After victims applied for it, the first examination was performed by city government, the second was performed by prefectural government, the final was performed by the prefectural center foundation, and the center arranges the distribution of the subsidy. Because of this long process, the payment of the subsidy requires much time, and it is not kind to disaster victims.

The detail of rent subsidy is not clear because no organization can summarize the result while operating the countermeasures. Though, the data about only Old Nagaoka city (Nagaoka city combined with nearby small town in 2005) was captured because the city cooperated specially. According to the data, 1.69 billion JPY was distributed as subsidy until 2006/07/24 totally. Expenditure for daily life was 0.95 billion JPY and expenditure for habitation was 0.74 billion JPY. In expenditure for habitation, rent subsidy was only 0.06 billion JPY and 266 households used it. The average of rent subsidy is 23 thousands JPY per one household. If other areas of the city are the same proportion, it can say that approximately 400 households used the rent subsidy from simple calculation (such as 266 households times 2.54 billion JPY per 1.69 billion JPY).
4. Discussion

Main emergency housing countermeasures in Nagaoaka city was prefabricated temporary housing. The statistical survey of central government reported that 5500 vacancies of rental housing in Nagaoka city (Statistics Bureau, 2003). If the government kept 2000 vacancies as emergency housing, provision of prefabricated temporary housing would become near 0. However, the case of the Nagaoka shows the difficulty of utilizing rental houses for emergency housing by National Disaster Act because the government cannot hold the housing market completely. In the future, we have to consider a way of utilizing the housing market for emergency housing such as rent subsidy, so that the revision of Natural Disaster Victims Relief law becomes important. It can say that the prefabs had an advantage because there were 1800 prefabs and 400 rent subsidy in Nagaoka city. Rent subsidy had the limitation and distributed 4 months after. By contrast, the prefabs were free and provided one month after. From the viewpoint of disaster victims, saving of their money to reconstruct their homes is natural, so that temporary housing becomes a better choice. For city government, they try to provide the prefabs if the victims require it, because the cost of constructing prefabs is from budget of central government. Also, because of small cost at all budget, the central government has no attention to the prefabs.

The prefabs, which provided in Hanshin-Awaji Earthquake, needed about 6 million JPY including maintenance and removal. The prefabs, which provided in Mid Niigata Earthquake, needed 1.5 times as much cost as in the Hanshin-Awaji Earthquake because measure to snow of Niigata area was required. Though, utilizing existing vacancy of rental housing doesn't require much cost. If victims receive 50,000 JPY per a month, we need only 1.2 million JPY in 2 years. Adding to this, if we can use such difference in price and labor power, the reconstruction will become speedy and we will have possibility of better urban reconstruction. In the damage scale of Mid Niigata Earthquake, emergency housing countermeasures did not become serious problem. However, when we consider estimated 1 million households who loses their houses in Tokyo Metropolis Earthquake, the problem will become serious. It is important that we should avoid constructing 0.5 million prefabricated
temporary housing and we can utilize 105 million vacancies of rental housing in Tokyo metropolis.

5. Conclusion
Because of the Mid Niigata Pref. Earthquake, 9627 household’s dwellings were damaged and 2000 to 3000 households who lose their houses came into existence. For these households, 1890 units of prefabricated temporary housing were provided. 145 victims used rental houses kept by the government as emergency housing. The amount of vacancy of public housing as emergency housing is only 13. Also rent subsidy based on revised Natural Disaster Victims Relief Law was performed and about 400 household used it for emergency housing. In Nagaoka city, the countermeasures based on National Disaster Act were performed mainly. However, when we consider the serious damages such as Tokyo Metropolitan Earthquake, utilizing vacancy of existing houses becomes important because the prefabs need much cost and land. In this survey, the institution of Japanese rent subsidy was shown and the application case was also described. It inspired the importance of revising the present institution.

![Fig.5 Emergency Housing Countermeasures in Nagaoka City](image-url)
References


