SOCIO-ECONOMIC RECOVERY FROM THE 2004 MID-NIIGATA PREFECURE EARTHQUAKE DISASER - Report of Social Random Surveys Data 2006 from the Impacted Area of the 2004 Mid-Niigata Prefecture Earthquake -

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ABSTRACT :

This study is based on the analysis of social sampling random surveys conducted in the 2004 Mid-Niigata Prefecture Earthquake impacted area Mar 2006 and Oct 2006. Those surveys were designed on the basis of the social random surveys conducted 1995 Hanshin-Awaji Earthquake impacted area every two-year from 1999. In the case of the Hanshin-Awaji Earthquake the administration in Hyogo prefecture has promoted the policy for the recovery which set three major fields; 1) redeveloping destructed cities, 2) revitalizing local economics, 3) reconstructing daily and social life; however, there was no study about what life recovery was from victims' point of view. The research frame building for the survey study was hypothesized by the major findings from the grass-root workshops, which identified seven critical factors; physical/mental health, preparedness, economic/financial situation, and relation to government. The administration in Niigata prefecture learned from lots of experiences of Hyogo Prefecture, and asking the victims' point of view about the recovery process was also realized in Niigata case.

To redevelop the destructed towns and cities, there are the most two critical factors; housing and land use planning. The satisfaction with their current housing condition is key issue of the feeling their completion of recovery from the damage. While respondents, who thought that they were not attached to the place where they lived, they felt that their life recovery was not well enough.

To revitalize local economics, victims' economic condition is a critical issue. There is strong correlation between the degree of housing damage and the present condition of their family budget. When the respondents' houses suffered the severe damage, their family budget was still in bad condition. Especially the cost of housing, medicine, and insurance increased compared with the condition before the event, while the expense of having recreation activities decreased.

To reconstruct daily and social life, mental and physical condition has to be considered first. When respondents had lower mental stress, they had high sense of life-restoration. On the other hand, when respondents had moderate physical stress, they had high sense of life-restoration.

KEYWORDS: Life Recovery, Niigataken Chuetsu Earthquake, 7-element model

1. DEFINING RECOVERY: 7-ELEMENT MODEL

The recovery from disasters is not a new issue in Japan, which had been discussed after major disasters, such as 1923 Tokyo Earthquake and WWⅡ; however, the recovery at those times was mainly considered as the reconstruction of physical structures in cities. The reconstruction process from the 1995 Hanshin-Awaji Earthquake was the first time in Japanese History to be considered not only as the reconstruction of physical structures but also reconstruction of social structures. The administration in Hyogo Prefecture had promoted the policy for the long-term recovery, which set three major fields; 1) redeveloping destructed cities, 2) revitalizing local economics, 3) reconstructing victims' daily and social life. The Disaster Master Plan of Japanese Government was revised six months after the Hanshin-Awaji Earthquake, to which the concept of the recovery from disasters was added in order to reflect the Hyogo Prefecture's policy. Four social surveys were planned to conduct in the impacted area of Hanshin-Awaji Earthquake every 2 years in 1999 to clarify what life recovery was for the victims themselves. The research frame called "7-element model" building for the 2001 survey study was hypothesized by the major findings from the grass-root workshops, which identified seven critical factors which influence long-term recovery; 1) housing, 2) social ties, 3) land use planning, 4)physical/mental health, 5) preparedness, 6) economic/financial situation, and 7) relation to government.

Mid-Chuetsu Area in Niigata Prefecture was hit by the major earthquake in 2004. We conducted two random social surveys in the impacted area of 2004 Mid-Chuetsu Earthquake based on the same framework of surveys which were conducted in the impacted area of 1995 Hanshin-Awaji Earthquake. This study showed the results of the analysis of social sampling random surveys conducted in the 2004 Mid-Niigata Prefecture Earthquake impacted area Mar 2006 and Oct 2006. We planned to conduct the survey in 2007; however, it was not conducted because another major earthquake hit in the Chuetsu area called 2007 Mid-Chuetsu Oki Earthquake.

2. TABLES

2.1. Samples

The 2006 random sampled mail survey was conducted with 2,140 earthquake disaster victims who experienced severe life difficulties due to the 2004 Niigataken Chuetsu Earthquake. They were sampled based on two-step stratified random sampling method from those residents of the areas with JMA (Japanese seismic intensity scale) 6. 907answered questionnaires were accepted as subjects in Mar 2006 survey and 1013 in Oct 2006 survey (Table 1).

Table 1 Overview of two surveys

	the Mid-Niigata Survey in March 2006	the Mid-Niigata Survey in October 2006
Earthquake occurred in	23 October 2004	
Surveyed Area	Areas where 7 on the seismic scale was recorded and gas was stopped + Kobe City Kita ward and Nishi ward	Areas in Nagaoka City, Ojiya City, and Kawaguchi Town, where 6 lower on the Japanese seismic scale was recorded
Surveyed person	Man and woman 20 years or older	Man and woman 20 years or older
Sampling	Sampled from resident register using stratified two-stage sampling (each 50 points in Nagaoka City and Ojiya City, 7 points in Kawaguchi Town, 20 residents per point)	Sampled from resident register using stratified two-stage sampling (each 50 points in Nagaoka City and Ojiya City, 7 points in Kawaguchi Town, 20 residents per point)
Number of surveyed persons	2,140	2,140
Number of effective answers	907	1,013
Rate of effective answers	42.4%	47.3%
Method of survey	Fill out questionnaire sent by mail and collect it by mail	Fill out questionnaire sent by mail and collect it by mail

2.2. Instruments

Life Recovery Scale. The life recovery scale consists of 14 five-points Likert scale that asks 1) the recovery of daily activity, social relationship, subjective well-being (7 items), 2) life satisfaction and quality of life (6 items), and 3) optimistic/pessimistic prospect of life that is one year from now (1 item). These 14 items were originally developed in the 1999 Kobe survey and showed unidimensionality with high reliability (Cronbach's alpha was .91) (Tatsuki & Hayashi, 2000).

3. RESULTS AND DISCUSSION

3.1 Changes in the Victims' Dwelling Places

To grasp the data of the dwelling places and shelters quantitatively, the respondents were asked about the types of dwellings and shelters they used on the day of the earthquake until six months afterwards (since the survey was conducted in 2005). A previous study on the victims of the Great Hanshin Awaji Earthquake verified that a logarithmic axis "changing at the intervals of 10 hours, 100 hours and 1,000 hours" is meaningful (Kimura et al. 1999, 2001, 2004).

In the Mid-Niigata Prefecture Earthquake there were a low percentage of victims that dwelled in their own homes and a high percentage that evacuated outdoors. This is most likely due to the frequent aftershocks. Fewer victims used their relatives' houses as shelters (Figure 1). In the Great Hanshin Awaji Earthquake, relatives' houses were the largest alternatives to shelters two to four days after the earthquake. However, this tendency was not observed in the Mid-Niigata Prefecture Earthquake (Figure 2). This is probably because relatives' houses were in close proximity to the disaster-stricken area and the community was more intimate than in an urban area so that they did not feel as uncomfortable or inconvenienced at the shelters.

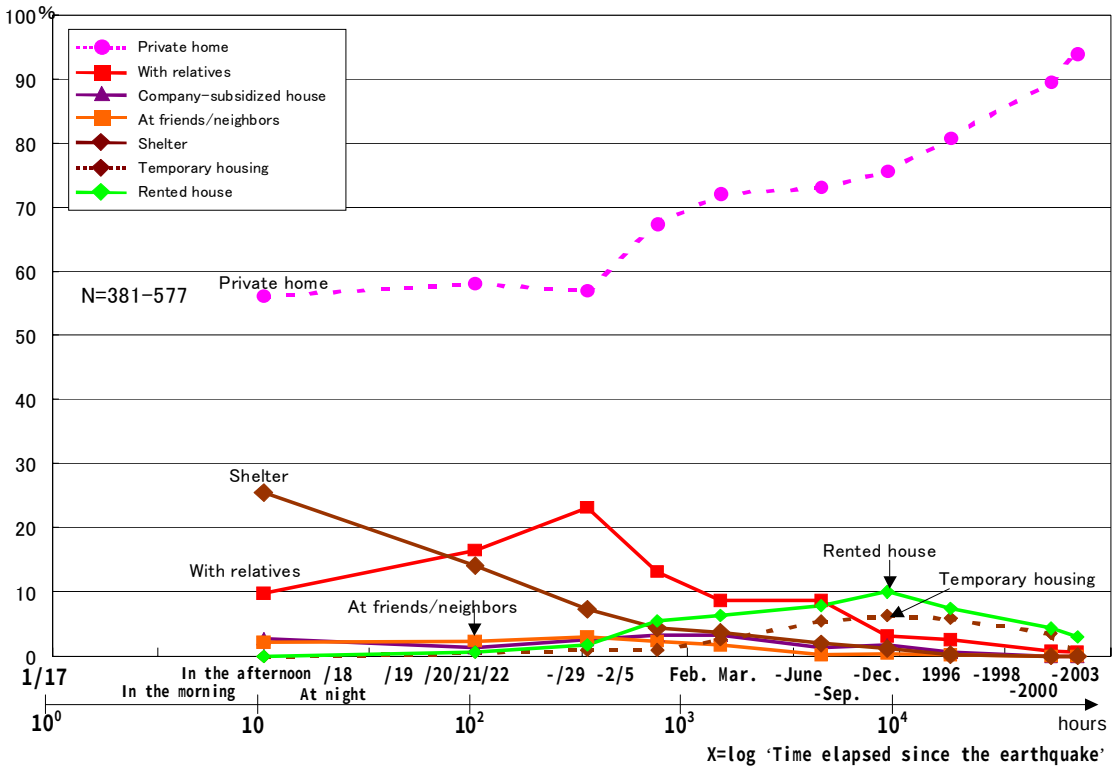

Figure 1 Changes in the Victims' Dwelling Places in the 2004 Mid-Niigata Prefecture Earthquake

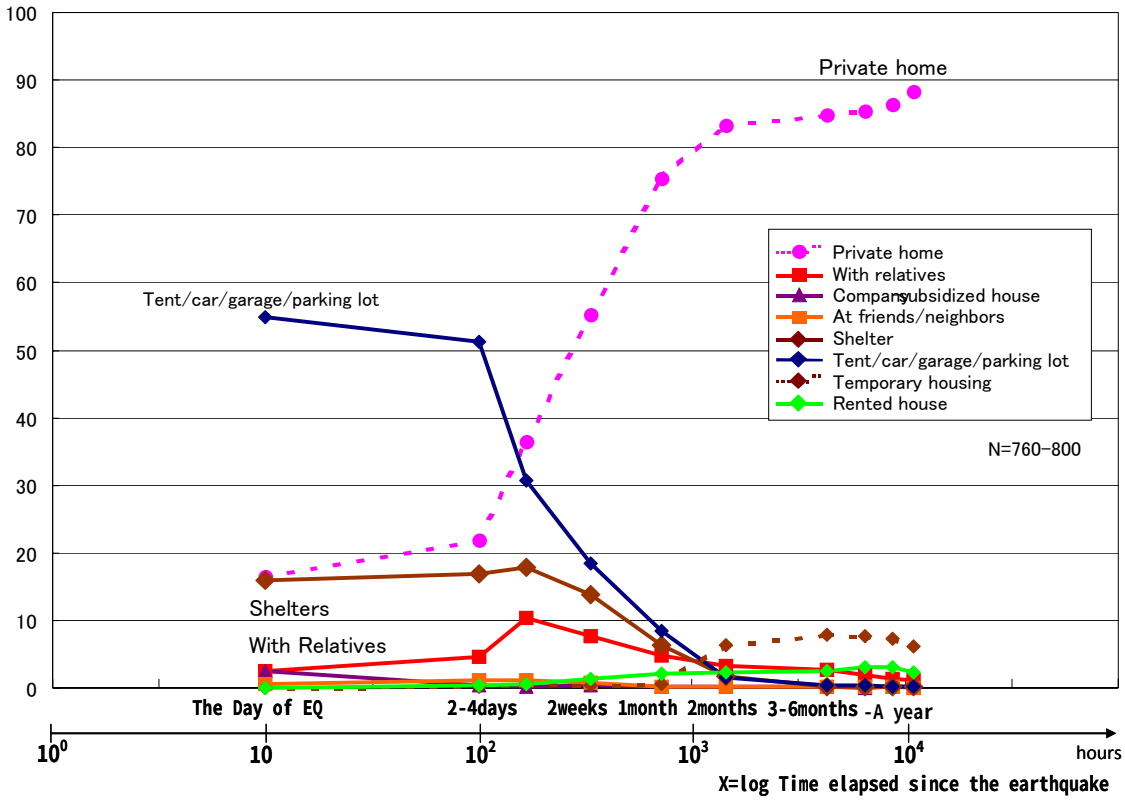

Figure 2 Changes in the Victims' Dwelling Places in the 1995 Hanshin-Awaji (Kobe) Earthquake

3.2. Sense of Life Recovery

The life recovery scale was demonstrated scientifically in measuring the victims' sense of recovery. Compared the distribution of Oct 2006 survey's result to Mar 2006, it was apparent that the situation in the sense of life recovery was changing for the better (Figure 3). Compared the average point of male to female, it was obvious female's average point was higher than male's (Figure 4). At the time of Mar 2006 there was no statistically significance between male and female; however, at the time of Oct 2006 there was statistical significance between male and female.

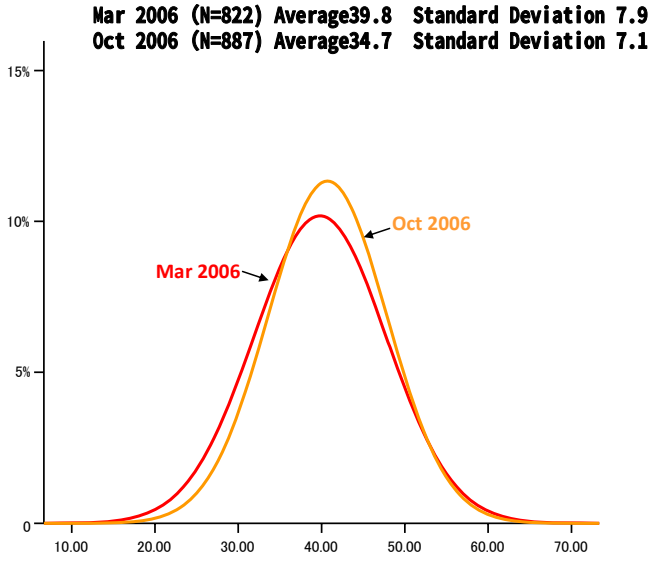

Figure 3 Distribution: Points of Life Recovery Scale

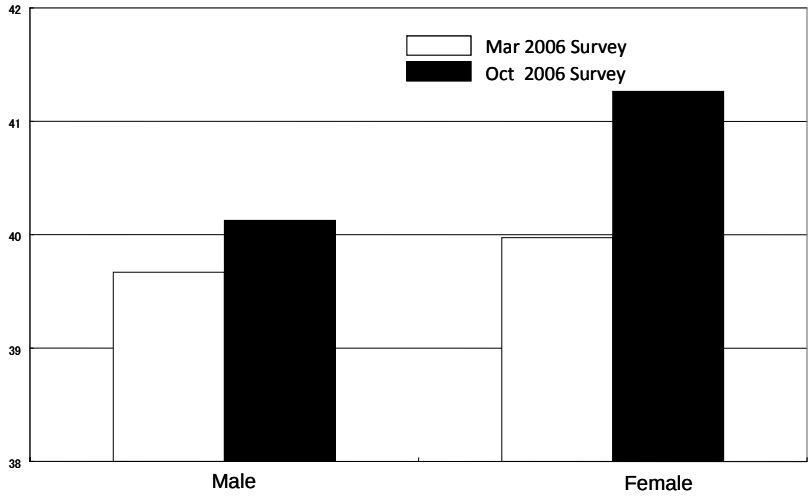

Figure 4 Sense of Life Recovery (Gender)

Compared the average point of life recovery scale in each generation, 20's and 30's average point was much higher than 40's & 50's and 60's & above at the time of Mar 2006 while here was no statistically significance in any generation (Figure 5).

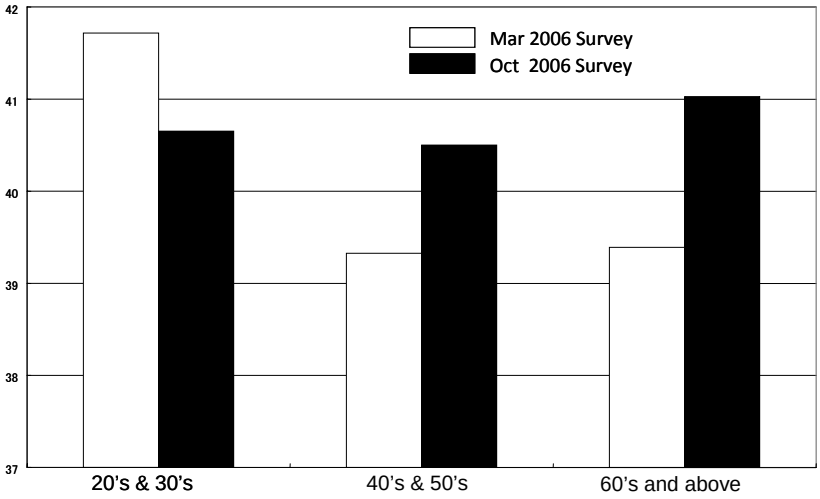

Figure 5 Sense of Life Recovery (Generation)

Compared the average point of life recovery in the occupation which victims' had taken at the time of the disaster, there were interesting differences among those occupations. The situation of the victims in management position, "agriculture, forestry and fisheries," housewives, unemployed(Over 60-y-old) was getting much better in Oct 2006 than Mar 2006 while other occupations did not show significance difference between Mar 2006 and Oct 2006 (Figure 6). The life recovery scale is very effective tool to monitor the life recovery process in the impacted area.

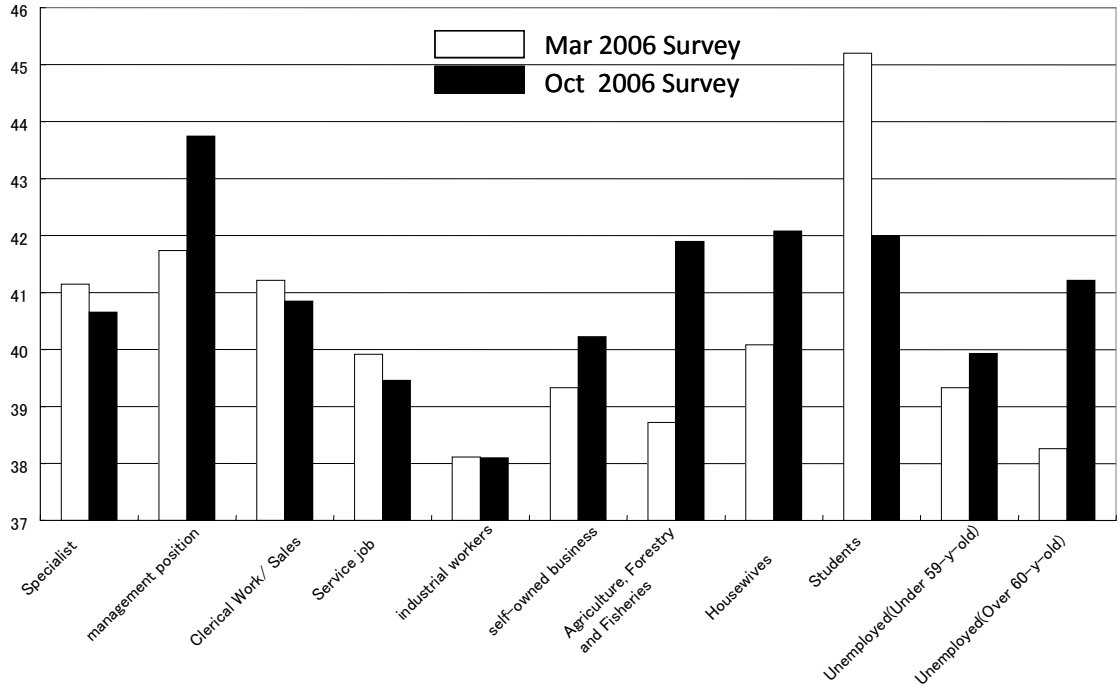

Figure6 Sense of Life Recovery (Occupation)

REFERENCES

Kimura, R., Hayashi, H., Tatsuki, S., Tamura K. (1999). "Clarifying the human behavior of the disaster victims after the Great Hanshin-Awaji earthquake," Journal of Social Safety Science, No, 1, pp.93-102.

Tatsuki, S., and Hayashi, H. (2000). "Family system adjustment and adaptive reconstruction of social reality among the 1995 earthquake survivors," International Journal of Japanese Sociology, 9, 81-110.

Tatsuki, S., and Hayashi, H. (2001). "General Linear Model Analyses of Life Recovery Factors in the 2001 Kobe Panel Survey Data" Proceedings of U.S.- Japan Cooperative Research in Urban Earthquake Disaster Mitigation Third Grantees' Meeting. pp.557-574, 2001. 8

Tamura K., Kimura, R., Hayashi, H., Tatsuki, S., Kimura, R. (2001). "A Quantitative Verification of the Seven Elements Model of Socio-Economic Recovery from the Kobe Earthquake," Journal of Social Safety Science, No, 3, pp.33-40.

Hayashi, H. (2001). "Long-term Recovery Processes and Their Planning from Devastating Earthquake Disasters," Journal of Geography, 110(6) 991-998.

Kimura, R., Hayashi, H., Tatsuki S. and Tamura, K. (2001). Determinants and Timing of Housing Reconstruction Decisions by the Victims of the 1995 Hanshin-Awaji Earthquake Disaster - A 2001 Replication -. Journal of Social Safety Science 3, 23-32.

Hayashi, H. (ed) (2002). Socio-economic Recovery from the 1995 Hanshin Awaji Earthquake Disaster - Report of Panel Survey 2005 -, Technical Report DRS-2001-01, Kyoto University, JAPAN.

Kimura, R. (2007). Recovery and Reconstruction Calendar. Journal of Disaster Research 2:6, 465-474.

Kimura, R., Hayashi, H. and Tamura, K. (2007). Which Roles are Citizens and the Community to Play in the Field of Disaster Management? (Results from the Random Sampled Social Surveys to the Disaster Victims of the 1995 Kobe Earthquake and the 2004 Niigata Earthquake Disaster). 2nd International Conference on Urban Disaster Reduction Proceedings CD-ROM (6pp.).