

# Socio-economic Recovery from the 1995 Hanshin-Awaji Earthquake Disaster

## -Report of Panel Survey Data 2001-

Keiko TAMURA<sup>1</sup>, Haruo HAYASHI<sup>2</sup>, Shigeo TATSUKI<sup>3</sup> and Reo KIMURA<sup>1</sup>

<sup>1</sup>) Graduate School of Informatics, Kyoto University

<sup>2</sup>) Disaster Prevention Research Institute, Kyoto University

<sup>3</sup>) Department of Sociology, Doshisya University

### Abstract

This study is based on the analysis of one of social sampling random surveys conducted in the Hanshin-Awaji Earthquake impacted area every two-year from 1999. 2001 and 2003 surveys were designed as the panel surveys, and 2005 survey will be. The administration in Hyogo Prefecture had promoted the policy for the recovery which set three major fields; 1) redeveloping destructed cities, 2) revitalizing local economics, 3) reconstructing victims' 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; housing, social ties, land use planning, physical/mental health, preparedness, economic/financial situation, and relation to government. It was the main theme of designing 2001 and 2003 surveys to examine how those seven elements determined the degree of life recovery in the impacted area.

To redevelop the destructed cities, housing was the most critical issue among victims. 36.8% of respondents were evacuated, and 42.4% of those who moved to emergency shelters after the impact. At the time of 100<sup>th</sup> after the impact, 12.3% respondents stayed at emergency shelters while near the same size of them was in family and relatives' houses. To revitalize local economics, victims' economic condition was the most critical issue. There was 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 victims' daily and social life, their mental and physical condition had 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-recovery.

### Introduction

The recovery from disasters is not a new issue in Japan, which had been discussed after major disasters, such as 1923 Tokyo Earthquake and WW II; 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 in 1999 to clarify what life recovery was for the victims themselves. The research frame 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. This study showed major results of 2001 Survey.

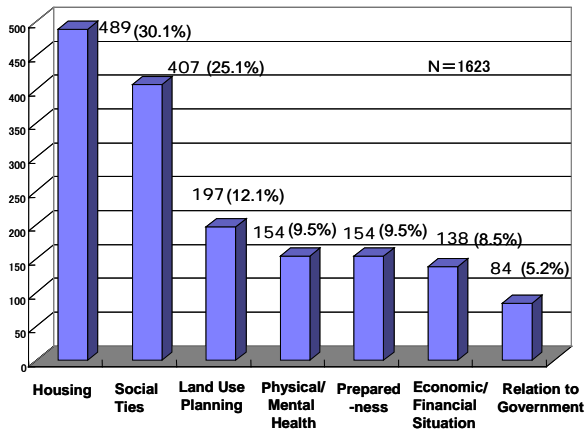


Fig. 1 Seven Elements for Life Recovery

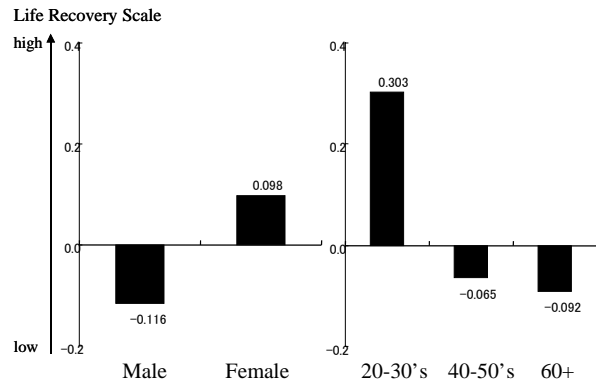


Fig. 2 Life Recovery Scale (Gender & generation)

### Samples

The 2001 random sampled mail survey was conducted with 3,300 earthquake disaster victims who experienced severe life difficulties due to the 1995 Kobe earthquake. They were sampled based on two-step stratified random sampling method from those residents of the areas with JMA (Japanese seismic intensity scale) 7 or those with the cut-off of city gas supply for more than two months. Kitaku & Nishiku, which were the wards in Kobe city, also included in the sampled area because two areas were considered as the area where the residents experienced severe life difficulties in spite of not experiencing JMA (Japanese seismic intensity scale) 7 or those with the cut-off of city gas supply for more than two months. 1250 answered questionnaires were returned and 1203 were accepted as subjects.

### 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).

### Results and Discussion

*Demographics.* The female respondents had higher sense of life-recovery than the male respondents. 20s and 30s had much higher sense of life-recovery than 40s and above. Before the severity of housing damages and respondents' life stage were analyzed together, the previous findings made us expect that those who suffered severe housing damages at their later life stage would be the lowest in terms of the sense of life recovery. Contrary to our expectation, those who suffered severe or moderate damages at 60 years old or more showed no differences with those who had the same damages at their 40s and 50s. This result can be considered as an evidence of support given as the government assistance in providing temporary housings and low-rent permanent housings to those who were over 60 years old.

*Housing.* The analysis of responses of questions about housing clarified how victims' moving at different time stages. 36.8% of respondents were evacuated, and 42.4% of those moved to emergency shelters after the impact. At the time of 100<sup>th</sup> after the impact, 12.3% respondents stayed at emergency shelters while near the same size of them was in family and relatives' houses. At 1000<sup>th</sup>, 2.6% respondents remained at emergency shelters. Those findings showed that emergency shelters and temporary housing were not the major choice for the victims to select their location. The majority of the victims used their own social networks to seek for help.

*Social Ties.* The analysis of responses of questions about support for victims made it clear who and which organizations will be the most countable for respondents in the case of the next major disaster. The questions were asked in terms of 'personal & emotional support,' 'material & financial assistance,' and 'assistance for receiving vital information.' 24 choices were given. 8 of 24 choices received the response rate over the average, which were 1) lifeline services or industries, 2) city administration, 3) mass media, 4)

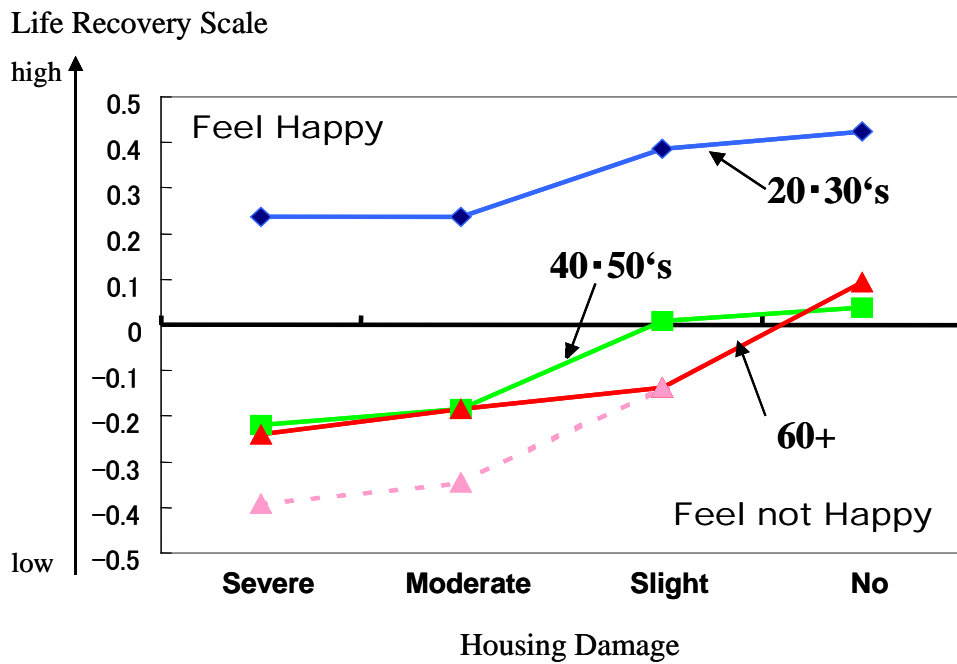


Fig. 3 Life Recovery Scale (Generation & Housing Damage)

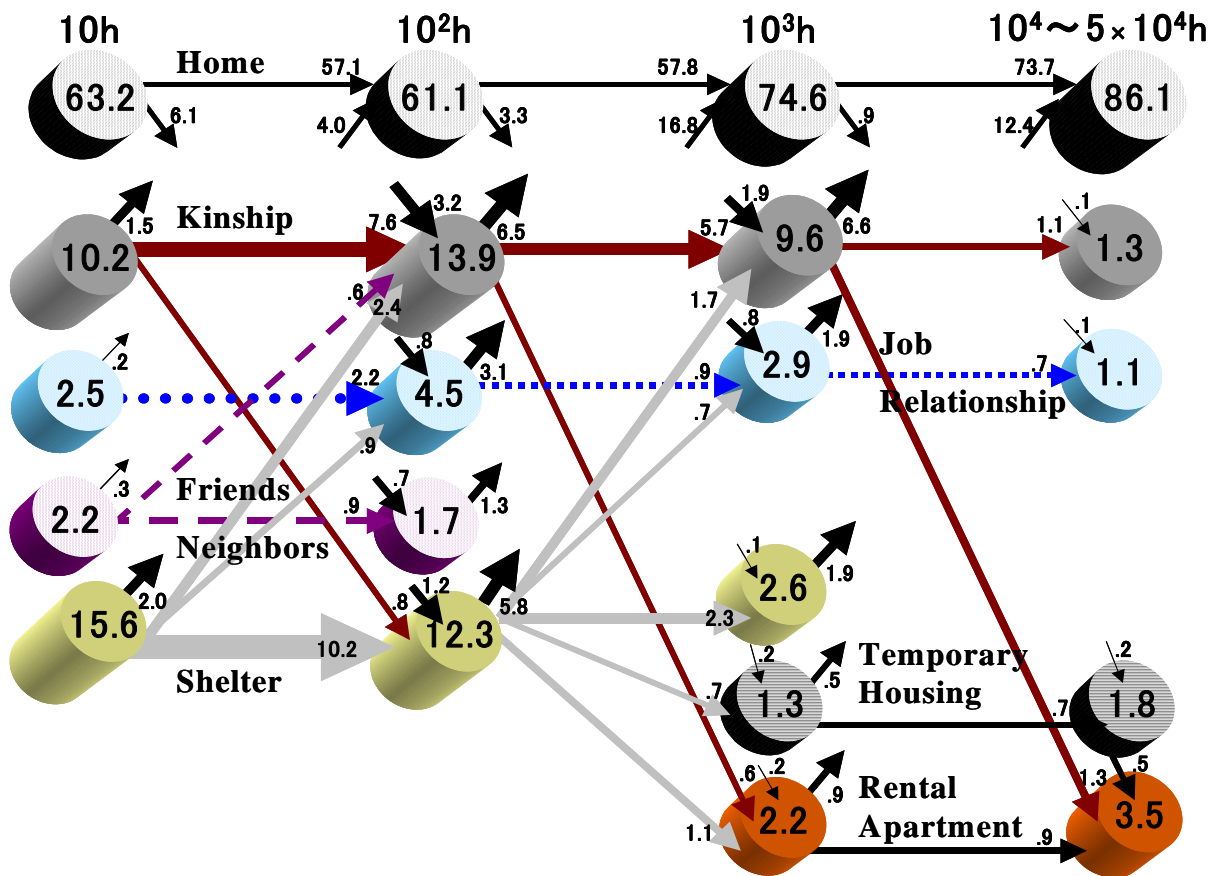


Fig. 4 The Changes of Victims' Location at Different Time Stages

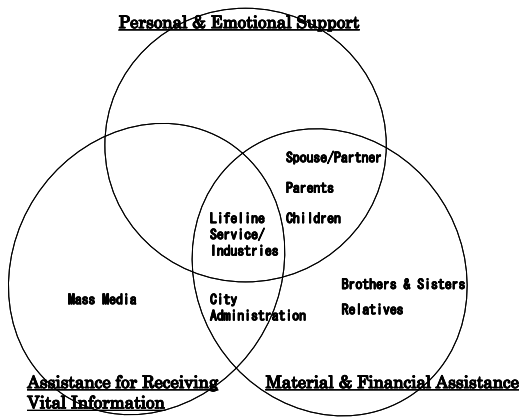


Fig. 5 Victims' Subjective View on Countable Social Resources

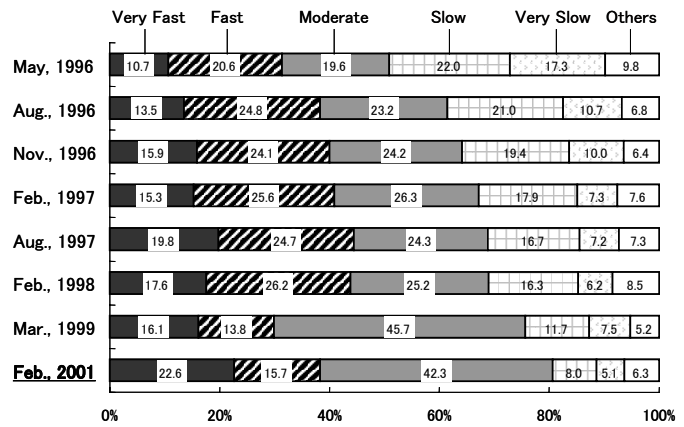


Fig. 6 Victims' Subjective View on the Speed of Redeveloping Destroyed Cities

parents, 5) children, 6) spouse or partner, 7) brothers & sisters and 8) relatives. All 7 except mass media were expected to support people in terms of material & financial assistance. The lifeline services or industries were considered the most countable in terms of all those three.

**Land Use Planning.** The numbers of respondents, who thought that the destroyed cities had redeveloped, increased year by year from 1996. This analysis based on 1999 & 2001 survey compared to other social surveys conducted in Kobe City.

**Physical/Mental Health.** 12 five-points Likert scale questions were asked about the physical and mental health. When respondents had lower mental stress, they had high sense of life-recovery. On the other hand, when respondents had moderate physical stress, they had high sense of life-restoration.

**Economic/Financial situation.** The questions about the family budget were asked in the form of household accounts book. 3 choices (decreased, no change, increased) were given to 3 categories (household income, expenditure, savings). In addition the same 3 choices were given to 12 elements of household expenditure; 1) food, 2) dining-out, 3) housing, 4) light, fuel and water, 5) other daily necessities, 6) clothing, 7) education, 8) entertainment and social, 9) leisure activity, 10) transportation, 11) healthcare, 12) insurance. 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, which means that the amount of the income decreased, the expenditure increased, and savings decreased compared to the budget condition before the Hanshin-Awaji Earthquake occurred. Especially the cost of housing, medicine, and insurance increased compared with the condition before the event, while the expense of having leisure activities and dining-out decreased.

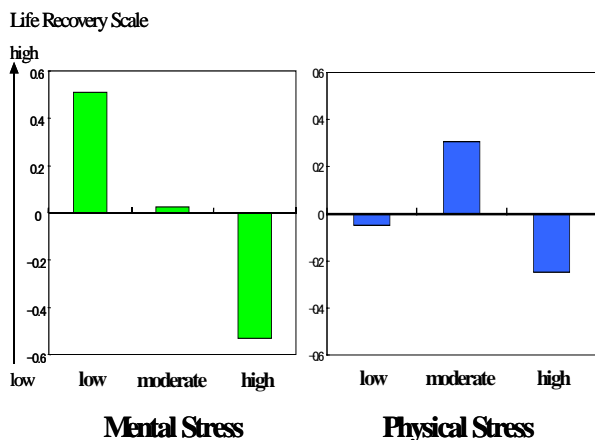


Fig. 7 Life Recovery Scale (Physical/Mental Stress)

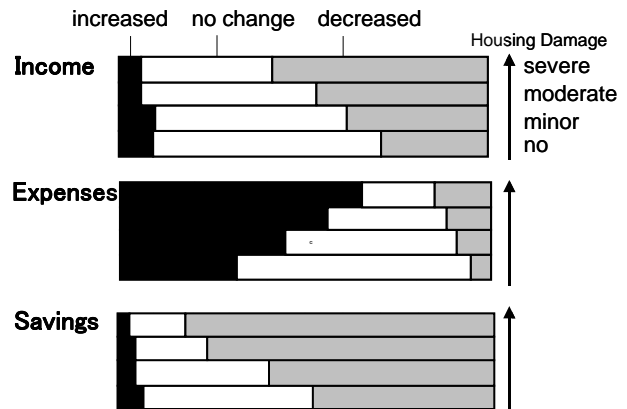


Fig. 8 Economic/Finance Situation (Housing Damage)

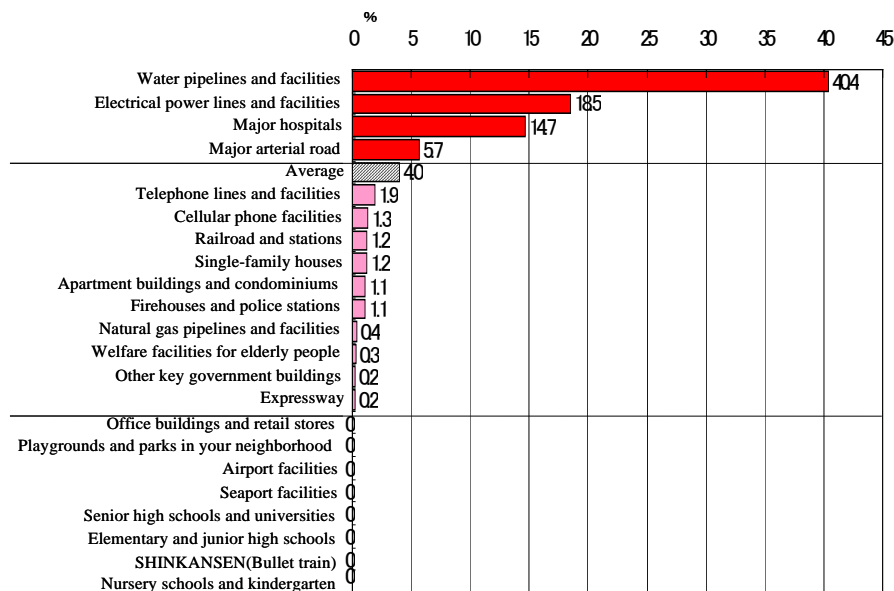


Fig. 9 Victims' Priority on Recovering Buildings and Services

*Preparedness.* The question was designed to ask respondents the priority in the terms of recovery and reconstruction in the case of the next major disaster. 22 choices including buildings, facilities, and services were given. The analysis of single-answers of the question showed that 4 of 22 choices received a response rate over the average, which were 1) water pipelines and facilities (40.4%), 2) electrical power lines and facilities (18.5%), 3) major hospitals (14.7%), major arterial road (5.7%).

*Relation to Government.* 4 questions were prepared to ask respondents' views of the relationship to the government. As the result of analysis, respondents were divided into 3 groups; paternalistic, liberal, or communitarian orientations. The respondents who belonged to communitarian orientations showed high sense of life recovery. The respondents who thought that citizens' participation was crucial in public setting had high sense of life recovery.

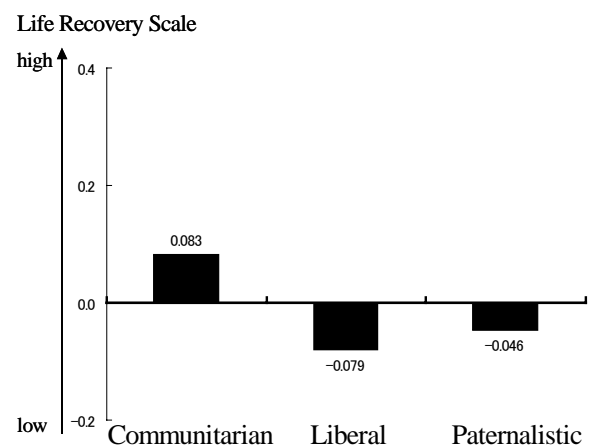


Fig. 10 Life Recovery Scale (Relationship to Government)

## References

- 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
- Aono, F., Tanaka, S., Hayashi, H., Shigekawa, K., and Miyano, M. (1998). "A study of disaster victims' response behavior during the Hanshin-Awaji Great Earthquake: A Nishinomiyama city case study," *Proceedings for Social Safety Science*, 8, 36-39.
- 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.
- 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.