

Analysis of the Process of Providing Public Support Programs for Damaged Dwelling Restoration: A Case Study of Recent Earthquake Disasters

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ABSTRACT :

There are many public support programs offered for damaged dwellings restoration to assist smooth recovery after the natural disaster in Japan. For example, building damage evaluation, issuing victim certificate, demolition and withdrawal of a damaged housing, providing temporary housing, temporary repair of a housing and etc. Most of these work needs to be carried out in a short period, almost of work differs from day-to-day-business, and the contents of support are differ under the influence of household's requirements such as housing damage level, income, and family structure. In the same way, these programs do not have the familiarity for a disaster victim.

Furthermore in Japan, each program is based on a different law and provided by various section, so it is difficult for each section to share information for providing victims with a measure.

For these reasons, there have been a lot of confusion between victims and local government on recovery process, and various problems were pointed out in the past disaster correspondence.

In this paper, we discuss the processes of public support programs for repair and reconstruction of damaged housing from the recent earthquake disasters in Japan, 2004 Mid-Niigata earthquake disaster and 2007 Noto peninsula earthquake disaster.

Based on the participant observation and the ethnographical interview to the local government staffs engaged in operation of Ojiya City, Wajima City and victims, we have analyzed the execution process of each support program, the correlation and influence of mutual program. Analyzing the process and the subject.

KEYWORDS:

Dwelling Restoration, Public Support Program, Disaster Victims, 2004 Niigata-ken-Chuetsu Earthquake, 2007 Noto-Peninsula Earthquake

1. INTRODUCTION

As public support measures relevant to residential restoration, which is one of the important factors for livelihood recovery of disaster victims, national systems such as the system of temporary residential repair based on the Disaster Relief Law, the Act on Support for Livelihood Recovery of Disaster Victims, and tearing down collapsed houses for the disposal of torn down houses are utilized. Furthermore, in addition to these systems, there are cases when a local prefectural government acts on its own accord to implement support measures such as expansions of eligibility qualifications for victims eligible for support and amounts of economic support. However, those disaster victims who do not meet the requirements for each system have to tackle residential restoration without any public support. Moreover, even if public support is available, an enormous amount of money is necessary for major repair or reconstruction of houses. It goes without saying that livelihood recovery after a disaster should be based on the self-help efforts of the disaster victims. However, in order to promote such self-help efforts, it is effective to appropriately provide the disaster victims with information on various public support measures at each point of the restoration process, based on which the disaster victims themselves can select better restoration methods. This would provide a residential restoration recipe which serves as a residential prescription.

Therefore, this study focuses on disaster victims who suffered extensive damage to their houses from earthquakes and had no choice but to reconstruct, repair their houses, or move out. Also, it investigates in detail individual residential restoration processes and clarifies the association of self-help and public support

(public support measures) up until completion of residential restoration.

2. METHOD OF STUDY

This study focuses on disaster victims who suffered extensive damage to their houses from earthquakes and tackled some sort of residential restoration such as reconstruction, repair of their houses, or moving out. It also investigates in detail individual residential restoration processes, analyzes factors which affect residential restoration policy, and clarifies the association of self-help and public support (public support measures) up until completion of residential restoration.

Specifically, the method of study consists of collection and analysis of information on livelihood recovery of disaster victims by using the method of investigation of tracing and reproduction of disaster processes in chronological order (disaster ethnography). The subject of study includes victim families who completed residential restoration among the disaster victims of the October 2004 Niigata-ken-Chuetsu Earthquake in Ojiya-City and victim families who need reconstruction or major repair of their houses among the disaster victims of the March 2007 Noto-Peninsula Earthquake in Anamizu-Town and Monzen-area of Wajima-City. Participant observation and interviews were conducted regarding the livelihood recovery process of these victim families.

Table 2.1 Damage of Earthquakes

Event	Date	Seismic Intensity	Population	Number of Deaths	Houses Damage (Complete collapse)	Houses Damage (Half collapse)
Niigata-ken-Chuetsu Earthquake (Ojiya City)	2004.10.23 PM05:56	7	40,737	13	647	2,710
Noto-Peninsula Earthquake (Wajima City)	2007.03.25 AM09:41	6+	33,822	1	513	1,086

Along with organizing records on such individual residential restoration and constructing disaster ethnographies, basic factors of residential restoration support measures such as public support including temporary houses, tearing down houses, temporary residential repair, and the Act on Support for Livelihood Recovery of Disaster Victims as well as self-help efforts including insurance and 2-generation loan repayment are listed. Moreover, factors which significantly affected decision-making for restoration are clarified.

The following 8 cases are the subjects of this study.

Table 2.2 Victim families from the Niigata-ken-Chuetsu Earthquake (Interviews were conducted approximately 3 years after the occurrence of the earthquake.)

	Household composition	House at the time of occurrence of the earthquake	Damage	Restoration method
Case 1	5 members (husband in his 50s, his wife, his eldest son, and his parents)	Owned both land and the building, wooden construction, 65-year-old house	Complete collapse	Construction of a new house on new land by Relocation Program for Houses Adjacent to Cliffs
Case 2	3 members (husband in his 50s, his wife, and his child)	Owned the building in a leased land, wooden construction	Half collapse, inundation above floor level	Construction of a new house on purchased land within a residential estate developed by the city
Case 3	5 members (husband in his 60s, his wife, his daughter, and his two grandchildren)	Owned both land and the building, wooden construction, 26-year-old house	Half collapse	Repair of the house on the original land
Case 4	2 members (husband in his 60s and his wife)	Owned both land and the building, wooden construction	Large-scale half collapse	Moved to municipal housing in a residential estate developed by the city

Table 2.3 Victim families from the Noto-Peninsula Earthquake (Interviews were conducted approximately 1 year after the occurrence of the earthquake.)

	Household composition	House at the time of occurrence of the earthquake	Damage	Restoration method
Case 5	2 members (husband in his 50s and his wife) His eldest daughter lived separately in Kanazawa.	Owned both land and the building, wooden construction, constructed in his parents' generation	Complete collapse	Construction of a new house on newly purchased land
Case 6	6 members (husband in his 30s, his wife, his two children, and his parents)	Owned both land and the building, wooden construction, 40-year-old house	Half collapse	Construction of a new house on the original land
Case 7	4 members (husband in his 50s, his wife, and his two children) His eldest son lived separately in Kanazawa.	Owned both land and the building, wooden construction, 60-year-old house	Complete collapse	His wife purchased a house in Kanazawa and lives separately. Reconstruction policy of the damaged house is not yet decided.
Case 8	7 members (husband in his 50s, his wife, his two children, his parents, and his great-grandmother)	Owned both land and the building, wooden construction, 30-year-old house	Complete collapse	Construction of a new house on the original land

3. RESIDENTIAL RESTORATION PROCESS OF THE DISASTER VICTIMS

3.1. Niigata-ken-Chuetsu Earthquake

Case 1

Both the husband and his wife were working. The husband was working at the city office, while his wife was a nurse. Their house was located in a settlement of 30 houses in an intermediate and mountainous area 10 km away from Ojiya Station. It was a large-scale wooden house on land measuring 500 m² with a total floor area of 440 m².

They had planned to construct a house on the original land. However, tremors of the foundation were too severe after the earthquake, and a specialist said, "This land may collapse anytime." In addition, people in shelter started to say that, "That house cannot be used anymore." Eventually, their old parents agreed that it would be impossible to construct a house on the original land.

While specific policy remained undecided, his brother-in-law working at an architect office learned about the "Relocation Program for Houses Adjacent to Cliffs," and recommended them to utilize this program. When he checked, he found out that they would meet the requirements for the program. Hence, they applied for it and the application was accepted.

They started to find land with help of his brother-in-law. They purchased land measuring 600 m² at 15 million yen and spent another 5-6 million yen for foundation improvement.

Since the purchased land was rice field territory, they made arrangements for conversion of agricultural field area after foundation construction for a house. They registered in January 2006, and construction of a new house was completed at the end of 2006. Since they asked a carpenter they knew to construct the house, the construction was flexible in various areas such as foundation construction in snow.

They borrowed money from the prefecture and a Finance Corporation while utilizing a consolation payment of 3 million yen from the mutual aid association, earthquake insurance, prefecture's livelihood recovery support system, prefecture's interest subsidy, etc. Both the borrowed amount and the borrowing period are the maximum they can handle.

Case 2

The husband was in his late 50s and was engaged in the building industry. The certificate for victims said it was "half collapsed," but it was in an area where water rushed in from headwaters after the earthquake, which

resulted in inundation above floor level. Most household goods were rendered unable to be used.

When the settlement was inspected after the earthquake, many places with potential hazard of cliff failure were found. Since he felt that the mountain behind his house was dangerous as well, he made up his mind to move to a safe place. However, he was afraid of the envy of others, so he did not consult with anyone.

He learned in a city news report about the city's development of residential estate and sale of houses and participated in an explanatory meeting held by the city office, after which he decided to move there. He never failed to check city news reports distributed twice a month in order to learn about various support measures.

Once he decided to move to the new location, he started to think about financing, and a new house was constructed by taking out a 2-generation loan with his child. Unless he takes out a loan with his child, they have to live in an apartment or could be homeless. Since it was covered by the earthquake insurance from the building rehabilitation mutual-aid program he had participated in through Japan Agricultural Cooperatives, they can receive an interest subsidy for 5 years up to 12 million yen because their house is half-collapsed, but they took out a 30-year loan.

Case 3

The husband was in his late 60s and had already retired. Their house was originally certified as "partially damaged," but they asked for reinvestigation, as a result of which it was certified as "half collapsed."

Even though they thought about reconstruction, it would require 4 or 5 times more money compared to repairing. When they asked a carpenter to investigate their house, the carpenter told them that it could be repaired, so they decided to repair their house.

Because construction work by professionals is costly, they repaired as much as they could by breaking walls and filling in cracks of the groundwork with concrete by themselves, but it still wound up costing them approximately 5 million yen nonetheless. They spent all the money they had saved for their post-retirement years for repairing the house. However, they are grateful that they were able to repair the house so that they can live there without taking out a loan.

Since they wanted to repair the bathroom and the kitchen immediately, they did not live in a temporary house so that they could utilize the system of temporary residential repair. Furthermore, they also received support measures such as the prefecture's support system for livelihood recovery and disposal of torn down houses.

Case 4

The husband was in his late 60s and had already retired. They lived in a settlement of 16 families, but all the surrounding mountain surfaces completely collapsed due to the earthquake, and the area was designated as a calamity danger district.

They discussed the construction of a new house with their children who had been married into other families and they had a quantity of savings, so they could have stayed there with a certain degree of sacrifice.



Photo 1 Reconstructed Houses(Ojiya City,2007)

3.2. Noto-Peninsula Earthquake

However, they hesitated to spend tens of millions of yen. In addition to that, when they thought about removing snow from the roof in the heavy snowfall area, they came to think that it would be better to live on flat land in town.

They came to have hope by the city's development of this estate with national aid. If one's house is designated as a danger district, one could apply by priority. They moved into municipal housing built by the city in December 2006. This was the first time for them to live in complex housing. The rent is less than half of that of private apartment.

Case 5

The husband was working at a fire station and had 5 years left before retirement, while his wife was a full-time housewife.

Although the husband was the youngest child of 4 brothers, he took over as head of the family and kept the Buddhist alter as well. His daughter had been working in Kanazawa, and they had been planning to purchase an apartment in Kanazawa and live there after retirement. However, his three brothers persuaded him into staying in Anamizu and keep the Buddhist alter by telling him that they would lend him money free of interest, which made him to decide to restore there.

When he walked on the raw land after teardown of the house, the foundation was so soft that his long boots sank, which made him concerned. Therefore, he purchased another piece of land 1 km away from the original piece of land and implemented foundation improvement at 2 million yen based on a specialist's advice.

Even though only two members (the husband and his wife) lived together in the previous house, they started to construct a large house with a large Buddhist alter space and a total floor area of approximately ※40-tsubo (approx. 132.24 m²) by conventional construction methods. The construction was expected to be completed at the end of December 2007, but the construction schedule was delayed because of the carpenters' schedule. It has not been completed as of March 2008.

Although he has no bank loan since he was able to borrow money from his brothers free of interest, he is concerned about repayment because he will retire in 5 years. Moreover, they still cannot give up entirely on their plan to live in an apartment in Kanazawa.

Case 6

Both the husband and his wife are in their 30s and working. Their house was half-collapsed, and it was not impossible to repair the house and live there again. In addition, his parents who had built the house and the husband who had grown up there had special feelings for the house, so they were undecided about whether they should repair the house or construct a new house. On April 1, 2007, which was immediately after the earthquake, the working status of the husband changed from temporary staff to permanent employee. As a result of this, it became possible to borrow money from a bank and therefore he decided to reconstruct the house. While they lived in a temporary house, the husband's mother checked into a hospital in the summer due to dehydration. This made him strongly feel that they should move out of the temporary house before it started to snow, and he decided to go ahead with early reconstruction of a house. They conducted a ceremony for sanctifying the ground in July 2007, and construction of a new house was completed at the beginning of December of the same year, which enabled them to see the New Year in the new house.

They had experienced inconvenience before when they had asked a carpenter they had known for an extension of the house, so they asked a totally new homebuilder for reconstruction this time. The homebuilder provided good support, empathetically gave them a helping hand, and learned about the system of interest subsidy and taught them about it.

Case 7

The husband was in his 50s and was a teacher. His wife was working as well. Among his three sons, the eldest son was a student and lived in Kanazawa. The house was a large 60-year-old wooden house with 11 rooms and total floor area of 80-tsubo (approx. 264.48 m²). The head of the household was strongly attached to this house, and wanted to repair it since it was where he was born, which kept him from making a decision. However, during that period, very few family members or relatives recommended repairing the house, and he was told that, "It is not necessary to make sacrifices just to keep the house because it is not a national treasure,"

which pushed him into deciding to tear down the house in January 2008.

Moreover, the son who lived in Kanazawa recommended residential restoration in Kanazawa, saying, "If you spend 40 million yen, you can spend money more effectively by investigating into Kanazawa rather than into Anamizu." His family members felt frustrated by his inability to decide whether or not to tear down the house and where to construct a new house. As a result, his wife purchased a house in Kanazawa without his prior consent, and all the children moved to Kanazawa with his wife as well. Currently, the husband lives in a temporary house by himself, and no residential restoration policy has been made at all.

Case 8

The husband was in his 50s and was working at a social welfare corporation, while his wife was working at a credit union. It was a big family of 7 members with 4 generations. The great-grandmother was bedridden and had dementia, so it was considered that life in shelter or a temporary house would be difficult. Therefore, all the family members continued to live in the house certified as "completely collapsed" until January 2008. The great-grandmother passed away in August 2007, and they started to consider residential restoration policy.

Even though the house was certified as "completely collapsed," it appeared to be repairable. Also, the house was only 30-years-old, and it was reformed only 3 years ago by taking out a loan, which made them think that tearing down the house was wasteful. When they asked several agents for estimations of repair cost, it was discovered that the foundation was damaged, and that would require 15-20 million yen for repair. As a result of it, they decided on reconstruction.

They continued negotiation with agents for 2 months from January 2008 to find out to what degree their requests can be realized with the budget of 28 million yen. Eventually, they contracted at 32 million yen including exterior work. Although it was constructed by wooden conventional construction methods, modern features such as barrier free layouts and wooden floors were adopted inside of the house. The construction started after the consecutive holidays in May 2008 and is estimated to be completed at the end of September 2008.

Even though he had no savings for housing, he had no choice but to take out the maximum 35-year loan until he reaches 80 years old. He is planning to use money from the Act on Support for Livelihood Recovery of Disaster Victims by the federal and prefectural government for construction of his house.



Photo 2 Damages on the Monzen area (Wajima City,2007)

4. ANALYSIS OF FACTORS RELEVANT TO DECISION-MAKING FOR RESIDENTIAL RESTORATION

It has been revealed that various factors such as extent of damage, fund-raising capacity, life stages of family, and support measures which can be utilized are relevant to decision-making for residential restoration of the disaster victims of the Niigata-ken-Chuetsu Earthquake and Noto-Peninsula Earthquake. Broadly divided, there are two aspects below in the selection of restoration policy.

- 1) Selection of place for residential restoration (Reconstruction/repair of house on the original land vs. moving out)
 - 2) Selection of repair, new construction, or other option
- Furthermore, it has been shown that the factors below affect decision-making.

4.1. Selection of place for residential restoration

- 1) Consideration of restoration in the original land unless there is any special reason
Unless there is any special reason, it is natural that everyone feels attached to familiar land and does not want to leave there. Even if a house is severely damaged due to an earthquake, people consider the option of restoration on the original land as much as possible.
- 2) Consideration of residential restoration in another place
There are two factors below when people start to consider moving to other place.
 - a) When there is a hazard in the land or the surrounding area
The first case is when there is a hazard in the land or the surrounding area they live. People select residential restoration in a safe place when they feel significant anxiety about spending an enormous amount of money for residential restoration in a dangerous place to continue to live there. For example, when they come to recognize an extreme weakness of the foundation of the land where they have lived as a result of an earthquake, or when they come to recognize the potential hazard of cliff failure, slope failure, etc. near their houses, they select restoration in a safe place.
Moreover, specialist advice regarding potential hazards of the land is important information for disaster victims to make a decision as to whether or not to move out.
Furthermore, the availability of various public support measures (such as the Disaster-prevention Group Moving Program) for avoidance of danger and restoration in a safe place as well as the availability of such information to the disaster victims at an appropriate timing significantly affects their decision-making.
 - b) Circumstances relevant to the family's life stages
Regardless of the occurrence of an earthquake, circumstances of the head of the household or the family could be a factor for the selection of moving out of the original land. For example, when the family had been originally planning to live with their child/children in the future or had wished to avoid heavy snow and live in town due to aging, they may select to move out.
In such a selection, decision-making is based on discussion with their child/children and family and the results of discussion.

4.2. Selection of repair, new construction, or other option

- In this decision-making process, each victim family selects the most reasonable option by considering three factors below. These three factors significantly affect each other.
- 1) Comparison of costs for repair and new construction
 - a) Technical possibility of repairing the house
In case of a wooden house, even when the house was certified as "completely collapsed," it can be technically repaired in many cases. Unless it is apparent at a glance that the house is completely collapsed and has to be reconstructed, the family will first consider the possibility of repairing the house and continuing to live there. In addition, in this case, the technical possibility of repair and specialist advice regarding costs mentioned in b) below are important criteria for judgment.
 - b) Comparison of costs for repair and new construction
This factor is related to a). Even if it is possible to repair the house, a decision will be made between repair and new construction based on a comparison of costs. In this case, the disaster victims make a decision based on the opinion of specialists whom they trust.
 - 2) Future value of the house for the family
Even if a house can be reconstructed by spending an enormous amount of money, the family may not construct a new house and choose to repair the house instead if the future value of the house is not high for the family. On the contrary, they may choose to construct a new house instead of repairing the house in other cases. For example, when the family already knows that their child/children will become independent and the number of family members will decrease in the future, the family may not construct a new house and choose to repair. When the family chooses to construct a new house, they decide the house size and room arrangement

with the future utilization of the house in mind.

3) Fund-raising capacity

The fund-raising capacity for repair or reconstruction of a house is a key factor which determines the restoration method. Moreover, in this case, public and private support measures such as insurance coverage, money from the Act on Support for Livelihood Recovery of Disaster Victims, the system of temporary residential repair, a low-interest loan from a public agency, and various interest subsidies function effectively. The disaster victims' fund-raising capacity for residential restoration is defined by the following three factors.

a) Potential of future income

The factor relevant to the potential of future income of the family significantly affects the decision of the amount of money they can spend for residential restoration. Factors include whether or not the head of the household has a regular job, the remaining years before retirement, whether or not both husband and wife are working, and whether or not there is a sound income source.

b) Fund-raising from an outside source

Although this is related to a) above, potential of fund-raising of the necessary amount from an outside source is another factor for the decision of restoration method. Factors include whether or not the head of the household can take out a loan by himself as needed, whether or not a 2-generation loan with his child/children is possible, and whether or not financial support from relatives is available.

c) Savings

In the case of the disaster victims of the Niigata-ken-Chuetsu Earthquake and Noto-Peninsula Earthquake who were the subjects of this study, they have lived there for generations and there were many disaster victims who have not saved money for the purchase of house at all, unlike office workers in urban areas. On the other hand, there were very few disaster victims who had debts relevant to house acquisition. Whether or not a disaster victim has savings of his own funds which can be used for repair of the damaged house or new construction and its amount are factors relevant to the limit of the amount of long-term loan and the repayment period.

5. CHARACTERISTICS OF THE RESIDENTIAL RESTORATION PROCESS OF THE DISASTER VICTIMS

Analysis of the residential restoration process of the disaster victims of the Niigata-ken-Chuetsu Earthquake and Noto-Peninsula Earthquake revealed the characteristics below.

1) Under the circumstances where the disaster victims were not prepared or had no savings for construction or repair of their houses, these earthquakes suddenly gave rise to such need. Therefore, there is significant variation in the pace of restoration among the victim families depending on the amount of time necessary for emotional recovery or establishment of fund-raising method, etc.

2) It has been shown that each specialist in the fields of construction, foundation structure, financing, or financing system plays a significant role in the disaster victim's decision-making route in the residential restoration process.

3) Since the circumstances of the victim families which affect future fund-raising for restoration vary significantly, advice from banks, Japan Agricultural Cooperatives, labor credit associations, homebuilders, etc. who empathetically give them a helping hand plays a significant role. Such circumstances include the age of the head of the household, ability of self-financing (savings etc.), and the possibility of a 2-generation loan (presence/absence of child/children willing to live with their parents and take over their parent's house).

4) Unlike the case of decision-making by indication of potential hazards of the land with a hazard map in a normal situation, those who were truly scared by an earthquake tend to become sensitive to the safety/hazard level of land. In many cases, they ask for the opinion of a specialist. Even when they have no choice but to move out and select a new place, they are very careful about the foundation conditions of that place. The presence of specialists who judge and give them advice regarding potential hazards of the housing land or the surrounding area from an impartial point of view when the disaster victims feel it necessary is extremely important for safe residential restoration triggered by earthquakes.

REFERENCES



Kishie S., Satoshi T. and Masasuke T.(2006), “Analysis of correlation between public assistant systems for damaged dwellings restoration -A Case Study of Ojiya City after the 2004 Mid-Niigata Earthquake-”, Journal of Institute of Social Safety Science, No. 8,,pp71-80.

Kishie S., Satoshi T. and Masasuke T.(2005), “Some Regulational Issues on Building Damage Assessment-A Case Study of Niigata-ken Chuetsu Earthquake-”, Journal of Institute of Social Safety Science, No. 7