Review:

Problems in Housing Restoration After the 1995 Great Hanshin-Awaji Earthquake

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This study clarifies housing recovery problems in areas stricken by the 1995 Great Hanshin-Awaji Earthquake, using findings of surveys on the situation 5 years later. These problems included a lack of consistency in support measures and the image targeted in urban reconstruction after reconstruction. Results of individual housing recovery lead to confusion about reconstruction in communities and town blocks. Housing reconstruction after the earthquake had two missions: (1) "Lifestyle reconstruction" for victims and (2) implementation realizing a safe city through "city remodeling." The major lesson of the Great Hanshin-Awaji Earthquake would be that, along with the development of solutions based on previous planning in housing recovery and restoration, the importance of proactive measures should be appropriately recognized – alleviation of housing and urban damage taking into account the difficulty of postdisaster planning.

Keywords: housing recovery plan, urban reconstruction, Hanshin-Awaji Earthquake, disaster recovery of public housing

1. Introduction

The area stricken by the Great Hanshin-Awaji Earthquake, in 1995 now features many newly built individual residences, high-rise apartment buildings, and public housing. The number of newly built houses – about 150,000 -outnumbered the number of damaged houses 3 years after the quake, and 5 years after, the residents of 48,300 temporary houses had moved to permanent housing. The reason so many houses were provided is largely due to steady implementation of public support for housing and the construction of new housing in the private sector, greatly exceeding expectations. Private-sector housing tended to be excessive to some degree and lowered housing sales and rent by nearly 30%, resulting in an increase of new housing and an influx of residents from outside the stricken area. Now we see the situations on housing in the stricken area, which has been compounded of two main factors affecting each other, the plan on housing supply in an emergency and the tendencies of housing construction in ordinary time. As a result, viewpoint it has become difficult to recapture the actual situation among earthquake victims in the stricken area during restoration.

Policies for supporting public housing after the Great Hanshin-Awaji Earthquake were implemented during an urgent need for large numbers immediately, so the gap between policies and the needs of victims in location, environment, and lifestyle has grown over time. Problems also remain in funding institutions and subsidy policy toward restoration. It is indicated that these problems causes continuous damages on victims in restoration process.

We review overall housing supply plans using findings of surveys on the situation 5 years later.

2. Postquake Housing Restoration Plans

2.1. Housing Restoration and Move of Victims

Many issues in housing restoration have been pointed out in reports and papers[1]. It is first of all necessary to determine the materials from which plans have been made, and to examine relationships among them. To determine an overview of the situation, we start by exploring to situation of the victims and the response of administration over time (**Fig. 1**).

In preparing for housing reconstruction, the factors of legal decision-making and surveys on resident awareness are complex, and support policy has involved both positive and negative factors. Policies immediately after the earthquake, such as certification of total housing destruction in evaluation and demolition at public expense for which a deadline for applications was set reduced the possibilities for private parties to build emergency housing on their own, e.g., by repairing private dwellings, and this led to an increase in the supply of temporary housing, i.e., newly-built public

1. For example, "Theory and practice of earthquake disaster recovery public housing," edited by Kobe Urban Problem Institute, 1998.

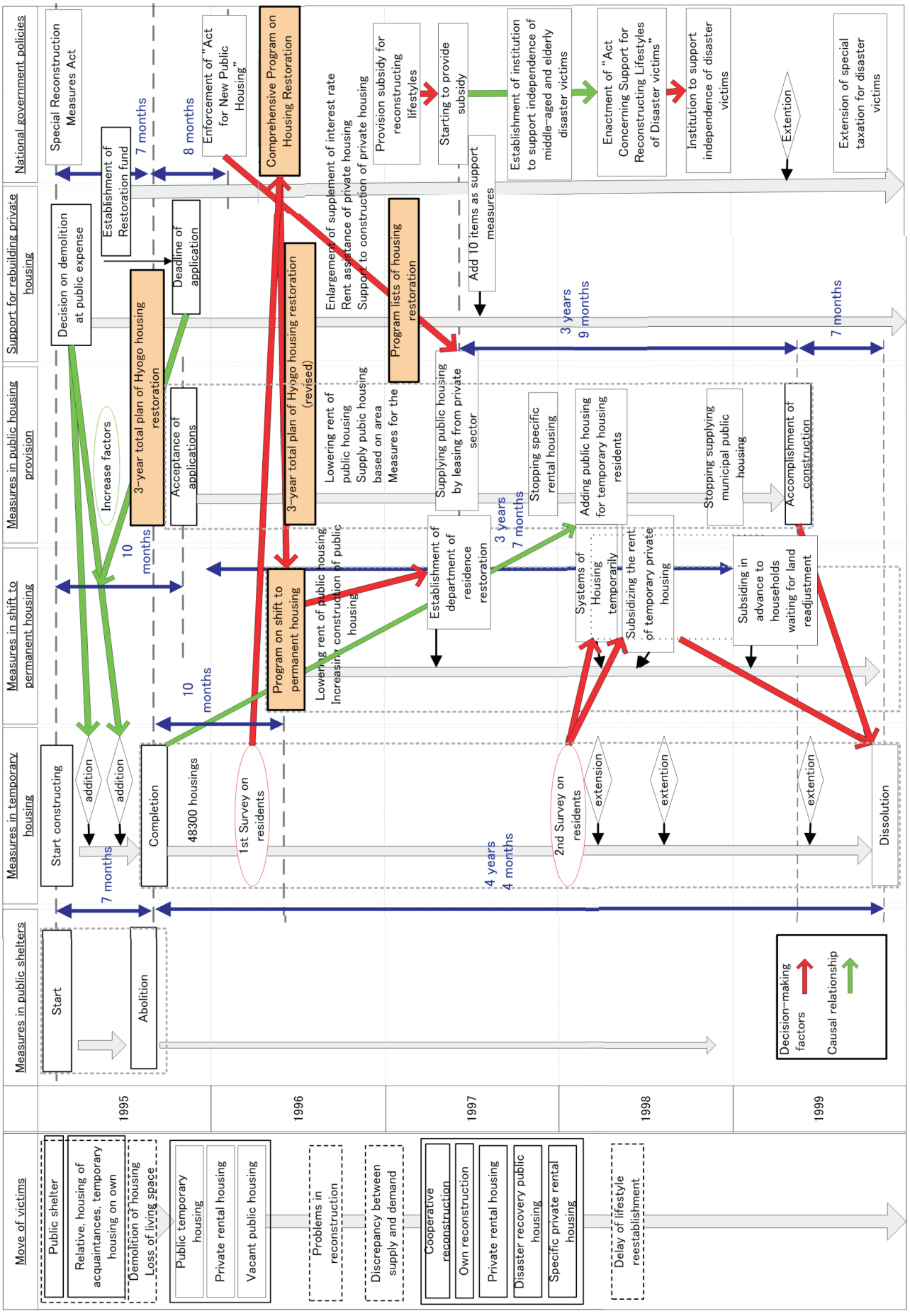

Fig. 1. Move of victims and response of administration in Great Hanshin-Awaji Earthquake.

emergency housing. The poor surroundings of evacuation areas and prolonged living in emergency shelters resulted in a high demand for temporary housing. As main support policies for those who had difficulty in rebuilding their lifestyles by their own efforts, a series of the policies on public housing supply ranging from public temporary housing supply to public permanent housing supply have been implemented afterward. However these programs caused those who belong the same social stratum to move in similar direction in the simplified way, so that the problems which had already emerged at the time of public temporary housing were repeated, continued and even worsened in some cases. One feature of disaster recovery public housing at this time was that the effect of individual policies obscured the direction of the overall plan.

2.2. Reconstruction for Victims

In view of reconstruction as seen from the side of victims, **Fig. 2** shows the general flows of moving of residents and reconstruction of housing based on social stratum of residents, together with advantages and disadvantages.

Moving is divided roughly into three states – first a move to temporary evacuation areas, then to emergency housing, and last to permanent housing. It is decided whether emergency evacuation housing is necessary or not, based on the judgment on availability of the previous housing. However the factors and the advantage and the disadvantage in making this decision are different according to the form of possession of housing. Based on surveys[2], As for the percentage of each moving process of the households lost their residences to emergency evacuation housing, temporary housing accounts for 25%, rented housing 35%, and housing of parents or acquaintances 12%. As for the permanent housings which the households moved into afterward, the following are considered as main support policies: the construction of the detached housing and the condominium in private sector, and public housing, subsidized private rental housing and housing leased from private sector under subsidization from administration. It is the support policies such as the above housing reconstruction programs that influence the factors of self-determination in the process of reconstruction. In the Great Hanshin-Awaji Earthquake, as seen from the side of victims, the following three possibilities were not allowed victims in housing reconstruction: (1) selecting the alternative of private house repair, (2) reconstruction of the previous area, and (3) using existing housing in the stricken area. These possibilities show the limits of disaster reconstruction institutions in Japan, and are the starting point in planning the measures against urban disasters. As a result of this reconstruction process, people owning their own homes increased under the support policies for public housing, while households receiving welfare benefits also increased, indicating increased polarization of housing reconstruction in the view of victims.

2.3. Considerations in Housing Reconstruction Plans

The most significant factor making housing reconstruction after the Great Hanshin-Awaji Earthquake difficult is that because so much housing was damaged in the so-called “earthquake disaster belt” along the active fault, newly-built housing should be quickly provided to districts as well as the edge of the stricken area. In addition, it is significant characteristic that diverse reconstruction processes have been developed, because the damaged housings do not have similar character and there are various social strata and damage situations. Thus one policy could cause another effect on another social stratum than it had originally intended to exert.

Housing reconstruction plans at the time involved two major problems.

The first problem involved the process of development in which policies and plans were made gradually in response to the needs of victims. Newly-built public housing such as temporary housing and public housing provided as much as the victims needed. Kobe City reviewed the amount of supply of public housing based on findings of a survey on residents of temporary housing. Problems in reconstruction in the stricken area were responded to one after another by assistance in rent for private housing and support in rebuilding support in joint housing project. As a result, victims were not really satisfied with what was done for them, possibly because measures followed far behind the occurrence of the problems they were to treat. Reconstruction lost its flexibility and began to take the form of repeated escapes from difficult short-term situations. In other words, many measures had the characteristics directed toward single direction, although multiple programs with their diverse directions were in fact necessary. One typical feature of disaster restoration plans is that administration policies and plans are realized quickly in the behavior of the residents.. Simple responsive policies are effective only temporarily and locally, but do not always have enough effect on housing reconstruction as a whole. The support policies in force only for a limited period of time, issued immediately after the earthquake could cause more confusion for the victims who were still in confusion. So the restoration plan must show its relation to the total plan and its time schedule much clearer than in the case of ordinary policies on support. And the restoration plan must also take the developments and the plans in the future into consideration.

The second problem was that it was not adequately

2. Prof. Murosaki, “The study on housing reacquisition process in the case of Great Hanshin-Awaji Earthquake disaster and its support policies,” Urban planning papers No.31, pp. 799-804, 1996.

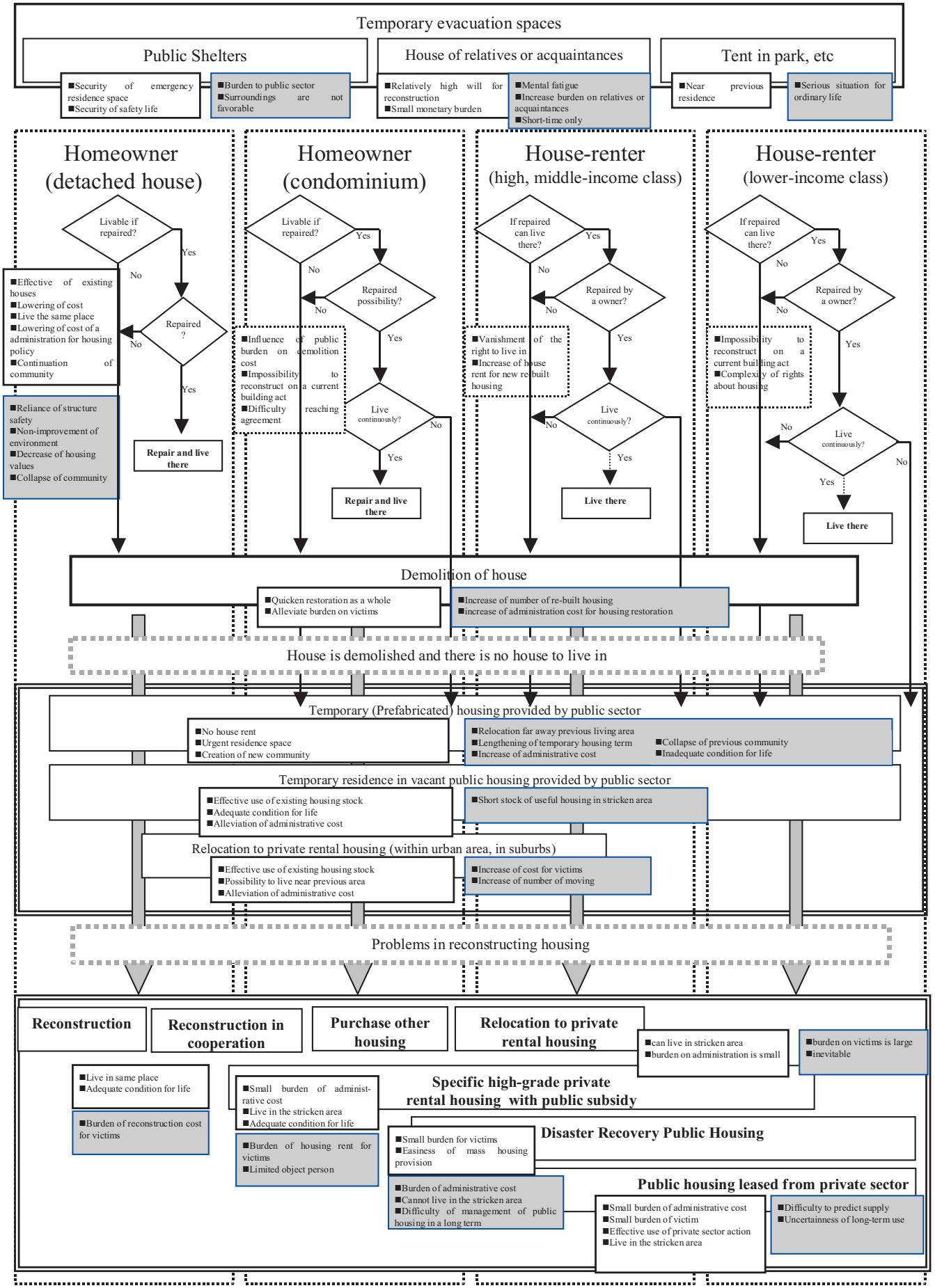

Fig. 2. Move of housing after the Great Hanshin-Awaji Earthquake.

Table 1. Overview of survey.

	number of distributed	number collected	rate respondents	rated 60 years and over	avarage number of members of responding household
disaster recovery public housing	298	257	86.2%	77.0%	1.9
public housing leased from private sector	52	45	86.5%	77.8%	1.4
specific rental housing with public subsidy	49	42	85.7%	21.4%	3.2
resident (Nagata-Hyogo wards)	297	258	86.9%	46.9%	3.1
resident (Nada-Higashinada wards)	307	282	91.9%	54.3%	3.0
unknown	-	10	-		-
total	1003	894	89.1%	57.9%	2.6

Table 2. Transition in number of households in Nagata ward, Hyogo, Nada, and Higashinada wards.

location	type	number collected	number of dwellings			rate of recovery
			1990	1995	2000	
Nagata/Hyogo	Black	104	3911	1752	2503	64.0%
	White	154	2546	1457	2256	88.6%
Nada/Higashinada	Black	139	2542	1219	1892	74.4%
	White	143	2782	1521	2820	100.7%

recognized that if more housing were covered in the plan, the problems that occurred would increase in geometric progression. Even under ordinary circumstances, housing reconstruction involves both economic problem, as seen in the implementation of land readjustment, and factors such as legal issues, interests and characteristics of communities. In a disaster, it can be foreseen that additional problems would occur than in the ordinary time. The problem to be solved in planning for restoration from now on is how the construction of new housings can be restrained, and how the problems that would occur can be integrated into the planning from the beginning.

Finally, it must be considered, in taking the above points into account, that all housing reconstruction plans are surly realized in the town and in the city finally. Do the current town and the current city correspond to the town and the city expected and aimed originally at the time of planning? Would the uncertainty of the total image and the total objective cause a lot of problems?

3. Problem of Housing Reconstruction Recognized in the Stricken Area

3.1. Overview of Survey

A survey of Kobe City, where damage and injury from the earthquake were worst, involved 3 housing complexes of to disaster recovery public housing, 5 of leased public housing, and 5 of subsidized private rental housing as cases of public housing supply and further selecting stricken areas in Higashinada and Nada ward in eastern Kobe and Nagata and Hyogo Ward in western Kobe as cases of private rebuilding. The district for distribution of questionnaire was selected based on the criterion of 60% or more of total destruction and whether the district was appointed as project area or not was also taken into account in selection [3].

Respondents were randomly sampled from a housing map, and the survey was conducted by distributing and collecting questionnaires during visits in December 2000 (**Tables 1**, **2**). The response rate was 89.1%. Attributions of respondents are of respondents is shown in **Tables 3**, **4** and the number of respondents based on the type of residence and their age distribution in **Table 5**. The content was intended to reflect the situation of victims such as changes in housing environment, time required to rebuild, and changes in lifestyle and physical and mental condition. Residents were also asked about the subjective opinions of victims on evaluation of restoration or lessons from the earthquake disaster, which clarify their evaluations on housing reconstruction process at large disaster recovery public housing.

3. In Kobe City, as a result of the zoning on the basis of the Shinsai Fukko Kinkyu Seibi Jorei, each district is designated as a “black,” “gray” or “white” zone depending upon the degree of public agency participation ans regulation in the district. An area with changes in land patterns and land use with large government support, such as a land readjustment project, an urban redevelopment project and a district planning project, was designated as a “black zone” (corresponding to approximately 3% of the afflicted urban area). An area in the priority rehabilitation promotion district excluding the city planning project district is designated as the “gray zone.” The other area included in the rehabilitation promotion district where the rehabilitation was left to efforts of the residents is designated as the “white zone.”

Table 3, 4. Attribution of survey respondent.

occupation	number collected	%
company employee	112	13%
student	3	0%
housewife	122	14%
civil servant	13	1%
self-employed	151	17%
part-time	75	8%
unemployed	365	41%
others	36	4%
no answer	17	2%
total	894	100%

age	number collected	%
20-29	28	3%
30-39	80	9%
40-49	92	10%
50-59	168	19%
60-69	253	28%
70 over	265	30%
No answer	8	1%
total	894	100%

Table 5. Age distribution based on type of residence.

	20-49	50-59	60-69	70-	total
disaster recovery public housing	11%	11%	31%	47%	254
public housing leased from private sector	5%	14%	40%	42%	43
specific rental housing with public subsidy	71%	7%	10%	12%	42
owner	23%	24%	29%	23%	446
rented	45%	19%	21%	14%	42
total	187	159	246	255	847

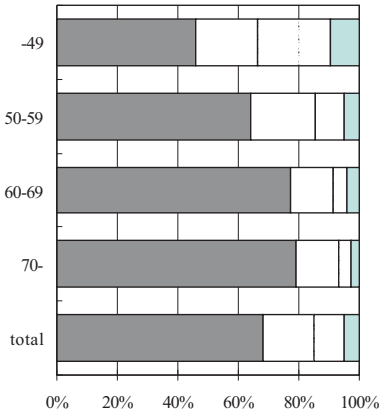

Fig. 3. Intent of residence by age group.

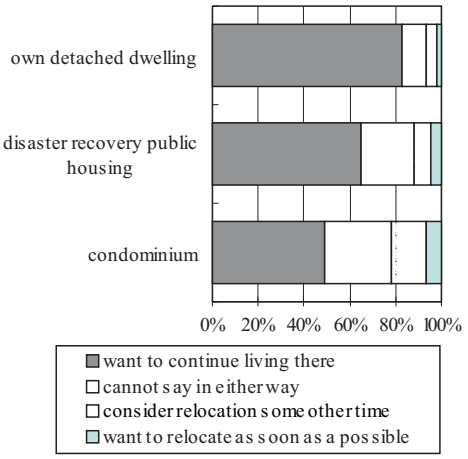

Fig. 4. Intent of residence based on current type of residence.

3.2. Findings

(1) Change in housing before and after earthquake and the intent of residence in the future

Changes from housing at earthquake occurrence to current housing is shown in **Table 6**. Of those now living in detached dwelling, 84% lived previously in the same type but about 9% of households going from "own row house" to "own detached dwelling," and those who had lived in own row house, whose number decreased sharply, moved into a part of newly-built detached housings provided in large amount after the earthquake disaster [3]. Some 24% of residents in disaster recovery public housing, who had their own homes previously, are considered as those who cannot make current housing private property or have given up doing so.

Concerning the intent of residence,67% want to continue to live in current housing. The higher the respondent's age, the higher this rate, reaching 76% among those in their seventies and over. Among those in own detached dwellings, 82% "want to continue living there" and among those in disaster recovery public housing, 69% wish to continue doing so (**Figs. 3**, **4**).

Table 6. Change from housing earthquake occurrence to the current type of housing.

		type of housing at earthquake									total
		own detached dwelling	rented detached dwelling	own row house	rented row house	rented wooden apartment	condo-minium	private rented condo-minium	disaster recovery public housing	others	
current type	own detached dwelling	309	9	33	4	3	5	10	1	1	375
	rented detached dwelling	2	4	0	0	3	0	1	0	0	10
	own row house	4	0	10	1	0	0	1	0	0	16
	rented row house	0	1	0	1	0	0	0	0	0	2
	rented wooden apartment	0	0	0	1	3	0	0	0	0	4
	condominium	7	1	3	0	4	49	7	0	2	73
	private rented condominium	10	3	1	5	4	4	19	0	0	46
	disaster recovery publichousing	59	38	18	59	91	13	37	8	3	326
	others	8	0	2	4	4	1	3	4	1	27
total		399	56	67	75	112	72	78	13	7	879

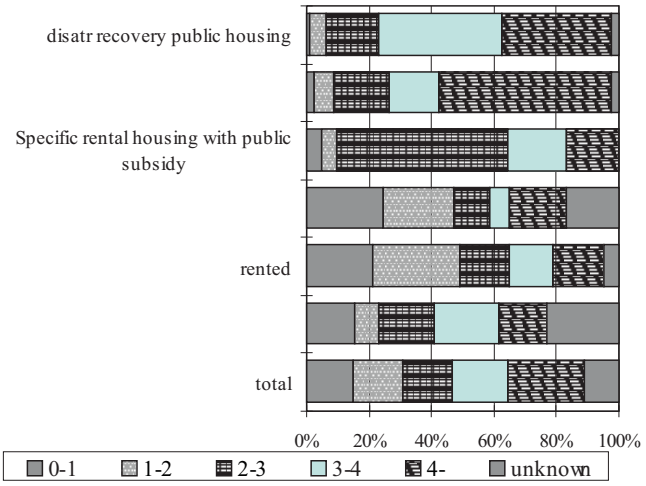

Fig. 5. Current type of residence and time until moving in.

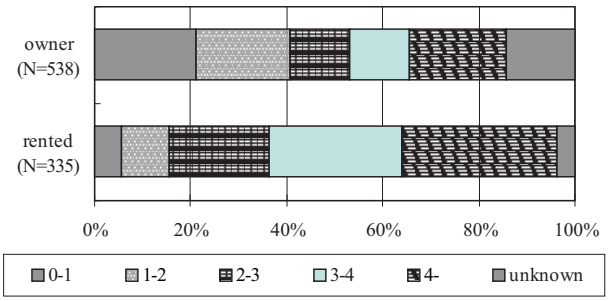

Fig. 6. Type of residence at earthquake occurrence and time until moving into new residence.

(2) The time of housing reconstruction

The time of moving into current housing by current type of housing is shown in **Fig. 5**. Among householders who live now in their own houses, the answer "within 2 years" accounts for about half, but the percentage of "more than 4 years after earthquake" is higher than that of "2-3 years" and "3-4 years.". This indicates attempts to reacquire housing are prolonged and continue even now. And in the case of disaster recovery public housing, because occupation is only possible after a large-scale housing complex is completed, it takes longer before residents can move in. The comparison based on the housing type at earthquake occurrence (**Fig. 6**) generally shows that those who previously rented housing need more time than those who previously owned houses.

In the evaluation of time needed for reconstruction, the percentage of residents answering "cannot reconstruct yet" and "take more time than expectation" exceeds 30%, while the percentage of those who answer "as expected" and "can construct sooner than expected" also equaled 30%. By current type of residence, among those owning their own houses, the evaluation is divided into half (**Fig. 7**). Among the reasons (multiple answers are possible) why much time was needed for reconstruction by those owning their own homes, "delay due to land readjustment project" reaches 48%, and whether there exists project area or not is reflected in the difference in time for reconstruction. Factors such as "shortage of funding" and "shortage of support from administration" account for about 30%.

(3) Hindrance in reconstruction of housing

Among those currently owning their own houses what was the largest problem they had in reconstruction, purchase, and repair, "funding" accounts accounted for the most at 43%, followed by "no special hindrance" at 20% and "delay due to land readjustment, etc." at 14%. Concerning resources for reconstruction and purchase (multiple answers are possible), "funds on funds" accounted for the most at 74%, followed by "public

Table 7. Reasons for hindrance in reconstruction for those in rented housing.

	amount of rent or key money	location	standards and rules	facilitied	relationship with neighbors	no spcial	others	total
disater recovery public housing	8%	21%	17%	4%	15%	22%	12%	243
public housing leased from private sector	10%	20%	12%	7%	10%	17%	24%	41
specific rental housing with public subsidy	24%	5%	39%	5%	2%	12%	12%	41
rent private sector	55%	5%	8%	15%	0%	8%	10%	40
total	15%	18%	18%	6%	11%	19%	13%	365

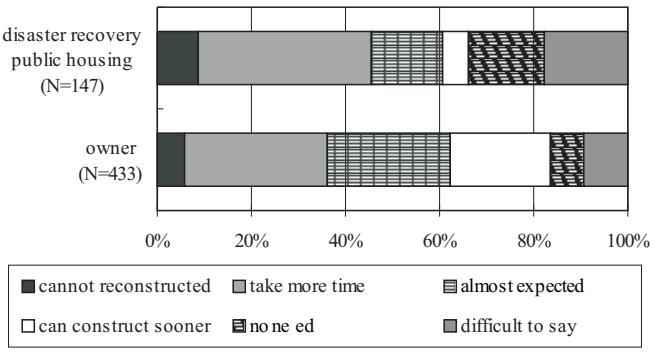

Fig. 7. Comparison of evaluation on the time for reconstruction in disaster recovery public housing and disaster restoration own housing.

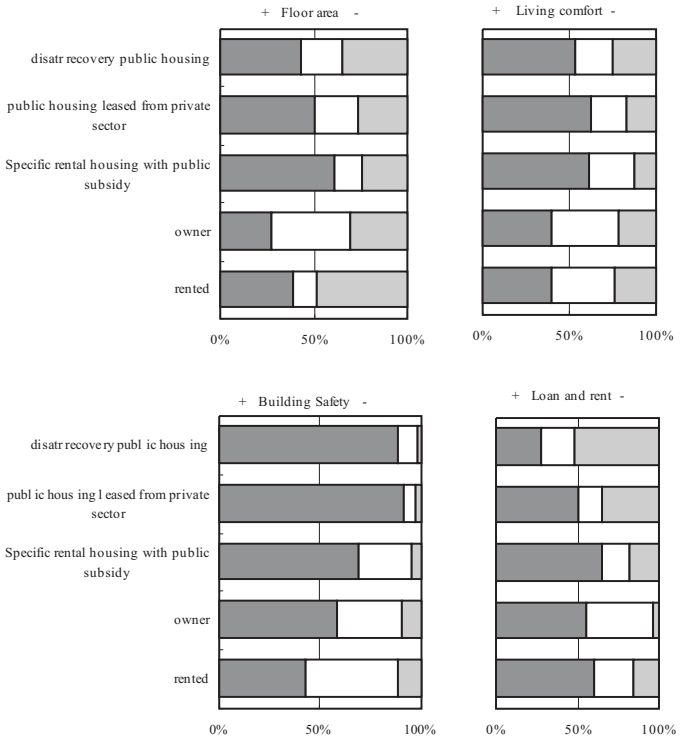

Fig. 8. Evaluation of current housing.

funding from government finance, etc." at 34%, and "funding from private financing institution such as bank" at 29%. Among hindrances in those currently renting houses, "amount of rent or key money" accounted for the most at 55%. In the case of disaster recovery public housing and leased housing, those citing funds as a hindrance were relatively few and reasons connected with lifestyle functions such as "location" and "relationship with neighbors" were more significant hindrances.

In a question on current monthly rent among those in in the case of disaster recovery public housing and leased housing, "under 10,000 yen" exceeded 30%, 20,000 yen and under reached 50%, and 50,000 yen and under reached 90%. Among those in subsidized private rental housing and rented housing, "50,000-100,000 yen" accounted for just over 60% and "100,000 and over" reached 30%.

(4) Evaluation of current housing

Evaluations based on positive change, negative change, and no change, in "floor area," "living comfort," "building safety," and "loan and rent" in housing before and after the earthquake are shown in **Fig. 8**. For "living comfort" many answered generally "better" and the percentage answering "safe" about "building safety" is also high. Change of performance in hardware aspect in housing such as "living comfort" and "safety" are evaluated positively, and especially by those in restoration and leased housing, the majority evaluated current housing as "safer" than before. For "loan and rent," those in disaster recovery public housing answering "cheap" exceeded 50% and policies for substantial rent assistance have influenced the answers.

(5) Reestablishment of lifestyle

Compared to before the earthquake, the percentage of households answering "lifestyle becomes hard" reaches 53% while those answering "lifestyle becomes comfortable" account for only 2.5%. This indicates that difficulty in lifestyle reestablishment that still continues. By age group, this was felt most by those in their forties to sixties. Regarding post-earthquake income disaster, half ore more respondents answer "decreased." Of these,

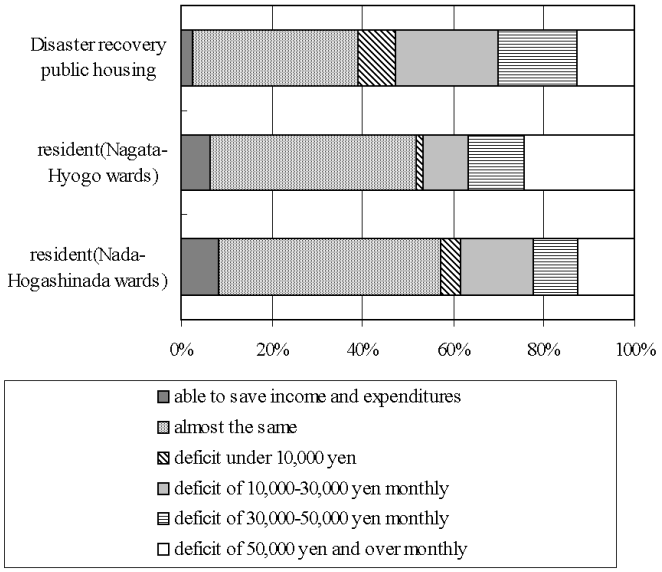

Fig. 9. Current family budget.

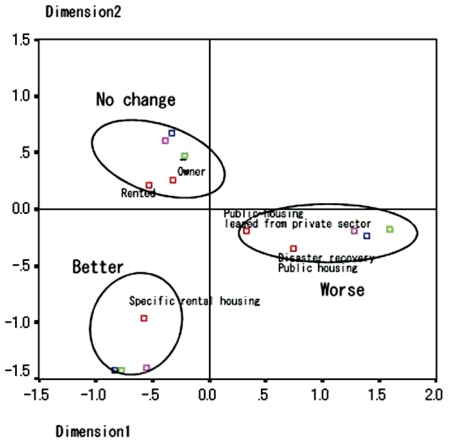

Fig. 10. Situation of community activity.

* Quantification class III:

This used for structural analysis of multivariate categorical data. It quantifies categories by "internal consistency" principle rather than by external standard.

those answer a decrease of 30-50% reached 60%. Among reason for decreased income, those answering "decrease in clients and orders due to recession" reached 27%, indicating that social situation significantly influences the reestablishment of lifestyle of victims.

Regarding family budget, about 50% answered that they lived in the red every month, and in rented houses, disaster recovery public housing, and leased housing, the percentage of negative impact was higher than among those who owned their own homes. In Nagata and Hyogo wards, the degree of negative impact tended to be greater than in Nada and Higashinada wards (**Fig. 9**), indicating a regional differences in economic reestablishment of lifestyle and discrepancy due to types of housing.

(6) Current community activities

To determine changes in community participation, the survey asked about "participation in community activity," "number of friends," and "frequency of chances to go out." About half of respondents answered "not so much change from before". The result of structural analysis, quantification class III [4] -in evaluation of community activity and current type of housing is shown in **Fig. 10**. Three groups were seen: active, passive, and unchanged. Those living in disaster recovery public housing and leased housing tended to be in the passive group, indicating a negative result, in contrast to trends of positive evaluation on housing functionality. Judging from this result, viewpoints on housing reconstruction in the stricken area have shifted from a stage of personal response to provide housing for victims to another response on the district or area scale including the social environment such as revitalization of community activity.

In cases where owners or renters reconstructed dwellings on their own fall in the category of "no change," and subsidized private rental housing in the active group. No distinct differences were seen between eastern and western districts of Kobe, or between white and black zones, but statistical dispersion largely depends on the distributed "chome" ("block" in addresses in Japan), situations in communities within the stricken area differ widely.

Changes in the convenience of commuting, shopping, and medical treatment are large depending on statistical dispersion location, so locality has an effect. The percentage of "become inconvenient" is high especially in large-scale disaster recovery public housing in Nishi, Chuo, and Nada wards. Seeing the relationship to community activity, the evaluation category is occupied by the same group, as expected, indicating a strong relationship.

(7) Physical and health conditions

Changes in physical condition and recovery from mental shock related to the current type of housing are shown in **Figs. 11** and **12**. For mental condition, 27% of respondents answered "still have not recovered," 11% answered "do not recover," and 61% showed recovery, indicating 6 years that have passed since the earthquake, so mental healing has been finally gradually spread. As to why answers from those in disaster recovery public housing and leased housing answering "still have not recovered" is high, **Table 5** suggests that aging is a factor. Residents in large-scale housing complexes built after the earthquake differ from that in general large-scale housing complexes, making it necessary, for example, to consider providing mental health care services by going the rounds and health maintenance facility.

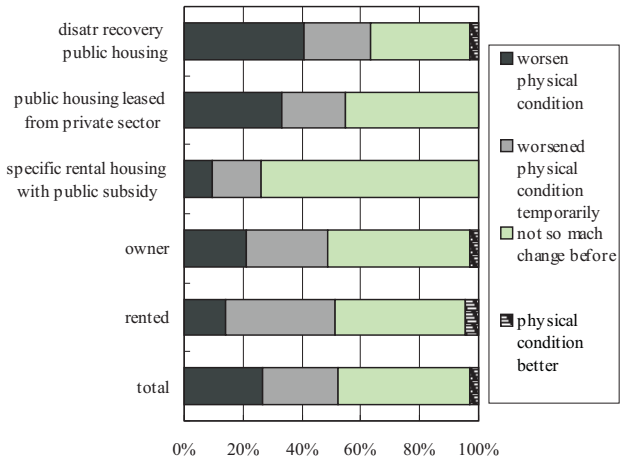

Fig. 11. Based on type of housing change of physical condition.

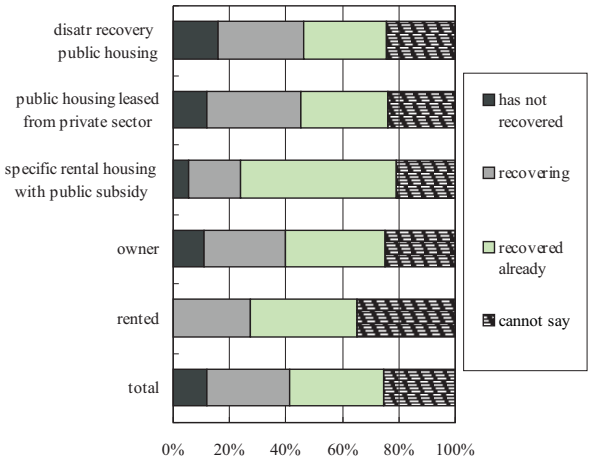

Fig. 12. Based on type of housing recovery from mental shock.

(8) Estimation on disaster restoration of current town

Results for changes in housing environment based on the three stages in the previous paragraph – natural environment, town atmosphere, and safety" – comparing to before the earthquake are shown in **Fig. 13**. Positive and negative reactions are divided, but town prosperity atmosphere was viewed most negatively, suggesting that improvements in the aspect of hardware in the urban environment such as housing have steadily proceeded, while concerning "prosperity" on a district scale where human activity can be felt remains insufficient.

Viewed by type of housing (**Fig. 14**), in the case of own house and rented house the proportion of positive evaluation is smaller compared to the case of disaster recovery public housing For those with their own and rented houses, statistical dispersion of evaluation differs greatly by district, especially in the black zone in Nagata and Hyogo wards, where evaluation tended to be negative. Comparing three housing complexes viewed as disaster recovery public housing, town environment is

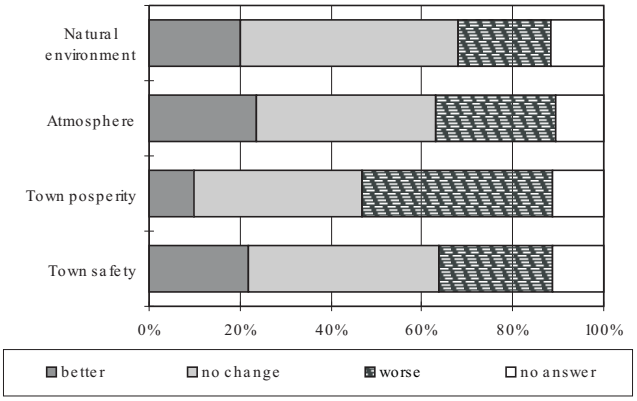

Fig. 13. Evaluation on town housing environment.

evaluated highly. Especially at the large-scale housing complex in Nishi ward far from the center of the stricken area, natural environment is evaluated by over double points compared to other housing complexes.

Among those with their own or rented houses, "dangerous" surpassed "safe." Even if buildings in which the residents felt "safe," the safety of the current town is not evaluated as appropriate, so type of housing requires disaster recovery public housing in safety on the district scale.

The result of quantification class III in each evaluation and type of housing is shown in **Fig. 15**. Viewpoints on restoration are clearly divided. Respondents in restoration and leased housing and subsidized private rental housing Were generally positive. Respondents in rented house have no change in evaluation and those in own house are located ranging from no change to negative.

Asking about overall restoration progress, respondents answering "almost restored" and "restored by about 80%" reach 48%, making current restoration evaluated somewhat positively. Among those living in disaster recovery public housing, respondents answering "almost restored" reached 25%, higher than among those in owned and rented houses. Among those with their own houses, 40% answered "almost half" and "under half," making evaluation low. By district, disparities have developed between black and white background areas, and between eastern and western districts, and the evaluation of restoration is lower in Nagata and Hyogo wards and in the black background area.

(9) Estimation of town restoration in the future

Results about town restoration in the future are shown in **Table 8**. Answers such as restoration to the same state as before the earthquake or improvement are positive, while the percentage of answers of "cannot see any difference" reached 30%. Especially among those living in disaster recovery public housing, the answer of "cannot see any difference" reached 42%, higher than in

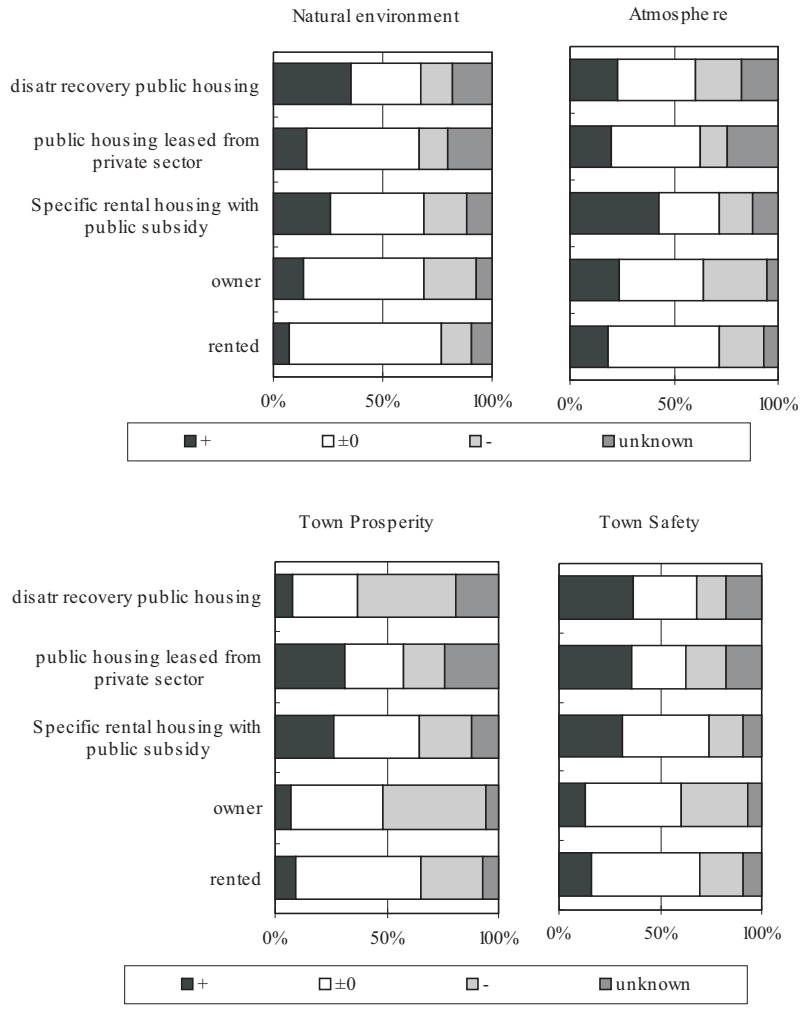

Fig. 14. Based on type of housing evaluation on restoration of town.

Fig. 15. Evaluation on town housing environment.

other categories.

Results for quantification class III in evaluation of town restoration evaluation of overall restoration, estimation of restoration in the future, and classification of distribution of questionnaire location are shown in **Fig. 16**. Nada and Higashinada wards showed high evaluation in both evaluation on restoration and estimation on restoration, while Nagata and Hyogo wards showed low evaluation. Those living in disaster recovery public housing responded with "cannot see any difference" in both evaluation and estimation. Based on results of the estimation in the future and a structural analysis, quantification class III [5] for Nagata and Hyogo wards and Nada and Higashinada wards (**Fig. 17**), the estimation on restoration is negative in the black zone in Nagata and Hyogo wards, restoration to the previous state is expected in the white zone, and positive estimation on restoration is indicated in the black zone in Nada and Higashinada wards.

3.3. Summary of Findings

The following three points were clarified by the survey:

(1) Concerning disaster recovery public housing as a pillar in the housing provision plan in the stricken area,

Table 8. Evaluation and estimation on restoration.

	evaluation on reconstruction					estimation on restoration in the future				
	almost 80%	about 50%	under 50%	unknown	no answer	improvement	same	difficult	unknown	no answer
disaster recovery public housing	48%	16%	4%	23%	9%	20%	21%	9%	0%	8%
resident(Nagata-Hyogo wards)	43%	26%	18%	12%	1%	19%	31%	19%	0%	0%
resident(Nada-Higashinada wards)	50%	26%	10%	13%	1%	31%	32%	9%	0%	1%
public housing leased from private sector	53%	16%	7%	22%	2%	29%	29%	9%	0%	2%
specific rental housing with public subsidy	64%	14%	0%	17%	5%	33%	24%	5%	0%	2%
total	48%	22%	10%	16%	4%	24%	28%	12%	0%	3%

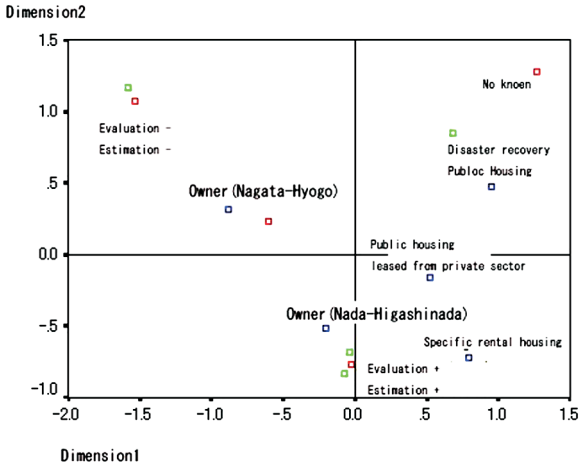

Fig. 16. Analysis of evaluation and estimation on restoration.

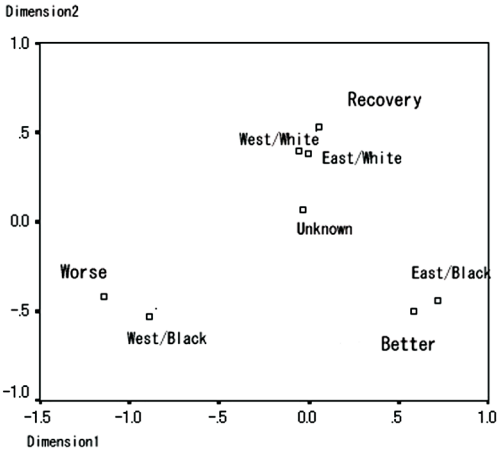

Fig. 17. Estimation of restoration by district.

residents evaluated the performance of building and the surroundings somewhat positively, thus this housing serves as permanent housing with favorable performance of hardware aspect in building. This because the economic burden is alleviated by affluent assistance in rnt, and residences in modern high- and medium-rise buildings has changed living comfort and building safety, which were highly evaluated.

Concerning the construction of disaster recovery public housing, it is positively evaluated that housing complexes with good quality were provided in a short period, but some problems are pointed out, for example, they have been constructed unevenly in number among districts; the low income class and the aged have priority to move into them, so the characteristics of the previous communities have been lost and it has become more difficult to build new community there; the support to the socially vulnerable residents has become new problem after their moving into them; the design of building is monotonous and uniform like social welfare public facility. Victims thus evaluate disaster recovery public housing positively as residence space, but not so in community activity and health conditions compared to residents of other types of housing. This problem thus remains.

(2) The streamlined support programs on housing reconstruction have has influenced both the process of individual housing reconstruction and restoration of town. Under this program, currently, those who constructed their own housings still live in the same district, but those who could not do so had to move into large-scale disaster recovery public housing or rented housing in other districts. Because the support program on housing reconstruction provides limited support to reconstruction based on conditions such as damage, economic circumstances, and lifestyle environment, a review of the type of housing – own, rented, and disaster recovery public housing – shows that people having similar lifestyle standards and economic environments reside separately in each type of housing. This means

that residents having similar problems belong to the same group, as reflected in the district and evaluation of the district.

(3) By the time 6 years had passed after the earthquake, housing reconstruction had finished its first phase, but difficult situations for lifestyle reestablishment continue, influenced by the recession environment, although the negative economic situation is so widespread that household budgets of victims are directly hit. A shift is needed from previous economic support policies for individual housing reconstruction to those for lifestyle improvement, including improvement of the district environment and economic situation.

4. Conclusions

Housing reconstruction after the 1995 Great Hanshin-Awaji Earthquake had two missions:

(1) Housing reconstruction as "lifestyle reconstruction" for victims, i.e., that foothold for lifestyle reconstruction for victims must be established as soon as possible while maintaining a certain level of life. Housing reconstruction and district reconstructions should be compatible and urban restoration should be realized in the relationship between both elements. The process of housing reconstruction, which generally takes about 5 years, was not always connected with district reconstruction, and in some cases the support for individual housing reconstruction ignored its relationships to district reconstruction The viewpoint will change based on what thedistrict scale in restoration is. The hypothetical identity of Kobe City has thus already vacant existence in the concrete restoration process from the earthquake disaster.

From the viewpoint of victims, the unity of the neighborhood is the meaningful unit, and district reconstruction would contribute to this level. Namely, "life reestablishment" has been separated from district reconstruction through the process of housing reconstruction.

(2) The second mission is that housing reconstruction must be implemented aiming at realizing a safe city by means of "city remodeling". The stricken area had a high concentration of wooden structures and its vulnerability had been pointed out before the quake, so in the process of restoration, making space safe takes priority. In this process the difficult problems have come to s–urface at once, for example that on relationships between individual housing reconstruction and urban planning such as arrangement of safe space like road and park or remodeling for disaster resistant city. Both the problem on the agreement with rightful claimant and project contractor and that on the ways and methods to manage the victims without right, namely those who are difficult to rebuild their lifestyles on their own in the total plan have come into sight.

Cities in Japan are highly vulnerability and the possibility of similar damage occurring in another large earthquake is extremely high. The lesson of the Great Hanshin-Awaji Earthquake would thus be that along with the development of solutions based on previous planning in housing recovery and restoration, the importance of proactive measures – alleviation of housing and urban damage – taking into account the difficulty of planning after disaster should be appropriately recognized.

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