

DAMAGE CAUSED FROM EVACUATION LIVES AFTER THE 1995 HANSHIN-AWAJI EARTHQUAKE DISASTER IN JAPAN

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ABSTRACT



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The authors conducted a survey on the refuge life distress in Kobe City, Nishinomiya City, Ashiya City and Awaji Island after the 1995 Hanshin-Awaji Earthquake Disaster. The prime object is placed in the examining of problems in an environmental change arose in a time series.

The first obstacle to evacuees' lives consisted of a shortage of water and food and shut-down of gas and electricity. People who forced to continue their lives in shelters were anxious about reconstruction of their houses and return to their place of work, exhausting their body and mind in life space where their privacy was lost. School facilities were used as shelters and were positioned as an evacuation base. Yet, there are many things to be prepared after reconstruction of the earthquake : for examples, construction of earthquake-proof pool usable as a water tank, utilization of feeding facilities, improvement of lighting equipment, making out of a manual for control and management.

KEYWORDS

Earthquake; evacuation lives; shelter; waiting place; TAIKISHO; temporary dwelling

OBJECT

Among the total number of destroyed houses in the 1995 Hanshin-Awaji earthquake disaster, 99,966 houses were completely destroyed (including houses completely burnt-down) and 100,166 houses partially destroyed (including houses partially burnt-down) in Hyogo Prefecture. Due to a great deal of damage done to their houses, about 320,000 people evacuated their homes, at first, to shelter tents set up in public facilities such as schools and city halls or on park grounds and schoolyards. When a big city is struck by a large-scale disaster, one of the most characteristic phenomena is that a large number of people are to become sufferers immediately

after the disaster has broken out, and that they all need to be rescued.

In this paper, sufferers' evacuation lives at shelters, waiting paces and temporary dwellings after the 1995 Hanshin-Awaji Earthquake Disaster are made clearer, and the problems posed after the earthquake are examined; in particular, the prime object is placed in the examining of problems in an environmental change arose in a time series, say, one to two weeks, one month and half a year after the earthquake. The results of this research should be served as an aid to establish the best rescue method toward the earliest possible reconstruction and to provide important information for employing a new countermeasure and system against disasters.

SHELTERS

The first research

In cooperation with THE SANKEI SHIMBUN (Japanese newspaper company), interview questionnaires have been addressed to the earthquake sufferers once a month after one month had passed since the earthquake.

As of February 16, 1995, when one month had passed since the earthquake, more than 210,000 people still had stayed in shelters. In order to seize actual condition of their shelter lives, the first research was conducted early in February, and interview questionnaires were addressed to the total 310 evacuees in Nagata, Chuo, Higashinada, the 3 wards of Kobe that suffered most from the earthquake. Number of the respondents were 310.

Affection to Kobe

As for damages to houses of the subject households who suffered from the earthquake, houses of 119 households (38.4%) were completely destroyed or burnt-down, and when partial destruction or burn-down (104 households) and slight damage or submerge damage are included in counting the houses, the households which suffered damages from the earthquake come to 97.1% of the total subjects. As for casualties, of all respondents and their families, 51 received minor injuries and 19 major injuries, and 9 were killed: that is to say, a quarter of the subject households suffered human damages from the earthquake. In spite of the above mentioned damages to their houses, property and themselves, 273 of 310 respondents, which was 88% of the total respondents, chose an answer "I do not want to leave Kobe" to a question "Do you want to leave Kobe and live somewhere else?" while only 16 respondents (5%) chose an answer "I want to leave Kobe". As the reason that they "do not want to leave Kobe", "Affection to the town of Kobe" dominated other negative answers like "Business / Life basement" or "I have nowhere to go". The 88% to indicate evacuees' affection to Kobe exceeded researchers' expectation. This Kobe research suggests that attractions the town of Kobe creates with its atmosphere and community can be a positive element for the reconstruction scheme.

"Instant community" made immediately after the earthquake

What is most notable here is a fact that so-called "instant community" was made up through evacuees' rescue operations done immediately after the earthquake. Although urbanites are considered weak when they meet an emergency situation, evacuees' common sympathy as sufferers and centripetal force to Kobe represented as

their affection to “our town” played a major role to consolidate mutual relationship of the urbanites through mutual actions “to rescue and to be rescued”. This instant community” also prevented the evacuees from being struck by a panic. That became the reason why anxiety for the public peace and order was not heard very much.

Days in the evacuation lives

Soon after the earthquake broke out, in the evacuation lives there was a shortage of various things, from supply of life lines such as electricity, gas and water to food, bedclothes, clothing items and medicines, most of which were the necessities of life. Sufferers’ annoyance became clearer by realizing their lives changed from state with everything furnished to state with a shortage of everything. A percentage to indicate complaint about lack of toilet rooms and bath rooms were, however, lower than researchers’ expectation; that was because the earthquake broke out in winter season. Although a countermeasure to protect evacuees from coldness of winter should be further considered, it is consoling to know that problem of sanitation did not arise. However, if the earthquake had broken out in the summer situation, sufferers would have been put in more serious situation, and season should be a factor to be added to manuals for earthquake.

When the respondents were asked about anxiety for life immediately after the earthquake, number of the respondents who chose an answer “aftershock” was more than researchers’ expectation. This fact indicates that unimaginable terror seized the evacuees who were placed in situation which no information was provided. On the other hand, the respondents who chose an answer “safety of family members and relatives” were not so many. It can be assumed that the reason of the rather low rate for “safety of family members and relatives” is because the earthquake broke out in a time zone when most people were with their families. Furthermore, as present anxiety, many of the respondents chose an answer “house and future life” from outset. This answer relates to results of questionnairing research showing that many have affection to Kobe and a fact that many have live in Kobe for a long time, and it can be assumed that the longer one had lived a full life before the earthquake, the more one lost his peace of mind. Although some respondents replied that food and relief goods were sufficiently supplied from the beginning, it seems that the goods were not supplied evenly to each shelter at beginning and supply of the goods was sometime inconsistent. If a manual for transporting relief goods is made out, such problems will be settled.

As three months had passed since the earthquake, evacuees’ needs for life lines such as electricity, gas and water were being considerably dissolved, and lack of temporary dwellings and loss of privacy were brought to the fore. It became clear that evacuees’ stress of sanitation and privacy had built up as evacuation lives became longer. It is a natural way of thinking that when food and clothing are supplied to some extent, one’s eyes go to housing, the most important base of life in an individual life, and the evacuees’ affection to Kobe make their demands for houses greater. To a question about anxiety, answers such as “houses”, “future life” and “job” dominated others, and number of the respondents who chose an answer “terror for aftershock”, a dominating answer several days after the earthquake, was greatly decreased. Instead of the terror to take one’s life in a moment, anxiety for future life lain heavily on sufferers’ minds.

The sixth research

As of July 16, there were 17,629 evacuees at 332 shelters in Hyogo Prefecture, and a decision was made to close the shelters on August 20. In order to seize actual condition of shelter lives, the sixth research was conducted early in July, and interview questionnairing was addressed to the total 237 sufferers at shelters in cities of Kobe and Nishinomiya. Number of the respondents were 237.

Health condition and annoyance

When a half year has passed in shelters, questionnairing on their health condition was addressed to the evacuees (plural answers acceptable), and 113 respondents complained about their mental irritation and 111 about sleeplessness, and lack of appetite was also remarked. As a cause of such abnormal symptoms, difference in quality of life space can be considered. To a question about “present life space in the shelter”, 78.2% of the respondents chose an answer either “large” or “fit”; comparing to the overcrowding situation taken place just after the earthquake, the evacuees seemed to have such impression. In reality, as number of the evacuees in shelters had decreased, life space per a family become surely larger. However, it was impossible to secure one’s privacy in mixed living which rooms were divided only by panel elements. That can be proved by a fact that when questionnairing on their annoyance was addressed to the evacuees (plural answers acceptable), 93 respondents chose an answer “other people’s eyes”. The answer that the most respondents (119) chose to this question was “human relationship”. What is concerned is that a vicious cycle may be caused, if stress caused by shelter lives worsen human relationship and one’s health.

Anxiety in shelter lives

When questionnairing was addressed to the evacuees on their anxiety on shelter lives (plural answers acceptable), three answers dominated others; that is, “securement of own dwelling” (173 respondents), “money to live on” (126) and “job” (88), where the above three answers were analyzed by sex, it was noted that females were more anxious about “securement of own dwelling” and “money to live on“, while males were more anxious about “job”. As for securement of own dwelling, the aged people were allowed to move into dwelling on preferential basis. On the other hand, the younger generation tried as many means as they could to leave shelter. Attention should be paid to a fact that, as the result, more than 60% of the subject evacuees belonged to the middle generation in their forties and fifties. In fact, people in this generation bear a lot of loan and have difficulty in finding a new job in Japan. In some sense, this generation lost most by the earthquake. In the first research conducted three weeks after the earthquake of January 17, 187 of 310 households replied that they anxious about securement of future dwellings, due to destruction of their houses. As far as the researchers can be see in the sixth research, the evacuees’ fundamental anxiety was not dissolved in the time period when a half year had passed since the earthquake.

In the forth research with “Earthquake unemployment” as its theme conducted in May (204 respondents), an answer “withdrawal of deposit and saving” was chosen by most respondents (112 respondents) as a means to maintain their lives. This result was firstly interpreted as a ground to prove that Japan’s high saving rate, which occupies a very high place in the world, played a rote of a safety valve to dispel social unrest. However, as a half year had passed since the earthquake, evacuees’ deposits and savings steadily decreased and, at the same time, unemployment insurance of some sufferers started to expire. Such situation was reflected by the results of this sixth research in which noticeable many sufferers were anxious about “money to live on”.

“TAIKISHO”

The eighth research

Eight months had passed since the earthquake. Aiming at closing shelters, the City of Kobe stopped rationing and set up “waiting places” which called “TAIKISHO” in Japanese. In order to seize actual condition of the lives in the waiting places, the eighth research was conducted early in September, and interview questionnairing was addressed to evacuees at four waiting places in the 4 Wards of Higashinada, Nada, Nagata and Suma, out of total 12 waiting places set up in centers for the inhabitants of wards and gymnasias. Number of the respondents were 193.

Ration

Difference between shelters and waiting palaces comes to whether or not the evacuees were rationed food; in waiting places, self-cooking was mandatory. In the research, 107 respondents (55.4%) cooked for themselves, while the other respondents ate their meals out or bought a box lunch at supermarkets etc.. Since some had already reported that the same rationed box lunches caused evacuees a loss of appetite in the eight month evacuation lives, and a percentage of evacuees who cooked for themselves was not so high. Furthermore, attention should be paid to a fact that 35 (26.5%) of 132 respondents who gave valid replies chose an answer “Ration was better”. For this result, it should be noted that the eighth research was conducted early in September shortly after evacuees had moved into waiting places; it is assumed that the finish of rationing overlapped evacuees’ unsettled feeling caused by moving from shelters to waiting places, and that, as a result, evacuees’ “isolated feeling” was intensified. It should be also considered that evacuees were so sensitive to the finish of aids by the administration that were put under some uneasiness, and chose an answer “rationing was better”. In some shelters, rationed box lunch did not stimulate evacuees’ appetite and a lot of meals were dumped. Such futility should not be done, and rationing should not be resumed. However, it is important to create an environment in which the evacuees can feel that they are not isolated.

Dwelling environment

Comparing to dwelling environment in shelters, 74 (40.4%) of 183 respondents who gave valid replies chose an answer “dwelling environment has become worse”, and 76 (41.5%) “dwelling environment was not changed”. As the reason of having chosen an answer “dwelling environment became worse”, the respondents pointed out “too small space for family”, “loss of privacy” and “small rooms”. Since the respondents were not used to the lives in waiting places, figures to indicate serious situation did not appear in overall. However, the result of this research do not indicate that waiting places are comfortable to live on for a long term, and that waiting places are suitable for living for a long term. Since they are temporary facilities, it would be difficult to excessively well-equip dwelling environment of waiting places. However, if waiting places are kept unclosed for a long term, it would be necessary to consider to well-equip dwelling environment of them.

TEMPORARY DWELLINGS

The second research

Early in March, interview questionnaires were addressed to total 101 households moved into temporary dwellings in the City of Nishinomiya (76 households) and Ashiya (25 households) which received the greatest damages next to Kobe.

Comfortableness

What was the most noticeable factor regarding the satisfaction rate was (sound) insulation. Regarding insulation of temporary dwellings, 53 (69.7%) of 76 respondents in Nishinomiya and 8 (32.0%) of 25 respondents in Ashiya chose an answer “dissatisfied” or “a little dissatisfied”. Specifically, the respondents complained that they heard neighbors speaking voices, that noises from outside roads were too intrusive to sleep, and that a whole house could be seen from outside. Although those temporary dwellings were better than shelters, it can be seen that evacuees’ stress of life environment was being intensified. Since one’s privacy is closely related to his mental hygiene, it is necessary to make out as appropriate construction manual to review materials to enhance sound insulation when constructing temporary dwellings.

As well as protection of privacy, another important element to be noted for lives in temporary dwellings was establishment of “community”. Although temporary dwellings were constructed as an emergency evacuation facility, another “neighborliness” might have been evacuees’ stress. However, to a question about “relationship with neighbors”, only 7 respondents (7%) in Nishinomiya chose an answer “a little dissatisfied”, and none for “dissatisfied” in both cities. A fact that there still exists many vacant dwellings around respondents’ may be one of the reasons. However, it should be noted that many respondents replied that they were in an emergency situation and that was why they wish to create comfortable life environments by mutual aids.

After the earthquake, “instant community” was immediately established by the evacuees, then self-governing organizations were created in shelters. Common feeling as “one who share same suffering” might let evacuees have a great deal of enthusiasm in establishing communities. Such movements can be positive factors for the reconstruction of the local area.

Furthermore, as the point as issue of temporary dwellings, attention should be paid to a lack of care to the handicapped people. As well as the aged people and fatherless families, the handicapped people were allowed to move into temporary dwellings as “the weak” on a preferential basis. However, helping hands were not extended to improvement of equipment such as unit bathes which the handicapped people may have difficulty in using as it is. Care to the handicapped people should be involved in a manual for emergency temporary dwelling construction.

Health condition

Of 101 households who moved into temporary dwellings, 56 households (55.4%) replied that their physical condition declined. When they moved into temporary dwellings after the long evacuation lives, they heaved a sigh of relief, then immediately felt fatigue. Moreover, drafts and noises affected their physical condition. When the symptoms were asked (plural answers acceptable), 32 respondents (31.6%) chose an answer

“fatigue”, 20 respondents (19.8%) “sleepless”, 16 respondents (15.8%) “stiffness in bodies” and 15 respondents (14.9%) “back pain”. Since many aged people still live in the temporary dwellings, the issue on health condition remains as a big task at hand.

The seventh research

The seventh research was conducted with “lighting and evacuees’ lives” as its theme early in August, and the interview questionnairng was addressed to inhabitants in temporary dwellings in the City of Kobe, Ashiya, Nishinomiya. Number of the respondents were 221.

Lighting at the time when the earthquake broke out

When the earthquake broke out before dawn at six forty-six in the morning of July 17, most of the sufferers were sleeping at their homes. The first sight they saw after their houses collapsed was total darkness. 215 (98.6%) of 218 respondents replied (plural answers acceptable) that electricity of their homes were cut off. Moreover, what was noticeable was power failure of street lights. At the present time, few houses are equipped with guiding lights or an independent power plant. Under such situation, street lights can be a life line for evacuation, and a fact that such street lights were on the point of annihilation poses serious issues. Since the earthquake broke out about one and an hour earlier to the daybreak, most people stayed in their home to evacuate after sun rises, and as the result, confusion was avoided. However, if the earthquake had broken out a little earlier, they would have been forced to evacuate their house in darkness, depending upon power plants of cars etc., and there might have been possibility of panic caused by immoderate traffic jam. Street lights should be considered not only as prevention of crimes, but as prevention against disasters to let evacuees know actual condition. Street lights should be, therefore, equipped with emergency power sources.

Lighting at shelters

After the earthquake, most of evacuees lived in shelters set up in schools at first. In order to avoid the terror of the aftershock in darkness, many shelters were lit up even during bedtime. At very beginning, electricity of schools were also cut off. However, since the earthquake broke out before daybreak, power failure in schools was fortunately recovered in daytime and the shelters in schools were lit up at the first night after the earthquake. Still, what is important is a fact that independent power plants were hardly equipped even to schools which were designated as shelters. In the Fire Service Act of Japan, hospitals and places which many and unspecified people come and go like departments stores are obligated to be equipped with independent power plants, but schools are excluded in this regulation. Further, 90 (44.6%) of 202 respondents replied that they calmed down when lights were turned on, that they were scared of darkness and that they wish day dawns in immediate time. These replies suggest that all the shelters should be equipped with lighting apparatus like an independent power plants.

Another interesting fact is that most of evacuees saw the color of lighting in the shelters as “whitish”, although these might have seen relatively pale colors on mercury lamps in gymnasia. It is not, therefore, necessary to prepare reddish light to comfort evacuees in shelters where a short stay is prerequisite, but what is most important is to secure lighting.

Lighting in temporary dwellings

Regarding brightness of lights in temporary dwellings, 182 (82.7%) of 220 respondents chose an answer “appropriate”. This result should be, however, considered as data only to indicate that lives in temporary dwelling where privacy were protected were only a little better than situation soon after the earthquake when no electricity or no water were not supplied; and it is appropriate to think that evacuees’ state of tension still continued. This consideration is proved by the data indicating that many evacuees sleep, turning on lights.

All the lights in the temporary dwellings were fluorescent lights. In order to comfort evacuees, reddish lights are rather suitable. Municipal corporations are now being engaged in installing street light in area where temporary dwellings are concentrated. However, it is most necessary above all to consider volume and quality of street lights, because these lights are to be installed in “life space” where people live on for one or two years.

CONCLUSION

The first obstacle to evacuees’ lives consisted of a shortage of water and food and shut-down of gas and electricity. Although issues on the quality and quantity remained, a shortage of drinking water and food was rapidly settled in several days after the earthquake. As for life energy, electricity was recovered later on April 11. when one week had passed since the earthquake, people who avoided damage to their houses were able to take the first step to make a substantial action for reconstruction of their lives.

On the other hand, people who forced to continue their lives in shelters were anxious about reconstruction of their houses and return to their place of work, exhausting their body and mind in life space where their privacy was lost. Although it differs by area, it took three to six months for some evacuees to move into a makeshift temporary dwelling. A certain measure should be consisted to shorten shelter lives as emergency evacuation to one week to one month.

Since they have grounds and are effective as a local landmark. School facilities were used as shelters and were positioned as an evacuation base. Yet, there are many things to be prepared after reconstruction of the earthquake : for examples, construction of earthquake-proof pool usable as a water tank, utilization of feeding facilities, improvement of lighting equipment, making out of a manual for control and management.

As for makeshift temporary dwellings, many regulations exist in relation with urban planning for the reconstruction. However, upon mutual agreement that the temporary dwellings are literally “temporary”, a certain measure should be consisted to allow construction of temporary dwellings on plots.

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