

A Research Report Concerning the Operation of Relied Shelters after the 1995 Hanshin-Awaji Earthquake

著者	MIZUTA Keizo, FUKUOKA Yoshiharu, MATSUI Yutaka, NISHIKAWA Masayuki, SAIDO Minoru, SHIMIZU Yutaka, TANAKA Masashi
journal or publication title	Tohoku psychologica folia
volume	58
page range	19-35
year	2000-07-01
URL	http://hdl.handle.net/10097/54788

A Research Report Concerning the Operation of Relief Shelters after the 1995 Hanshin-Awaji Earthquake — Verification of a Loop Model

MIZUTA KEIZO (水田恵三)¹, FUKUOKA YOSHIHARU (福岡欣治)
(*Shokei Women's College*) (*University shizuoka, Hamamatsu College*)

MATSUI YUTAKA (松井 豊), NISHIKAWA MASAYUKI (西川正之)
(*University of Tsukuba*) (*Tezukayama University*)

SAIDO MINORU (西道 実), SHIMIZU YUTAKA (清水 裕)
(*Pool Gakuin university*) (*ShowaWomen's University*)

and TANAKA MASASHI (田中 優)
(*Otsuma Women's University*)

Our study of the 1995 Hanshin-Awaji Earthquake was conducted for various reasons. First, we wanted to test our concept of a Loop Model. Using this model as a reference, we divided the operation of the shelter into four time periods: the initial emergency period, the organization forming period, the stable organization period, and finally the winding down period. Second, we studied the formation of system processes leading to optimal forms of organization at each of the four time periods. Third, we verified the use of the Loop Model. In order to do this we conducted interviews during the first three weeks after the disaster with leaders of 32 relief shelters and volunteer workers in 25 shelters. Then we sent them follow up questionnaires, which we analyzed. Finally, we conducted a second interview about one year after the disaster. Our major focus was on types of shelter management and related issues to be dealt with.

We reached several important conclusions from our study. First, as a whole a suitable time limit for the shelters was three months at most. We found this time period adequate considering the psychological stress of the leaders and the residents in the shelters. However, some shelters had to be kept open for six months or longer because the persons in them could not find other housing. Therefore, although our study indicated that a three months time period for a shelter was the ideal, in reality in some cases this had to be extended.

To conclude, we believe our study provides an effective guideline for disaster emergency measures, although we hope that such a need will never arise again.

key words: disaster, shelter, leader

1 Shokei Womens' College, Natori-Shi Yurigaoka 4-10-1, Miyagiken, Japan.
e-mail: mizuta@shokei.ac.jp

Problems

The Hanshin-Awaji Earthquake occurred on January 17, 1995 at 5:46 am in the southern part of Hyogo Prefecture in Japan. It caused severe destruction in Kobe City and the surrounding Awaji areas. The number of people who took shelter in these areas reached a peak on January 23 with 319,638 persons. The maximum number of shelters totaled 704 in mid-March 1995. The Kobe Municipal Government closed all the shelters on August 20, 1995 and sent people remaining in shelters to other temporary dwellings which had been prepared for them. These places were managed by the local government until March 31, 1998.

According to the Town Planning Research (1995) a break down of the types of shelters used was as follows. a) schools (kindergarten, elementary, junior and senior high schools, and universities) were a little over 50%, b) public institutions (for example public assembly halls) were slightly more than 30% and c) others (public parks, vacant lots, and private institutions) were less than 10% (See Figure 1).

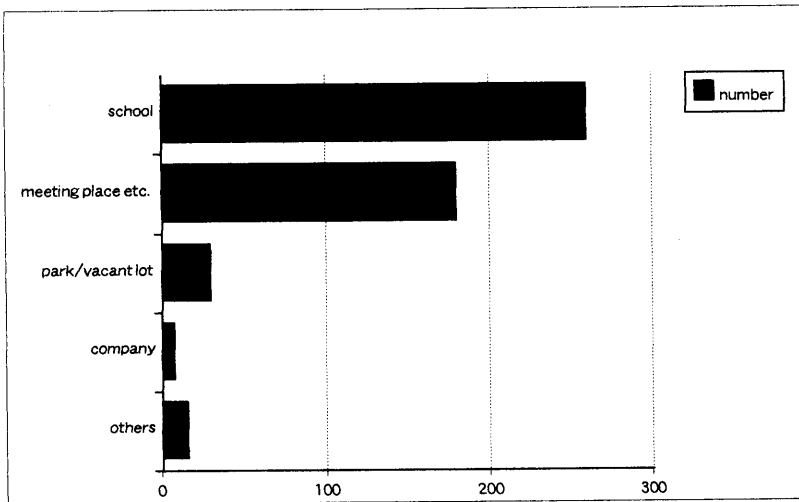


Figure 1 :Kinds and number of shelters.

There were several reasons why the disaster victims took a particular shelter. First, their neighborhood evacuated to a particular place. Second, some preferred a public institution. Third, the government had previously established emergency shelters. Fourth, many went to the nearest shelter. And finally, the majority of people selected shelters that they felt were the safest. (Kashihara et al, 1998). The size of the shelters varied from small to large. About 40% took less than 100 refugees. Less than 20% held from 101 to 200. About 10% housed from 200 to 300 or 500 to 1000. About 50% of these shelters were small, in buildings such as public assembly rooms. Large relief areas were mostly in schools.

Watanabe (1981) published his research findings on the management of shelters after the August 7, 1977 eruption of Mt.Usu in Hokkaido. This disaster forced the 5,200 residents of Lake

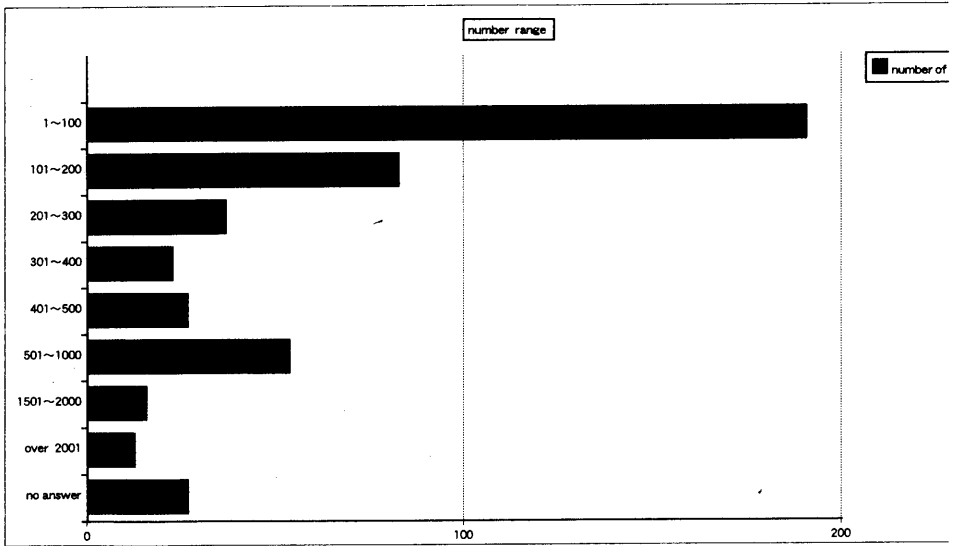


Figure 2 :The Number of Refugees per Shelter

Touya Spa to become refugees for about one month. In this particular case there were several unexpected problems. The influential citizens of the town were expected to become shelter leaders, but they were occupied with their own jobs and personal responsibilities. So could not oblige. Therefore, various problems related to shelter life could not be immediately solved. Likewise, the shelters were poorly managed and badly organized. Although the mayor organized self-governing bodies in each shelter, which in turn broke down into small groups, many small routine problems could not be solved due to the urgent situation.

Using Watanabe’s research as a reference, we found that many of the shelters used during the 1995 Hanshin-Awaji Earthquake were managed well, enabling operation in them to run smoothly.

Although there has been a lot of research in Japan concerning the organization and operation of shelters and on the leadership in such places, there has been surprisingly little research done on shelters set up in urgent disaster situations. Therefore, we felt strongly motivated to perform this research on shelters set up for the Hanshin-Awaji Earthquake, but at first were hesitant because of our sensitivity to the feelings of the victims. We did not want to add to their suffering.

Besides the work done by Watanabe, there is another informative investigation concerning the operation of shelters done by Sugiman et al (1995). They presented a triangle as a model of the dynamics of shelter operations. (See figure 3).

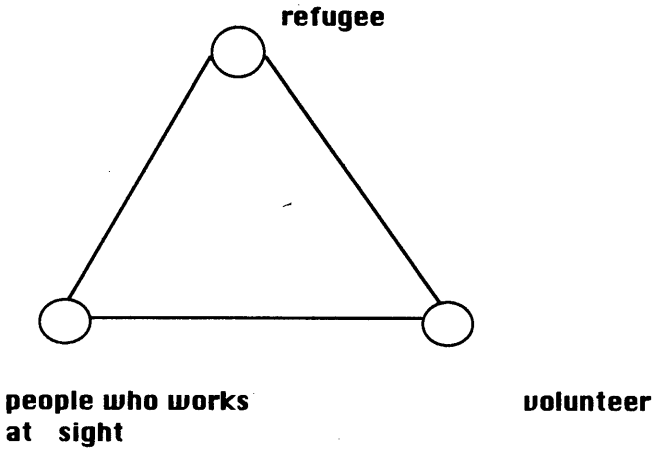


Figure 3 :Three groups of people involved with a shelter

We used a loop model to divide various types of shelters into three groups, using the following criteria. First was the location of the shelters' headquarter. Second was the relationship between a shelter and its self-governing body. And finally was the purpose of the activities of a shelter.

We also divided the volunteer groups into three categories. However, in this report the first two groups are not sharply separated because in most actual situations they could not be clearly divided. So, these categories reflect an ideal.

First were social welfare volunteers working during the time of emergency immediately following the natural disaster. We called these people "disaster social welfare volunteers". These people's responsibilities were to always stay in their shelters. And to manage them along with the self-governing bodies during the time immediately after the earthquake.

Second were social welfare volunteers already serving large areas in the vicinity of the disaster. We called these people "local area social volunteer workers". Their job was to cooperate with the self-governing bodies and to assist the refugees in leaving shelters to resume their independent lives. These volunteers worked during the stable organization period of a shelter.

Our third category of volunteers were individuals who came from other areas. These people did not always stay in the shelters and did not work closely with the shelters' management. Rather they had specific tasks to perform, such as distributing food, medical supplies and blankets and also caring for the mental /emotional well being of the refugees.

Initially the management of the shelter was divided into three groups : the refugees, the staff, and the volunteer workers. Later a more expanded version was made, as seen in figure 4. This larger perspective includes the the triangle model of figure 3 as well as government organizations and volunteer organizations responsible for large regions.

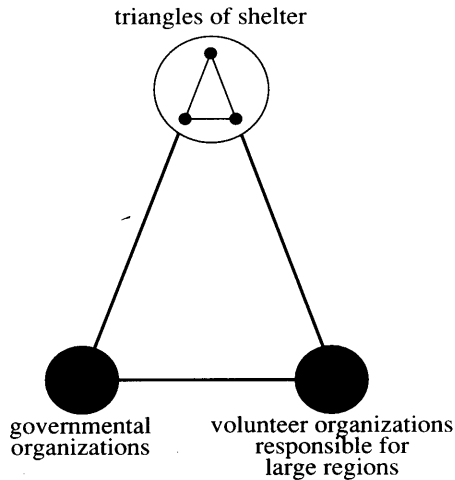


Figure 4 : An Expanded Triangle Model for Shelters.

In this expanded model, the role of the volunteer organizations was very important. They served as a communication link between the shelters themselves, as well as between the shelters and government organizations, informing them when it was necessary of the need for relief goods and other forms of assistance.

We had two problems in their research. First, we were unable to investigate a large number of shelters. Second, as the functions of the shelters changed over time, we were unable to keep pace with those changes.

However, we were able to come up with a pattern of the transitions that occurred over time, which are shown in Figure 5. This model shows a chronological pattern of four phases, the initial emergency period, the organization-forming period, the stable organization period, and finally the winding down period. This model also shows how each phase was optimally organized.

In each phase various groups held certain responsibilities. In the early stages, the regular staff of each institution determined how to organize their shelters. The volunteer workers who managed the shelters coordinated with the self-governing bodies of each shelter. Likewise, volunteer organizations covering large regions encouraged the independence of people in each shelter while the government organizations deal with specific problems in each shelter.

Figure 5 is a circular diagram, based on our idea of “the time limit” “of a suitable shelter and of the eventual return of the refugees to the community. We derived this model after conducting our first survey, and then verified it with our other surveys.

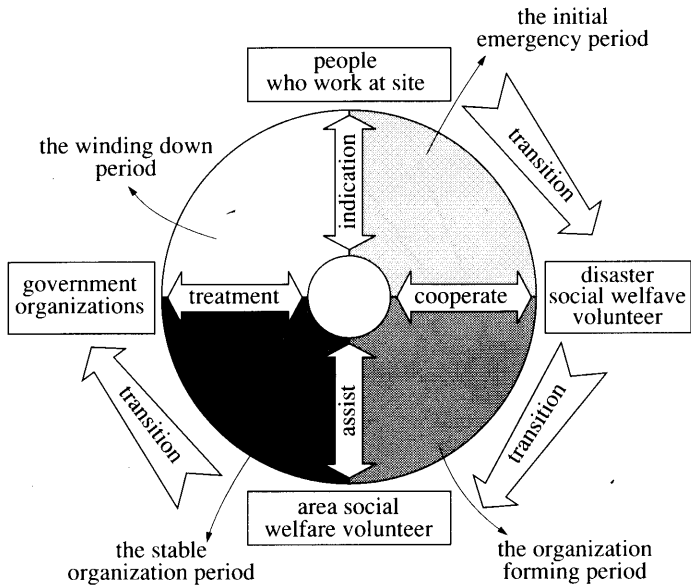


Figure 5 : A Model How the Organization of a Shelter Evolves Over Time

Method

We conducted five surveys after the 1995 earthquake, three of which are outlined below.

The First Survey

We conducted interviews from February 11-13, 1995 in Nishinomiya City, Ashiya City, Kobe City (Higashinada Ward, Nada Ward, and Chuo Ward) in Hyogo Prefecture, mostly in shelters constructed in schools and other public institutions. The persons interviewed were leaders of 32 shelters and volunteers of 25 shelters. The interviews were standardized, using the following points : 1. the present condition of the shelter, 2. the operation of the shelter, 3. the process of selecting a leader and their subsequent responsibilities, 4. the problems of management, 5. the distinctive qualities of the area, and 6. the specific characteristics of the leader.

The Second Survey

This survey consisted of a questionnaire sent out from the middle to the end of August 1995. The questions were the same as those in the first survey, that is about the operation of the shelters from February 1995 up to the time of their closing, or up to the time of the survey if they were not yet closed.

This survey was conducted with seventeen leaders of seventeen shelters. The questions asked concerned 1. the characteristics of the leaders and the circumstances that made them become

heads of shelters,2. when and why they left the shelters and the number of remaining victims who remained when they left or at the time of the survey,3. when the shelters were dissolved,4. what managerial transition measures were taken,5. problems in the shelters, and 6. the leaders' impressions of their work in the shelters.

The Third Survey

For this survey we interviewed 16 leaders, each from a different shelter, during the last ten days of March, 1996, over a year after the earthquake occurred. The subject of this survey dealt mostly with the role of the leaders when the shelters were closing down.

Results

Table 1 shows the classification of shelters in two cities set up after the 1995 Hanshin-Awaji Earthquake according to the length of time they were open. We found three months to be the ideal time length for a shelter to be in operation, but some shelters stayed in existence beyond that time frame.

Table 1 The initial emergency period and the organization forming period

	initial emergency period	organization forming period	stable organization period	winding down period
This model	immediately ~ a week	~ a month	~ two months	~ three months
Kobe City	immediately ~ one or two weeks	~ one or two months	~ three or four months	~ seven months
Nishinomiya City	immediately ~ a week	~ one or two months	~ two or three months	~ seven months

Our surveys began three weeks after the earthquake. So they took place during the organization-forming period. At that time the initial leaders, who were staff of institutions, had already been replaced by individual volunteer workers, who in turn had been replaced by members of established volunteer organizations that operated over large areas. Table 2 shows the data concerning the types of leaders.

Table 2 Data concerning leaders of relief shelters

<p>(1) physical characteristics</p> <p>1 the shelter scale (the refugee person number): 0~99persons...3 100~199...6 200~699...8 over 700...8</p> <p>2 the attribution of the building: primary school...10 junior high school...0 high school...4 university...2 other school...5 public facilities...3 park...1</p> <p>3 the nearness to trunk road: road side...11 non road side...13 not clear...1</p> <p>4 the area characteristics: residence area...18 commerce area...13 not clear...1</p> <p>5 suffered degree of periphery: many...9 middle...10 a few...6</p> <p>6 beforehand designated shelter: yes...11 not... 9 not clear...5</p>
<p>(2) characteristics of leader</p> <p>1 age: teen 2, 20~ 1 30~ 3 40~ 8 50~ 7 over 60 4</p> <p>2 vocation: company employees ...1 teacher...8 student...4 jobless or other...12</p>
<p>(3) the condition within operation /organization</p> <p>1 the continuation of the structure of organization before suffering: yes...13, no...12</p> <p>2 the day organization formation : that day...8, 17days after...9, 8...2 not clear...6</p> <p>3 organization formation circumstances: top down...19, bottom up...1, others...1, not clear...3</p> <p>4 the shift of leader : yes...6, not...18, not clear...1</p> <p>5 the role share of the shelter and social welfare activities yes...15, no...8, not clear...2</p>
<p>(4) relation with a foreign organization</p> <p>1 relation with administration: good...5, normal...17, bad...3</p> <p>2 presence of the organization social welfare activities yes...2, other group...8, not group...11, not clear...2</p>

Figure 6 is based on a study by Shimizu (1998) and is concerned with the people who played leading roles in shelter operations in Kobe City. Since the disaster was so unexpected and vast, most of the leaders were quickly designated and came from the managerial staff of schools. Shimizu’s study and ours agree on the distribution of the leaders’ ages, jobs, positions at work, and motivations to become leaders. Leaders of shelters who held managerial positions in their regular jobs accounted for 23,3 % of the shelter leaders, according to our survey held three months after the earthquake. Please see Figure 7.

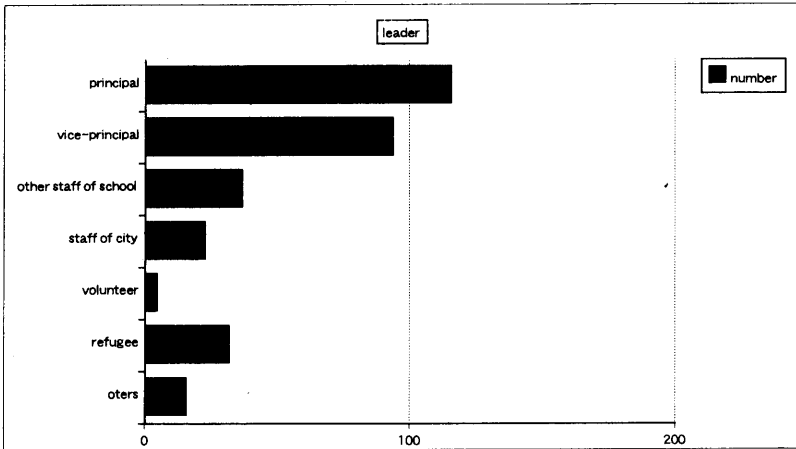


Figure 6 : Types of People Playing Leading Roles in Shelter Operations

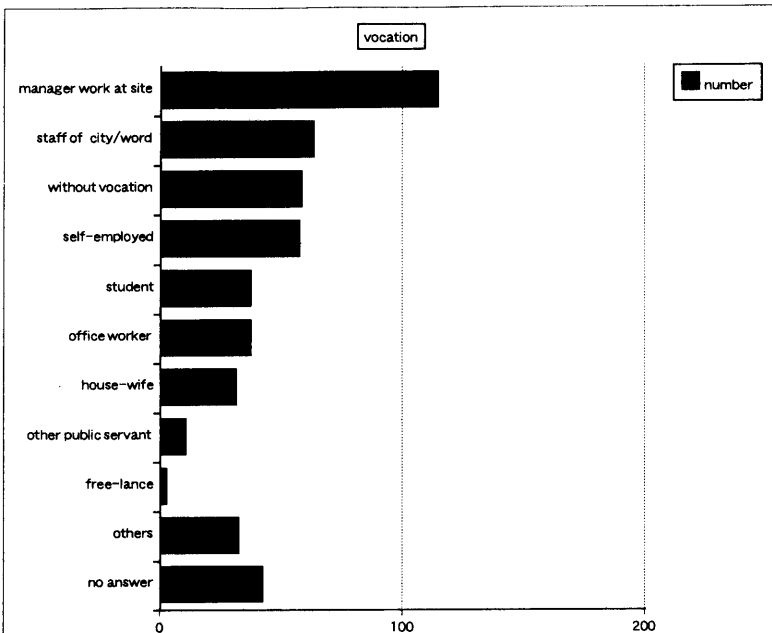


Figure 7 : Regular Jobs of Leaders Before the Earthquake and the Formation of Shelters

The Initial Coordination and Subsequent Transformation of Leadership

Regarding leadership, we found that the most smoothly managed shelters began with leaders from the staff of institutions or with individual volunteers, and then shifted to self-governing bodies within each shelter, and finally to volunteer organizations of large regions. We also found the importance of transferring leadership to self-governing bodies as early as possible. Likewise, we found it was beneficial if these self-governing bodies cooperated with the staff of institutions and also received assistance from individual volunteer initially and welfare volunteer organizations responsible for large areas after that.

The self-governing bodies were set up either by the staff of institutions, by volunteers, or by the refugees themselves. The most stable and well managed shelters were those which followed the leadership pattern starting with staff of institutions and progressing to individual volunteers groups and then to self-governing bodies before being managed by welfare volunteers of large organizations.

This smooth running process can be seen in Figure 8, which shows the early stage of leadership in shelters, for more details, please refer to the study by Matsui et al (1998).

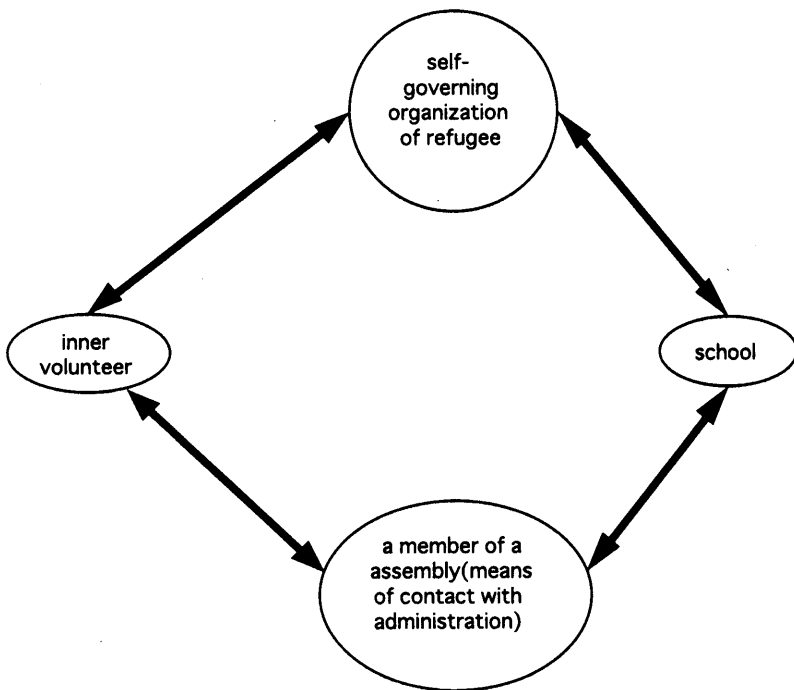


Figure 8 : An Ideal Model of Shelter Management at an Early Stage

Using the triangle model indicated in Figure 5 above, we found the most smoothly run shelters managed by the staff of institutions followed this pattern. Even more ideal would be a diamond-shaped model with an assembly person as the fourth factor. In the triangle model the staff of institutions served as a nucleus from which self-governing bodies were formed, either from

the incentive of the staff or from the wishes of the victims themselves. These in turn were given support by volunteer workers.

As time went on the institutions reverted to their original functions, such as schools, and the staff returned to their regular jobs. When that happened the self-governing bodies took over full leadership of the shelters. Although the welfare volunteer groups also left the shelters at about the same time, ideally they continued offering support to the shelters, especially if they were from a local area. Also, it was very helpful if refugees who had already left the shelters continued to offer assistance.

We found that when the refugees themselves formed self-governing bodies, yet followed the guidance of welfare volunteers, and when the relationships between the various leaders (from the refugees, institutions and government agencies) were harmonious, there were minimal problems. However, if the relationships between the leaders were controversial, there were many difficulties between the leaders and the victims. We found that serious problems happened most often in shelters where leaders took over spontaneously, rather than being elected or appointed, because their motivation was questionable or weak. These leaders tended to have bad relationships with the staff of the institutions and volunteer leaders, not to mention with the refugees themselves.

Therefore, we suggest that the most efficient model of shelter management is that in which the staff of institutions serve as the nucleus of management in the early stages and that those staff members direct the formation of self-governing bodies, and continue to coordinate with them. Then as the shelters begin to be reduced in number or made smaller, the leadership should shift more to the self-governing bodies and the initial leaders should return to their regular jobs.

So, although the general impression of most people is that shelters were continuously run by the same persons, in reality the leadership shifted throughout the duration of the shelters. Figure 8 shows when self-governing bodies were established, which occurred before the end of January in half the shelters. Table 2 shows that only ten places had well organized volunteer leadership three weeks after the disaster, and that 15 places, or 60% of the total shelter surveyed, had good coordination between leaders and volunteer workers. We found that although these leaders were from the managerial staff of institutions, the actual management in the shelters was mainly done by volunteer workers who performed social welfare activities.

Although the ideal transition of leadership began with the managerial staff of institutions or individual volunteers from far away and gradually shifted from self-governing bodies to social welfare workers, several shelters did not follow this pattern. In fact, in some shelters self-governing bodies were not even formed.

We also divided how people became leaders, we put these into three groups : 1. the spontaneously installed type, 2. the voluntary or elected type and 3. the type chosen because of the person's regular job, for example a manager or principal of a school. A detailed discussion of these types of leaders can be found in Shimizu et al (1995), so will not be presented here.

The operation of the shelters themselves can also be divided into three types, following the same breakdown as that of the leaders.

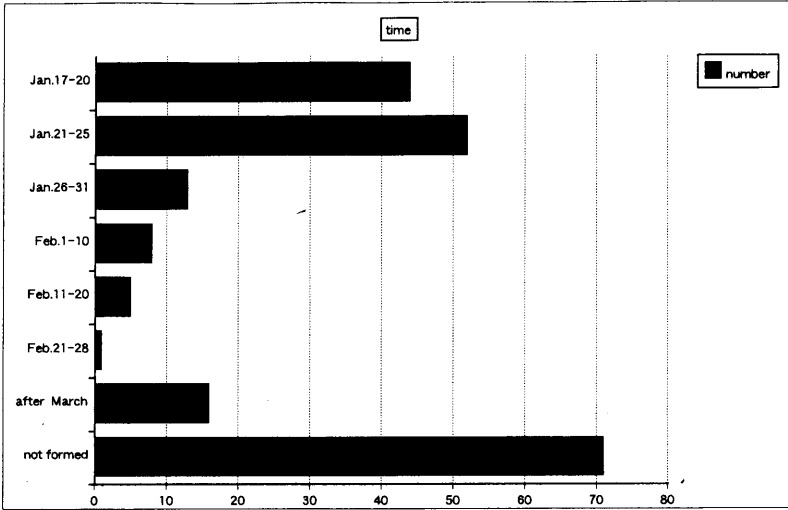


Figure 9: Timing of the Formation of Self-Governing Bodies

Although the ideal transition of leadership began with the managerial staff of institutions or individual volunteers from far away and gradually shifted from self-governing bodies to social welfare workers, several shelters did not follow this pattern. In fact, in some shelters self-governing bodies were not even formed.

We also divided how people became leaders, we put these into three groups : 1. the spontaneously installed type, 2. the voluntary or elected type and 3. the type chosen because of the person's regular job, for example a manager or principal of a school. A detailed discussion of these types of leaders can be found in Shimizu et al (1995), so will not be presented here.

The operation of the shelters themselves can also be divided into three types, following the same breakdown as that of the leaders.

1. Characteristics of Shelters Managed by Spontaneously-Installed Leaders

This type of shelter was mostly medium-sized, mainly in public parks in commercial areas, and took from 200 to fewer than 700 refugees. It took more than eight days to divide the victims into groups and to establish the headquarters, so there were delays in distributing relief goods and food. To compound the difficulties, relations with other organizations, such as government agencies, were strained, plus within these shelters themselves there was often an uneven distribution of work among the staff. In addition, many of these spontaneously installed leaders lacked motivation so there were innumerable problems concerning headquarter formation and management. Obviously, it was imperative that these leaders be replaced as quickly as possible.

2. Characteristics of Shelters Managed by Voluntary or Elected Leaders

These shelters were mainly small, unofficially built, and located in factory areas away from principal roads. Usually the formation of the headquarters and division of the refugees into groups

occurred within one week of the earthquake. We concluded that this was possible because of the ability of the leaders to relate to their situation subjectively.

3. Characteristics of Shelters Whose Leaders were Managers of Institutions Before the Earthquake

In some large-sized officially designated shelters, mainly schools, the leaders had been part of the regular management of those institutions. These places were usually located in residential areas along main thoroughfares and during the time of the disaster were assisted by Self Defense Forces. These shelters had an advantage in that they already had managerial systems in operation, so could easily be converted to well managed shelters immediately following the earthquake. Usually in these places of refuge, the victims were put into groups within two days, which was extremely early compared to other shelters. Therefore, the distribution of food and relief goods, such as blankets, could be carried out easily.

However, because of the excessive pressure upon the leaders, their health tended to deteriorate. This was exasperated by there being no one to replace them as qualified leaders, despite a large number of helpers, who were mostly untrained.

The Winding Down Period

The Winding Down Period of the shelters occurred when the leadership shifted from volunteer organizations of large regions to government agencies. At this time the smaller volunteer organizations were dissolved. We conducted our first survey of this transition period by interviews and mailed questionnaires one year after the disaster, when most of the shelters were already closed.

Although most shelters had been closed down by mid-April 1995, there were still more than 15,000 refugees remaining in shelters in Kobe City and more than 700 in Nishinomiya City at the end of July. The Kobe City Counter-Disaster Headquarters closed all of its shelters by September 30, but a total of 6,672 refugees were still living in 194 shelters. This reality does not fit into the ideal three months time-limit of shelters.

Our second and third surveys, which were discussed earlier, reached 19 shelters and were analyzed together. These surveys were done in many different types of shelters. First were five large-sized school shelters, with over 700 refugees in each, which had been managed by leaders who worked in those places both before and after the earthquake.

Second was one medium-sized shelter with 200 to 699 refugees. Third was one small-scale institutional shelter with 199 or fewer inhabitants. And next were one middle-sized and four small-sized shelters managed by voluntary leaders. After that came two large-scale school shelter managed by spontaneously installed leaders, one small institutional shelter and one small shelter, both built in public parks. Finally there was one medium-sized school shelter managed by an elected leader.

Transitions of Shelter Operations

Initially there were many student volunteers in the shelters, but between mid-February and mid-April they gradually left the area because of school responsibilities. As this happened, the

management of the shelters was transferred from the volunteers to the self-governing bodies. Also at this time, unfortunately, many emotional and leadership problems arose. Other volunteers were employees sent by their companies. They left the area between the middle of April and the end of June. Most of the shelters were dissolved between July and the last ten days of August. Then they were altered to "waiting" places. Unfortunately, the problems associated with the final closing down of shelters were hardly reported, because most shelters had already been dissolved by the end of August.

We found several reasons for the problems in medium to large shelters. First, the large size of many of them seemed to invite difficulties. Also, from mid-February to mid-March, many institutions resumed their original functions as schools. Likewise, often unidentified people entered these large scale shelters.

In medium to small shelters there were different sorts of problems. For example, some volunteers left without notice or drank alcohol with the refugees. We believe these problems arose because the volunteers in them had more free time than those in larger shelters.

As the shelters became smaller in size and fewer in number, there were other problems that came up. In large scale shelters the management had been extensive, but as the shelters were reduced in size and numbers, the operations systems, had to be significantly downsided. Compared to medium or small scale shelters, this change required almost an entire reconstruction of the original organization of the management. In medium-sized shelters many refugees hoped to stay on because of the convenience, so they did not apply for temporary residence in other areas. Between the middle of March to the end of June many refugees tried to prevent the closure of small shelters. However, no matter what the size and problems, all shelters were altered to "waiting" areas from the beginning of July to the end of August.

3. Loop Model

From the data collected during our survey we were able to systematically look at the situation and problems concerned with the shelters relationships to assisting need organizations and then to other shelters. This can be seen in Table 3.

From our survey's data we concluded five problems concerning shelter operations. First, there were no rules for the setting up of leadership. Each shelter found a leader in its own way. Second, the longer a shelter was in operation, the more frequently the leaders were replaced. This was because of the stress involved or because of the need of a leader to return to his regular job. Third, the time that volunteers could help was limited. For example, student volunteers had to return to school when the new academic year began in April. Also company volunteers could offer their services for only one week at most. Naturally, this rapid turn over of volunteers disrupted the operations of the shelters. Fourth, many measures taken by the government were not sufficient. Even none was effected by the disaster, so even administrative organizations themselves were unable to fully meet the needs of the refugees. Fifth, the aged and physically / mentally challenged remained in the shelters the longest. This was because of their private and economic circumstances. The aged tended to stay in the shelters the longest of all the groups of refugees.

Table 3 The situation of coordination for each shelter

shelter number	Type institution	external	regions	administration	change	dissolution
1	natural	○	○	○	no	7/20
3	natural	○			yes	8/31
4	voluntary	○		○	no	8/20
6	job	○	○	○	no	8/20
7	job	○	○		?	after8/17
8	voluntary	○	○		no	4/16
11	voluntary	○			yes	8/20
13	job	○	○	○	yes	8/31
15	natural	○	○		yes	7/31
18	job	○	○	○	?	after8/11
20	natural	○			yes	5/28
24	job	○	○		no	2/28
28	job	○			no	7/30
30	job	○	○	○		after8/7
31	voluntary					6/
33	job	○	○	○		7/30
36	job	○	○	○	yes	9/20
37	voluntary	○	○		yes	8/27

Type indicates leader types based on the taking up motivation.
 institution indicates the staff of institution.
 external indicates external volunteer.
 administration indicates administrative organization.
 change indicates leader's change.
 by Saido et al(1999)

Considering the above problems, we came up with the following ideas which could serve as a guideline, for the establishment of emergency shelters in the future.

1. Immediately after a disaster, the staff of institutions, such as schools, should manage the shelters, which would include putting the refugees into groups and distributing food and relief goods.
2. At this early period the initial leaders should be in charge for only one month.
3. If the first leader must return to his/her regular job, he/she should appoint a short-term volunteer worker to replace him/her. This second leader should also manage a shelter for only one month.
4. After the short-term volunteer has completed one month as a leader, he/she should be replaced by long-term welfare volunteers whose organizations serve large regions. Of course,

these leaders should coordinate with the refugees.

5. The long-term welfare volunteers should establish support systems for the aged and physically or mentally challenged.
6. The government should concern itself with long-term support systems for the refugees, while welfare volunteers should deal with short-term disaster relief. Even though the ideal time of duration of a shelter should be three months, measures should be taken for longer time periods when needed.

Our Loop Model reflects the ideal duration of shelters and the rotation of leadership in them, but we are also aware of the need for continued assistance from government organizations over a long period of time.

Conclusions

In this study we investigated the management of relief shelters after the 1995 Hanshin-Awaji Earthquake, using and verifying our Loop Model. Although this model was devised in a Japanese setting, it could be usefully employed or adapted in other parts of the world. Following are four guidelines taken from this model and a summary of our research.

1. The Initial Emergency Period (The First Week After the Disaster)

Immediately after a disaster there are specific emergency measures that must be taken: secure shelter areas, manage the refugees, coordinate with government agencies, gather information, distribute food and relief goods and so on. Naturally, leaders are vitally needed from the very beginning of the crisis, however, in the case of the 1995 Hanshin-Awaji Earthquake, the way in which leaders emerged varied widely, with no definite rules. And even in shelters "designated by the administration", the leaders were seldom officially appointed. In many instances the regular staff of institutions which had been turned into shelters took up leadership. Because they were in a position of authority in normal times, we feel that during the initial stages of a crisis they should become leaders, directing refugees and organizing the management of the shelters.

2. The Organization-Forming Period (Beginning From Three to Seven Days and Ending One Month After the Disaster)

During this period the staff of institutions, who are serving as shelter leaders, should develop system of management, encouraging the self-reliance of the refugees while they are in the shelters. Ideally these leaders serve for one month at most, so the self-governing bodies of the refugees should be trained to manage the shelters as soon as possible. In other words, as the shelters begin to run smoothly, the leadership should shift from the initial staff of institutions to short-term volunteers, then move to self-governing bodies of refugees, and finally in stage three below to welfare volunteers of large organizations.

3. The Stable Organization Period (From One to Two Months After a Disaster)

By this stage the running of the shelters has been pretty much established, but as recovery of the devastated area gets underway, many people, especially men, tend to leave the shelters, transferring their management to housewives and the aged. Because this can prove challenging, we suggest that now is the time for welfare volunteers of organizations responsible for large areas to take over.

These people should pay special attention to the needs of the aged and the physically / mentally challenged by contacting or establishing supportive organizations and by solisiting the assistance of residents in the region.

4. *The Winding Down Period (From Two to Seven Months After a Disaster)*

In this stage the most important concern is to encourage refugees to leave their shelter and to reconstruct their regular lives. At this time it is necessary for refugees to coordinate with government agencies. However, the most serious difficulty at this stage is dealing with people who are not able to leave their shelter for whatever reason.

In the 1995 Hanshin-Awaji Earthquake this problem caused the greatest amount of criticism towards the administration. Therefore, we feel the government should not only assist during the most acute stages of a disaster, but should also set up a supportive organization for long-term assistance.

We hope that the Triangle and Loop Models plus the guidelines we proposed in this report will be usefull in the future if a major disaster should ever arise again, but of course, we hope that such an occation will never occur.

References

- Kashihara, S. Ueno, J., & Morita, T. (1998). *The research of the shelters in Kobe-Awaji Earthquake disaster*. Osaka University Press (in Japanese)
- Matui, Y. Mizuta, K., & Nishikawa, M. (Eds.) (1998). *How did the shelter system operate then. -Leaders of relief shelters following the 1995 Hanshin Earthquake* Brain Shuppan (in Japanese)
- Saido, M. Matsui, Y. Shimizu, Y. Tanaka, M. Nishikawa, M. Fukuoka, Y. Mizuta, K. (1999). *A comprehensive Study of the Management of Emergency Shelter after a Large Scale Disaster*. (in Japanese)
- Shimizu, Y. Mizuta, K. Akiyama, M. Ura, M. Takemura, K. Nishikawa, M. Matsui, Y. Miyato, M. (1997). A study on leadership of relief shelter following the 1995 Hanshin Earthquake *Reseach in Social Psychology vol13, no1 1-12* (in Japanese)
- Sugiman, T. Atsumi, T. Nagata, M. Watanabe, T. (1995). The process of Organizing Emergency Shelters after the 1995 Hanshin Earthquake. A Participant Observing Study. *The Japanese Journal of Experimental Social Psychology. Vol35. no2 pp207-217* (in Japanese)
- Town planning research institute (1995). *The survey research regarding the operating system and welfare activities of the 1995 Hanshin-Awaji Earthquake disasters, the shelters/the social welfare activities headquarters*. (in Japanese)
- Watanabe, Y. (1981). *The eruption of Mt.Usu* in Hirose, T. (Eds.) *Social scientific approach to the disaster*. Shinyousha (in Japanese)

(Received October 14, 1998)

(Accepted December 8, 1998)