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Lessons from the Great Hanshin-Awaji Earthquake

1995.1.17

阪神・淡路大震災 教訓集

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Disaster Reduction and Human Renovation Institution

A Message to Readers

The Great Hanshin-Awaji Earthquake, which occurred on January 17, 1995, inflicted devastating damage in southern Hyogo Prefecture and surrounding areas. More than 6,400 deaths and approximately 10 trillion yen in damage was caused by this unprecedented catastrophe. In January 2005, the United Nations World Conference on Disaster Reduction (Hyogo Conference) was held in Kobe, Hyogo Prefecture, calling for efforts to reinforce disaster response capacity in developing countries and regions through international cooperation.

With this backdrop, the Disaster Reduction Learning Center (DRLC) was established on April 1, 2007 as the focal point for promoting effective development of human resources who engage in disaster reduction activities in developing countries and regions. The DRLC, based in the Hyogo International Center of the Japan International Cooperation Agency (JICA Hyogo), was launched with cooperation from JICA and the Hyogo prefectural government. The main activities of the DRLC include (1) overall coordination of learning courses in the field of disaster reduction; (2) implementation of such learning courses; (3) construction and systematic use of human networks; (4) development, maintenance and effective use of human and other resource databases for related activities; and (5) implementation of survey and research activities. The DRLC is located in the Kobe New Eastern City Center, or HAT Kobe, which was developed as a district symbolizing recovery from the Great Hanshin-Awaji Earthquake. In addition to the DRLC, numerous other disaster reduction-related and international institutions are concentrated in HAT Kobe. In cooperation with these institutions, the DRLC widely disseminates disaster reduction expertise accumulated in Japan to the rest of the world.

We at the Disaster Reduction Learning Center (DRLC) and the Disaster Reduction and Human Renovation Institution are pleased to issue this booklet, *Lessons from the Great Hanshin-Awaji Earthquake*, as a teaching material for disaster prevention training. This booklet aims to promote international human resource development in the field of disaster reduction, drawing on experiences and lessons from the earthquake. Sharing a wide range of precious lessons learned from the experience of the earthquake, this booklet was compiled as a message to people around the world and to future generations. We hope this booklet will serve as a useful teaching resource for people worldwide in considering disaster reduction and damage mitigation in their respective countries, regions and communities.

Hideo Morikawa
Director General, Disaster Reduction Learning Center
(Director General, Hyogo International Center,
Japan International Cooperation Agency)

Preface

It is extremely significant and important that in approaching ten years since the Great Hanshin-Awaji Earthquake we summarize the lessons learned from the disaster and convey those lessons to the world and the 21st century. This is because the earthquake's occurrence was unprecedented: it was the first time such an earthquake has struck a modern city with an aging population. It is possible that an even larger disaster could occur somewhere in the world in the future. This is the earthquake occurred in modern times, which we have been able to research in detail the process of restoration and recovery. The research can be retained and utilized in various forms, which in itself is an unprecedented achievement.



Yoshiaki Kawata
Executive Director, Disaster
Reduction and Human Renova-
tion Institution

This report identifies lessons vital for any citizens of disaster-prone countries for protecting life, restoring everyday living and communities, and preparing for potential disasters in the future. It summarizes the lessons from the viewpoint of the process which starts directly after the earthquake's occurrence and continues through the prolonged recovery. The lessons are based on a great deal of data and research that has been compiled thus far and on the knowledge of those who were directly involved. They are organized in terms of government efforts, which have been the conventional pillar of disaster reduction management, as well as individual efforts and mutual-help efforts, whose importance were reconfirmed with the Great Hanshin-Awaji Earthquake.

It is also important to realize that there are limitations to some of the lessons and other information that can be passed down; the lessons are not all necessarily universally applicable. It is not possible to definitely say that the lessons included in this report will continue to be universally applicable. This is because the society we live in has changed and will continue to change in the future. Our values will also change along with the times. Allow me to give an example. Thanks to the disaster countermeasures Japan has been continuously implementing, casualties have clearly decreased when comparing disasters occurring in 2004 and disasters of the same scale from 20 years ago. However, economic damage is incomparably more than it was 20 years ago. Moreover, today, casualties are directly impacted by the fact society has aged, and physical damage is directly impacted by the development of infrastructure for an affluent society. Accordingly, factors causing a society to be vulnerable to disasters emerge with the times and change with the times. The difficulty of disaster reduction management lies in this fact.

In addition, passing down fragmentary information on disasters sometimes conveys skewed conceptions of them and leads to mistaken action being taken. In order to avoid this, people who directly experienced disasters must communicate their lessons to future generations accurately and in an organized form.

Looking at lessons from this perspective, the importance comes into view of considering first and foremost how society, which constitutes the backdrop of a disaster, has changed. In other words, it is essential to think at that particular time and place. It is my earnest hope that the lessons contained in this report are read from this sort of perspective, that they serve as a starting point for learning and thinking about measures to prevent future disasters, and that they are utilized by many people.

This report summarizes lessons learned from the Great Hanshin-Awaji Earthquake. It consists of a source of learning and thinking about prevention.

Learn

Use every possible setting and opportunity to learn about disasters and disaster prevention

It is important to gain knowledge about disasters in the region, and memorize correct information about crisis survival through disaster-fighting drill and education for disaster prevention on a routine basis.

Protect

Protecting our lives and our towns ourselves

Disaster prevention is centered on Private efforts. Government efforts play an important role in the areas where private efforts or community efforts are not possible, and the coordination of private, community and government efforts are necessary.

Housing security protects your own family and your neighbors

In order to protect the lives of yourself and your family, it is vital to take precautions such as earthquake-proofing your house. Securing the safety of your own house also leads to an increase in the safety of the region.

Think

Using imagination in

Do not simply consider you must get to know the k in the area where you live. It is also imperative to mak in your everyday life, taking

Cooperate

For disaster victims, "residential security" and the "connections" between people are important

For disaster victims, residential security is central in the quest to rebuild their lives. The connections between people are also important keys towards putting lives back together.

It is essential to carry out adapted to the needs of disaster-s

It should be considered w truly require, in order that good intentions does not for the region.

transmits a message to people around world and future generations and is to be used as a reference for preventing and reducing future disasters.

Learn

Share the lessons gained from disasters, using it to aid disaster prevention and disaster mitigation.

Disasters repeat themselves. It is essential to pass on to the next generation the lessons which have been gained from past experience, making full use of this knowledge in all disaster countermeasures.

Link

Response to disasters

For our own safety; rather, to be aware of dangers which lurk around us and to take disaster preparations to the best of whatever steps you can.

Rate

It is the support which has been provided to disaster-stricken areas

What it is which disaster victims need, the support born of the disaster itself, and end up as a second disaster

Create

Creating our own towns ourselves

It is important to promote town planning by regional residential bodies. In addition, town planning which is good for the people and considerate of the environment is also strong in the face of disaster.

It is vital to make efforts directed towards regional independence at the earliest stage possible

The early opening of businesses and stores in disaster-stricken areas sustained the city directly after the disaster. In addition, efforts directed towards the recovery of the regional economy starting immediately after the disaster lead to the reconstruction of the region.

Shelters become regional bases

In times of disaster, information regarding disaster and daily life becomes crucial. For people in a disaster-stricken region, shelters become a regional base where they may obtain daily living information.

The following organizes the manifold lessons learned from the Great Hanshin–Awaji Earthquake and government efforts, 2) life, living, and community, and 3) emergency response and reconstruction.

Basic Elements for Developing a Culture of Prevention
1 Disaster Management Requires Coordinated Efforts by Individuals, Communities, and Governments 6
2 Importance of Residents Using Their Imagination in the Event of a Disaster and Not Thinking Themselves Disaster-Free 6
3 Importance of Transmitting to Future Generations the Lessons Learned from Past Disaster, and Applying those Lessons in Disaster Reduction Activities 7
4 Disaster information Lessens Damage 7

		Life		
Emergency Response	Individual effort	5 Accurate Assessment of Situation and Rapid Action Save Lives 8	Individual effort	6 Importance in Actions that Co
	Mutual-help effort	8 Significant Results from Rescue and Fire Fighting Activities by Communities and Neighbors 10	Mutual-help effort	9 Importance of Suitable to the Urban Areas and 10 Evacuation Community Centers in Areas
	Government effort	12 Importance of Wide-Area Disaster Relief Systems and Medical Systems 12	Government effort	13 Importance of the State of Disaster Damage Verification
Relief to Recovery	Individual effort	15 Engaging With Other People and Cultural Activities is a Source Strength 14	Individual effort	16 Emergencies Living and Community
	Mutual-help effort	18 Voluntary Activities Among Local Residents are Indispensable to Caring for Victims and Rebuilding Their Strength for Living 16	Mutual-help effort	19 Coordinating and the Government to Supporting the in Evacuation Emergency Housing
	Government effort	21 Importance of providing Emotional Support and Conscientious Care for Those Requiring Support 18	Government effort	22 Importance of Rebuilding Initiatives and New Development
Reconstruction and Mitigation/Preparedness	Individual effort	24 Importance of Being Prepared for Disasters in Daily Life 20	Individual effort	25 Corporate Disaster Activities in Communities Better Able to
	Mutual-help effort	27 Importance of Building Collaborative Relationships Among Various People and Groups, Including Residents, Volunteers, Specialists, and Public bodies 21	Mutual-help effort	28 Importance of Ways to Lessen Disaster Related to Housing
	Government effort	30 Importance of Human Resource Development through the Education and Training on Disaster Reduction, and Provision of Information 23	Government effort	31 People-Friendly Conscious City Communities that Cope

Awaji Earthquake: Lessons Matrix

earthquake from the three principal viewpoints of 1) individual efforts, mutual-help efforts, response, relief to recovery, and reconstruction and mitigation/preparedness.

Living		Community
Emergencies of Sober Consider Other Victims 9	Individual effort	7 Checking the Electricity and Gas and Other Actions of Individuals to Ensure That Fire Does Not Occur Help Protect the Community 9
Providing Assistance Needs of Disaster Stri- Local Communities 10	Mutual-help effort	11 Quickly Reopening the Stores and Local Businesses Supports Disaster Stricken Communities 11
Sites Serve as Comm- Disaster Stricken 11		
of Quickly Assessing age and Performing tion Inspections 13	Government effort	14 Importance of Coordinated Restoration of Roads and Lifelines 13
of New Ways of munity Businesses 15	Individual effort	17 Importance of Recycling Waste Products that Result from Disasters 16
Residents, Volunteers, ment is Indispensable Process of Living Centers and sing 17	Mutual-help effort	20 A Community-Building Perspective is Essential to Securing and Reconstructing Housing 17
of Rapid, Commercial tiatives Focused on ment 18	Governm ent effort	23 Housing Initiatives are the Cornerstone of Recovery Policy 19
saster Reduction junction with Local Create a Society Cope with Disasters 20	Individual effort	26 Ensuring the Safety of One's Home Protects One's Family and Neighbors 21
of Further Reviewing Economic Loss sing 22	Mutual-help effort	29 Importance of Advancing Resident- Led Urban Planning 22
ly, Environmentally- Planning Leads to Well with Disasters 23	Government effort	32 Importance of Promoting the Development of Disaster-resistant Urban Infrastructure 23

Incorporating Disaster Reduction into National and Local Government Policy
33 Importance of Establishing Laws and Legislation to Respond to Large-Scale Natural Disasters 24
34 Importance of Strengthening Initial Response to Address Disaster Rapidly and Appropriately 24
35 Importance of Financial Coordination by the Central Government in Order to Secure the Vast Amount of Financial Resources Needed for Reconstruction and Recovery 24
36 Importance of Land and Regional Planning Incorporating Disaster Prevention and Mitigation and Considering Natural Disaster Risk 25
37 Reconstruction and Mitigation/ Preparedness are Premised on Risk Assessment 25



I Basic Elements for Developing a Culture of Prevention

【Basic Elements for Developing a Culture of Prevention】

1 Disaster Management Requires Coordinated Efforts by Individuals, Communities, and Governments

The experiences of the Great Hanshin-Awaji Earthquake have made clear the importance of exhibiting strength by coordinating individual efforts engaged in by each member of the community, mutual-help efforts in which people come together and support one another, including residents, businesses, volunteers, specialists, and municipalities, and government efforts.

A general principle in times of disaster is that people will protect themselves. It is important, therefore, that individuals are psychologically prepared in their daily lives for the possibility of a disaster, and that necessary measures are implemented in advance. In addition, when a disaster actually occurs or there is a strong likelihood that one will occur, it is important that each individual takes appropriate action. Companies must also take necessary measures to protect the lives of their employees.

In addition to such individual efforts, it is important that the residents of an area remember the necessity of assisting their elderly and disabled neighbors.

In order for residents to look after their own communities, community members should combine their strengths on a regular basis to work for solutions to problems affecting their communities. And, when a disaster does occur, it is important that community members collaborate on efforts to keep damage in their area to a minimum as well as on initiatives aimed at the community's reconstruction. There should also be initiatives implemented through the collaboration of residents, local businesses, volunteers, specialists, government agencies and other organizations.

It is the responsibility of the national government and local governmental bodies to develop necessary disaster countermeasures to protect the lives and property of residents. At the same time, it is essential that the government support the individual efforts of individuals as well as the cooperative undertakings of community members.

A coordinated response consisting of individual, community and government activities is crucial for reducing the damage inflicted by a disaster and expediting the process of reconstruction.

【Basic Elements for Developing a Culture of Prevention】

2 Importance of Residents Using Their Imagination in the Event of a Disaster and Not Thinking Themselves Disaster-Free

At the time of the Great Hanshin-Awaji Earthquake, both residents and public agencies were convinced that if a disaster were to occur it would be caused by wind or flooding and that the Kansai area was not susceptible to large-scale earthquakes. Nevertheless, the Great Hanshin-Awaji Earthquake occurred and caused unprecedented damage.

Japan has suffered damage throughout its history from innumerable earthquakes, tsunamis, volcanic eruptions, wind storms, heavy rainfall, heavy snow fall, flooding, storm surges, debris flows, landslides, earth-falls and other natural disasters. And, there is a strong likelihood that such disasters will continue in the future. It is impossible to know when and where a disaster will strike.

When a disaster occurs, many people realize that they are truly frightening events and they tell themselves that they need to implement some countermeasures for the future. As time goes by, however, this determination fades. Thinking only that one is safe and secure or only that one's community is safe exacerbates the damage that is incurred should a disaster occur. Things that one cannot do in everyday life are not suddenly learned when a disaster strikes. For this reason, it is important for people to be constantly using their imagination, thinking, "what will happen to me in a disaster?, what will happen to my family?", and to be always considering disaster countermeasures and preventative measures so that action can be taken.



The state of towns in disaster-stricken areas



Toyooka city centre, submerged during Typhoon No. 23 (October 2004) (courtesy of Kobe Shimbun)



3

Importance of Transmitting to Future Generations the Lessons Learned from Past Disaster, and Applying those Lessons in Disaster Reduction Activities

Disaster Reduction and Human Renovation Institution has been established in order to transmit the experiences and lessons of the Great Hanshin-Awaji Earthquake to future generations so as to contribute both domestically and abroad to ameliorating damage inflicted by disasters, and to convey respect for the value of life and the importance of harmonious coexistence to the rest of the world.

Japan's environmental and geological circumstances make it highly susceptible to natural disasters. And, as is clear from its history of such disasters, inherent in Japan is the possibility of another large-scale disaster capable of severe damage over a large geographical area. In particular, concrete measures are urgent requirements in the Tonankai and Nankai regions, where there is a strong possibility of such an occurrence in the first half of the century, and in the Tokai region, where it would not be unusual for a major earthquake to occur.

The Great Hanshin-Awaji Earthquake has taught us many things. We must remember, however, that it is just one example of an earthquake striking directly beneath a major city.

It is essential that the lessons learned from the Great Hanshin-Awaji Earthquake and other past natural disasters are conveyed to the next generation, that these lessons are utilized in disaster countermeasures aimed at lessening the damage inflicted by disasters, and that each individual incorporates these lessons in their concrete activities.



People and Disaster Prevention Future Center Exhibition
(courtesy of Kobe Shimburn)

4

Disaster information Lessens Damage

Immediately after the Great Hanshin-Awaji Earthquake, a survey of earth-fall and landslides was carried out, and efforts were made to set up warning devices and install extensometers in dangerous areas. However, even though evacuation advisory for disasters were issued for some afflicted areas where earthquake-induced landslides could occur, cliffs slide away or buildings collapse, there were areas where accurate information was not adequately conveyed to the local residents, which caused confusion and disorder. Information related to daily life, such as on the distribution of basic provisions and water, was passed on primarily by word-of-mouth immediately after the earthquake struck. Accurate information gradually came to be provided, which allowed information on daily life to be provided at evacuation sites.

Based on the experiences of the Great Hanshin-Awaji Earthquake, disaster reduction organizations have made progress with installing wireless communications facilities to serve as an effective means of communication during disasters as well as with establishing disaster information collection and transmission systems. Furthermore, monitoring systems for

earthquake disasters, sediment disasters, tsunamis, volcanoes, rainfall, snow cover, and other natural events have been set up, which constantly monitor conditions as well as process and analyze data, and make predictions. The data is transmitted to related organizations and also made available to the general public.

Rapid collection and accurate conveyance of information is a prerequisite for effectively responding to disasters and reducing the damage inflicted. It is therefore important to continue establishing information communication networks that are particularly effective during disasters and to engage in disaster-related research and development to strengthen monitoring systems and predicative capabilities. Furthermore, in order to enable each and every resident to accurately grasp the prevailing conditions and take appropriate action during a disaster, it is important that warnings, evacuation orders and other disaster-related information be conveyed to the public in an easy to understand format by taking advantage of various communications media, including the Internet and mobile phones.

Hyogo Prefecture Phoenix Disaster Prevention System



“Disaster forecast – map screen”



“Up-to-the-moment disaster reports
– graphic information screen”

II Lessons Related to Emergency Response

【Emergency response】 【Individual effort】 【Life】

5

Accurate Assessment of Situation and Rapid Action Save Lives

At the time of the Great Hanshin-Awaji Earthquake, it was difficult to promptly convey information to the victims of the disaster because of congestion and interruptions on communication networks and confusion in the information collection systems of governmental agencies.

Fortunately, major confusion caused by false rumors did not occur in the aftermath of the earthquake. However, when conditions prevail in which disarray in information communication networks makes it difficult to obtain information, there is a danger that, motivated by false rumors, people will act erratically, which can result in a general state of panic. Therefore, it is important for people not to be taken in by rumors or unreflectively accept information of unknown origins, and that efforts are made to ensure accurate information is available.

At the same time, because there are many problems that can potentially arise in the aftermath of a disaster, it is not necessarily the case that accurate information will be readily available. To ensure conditions are accurately assessed and appropriate actions taken even in such cases, it is important that in their everyday lives residents learn accurate information and engage in related practices.

ご利用方法

「171」をダイヤルし、利用ガイダンスに従って、伝言の録音・再生を行ってください。



Message dial service for use in disasters
<NTT WEST website <http://www.ntt-west.co.jp/dengon/way/index.html>>



6

Importance in Emergencies of Sober Actions that Consider Other Victims

When a large-scale disaster or accident occurs, a city's normal functions are paralyzed and people are shaken psychologically, which can create panic or give rise to violence.

Chaos did not occur at the time of the Great Hanshin-Awaji Earthquake, even though it was a large magnitude quake occurring in a place where such earthquakes were not anticipated. Scenes of people standing in line to receive relief provisions and going to water trucks to retrieve water were shown by the global media as admirable. On the other hand, a spike in phone calls as people tried to verify the safety of others in the afflicted region overloaded telephone lines, and traffic became congested as victims evacuated and the general public used cars to transport the wounded.



Highly congested trunk roads
(courtesy of Kobe Shimibun)

In any situation, it is important to understand the circumstances of others, and not think only of oneself. Especially in times of disaster, although one may find oneself in trying circumstances, others are also suffering and facing similar predicaments. It is in times of disaster when people especially need to take sober action, encourage one another, and work together to overcome the crisis.



Disaster victims waiting to pick up relief supplies

7

Checking the Electricity and Gas and Other Actions of Individuals to Ensure That Fire Does Not Occur Help Protect the Community

The Great Hanshin-Awaji Earthquake occurred in the early morning hours in winter. Many people therefore were using gas and electrical appliances to heat their homes and cook breakfast. In the midst of the severe shaking caused by the magnitude seven earthquake, people were not able to extinguish the flames of their gas burners and heaters or turn off their circuit breakers, and this caused a large number of fires to break out immediately after the earthquake.

When an earthquake occurs, it is important to protect oneself in a safe indoor place until the shaking subsides, and when it does to then turn off any gas flames that were in use. Also, before evacuating to a safe location, it is important to first close off gas valves and turn off circuit breakers. Appliances using a flame like heaters and gas ranges should be inspected regularly, and flammable, hazardous materials like kerosene and aerosol sprays need to be managed properly. Also, it is neces-

sary to have a system to ensure these types of individual-level safety checks are conducted to the extent possible.



The force of the fire increased and burned down residential areas
(courtesy of Kobe Shimibun)

8 Significant Results from Rescue and Fire Fighting Activities by Communities and Neighbors

The Great Hanshin-Awaji Earthquake resulted in a great number of people being buried beneath collapsed buildings, so rescue efforts had to be initiated as quickly as possible. Although there were extreme shortages of rescue equipment and teams, the rescue efforts of local residents managed to save many lives.

In addition, in areas affected by the disaster, fires started simultaneously in several places immediately after the earthquake, making it impossible for fire fighters to go to every location where a fire had broken out. Given these conditions, initial fire fighting efforts were conducted by community members and local companies, and there were cases in which they were able to contain the fires remarkably well.



The region's citizens cooperate in order to conduct a rescue (courtesy of Kobe Shimbun)

In order to protect people's lives from earthquakes and fires, it is important that community members join forces to carry out rescue and initial fire fighting activities. Such activities should be prepared for through the activities of volunteer disaster reduction organizations in normal times. It is also important that local residents team up and help evacuate to safe locations elderly community members who would have difficulty evacuating themselves and disabled individuals and others who require assistance in times of disaster.



Citizens fighting fire using a bucket relay (courtesy of Kobe Shimbun)

9 Importance of Providing Assistance Suitable to the Needs of Disaster Stricken Areas and Local Communities

After the Great Hanshin-Awaji Earthquake, donations totaling more than ¥180.0 billion were given from within Japan and abroad. The donations were used for condolence payments and subsidies, were distributed to disaster stricken cities and towns, and used to support victims of the disaster. The larger the scale of damage is, the greater the number of victims and the greater the amount of donations that is required. It is important to collect as much in donations as possible to aid victims, as well as to effectively distribute the funds so that the good will of those sending donations is utilized and victims are helped.

At the time of the Great Hanshin-Awaji Earthquake, many volunteers came from across Japan to the affected areas. They distributed provisions, managed evacuation centers, provided medical care and daily living assistance, cared for animal victims of the earthquake, and engaged in a variety of other activities, thereby imparting hope and strength to the victims. At the time of the earthquake, however, there was no system in place for receiving volunteers, and there were almost no experienced coordinators. There were also numerous first-time volunteers arriving haphazardly without lodging or plans for meals, and making housing and other arrangements for them were sometimes a hassle for the disaster stricken communities. Volunteer activities are engaged in solely at the discretion of the volunteers. As such, volunteers should be self-sufficient; they should act based on the understanding that they need to do things on their own.

Large quantities of relief provisions were delivered to disaster stricken areas. However, among the items delivered were goods that could not be used by the victims, provisions requiring an excessive amount of work to sort through, and other impractical items. As a result, some provisions were disposed of by incineration and many distribution sites ended up stockpiling inventory. It is important for people to consider what items are truly required by disaster victims and to not send things that cannot be used in disaster stricken areas, are difficult to sort, or otherwise place an excessive burden on the affected communities.



Volunteers sorting out relief supplies



10

Evacuation Sites Serve as Community Centers in Disaster Stricken Areas

Immediately after the Great Hanshin-Awaji Earthquake, a large number of people were evacuated to, or sought refuge in, public facilities and other sites. The number of evacuees at its peak swelled to more than 300,000.

Evacuation sites functioned as community centers, where relief provisions and information could be obtained, for both local residents who had been evacuated and for victims that had returned to their homes.

Evacuation centers are intended to provide temporary housing until emergency residences can be secured, but they are also places where members of the same community can meet and talk with one another. It is essential that recovery and reconstruction efforts begin immediately after a disaster occurs in order to rebuild people's lives and revive communities as quickly as possible. It is also important to begin moving in the direction of recovery by utilizing evacuation centers, where community members can engage with one another, for discussions of community reconstruction issues and for sharing visions of the reconstruction process.



The state of shelters (courtesy of Kobe Shimbun)



Disaster contact information board in a shelter

11

Quickly Reopening the Stores and Local Businesses Supports Disaster Stricken Communities

The Great Hanshin-Awaji Earthquake caused major damage to local supermarkets and convenience stores. Some stores recommenced business in spite of being damaged by using motorcycles, small trucks, and boats to make deliveries. In addition, truck and taxi associations transported relief provisions and people with the cooperation of private-sector companies. The efforts of local businesses and stores to quickly recommence activities, despite the confusion in the immediate aftermath of the earthquake, were a powerful source of support for the afflicted communities.

It is important that local companies and stores strive to continue business activities or quickly resume operations, even in the aftermath of a disaster, in order to help speed the reconstruction of local communities and rebuild the lives of victims. It is also essential that distribution and transportation systems be in place to support the efforts of companies and stores.



Stores reopened for business soon after the disaster (courtesy of Kobe Shimbun)

On the basis of the experiences of the Great Hanshin-Awaji Earthquake, mutual aid agreements are being concluded across the country. Immediately after the occurrence of a major disaster, demand for emergency measures, such as rescue and firefighting activities, care for the injured and evacuation of the critically injured, increases dramatically. Because it is likely that, by itself, the local government in the disaster stricken area will not be able to respond to this type of scenario, national and regional public bodies are working to strengthen wide-area mutual aid relationships that transcend municipal and prefectural borders. In 1995, the Emergency Fire Rescue Team (Fire and Disaster Management Agency) and the Wide-Area Emergency Relief Team (National Police Agency) were launched as wide-area support units for measures in times of major disasters. Furthermore, the Disaster Countermeasures Basic Act and the Self-Defense Forces Law were amended, strengthening the authority of municipalities to request the dispatch of Self-Defense Forces and the authority of Self-Defense Forces officials to dispatch personnel in times of disaster. Disaster response is otherwise being implemented by incorporating lessons learned from the earthquake.

The Great Hanshin-Awaji Earthquake caused extensive damage to many medical facilities, rendering it impossible to provide adequate medical services within the disaster area. It therefore became necessary to evacuate critically wounded and hospitalized patients to medical facilities located outside of the region. However, difficulties were encountered even in trying to procure ambulances, and helicopters were underutilized as a means of wide-area transport. There was also the problem of not conducting medical activities efficiently. Excess time was taken to receive the medical relief teams and volunteers who came from around the country, and communications between these teams and local efforts did not proceed smoothly. In the time since the earthquake, there has been progress in initiatives aimed at enhancing disaster relief medical systems. It is important that wide-area, disaster relief medical systems are implemented, including readying helicopters and heliports, to allow medical personnel to save the life of each and every victim who can be saved.



Self Defence Force personnel searching for people who were buried alive (courtesy of Kobe Shimibun)



Medical teams which rushed to the disaster region (courtesy of Kobe Shimibun)



13 Importance of Quickly Assessing the State of Damage and Performing Damage Verification Inspections

Information collection for fire fighting organizations was marked by confusion immediately following the Great Hanshin-Awaji Earthquake, making it extremely difficult to assess and analyze the state of damage. Based on lessons learned from this earthquake, disaster reduction organizations are progressing with system implementation for information collection and distribution as well as disaster reduction. Because of the necessity of readying a system of rapid emergency response and conducting necessary measures when a disaster occurs, it is important that information related to the disaster, including general information is assessed quickly as soon as the disaster occurs.

For the Great Hanshin-Awaji Earthquake, damage certification was utilized based on evaluation criteria for whether a given instance of damage qualified for relief measures. However, at the time, the only uniform standards for verifying damage in order to issue damage certification were extremely old

and not compatible with modern housing structures and specifications. Based primarily on visual inspections of the outside of the structure, the old system sometimes resulted in varying judgments depending on the inspector. Moreover, there were also local governments that conducted investigations with original evaluation methods and did not utilize the uniform standards. In the time since the earthquake, the national government has revised these uniform standards for damage certification, making it possible to carry out objective inspections corresponding to the structure and specifications of modern residential buildings. In order to make use of damage certifications, the inspections on which they are based must be carried out accurately. It is therefore important that a system is established by which the state of damage can be quickly assessed and verification inspections rapidly conducted.

【Emergency response】 【Government effort】 【Community】

14 Importance of Coordinated Recovery of Roads and Lifelines

The Great Hanshin-Awaji Earthquake inflicted extensive damage on the urban infrastructure including the roads and utilities that support the lives of residents and activities of cities. Transportation was severely obstructed by damage to road structures as well as by other obstacles that were scattered about including debris, toppled telephone poles and roofs, and abandoned vehicles. Because of the necessity of quickly clearing transportation routes for the delivery of equipment, personnel and emergency supplies for rescue and fire fighting activities and road-clearing operations were undertaken by transportation officials and road maintenance crews. For electrical, gas, water and communications facilities as well, damage inspections and recovery work was advanced immediately following the earthquake with the assistance of utility providers from outside the region. Telephone services were up and running the day after the earthquake struck, electricity took approximately one week, and water, sewage and gas were recovered in roughly three months. (LP gas was recovered in two weeks and water was available to all customers in three months.)

The transportation infrastructure must be restored as soon as possible in order to carry out emergency/relief response measures, including emergency response after the disaster occurs, restoration of communications, and delivery of equipment, personnel and emergency supplies for rescue and fire fighting activities. In addition, to enable the residents to resume their lives, the city to perform its administrative functions, and economic activity to restart, it is important that a support system is in place for recovering utilities and that the facilities are quickly reestablished. It is also essential that such recovery activities are coordinated with one another.



Lifeline rehabilitation work
(courtesy of Kobe Shimbun)



III Lessons Related to the Process from Relief to Recovery

【Relief to recovery】 【Individual effort】 【Life】

15

Engaging With Other People and Cultural Activities is a Source Strength

In the region affected by the Great Hanshin-Awaji Earthquake, uplifting catch phrases "Cheer up, Kobe!" and meet-and-greet activities intended to lend encouragement to the participants, along with participation in health, art, cultural and sporting activities, and establishment of Kobe Luminarie, an event initiated after the earthquake that is now held annually each winter, enabled all the people affected by the disaster to remain determined to continue with reconstruction and allowed them to face many difficulties. In addition, those victims who responded to changes in their living environment by retreating to their homes were invited to participate in health, cultural and sports activities to prevent them from isolating themselves from their communities.

Engaging with people and cultural activities provides strength to victims who become despondent due to a disaster, and serves as a driving force toward reconstruction. Restoring the connections among people is an important key to rebuilding lives.



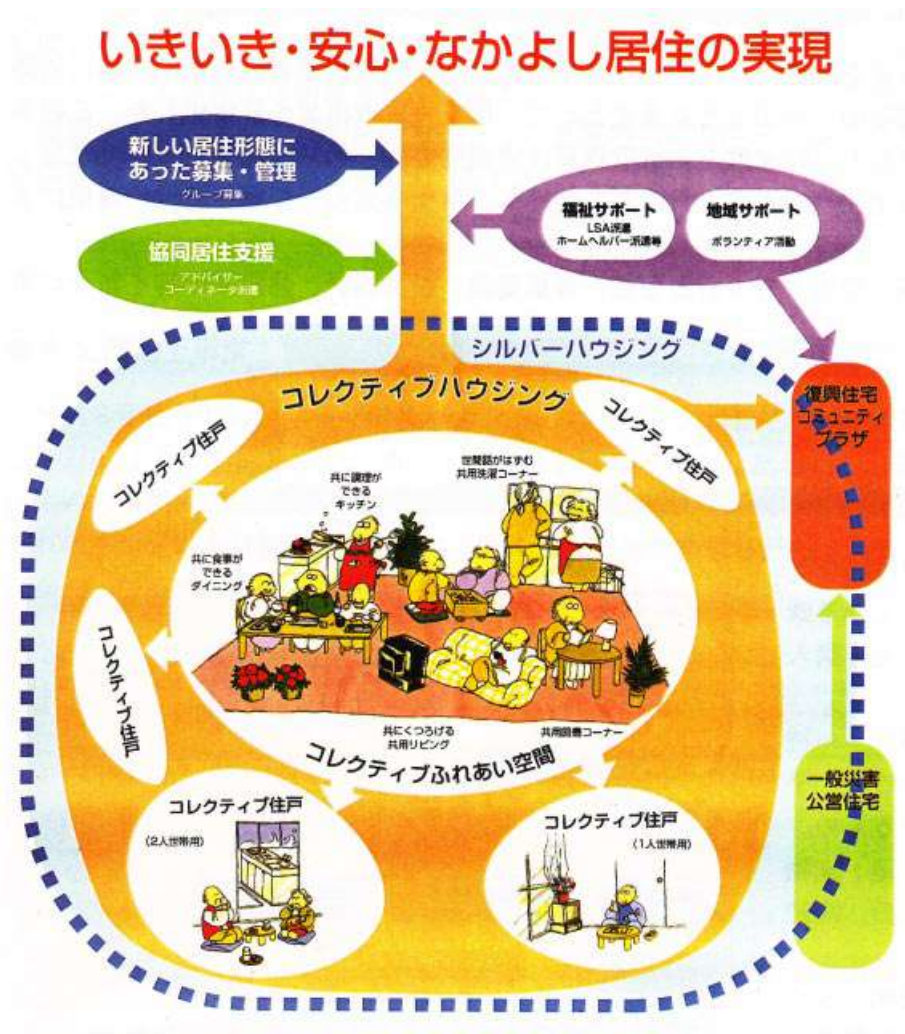
Elementary school visits
by the prefectural Piccolo Theatre Company



Kobe Luminarie (courtesy of Kobe Shimbun)
C Valerio Festi/I&F Inc./Kobe Luminarie O.C.

Collective housing was introduced following the Great Hanshin-Awaji Earthquake in order to build and maintain communities. Relief funds were granted to companies supplying group housing (for disaster reconstruction) with resident support staff. Also, after the earthquake, community businesses with close connections to local areas were developed in a number of fields by local residents, non-profit organizations (NPOs) and others. Community businesses are autonomous initiatives by community members to solve local problems by reviving business activity, so results can be expected with respect to resident-led community building, employment creation and revitalization of local economies.

It is important that new initiatives, such as these that were undertaken after the Great Hanshin-Awaji Earthquake, take root, given the diversification of lifestyles, ways of living, and ways of working that occurs with a disaster. In aging societies with low birth rates, it is important to incorporate into ways of living and working the idea that people live in communities and that the ties among people should be preserved.



Collective house

17

Importance of Recycling Waste Products that Result from Disasters

In the areas affected by the Great Hanshin-Awaji Earthquake, a large amount of rubble was generated, a large volume of household goods that could no longer be used was thrown out, and many unnecessary daily items were thrown away as people moved from evacuation centers to emergency housing.

While public funds were utilized for dismantling and disposing uninhabitable housing units in order to speed the process of reconstruction and recovery, it has been noted that this led to some buildings that could have been salvaged and repaired being torn down.

At the same time, volunteers with technical knowledge in light carpentry work or repair of furniture and fixtures promoted reuse and encouraged people to not throw out all waste from the disaster, so there was also substantial activity on this front.

Some of the emergency housing units constructed after the earthquake that were capable of being reused were provided to Turkey and Taiwan as temporary housing for victims of disasters.

In recent years, the trend toward a recycling-based society has gathered momentum. With the promulgation and enactment of the Construction Waste Recycling Law, it has be-

come mandatory to dismantle houses room by room. In addition, various recycling laws have been established, including the Home Appliance Recycling Law. We need to strive to take actions in our daily lives that do not excessively impact the environment, and even in times of disaster, it is important to throw out as little waste as possible.



Massive amounts of waste arising from the disaster
(courtesy of Kobe Shimbun)

18

Voluntary Activities Among Local Residents are Indispensable to Caring for Victims and Rebuilding Their Strength for Living

Following the Great Hanshin-Awaji Earthquake, victims who had trouble facing drastic changes in their living environments and relationships increased, as did those who tended to confine themselves to their homes. In disaster stricken areas, initiatives were undertaken to help victims recover both physically and mentally through meaningful and fun activities. Social activities were conducted to prevent elderly residents living alone from becoming isolated from their communities and health programs were implemented, which helped both build and care for the community. Through these activities many disaster victims were able to restore their mental and physical health. In addition, art and cultural activities were organized soon after the earthquake, and these touched the hearts of victims and provided them strength. The earthquake has lent vitality to the art and cultural activities of community members and private associations in the areas affected by the disaster.

Since the earthquake, in communities affected by the disaster, there has been increased momentum toward autonomous initiatives by residents to address community issues, and activities have developed among community members in a variety of areas, including social services, disaster reduction, the environment and culture. In order to stabilize and revive normal day-to-day living after a disaster, it is important to develop activities in which community members cooperate with one another and support the community.



Aged citizens have a lively conversation in a group home
(courtesy of Kobe Shimbun)



【Relief to recovery】 【Mutual-help effort】 【Living】

19 Coordinating Residents, Volunteers, and the Government is Indispensable to Supporting the Process of Living in Evacuation Centers and Emergency Housing

After the Great Hanshin-Awaji Earthquake, many school and government employees, volunteers and others engaged in activities to support daily life in the evacuation centers. In addition, volunteers, government employees and specialists in many fields, including social services, healthcare and medicine, contributed to supporting the daily existence of senior citizens living in emergency housing.

In evacuation centers and emergency housing, community members and residents of the facilities should cooperate with one another and live autonomously. Coordination of various individuals, including volunteers, specialists and the government is indispensable to achieving this.



Distribution of rice to shelters

【Relief to recovery】 【Mutual-help effort】 【Community】

20 A Community-Building Perspective is Essential to Securing and Reconstructing Housing

A large amount of emergency housing and public housing for disaster reconstruction was supplied in the aftermath of the Great Hanshin-Awaji Earthquake. Projects have been undertaken for supporting the day-to-day lives of those living in emergency housing or public housing for disaster reconstruction. The underlying aims of the projects are looking after the community and promoting social interaction. Various problems, however, have been pointed out, including the weakening of community ties.

Securing emergency housing is an important first step in rebuilding housing for victims, but rebuilding their daily lives is essential to proceeding with full-fledged reconstruction of housing. It is therefore important to progress with securing and rebuilding housing in a way that value the ties among people.



Aged receiving care in a collaborative lifestyle known as “Take-hisa-sho” (courtesy of Kobe Shimbun)

21 Importance of providing Emotional Support and Conscientious Care for Those Requiring Support

Sustained and inflated stress levels caused by tremendous psychological shock from the Great Hanshin-Awaji Earthquake sometimes resulted in Post-Traumatic Stress Disorder (PTSD), which hindered normal social life. In the aftermath of the earthquake, conscientious initiatives were undertaken to help provide emotional support, including establishing mental health clinics and setting up emotional support centers on the premises of emergency housing units.

In addition, demand for a substantial amount of social, healthcare and medical services was expected for those requiring support in the event of a disaster, particularly the elderly and disabled, so restoration of the systems to provide such services was expedited. In the city of Kobe, volunteers deemed Life Support Advisors not only cared for the elderly and disabled, but also engaged in community activities. Presently, care providers have been stationed at home nursing care support centers, and the scope of the program has been expanded from public housing for disaster reconstruction to regular communities, as progress continues on a citywide care system.

To aid recovery from the psychological shock of a disaster and to restore and stabilize normal day-to-day living, it is important that the wisdom and experience of many people, including the staff of NPOs, volunteers, specialists, and government workers, is pooled together and used to provide emotional support and conscientiously respond to the needs of those requiring support in times of disaster.



Counselling in shelters

22 Importance of Rapid, Commercial Rebuilding Initiatives Focused on New Development

The Great Hanshin-Awaji Earthquake struck in the midst of national economic stagnation, so it inflicted major damage on the economies of Kobe and other affected areas. In areas stricken by the disaster, existing industries were revived and initiatives were advanced aimed at transforming the industrial structure through enticements to companies in new areas of business. However, while the urban infrastructure was recovered relatively quickly, the rebuilding of micro, small, and medium-sized businesses and the population of commercial districts lagged behind. As a result, it required a substantial amount of time before the economies of disaster stricken areas were able to recover. Unless measures directed at economic recovery are implemented immediately following a disaster, the recovery of the entire region will be delayed. It is therefore important that commercial rebuilding commence soon after a disaster has struck. Also, it is important to prepare support measures that are easy for businesses affected by a disaster to utilize.



“Shoe Plaza” , a symbol of the chemical shoe industry
(courtesy of Kobe Shimbun)



The Great Hanshin-Awaji Earthquake caused the total destruction of approximately 100,000 housing units, and the partial destruction of approximately 190,000 units, which necessitated the supply of a large amount of emergency and permanent housing. Based on the Disaster Relief Law, 48,300 units of emergency housing were supplied to Hyogo Prefecture and 1,381 units were supplied to Osaka Prefecture. Under the Hyogo Prefecture Housing Reconstruction Plan, 125,000 units of permanent housing were planned, and an enormous amount of public funds has been spent on 38,600 public housing units for disaster reconstruction as well as on other projects.

Other housing measures were also implemented, including reducing rents for public housing, assistance for moving from emergency housing to permanent housing, and the introduction of collective housing and group homes.

Furthermore, there were strong calls for assistance in rebuilding privately owned homes in damage stricken areas. This has led to partial amendment of the Disaster Victim Relief Law in March 2004, which established a system for providing assistance for housing stability and a framework for cash payouts in support of stable housing.

The greatest concern for the victims of a disaster is securing housing. Securing housing, which constitutes the foundation of day-to-day living for disaster victims, not only stabilizes victims' lives and local communities, it revitalizes the communities, which is why housing initiatives should be the cornerstone of reconstruction policy.



Reconstructed public housing (courtesy of Kobe Shimbun)



IV Lessons Related to Reconstruction and Mitigation/Preparedness

【Reconstruction and mitigation/preparedness】 【Individual effort】 【Life】

24

Importance of Being Prepared for Disasters in Daily Life

It is important to be prepared for disasters in everyday life so that sober actions can be taken when a disaster occurs.

For example, just as people receive medical checkups to manage their health, it is important for people to conduct safety inspections of their homes, and conduct reinforcement work and take other measures should improvements be required. It is also important to conduct safety inspections that include preventing household furnishings from toppling over and falling down, because such things can be extremely dangerous when people are at home during an earthquake.

Immediately after a disaster occurs, it may be extremely difficult to procure daily necessities, so it is important that provisions such as food, water, and medical supplies are set aside in places that can be easily accessed in the event of a disaster. Also, because there is the possibility of a fire breaking out in

one's house or neighborhood, it would be helpful in emergencies to keep a fire extinguisher and buckets ready at hand and to regularly leave water in the bathtub. Furthermore, it is important for family members to discuss and confirm communications methods, evacuations sites, and other related issues.

It is important, in everyday life, to learn and think about disaster reduction, and for people to practice the countermeasures they are capable of implementing so that appropriate actions can be taken without panic, even when disasters occur.

【Reconstruction and mitigation/preparedness】 【Individual effort】 【Living】

25

Corporate Disaster Reduction Activities in Conjunction with Local Communities Create a Society Better Able to Cope with Disasters

The Great Hanshin-Awaji Earthquake occurred early in the morning. If it had occurred in the middle of the day, however, many people commuting to companies concentrated in downtown areas would likely have fallen victim to the disaster, and the extent of the damage would have been much worse. Since the earthquake, companies in the disaster stricken areas have strengthened their crisis management systems and engaged in their own disaster reduction activities.

It is important for companies to engage in risk management, which includes drawing up disaster reduction plan and business continuity plan (BCP), so as to be able to safeguard the lives of employees and customers and continue business activities even in times of major disasters and accidents. Companies are also members of the community, so it is important for them to work with local residents on improving local disaster reduction measures.



Former residential area liaison council disaster prevention activities
(courtesy of Kobe Shimbun)

26

Ensuring the Safety of One's Home Protects One's Family and Neighbors

Approximately 95% of the buildings that collapsed in the Great Hanshin-Awaji Earthquake were built before the new earthquake-resistance standards, which went into effect in 1981. It is estimated that more than 80% of people, who lost their lives in Kobe, were killed by collapsing buildings. Also, in dense urban districts, multiple fires broke out at the time the earthquake struck. The fires then spread and caused even more damage and casualties. It is important therefore to not only ensure the safety of houses themselves, but also to ensure safety inside through measures that include preventing home furnishings from being able to fall down or topple over.

The original role of a house is to provide a shelter to sustain life. In order to protect the lives of oneself and one's family, it is important to ensure that one's house is retrofitted for earthquake-resistance and to implement other safety measures inside. Ensuring the safety of one's home is also connected to protecting the lives of people in the same neighborhood.



Collapsed private housing (courtesy of Kobe Shimibun)

	death rate	rate of complete collapse	rate of partial collapse	rate of damage	rate of minor damage	rate of fire damage (%)
Higashinada Ward, Kobe City	0.623	36.5	16.0	44.5	18.0	1.0
Nada Ward, Kobe City	0.606	28.8	14.2	35.9	27.2	1.8
Hyogo Ward, Kobe City	0.325	19.5	20.0	29.5	33.5	3.1
Nagata Ward, Kobe City	0.515	25.6	22.0	36.6	32.4	7.0
Suma Ward, Kobe City	0.149	22.4	27.1	35.9	23.0	4.2
Chuo Ward, Kobe City	0.144	11.2	14.5	18.5	31.3	0.4
Amagasaki City	0.006	1.2	4.0	3.2	26.5	0.0
Nishinomiya City	0.207	13.8	11.8	19.7	26.0	0.1
Ashiya City	0.409	24.0	12.6	30.3	26.3	0.1
Itami City	0.005	1.9	5.3	4.6	33.7	0.0
Takarazuka City	0.038	4.0	5.6	6.8	24.6	0.0
Total	0.214	13.0	11.3	18.6	27.4	1.2
Correlation coefficient with mortality	—	0.933	0.486	0.877	0.231	0.408

(Source) Eiichi Itoigawa: "1.3 Analysis of the association between human suffering and architectural damage", Report on fires which occurred in the south of Hyogo Prefecture in the 1995 earthquake, taken from p24, 1996.11, Japan Association for Fire Science and Engineering (Data) Regional Disaster Prevention Data Overview - Compilation of Fundamental Data from the Great Hanshin-Awaji Earthquake

Various causes of death

27

Importance of Building Collaborative Relationships Among Various People and Groups, Including Residents, Volunteers, Specialists, and Public bodies

The Great Hanshin-Awaji Earthquake taught us the importance of combining the strengths of each individual and tackling a variety of problems. It can truly be said that reconstruction in disaster stricken areas succeeded precisely because the energies of local residents, volunteers and specialists, who came from all across Japan, and the government were combined to tackle the problem.

In particular, the earthquake served to remind many people of the importance of community. Local reconstruction was achieved because of the strength of communities. Since the earthquake, local areas affected by the disaster have worked to foster community and voluntary disaster-reduction groups and these activities have grown in vitality.

In addition, volunteers and NPOs played an important role in various fields. Today, the existence and role of volunteers are recognized by society. But work remains on a number of issues including how to divvy up the responsibilities of volunteers and how to train coordinators.

For the Great Hanshin-Awaji Earthquake, a system for dispatching specialists was created with reconstruction funds,

and there were instances of specialists in many fields coordinating with one another and working to support local reconstruction efforts.

In order to protect the community and the lives of its members, it is important to build collaborative relationships in normal, everyday life among local residents, volunteer disaster-reduction associations, specialists, government workers and other groups.



Disaster prevention training by citizens (courtesy of Kobe Shimibun)

28

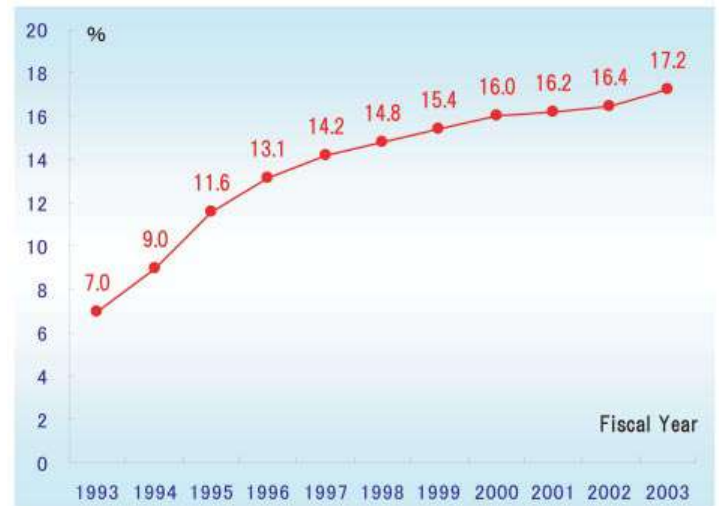
Importance of Further Reviewing Ways to Lessen Economic Loss Related to Housing

Rebuilding housing, which constitutes the foundation of day-to-day life, is indispensable to rebuilding the lives of disaster victims. However, for victims with anxiety related to their daily lives, numerous conceivable difficulties may arise in progressing with work on repairing or rebuilding damaged homes.

Since the Great Hanshin-Awaji Earthquake, more and more households have taken out earthquake insurance; however, the overall number still remains low, which shows that the earthquake insurance system is not yet very popular. If one imagines that one's own home had been damaged in a large-scale disaster, the importance is apparent of taking measures in advance to reduce the economic burden of such a loss.

Since the Great Hanshin-Awaji Earthquake, a mutual aid system has been proposed in which homeowners pay premiums in order to reduce, to the extent possible, the economic burden related to rebuilding the homes of disaster victims.

When restoring or rebuilding a damaged home does not proceed smoothly, it has an adverse impact on day-to-day life. It is therefore important that further discussions are held on mechanisms for reducing economic loss related to housing.



A change in the rate of subscription to earthquake insurance policies
 (Data from Non-Life Insurance Rating Organization of Japan)

* Data excluded Fraternal Insurance

29

Importance of Advancing Resident-Led Urban Planning

With respect to reconstruction in urban districts affected by the Great Hanshin-Awaji Earthquake, there were some areas in which large gaps existed between the local government's proposals and the plan sought by local residents, which caused delays in determining a course of action and other problems. Many districts, however, used this opportunity to create community development councils, and the initial opposition moved in the direction of collaboration.

Community members play the leading role in their communities. In order for the reconstruction of local communities to be a success, resident-led urban planning is essential. However, after a disaster occurs, even if the local residents gather and address local reconstruction issues, things often do not proceed smoothly. It is therefore important that local residents think about the development of their communities and engage in related initiatives in normal times. It is also important that a system is in place for supporting resident-led activities.



Members of the town planning council
 (courtesy of Kobe Shimbun)



【Reconstruction and mitigation/preparedness】 【Government effort】 【Life】

30

Importance of Human Resource Development through the Education and Training on Disaster Reduction, and Provision of Information

To lessen the damage caused by disasters, it is necessary to train people who are conscious of disaster reduction measures in their everyday lives and who can take sober, appropriate actions even in times of disaster. Therefore, it is important to promote the education on disaster reduction for a variety of people and groups, including the next generation of children, administrators and disaster-reduction staff in the national government and local public bodies, fire fighters and fire fighting associations, volunteers, NPOs and local residents. Practical training in normal times is also important so conditions can be grasped accurately and appropriate actions taken when a disaster occurs.

Furthermore, to ensure residents are able to protect their local communities, it is important to provide easy-to-understand information on local dangers and other issues by means such as creating and making public, maps of hazardous areas. It is also essential that a supportive environment be developed for teaching and training by local residents.



Water drainage training at “Give it a try week”
(courtesy of Kobe Shimbun)

【Reconstruction and mitigation/preparedness】 【Government effort】 【Living】

31

People-Friendly, Environmentally-Conscious City Planning Leads to Cities that Cope Well with Disasters

Many elderly people lost their lives in the Great Hanshin-Awaji Earthquake. The elderly, children and the disabled are the most vulnerable when a disaster strikes. Advancing community development that enables people who cannot care for themselves in times of crisis to live their daily lives in safety and security leads to the building of safe, secure cities that cope well with disasters. Based on the lessons of the Great Hanshin-Awaji Earthquake, it is important to promote universal design of safe, secure cities with mechanisms in place through which everyone can participate in local community planning.

The Great Hanshin-Awaji Earthquake has reconfirmed the necessity of always remembering to have reverence for nature. It is important to build a sustainable society in which the natural environment is protected and fostered, and impact on the environment is curtailed as much as possible.

【Reconstruction and mitigation/preparedness】 【Government effort】 【Community】

32

Importance of Promoting the Development of Disaster-resistant Urban Infrastructure

The Great Hanshin-Awaji Earthquake demonstrated that the structure of Japanese cities is extremely weak with respect to natural disasters. In the disaster area, the urban infrastructure that supports citizen lives, urban activities, and economic activities, including highways and roads, ports, railways, waterworks and sewage systems, electric power grids, gas lines, and communications facilities, suffered extensive damage. Recovery of city infrastructure was carried out in a short period of time, based on the Emergency Three Year Infrastructure Plan, which minimized the adverse impact of the disaster on citizen lives and economic activities. Also, the earthquake served as an

opportunity to work to make infrastructure earthquake resistant. Work was done on infrastructure that supports citizen lives, urban activities and economic activities, such as waterworks and sewage systems, electric power grids, gas lines, highways and roads, railways, communications facilities, and ports.

It is important that disaster-reduction projects continue and that the development of public infrastructure such as utilities, roads, railways, ports, and public buildings is promoted in order to prevent and reduce damage caused by disasters.



V Incorporating Disaster Reduction into National and Local Government Policy

【Incorporating Disaster Reduction into National and Local Government Policies】

33 Importance of Establishing Laws and Legislation to Respond to Large-Scale Natural Disasters

The experiences of the Great Hanshin-Awaji Earthquake led to substantial amendments to the Disaster Countermeasures Basic Act, and work has been done to develop and enhance related laws and ordinances in many areas. Work is also being done to enhance response to earthquakes in the Tonankai, Tokai, and Nankai regions. Furthermore, in order to support rebuilding of the lives of disaster victims, the Act Concerning Support reconstructing Livelihoods of Disaster Victims has been enacted. In this manner, Japan has established a full-fledged, disaster-related legal code comprising disaster-related legal provisions, led by the Disaster Countermeasures Basic Act; relief countermeasures, including the Disaster Relief Law and the Disaster Victim Life Support Law; recovery after a disaster and

economic and financial measures; measures for earthquakes, volcanic eruptions, typhoons, nuclear facilities; and laws related to mitigating/preparing all types of disasters.

On the impetus of the Great Hanshin-Awaji Earthquake, thinking is taking root on a comprehensive disaster-reduction policy that also covers disaster reconstruction. It is important to establish and promote a comprehensive risk management system, including a series of policies covering everything from pre-disaster countermeasures to reconstruction measures, and to establish supportive laws and ordinances as well as to work to rebuild legal systems.

【Incorporating Disaster Reduction into National and Local Government Policies】

34 Importance of Strengthening Emergency Response to Address Disaster Rapidly and Appropriately

The experiences of the Great Hanshin-Awaji Earthquake led to the establishment of Deputy Chief Cabinet Secretary for Crisis Management, Office of Assistant Chief Cabinet Secretary for Security and Crisis Management, an Emergency Assembly Team and a Crisis Management Center, among other new developments. The Disaster Countermeasures Basic Act has made it possible to establish the Headquarters for Major Disaster Countermeasures, headed by the minister of State for Disaster Management, and the Headquarters for Urgent Disaster Management, headed by the prime minister. For regional public bodies, the Disaster Countermeasures Basic Act provides for the establishment of Disaster Countermeasures Headquarters, headed by directors of the organizations, and the quick and appropriate implementation of necessary measures.

To enable rapid emergency response in the event of a large-scale disaster, it is important that new ways continue to be devised for strengthening emergency response. Furthermore, it is necessary that operations are developed to enable rapid and

smooth implementation of emergency measures even for disasters that cause tremendous damage across a wide area.



2004 Meeting of the Niigata Prefecture Chuetsu Earthquake Disaster Reduction Headquarters

【Incorporating Disaster Reduction into National and Local Government Policies】

35 Importance of Financial Coordination by the Central Government in Order to Secure the Vast Amount of Financial Resources Needed for Reconstruction and Recovery

An enormous amount of financial resources are required to reconstruct from a disaster. Regarding promotion of rebuilding and reconstruction from the Great Hanshin-Awaji Earthquake, the government made special provisions to deal with the shortage of funds at the local level in areas hit by the earthquake in order to ensure that the local governments had the financial resources they needed.

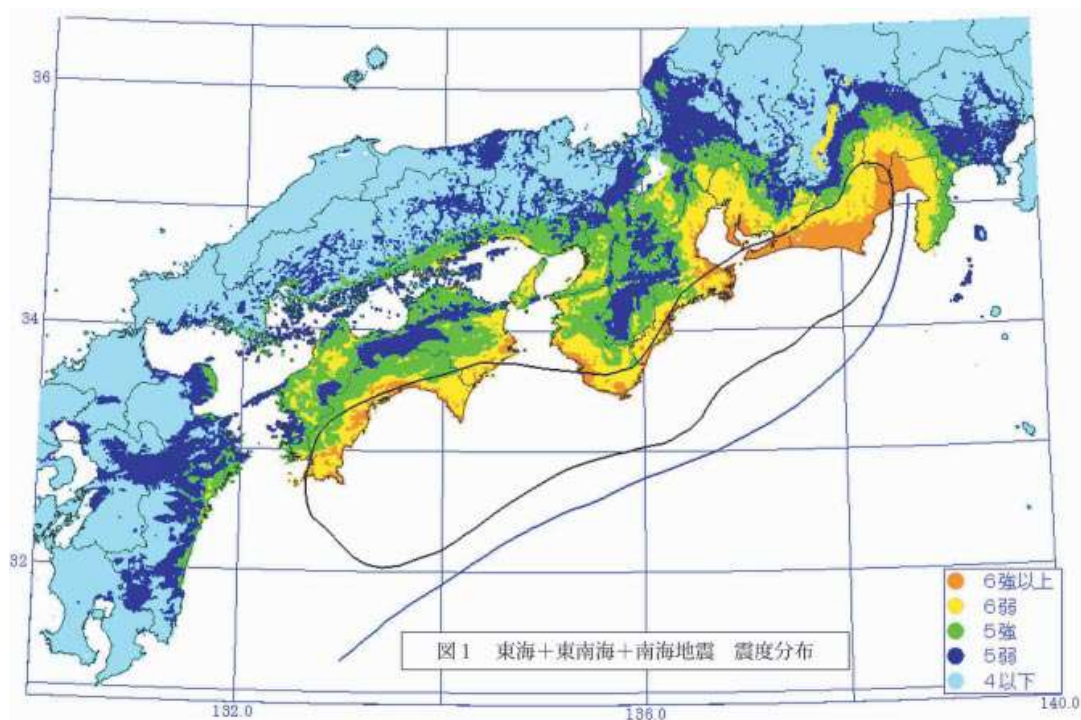
Reconstructing from a disaster requires an enormous amount of funds for rebuilding urban infrastructure and urban districts, rebuilding the lives of the disaster victims, and achieving other essential goals. To facilitate the securing of financial resources required for reconstruction efforts, it is necessary that the national government has a function to coordinate funding.



Importance of Land and Regional Planning Incorporating Disaster Prevention and Mitigation and Considering Natural Disaster Risk

The experiences of the Great Hanshin-Awaji Earthquake have led to the advancement of disaster preparedness measures such as urban infrastructure and urban district improvements, and community education programs. Other regions have also learned lessons from the disaster and have implemented measures to improve local disaster reduction.

Natural phenomena such as earthquakes, tsunamis, volcanic eruptions, windstorms, heavy rainfall, heavy snowfall, floods and high tides are unavoidable. It is also extremely difficult in actuality to achieve a zero casualty rate in the event of a disaster. In various types of planning, such as national land conservation and development plans as well as urban and regional planning, it is necessary that consideration be given to the conditions that will likely arise should a disaster strike, and that disaster prevention and mitigation be incorporated into the plans, for example, by establishing measures to lessen damage caused by disasters.



Seismic intensity distribution map of the Tokai, Tonankai and Nankai Earthquakes
(Central Disaster Prevention Council)

Reconstruction and Mitigation/Preparedness are Premised on Risk Assessment

Facing the challenge of damage from the Great Hanshin-Awaji Earthquake and a multitude of other large-scale natural disasters that have occurred in recent years, the importance of disaster reduction, the urgency of countermeasures, and decisions on the direction of reconstruction have been the subject of scrutiny. The first step in developing disaster reduction measures is risk assessment, which reduces hazards and damage.

The current methods for collecting data are insufficient for rationally assessing risk, and information is not being shared adequately. This applies not only to developing countries, where natural disasters cause great loss of life and property, but to developed nations, including Japan.

It is important that new and better methods of data collection and accurate risk assessment are promoted, and that measures be taken to ensure that the resulting information is shared and readily available.