５）1995 年　阪神・淡路大震災

Item	Sub-item	Information	Data Source
Data on Hazard	Date and Time of Occurrence	5:46AM, January 17, 1995 (UTC: 20:46, Jan. 16, 1995)	CAO1
	Magnitude(source)	M 7.3 (JMA) M 6.9 (USGS)	CAO1 USGS
	Epicenter	The northern part of Awaji Island N34.36, E135.02, Depth: 16km (JMA) N34.58, E135.01, Depth: 22km (USGS)	CAO1 USGS
	Intensity of Shaking	JMA Intensity scale: 7 (Identified by the post-earthquake survey) Ground shaking were felt wide area of Japan	CAO1
	Ground Motion	Max. peak ground acceleration of 818gal was recorded at Kobe. Vertical and horizontal shaking occurred simultaneously. Strong shake continued 10 to 15 sec, and very strong shake (maximum shake) continued about 3 sec.	CAO1 CAO2
	Tsunami (maximum height)	No Tsunamis	
Data on Damages	Major Affected Area	Wide areas of Kinki not only Hyogo pref. but also Osaka and Kyoto were affected.　Especially, Kobe urban area along the fault line was severely affected.	CAO1
	Human Damage	Dead:　6,434 Missing:　3 Injured:　43,792 65years and more occupied half the number of the dead. Most of death: Crushing death, about 7 % of the death by fires Estimated time of death of more than 90% of deaths was before 6:00am which is just 15 min after the earthquake.	CAO1 Hyogo1
	Damage of Buildings	Complete destruction:　104,906 houses (186,175 households) Partial destruction:　144,274 houses (274,182 households) Partial damage:　390,506 houses Fully burned:　7,036 houses Partial burned:　96 houses	FDMA1
	Infrastructure/Lifeline Damage	Road - Highway:　Elevated Hanshin Expressway was collapsed. Most of highways and urban express ways were closed for traffic. - Road:　7,245 sections closed to traffic - Bridges:　330 bridges damaged - Rivers:　774 places (dykes and other facilities) damaged - Slope failure:　347 places Railway - Shinkansen:　Kyoto–Himeji (max.130km, Jan.17, Stop Operation) - Main lines:　88km (Stop Operation) - Urban commuters:　157km (Stop Operation) Major Port:　Kobe Port and Amagasaki-Nishinomiya-Ashiya Port stopped operation. Electricity:　2.6 million houses power outages (Jan. 17) Water Supply:　1.3 million houses out of water supply Gas:　860,000 houses out of supply Telephone:　more than 300,000 lines stop operation	FDMA1 CAO2 Hyogo2

Item	Sub-item	Information	Data Source
	Main Damage Cause	A lot of people were sleeping as the earthquake occurred in the early morning. Many people (70 to 80% of dead) were crushed by the old timbered houses or by furniture. On the other hand, not many people were outside and roads and railways were not clouded, this may be causes of decreasing damages outside houses.	Hyogo1
	Characteristics of Damages (Physical/Social Aspects)	Large-scale destructions by earthquake and fires were happened in the areas where old wooden houses were densely constructed. Severe damages on wooden buildings were found in the range of 6 to 7km form the fault line while fewer damages were found more than 10km away from the fault line. Damage on the public buildings was also remarkable, and 15 % of damaged non-residential buildings were public buildings. As many of public buildings were used for evacuation shelters, some damaged public buildings were used as emergency evacuation shelters without confirmation of safety. Significant damages on buildings that were constructed before 1981 were found and it was pointed out that there was a big difference in the earthquake resistance before and after enforcement of new building code in 1981. It was pointed out that severe damages concentrated to the "Inner-City" area. Meanwhile, severe damages also found in the areas where high income people lived. Many fires occurred in the area where earthquake intensity scale was more than 6, especially scale 7, and it was proportionate to the housing damage.	Hyogo3 CAO1
	Direct Economic Loss	Total: 9,927 trillion yen Buildings: 5,800 trillion yen Lifelines: 1,488 trillion yen Ports: 1,000 trillion yen Industry: 630 trillion yen Education/Culture 335 trillion yen Agriculture/Fishery/Forestry 118 trillion yen Medical and Social Services: 173 trillion yen Other Public Facilities 382 trillion yen	hyogo4
	Lessons Learned	In general, preparedness for super-scale earthquake was not enough. Revised building code enforced in 1981 worked. Revision of seismic design code for infrastructure is necessary.	NP

Item	Sub-item	Information	Data Source
Emergency Response	Rescue activities	Police: 4,500 police officers working for helping people per day (Jan.20 to Feb.28) 5,500 police officers were dispatched to the disaster area from other areas and total of 16,000 police officers were allocated to the disaster relief. Helicopters, mobile units and other cars and equipment were put in relief activities. Self Defense Force (SDF): About 4,500 SDF (GSDF and MSDF) were dispatched the disaster area on Jan.17 which included cars, ships, airplanes/helicopters and operation equipment. Max. 21,760 SDF/day worked not only for rescue but also removal of rubbles and disaster wastes. Fire and Disaster Management Agency: Total of 32,400 fire department officers were dispatched by the end of march for helping rescue and relief activities. Community Level firefighting organization: Members for the community level firefighting organization ware deployed for search and rescue, firefighting, guide for evacuation and patrol the area. Collaborative search and rescue activities with several organizations such as prefectural government, police, SDF and fire department were remarkable as this kind of collaboration have never happened in the previous disasters. Communities played very effective role in rescuing people especially in More than 70% of rescued people were rescued by community people.	CAO4
	Medical services	Medical service points were established by the Ministry of Welfare (161, currently Ministry of Health, Labour and Welfare), SDF (15), Red Cross (12), and other organizations. Public and private hospitals, universities, medical doctors association and other organizations dispatched doctors and medical staffs to the disaster area. On Feb.7, 1,730 doctors and medical staffs from outside of the disaster area worked for taking care of the pacients, and total of 75,000 medical staffs worked by the end of April. Travelling clinics were also operated by those medical staffs and volunteers.	CAO4
	Evacuation shelter	About 317,000 people (at the peak on Jan 23) were displaced in 1,153 evacuation shelters. Though, regional disaster contingency plans designated certain schools as evacuation centers but many residents went to schools or public facilities that nearest to their homes. Foods, water and other emergency relief goods were supplied, however despite to the government officials' effort, those goods were not smoothly provided to the emergency shelters due to lack of proper information on the shelters especially immediately after the disaster. Shelters were mainly operated by the On Aug. 20, 1995, all shelters were officially closed however even one year after the disaster, about 800 victims could not move to temporary house or other places and kept displaced in shelters.	CAO4

Item	Sub-item	Information	Data Source
	Food, water and other relief goods supply	Supply of foods, water and relief goods were mainly done by the local government with help of the line ministries of central government, SDF and other local governments. Even though securing water, foods and other relief goods was the local government responsibility, the local government could not secure required amount of supplies because the scale of disaster was extensive. Therefore, the central government played great role to secure it. Water supply at temporary water supply point was made by more than 800 water tender deployed from outside the disaster area and it was continued till April. Foods and relief goods for displaced people secured by local government were delivered through various channels including private companies and volunteers. Shops of the major retail industry re-opened relatively early and this greatly supported the victims' life because official supply of foods and goods were not so sufficient.	CAO4
	Information and communication (Information to the disaster victims)	Information for the disaster victims were mainly provided by the local government through various medias. Local governments opened "information centers" for handling numerous inquiries from the residents immediately after the disaster. The information centers opened around the clock and deployed staffs who can speak foreign language to address inquiries from the foreigners. Local government also continuously provided the information on damage, current situation of shelters, etc. through mass media such as newspaper, TV and Radio by holding periodical press conference and having regular programs. That information was also provided in several languages. To improve the accessibility to the information, local governments provided 15,000 portable radios to the disaster victims. Paper based information dissemination was also done by the local governments. These paper based information that covers all necessary information for the disaster victims were distributed to the evacuation shelters, public facilities, stations and shops. To provide area specific information, community FM Radio played big role and the disaster victims highly depend on it to get the information. Information for volunteers were provided through the office of prefectural government's volunteer promotion section and social welfare council. The office also acted as a center for volunteer registration, coordination and guidance.	CAO4
	Support from Private Companies	Not sufficient information on this item was found because at the time of the Great Hanshin-Awaji Earthquake, supports from private companies were made in ad hoc and voluntary basis and not systematically provide. After Great Hanshin-Awaji Earthquake, many discussions on cooperation between public and private company have been made.	-
	Support from abroad	70 countries and territories and 3 international agencies offered support and received the supports from 44 countries and territories by Feb. 9. Rescue teams from Switzerland, France and England (NGO) were worked on rescue and recovery of body. 8 medical teams from abroad were also worked in Kobe under exceptional treatment in case of emergency. It was pointed out that receiving assistances from abroad forced additional work to the people in affected area and there were some mismatch between actual needs at the affected area and support from abroad.	CAO4

Item	Sub-item	Information	Data Source
	Lessons Learned	◆ Importance of establishment of coordination mechanism between the agencies related to disaster relief before disasters. ◆ Necessity of strong coordination and collaboration during disaster relief ◆ Government staffs and governments' facilities also affected by the disaster and faced difficulties for emergency response. ◆ Importance of ensuring the means of communication and keep functioning of information systems. ◆ Necessity of designation of evacuation shelters and keep it functioning and sufficient stockpile of emergency relief goods ◆ Necessity of special attention and care to the vulnerable person to disaster and foreigners ◆ Necessity of mechanism to receive assistance (rescue, relief, medical) ◆ Importance of information dissemination both disaster area and outside of the affected areas that including abroad.	IRP CAO4
Recovery	Infrastructure/ Lifeline	Road - Highways and express ways were mostly restored in one to 8 month. Collapsed express way sections were fully restored one year and 8 months after the disaster. - Major parts of national roads were restored in a few days. Railway - Damaged section of Shinkansen (130km) was restored about 3 months after the disaster. - Main lines were also restored in 3 months after the disaster. - Urban commuters were gradually restored and fully restored in 7 months after the disaster. Electricity: 5 days after the disaster (except collapsed house) Water Supply: 40 days after the disaster (temporary restored) 3 month after the disaster (fully restored) Gas: 3 month after the disaster Telephone: Switching equipment - one day after the disaster Telephone line – 2 weeks after the disaster	Hyogo4
	Other services	No sufficient information	
	Temporary House	The temporary houses are provided to all the victims who lost their houses by the earthquake. Construction of the temporary houses was started about one month after the disaster, and total number of temporary houses constructed was 48,300 (46,617 ware occupied in Nov. 1995) in Hyogo pref. All residents of temporary house left in Jan. 2000, and all the temporary houses were broke down by the end of Mar. 2000. Some of the temporary houses that can be re-used were sent to other countries such as Turkey and Taiwan as temporary houses for the disaster victims.	hyogo4
	Disaster Waste/Debris	Total amount of the disaster waste produced by the disaster was estimated at the 20 billion tons (21.1 billion m^3) which was equivalent to the 9-years waste production of Hyogo pref. Those disaster wastes were transferred to Osaka Bay reclamation area and Awajishima reclamation area.	hyogo5
	Finance	Central gov. formed a supplementary budget of 1,022 trillion yen for construction of temporary houses, recovery for lifelines, roads, etc. and support of victim's daily life about one month after the earthquake.	CAO2
	Support from Private Companies	N/A	
	Support from Abroad	N/A	

Item	Sub-item	Information	Data Source
	Lessons Learned	Temporary housing Policies • In temporary 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. • Project has been undertaken for supporting the day-to-day lives of those living in emergency housing for disaster reconstruction. The underlying aims of the project is 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. • 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.	IRP
Reconstruction	Principles	Reconstruction principles of the Great Hanshin Awaji Earthquake and Law for reconstruction 1) Promote prompt recovery of livelihood, economy and building safe community by proper role allocation and collaborative work of central and national government with respecting the wishes of local residents 2) Through the abovementioned activities, re-create dynamic Kansai Area.	CAO2
	Key issues	(1) Support normalization of peoples' life in affected area (2) Disposal of disaster waste/debris (3) Measures for preventing secondary disaster (4) Rehabilitation of port function (5) Early recovery of infrastructure (6) Upgrade of earthquake resistance (7) Measures for housing (8) Urban development/improvement (9) Ensuring employment, preventing of unemployment (10) Enhancement of medical/health services and welfare (11) Early recovery of education facilities (12) Reconstruction of agriculture and fishery related facilities (13) Economic recovery (14) Cross-cutting measures for smooth recovery and reconstruction (15) Ensuring of safety and smooth traffic (16) Measures for disaster prevention/mitigation	CAO2
	Organizations	Headquarters for reconstruction of the Great Hanshin Awaji Earthquake Chairman: Prime Minister Members: Ministers Secretariat: Secretary of National Land Agency and Central government officers from related ministries. Other members: Hyogo Pref. gov., Kobe City gov., Economic Association, Chamber of commerce, etc. Reconstruction committee of the Great Hanshin Awaji Earthquake	CAO2

Item	Sub-item	Information	Data Source
	Finance	Central gov. formed a supplementary budget about 1,429 trillion yen for initial reconstruction activities after 3 month of the earthquake. (780 trillion yen spent directly by central gov. and remaining were spent as subsidy to the local gov. project) Central gov. continuously allocate budget for reconstruction activities. Central gov. directly spent 37 % of total amount for reconstruction of 16,300 trillion yen, but the central gov. also provides money for reconstruction as subsidy to the local gov., and as a result about 95% of reconstruction budget spent by the central gov. In addition, followings were made for promoting the reconstruction. - Establishment of special foundation for reconstruction - Issuance of local bonds - Special grants of the "local allocation tax"	CAO2 ESRI
	Support from Private Companies	N/A	
	Support from abroad	N/A	
	Reconstruction Schedule	Hyogo Prefecture Strategic project for reconstruction: 3 years ◆ Housing reconstruction Public: 80,500 houses, Private: 44,500 houses ◆ Industry recovery Recover to the same economy/industry production level before the earthquake ◆ Urgent infrastructure rehabilitation 5,700 trillion yen Project for reconstruction promotion: 10 years	CAO4
	Key Target, featured strategies/approaches etc.	Basic Issue for Reconstruction ◆ Livelihood recovery - Measures for making stable for the peoples' life - Create cultural environment ◆ Economic recovery - Ensure employment - Recover economy - Create more vital economic environment ◆ Create safe and attractive community - Create a base for disaster resistance, comfort and convenient area - Create environmental friendly and barrier free community for older and disability people	CAO4
	Economic Recovery	Economic indicators, such as population, industrial production index, number of tourists, job-offers-to-seekers ratio etc. were generally recovered to the level before the earthquake in ten years. For example, census at Nov 2001, population of the affected area exceed the one before the disaster	hyogo4
	Other Characteristics	N/A	

Item	Sub-item	Information	Data Source
	Lessons Learned	◆ Importance of community leaded and government assisted community/urban reconstruction for creating safer communities against disasters, which includes keeping community tie and community revitalization, ◆ Importance of continuous mental health care for disaster victims ◆ Necessity of continuous take care of elders and other vulnerable people ◆ Necessity of revision of design standard of facilities. (Revision of design seismic intensity for buildings and full-scale revision of design concept for civil engineering structures) ◆ Necessity of mechanisms that help individual/household level revitalization including funding for victims and employment measures. ◆ Necessity of establishment of mechanisms that promote the reconstruction such as establishment of a special foundation, enforcement of laws and regulations for economic revitalization, and measures for small and medium sized industry recovery, etc. ◆ Necessity of promotion of disaster education based on the lessons learned from the disaster and keep memorize the disaster. ◆ Necessity of laws and/or regulations that promote activities and participation of volunteers, NGOs/NPOs who would be indispensable to post disaster recovery activities.	Hyogo6
References	Reports	CAO1: http://www.bousai.go.jp/1info/kyoukun/hanshin_awaji/earthquake/index.html CAO2: http://www.bousai.go.jp/4fukkyu_fukkou/hanshin_awaji.html CAO3: http://www.bousai.go.jp/1info/kyoukun/hanshin_awaji/download/index.html CAO4: http://www.bousai.go.jp/kensho-hanshinawaji/chosa/index.htm USGS: http://earthquake.usgs.gov/earthquakes/world/events/1995_01_16.php hyogo1: http://web.pref.hyogo.jp/pa20/pa20_000000016.html hyogo2: http://web.pref.hyogo.jp/pa17/pa17_000000002.html hyogo3: http://web.pref.hyogo.jp/pa17/pa17_000000001.html hyogo4: http://web.pref.hyogo.jp/wd33/wd33_000000010.html hyogo5: http://www.lib.kobe-u.ac.jp/directory/eqb/book/4-367/index.html hyogo6: Hyogo Prefecture (2005) The Great Hanshin-Awaji Earthquake. The Report of the 10-Year Reconstruction hayashi: www.taiwan921.lib.ntu.edu.tw FDMA1: http://www.fdma.go.jp/detail/672.html NP : Special issue on report of Hanshin-Awaji Earthquake by the Kobe Shimbun (Newspaper) recon: Reconstruction principles of the Great Hanshin Awaji Earthquake and Law for reconstruction ESRI: www.esri.go.jp/jp/archive/hou/hou050/hou44-6-2.pdf IRP: http://www.recoveryplatform.org/assets/file/irp_casestudies/irp-cs-8-jpn.pdf	
	Data/photos	<Photos> http://www.city.kobe.lg.jp/safety/disaster/earthquake/earthquake03.html http://momo.nishi.or.jp/GIS/AppRoot/hisai_Phot/index.asp http://www.lib.kobe-u.ac.jp/eqb/dlib/eqbdlib-photo.html http://www.lib.kobe-u.ac.jp/directory/eqb/photo/maeda/index.html	