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Transfer Lessons from the Great Hanshin-Awaji Earthquake to the SFDRR through the HFA

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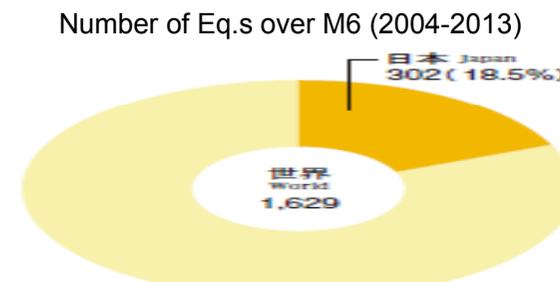
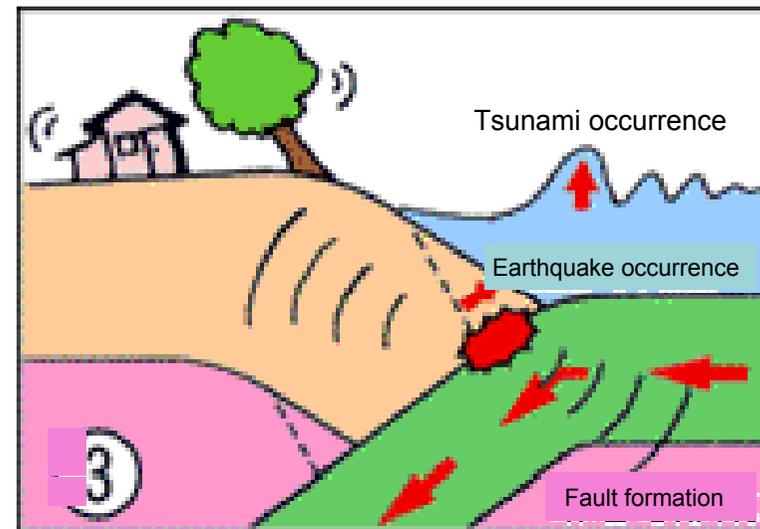
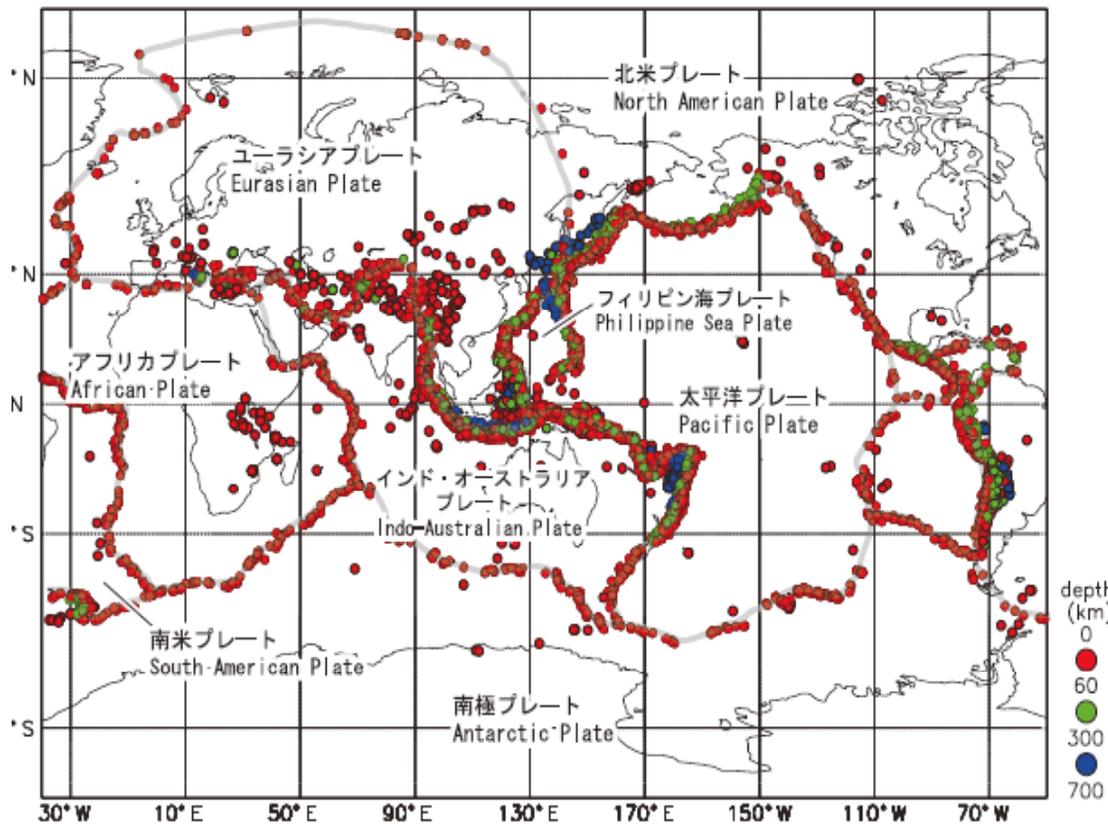
<Advisor to the Director General, Hyogo Pref.>



Japan: Earthquake-Prone Islands



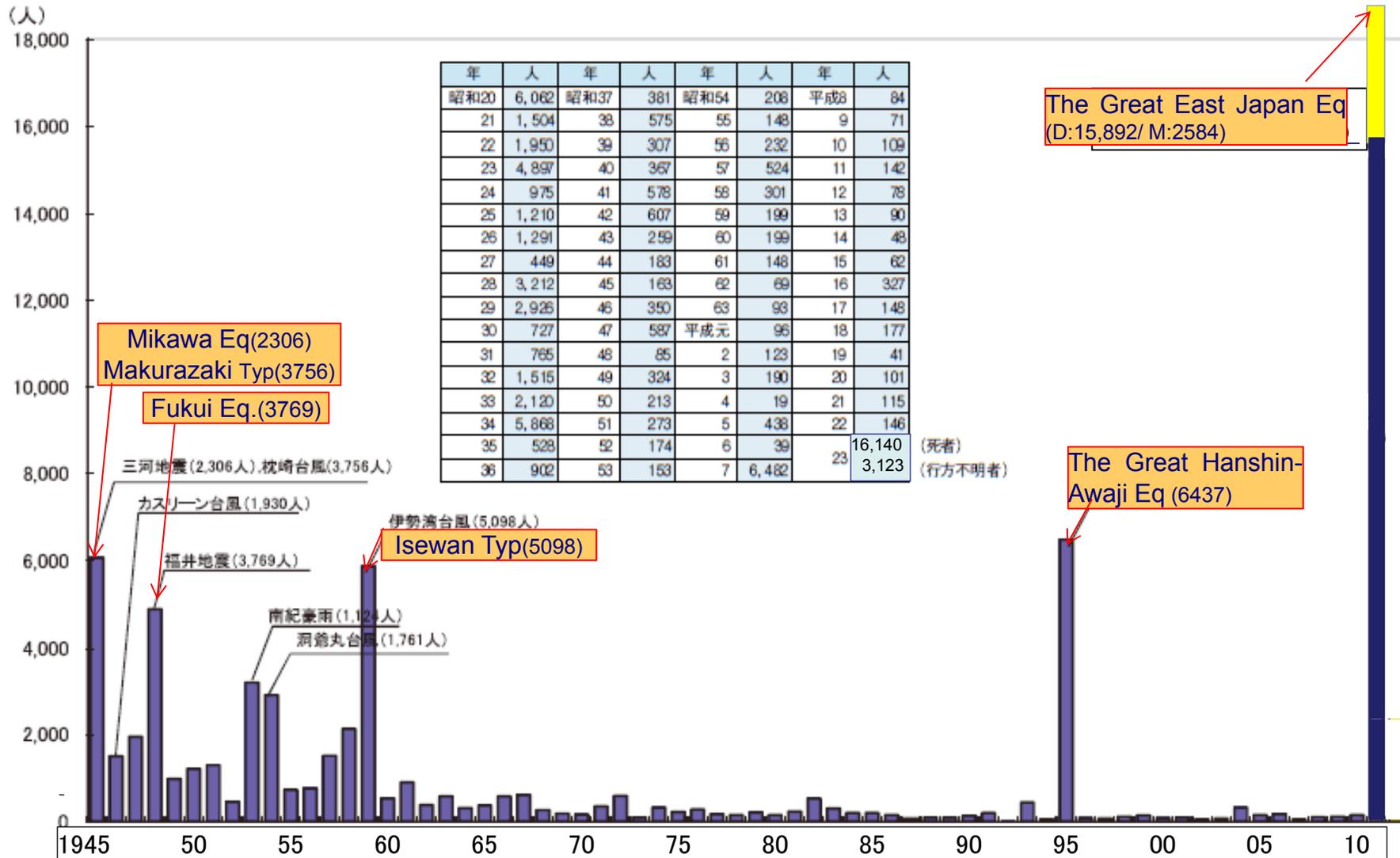
- **Japan's land area: 0.25% of the world**
- **20% of over M6 Eq.s in the world occur around Japan**
- **Kobe experienced the Great Earthquake for the first time in its history (No record of gigantic Eq. in Kansai) (No assumption of an earthquake hitting directly under the City of Kobe. The myth of "No Earthquakes in Kobe")**
- **The Great East Japan Earthquake was beyond expectation. (Then assumed intensity was M8.4 at the time, but the actual tremors were Mw9.0 followed by a gigantic tsunami and a nuclear power plant accident.)**



History of Disasters in Japan

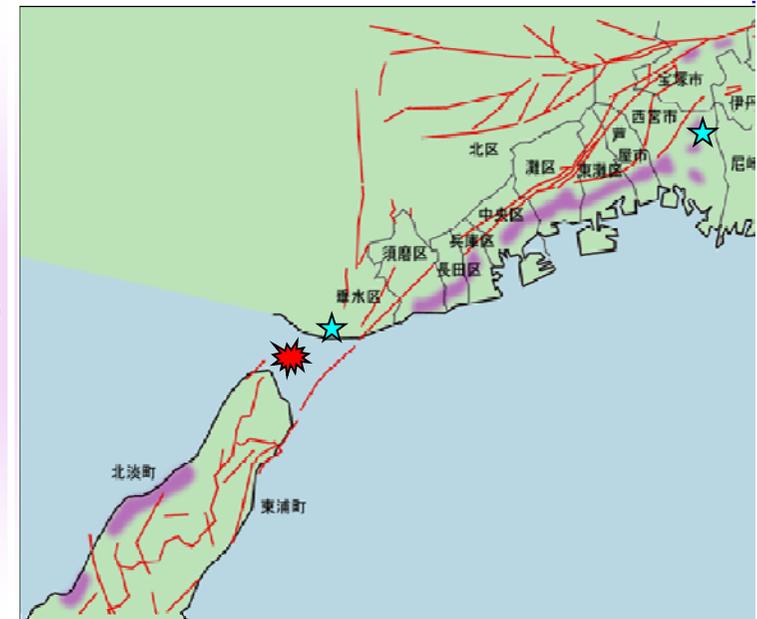
自然災害による死者・行方不明者数

30 May. 2012 FDMA



The Great Hanshin-Awaji Earthquake

- ▲ **Scale: Magnitude 7.3(JMA)<Mw6.9>**
- ▲ **Max. intensity: Seismic intensity of JMA 7**
- ▲ **Epicenter: South of Hyogo (North Awaji)**
- ▲ **Dead/Missing : 6,437**
- ▲ **Financial Damage: 9.9 trillion yen(2% of GDP)**
- ▲ **Max. refugees: 316,678**
- ▲ **Max. no. of shelters: 1,153**
- ▲ **Buildings damaged: 256,754**



Damage of old wooden houses (JP traditional)



Damaged Houses (Wood)



(Collapse)



(Wreck)



(Damage to the wall)



(Slant)

Collapsed RC building on a road

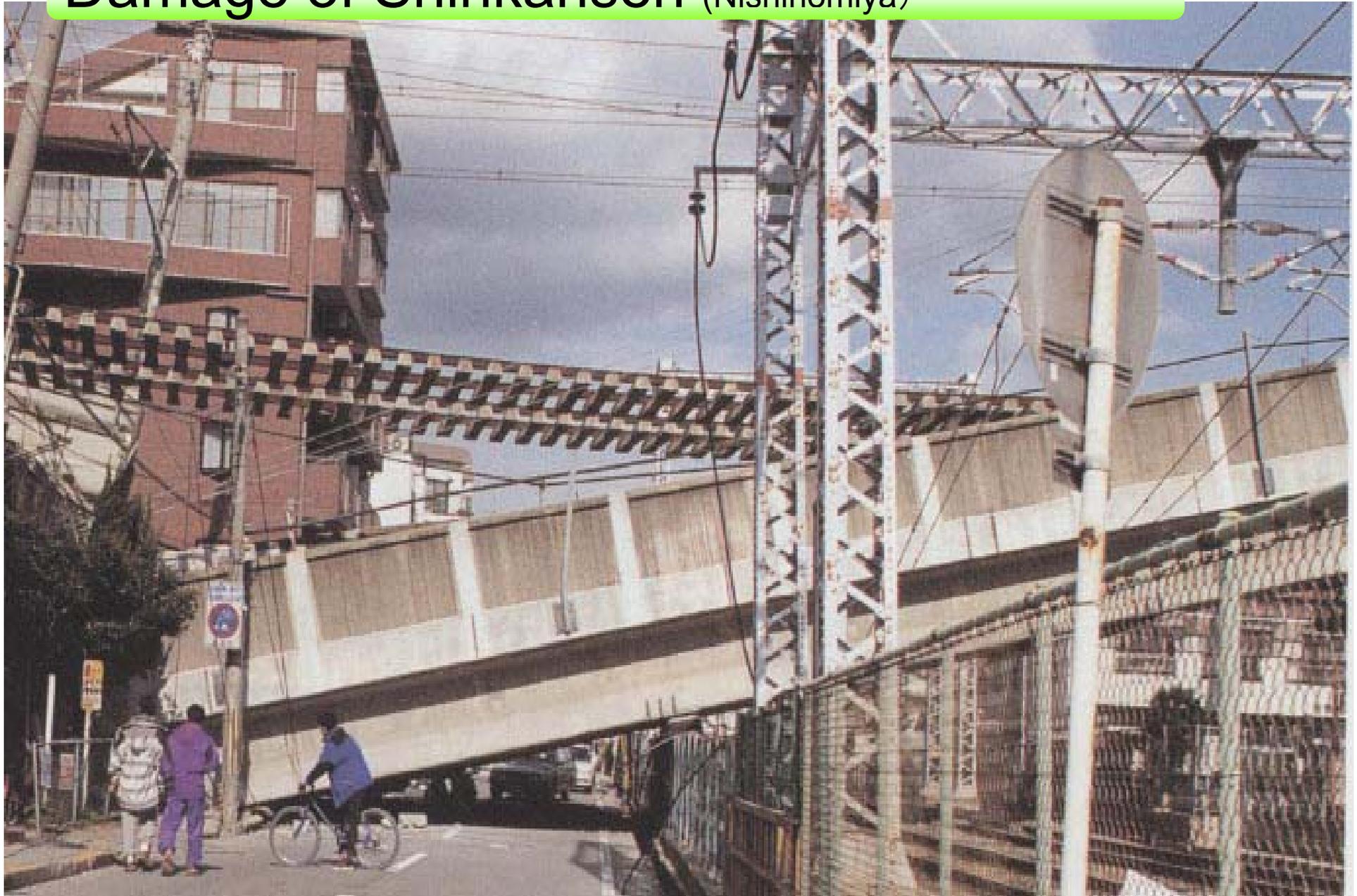


Damaged Buildings (RC)



Complete collapse of the
6th floor of the **Kobe City
Office**

Damage of Shinkansen (Nishinomiya)



Damage of Shinkansen (Nishinomiya)

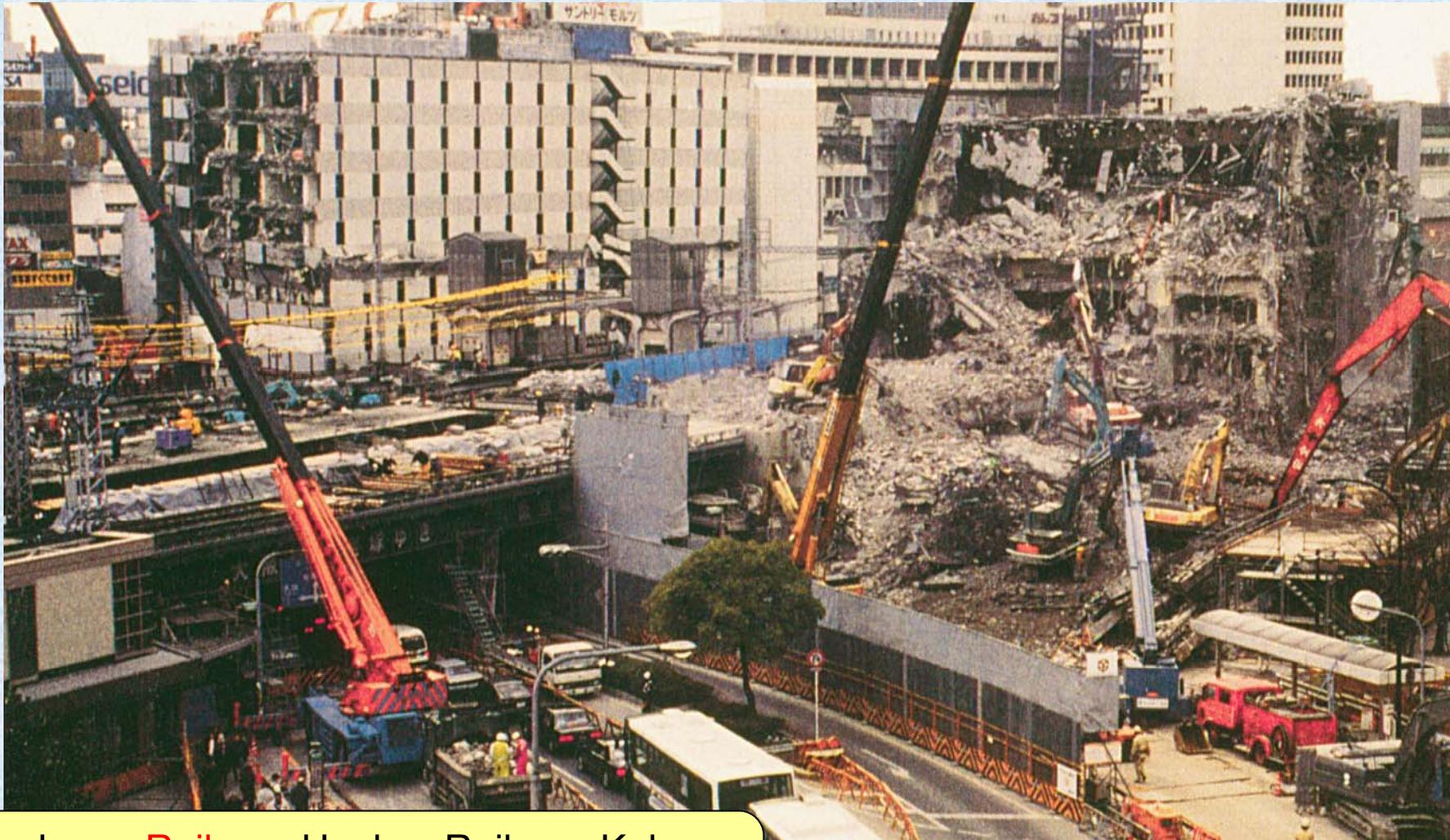
Re-opened within 3 months



Urban Disaster: Many Stakeholders for Recovery

Sannomiya Station (Central Kobe) just after the Eq.

→Need Coordination among stakeholders



Japan **Railway**, Hankyu Railway, Kobe **Subway**, **Bus** service, **Street roads**, **Water**, **Sewerage**, **Electricity**, **Telecommunication**,

Urban Re-development, Land Re-adjustment projects with Public-Private partnership (Shin-Nagata, Rokko etc.)

Quick BBB Recovery

Land Readjustment,
Urban Redevelopment



Fixed Point Observation Shin-Nagata 1995→2004

Quick BBB Recovery

Konan-Yamate 1997→2004



Characteristics of the Great Hanshin-Awaji Earthquake



■ Occurred amid a societal transition

From a growth society (20c) to a matured society (21c)

■ in the center of urban functions

Administrative organs of the nation, the prefecture & the municipality, information and logistics functions

■ Occurred amid an aging society

30.5% of the temporary housing inhabitants immediately following the earthquake, and **47.8% of the Reconstruction Public Housing inhabitants** were elderly of **65 and older**.

(The national population aging rate is 14.5% as of 1995)



Restoration and Reconstruction from Natural Disasters (Creative Reconstruction)



Basic Policy of reconstruction

Creative Reconstruction — Achieving reconstruction tailored to the matured society of the 21st century —



The aim is not merely returning to a pre-quake level, rather to restore the city with a viewpoint of creating a new future by preparing for an aging society and a shift in industrial structure.

《The Great Hanshin-Awaji Earthquake》

Basic Theme

- Harmonious Coexistence Between People and Nature, People and People, and People and Society

Basic Goals (5 pillars)

- Creation of a society dedicated to **public welfare** tailored for the 21st century
- Creation of a **culturally rich society** open to the world
- Creation of a **society where existing industries grow** and new industries flourish
- Creation of a **disaster-resistant metropolis** where people can live with confidence
- Formation of a **multicentered network-type metropolitan area**

Planning period

- Established: July, 1995
- Target Year: 2005

Project costs & expenses

- Planned amount: 17 trillion yen
- Actual amount: 16.3 trillion yen
- National government (51.3%), municipalities (38.7%), and the private sector (10.0%)

Lessons learned from the GHA Eq.

Lack of preparedness for Eq.

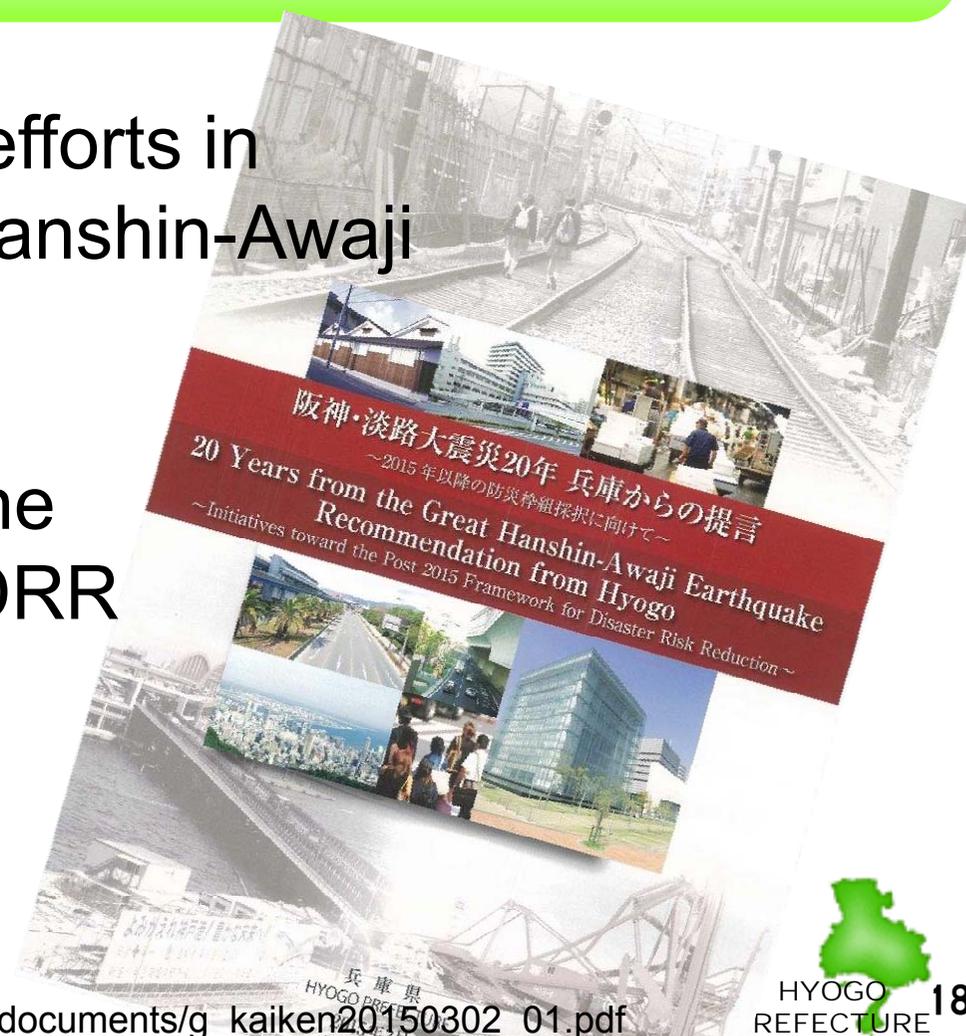
- Governments were not well prepared for Eq. disasters
<Initial response system, Cooperation among Dis. Man. Organizations were not enough >
- Rescue workers couldn't reach to individuals
<Importance of local community & voluntary activities:
Save our lives by ourselves and community,
Outstanding activities by Volunteers>
- Schools, public buildings, houses were not seismic resistant (83% killed by collapse of houses, 13% by fire)
<Earthquake doesn't kill people, but collapse of buildings kill people>

Towards Sendai Framework for DRR 2015–2030

Towards Sendai Framework for DRR 2015–2030

Hyogo and DRI jointly evaluated 20-year Recovery Projects (1995-2015)

- Verification of 20 years efforts in Hyogo after the Great Hanshin-Awaji Earthquake in 1995
- Recommendations for the Sendai Framework for DRR 2015-2030



<http://17jan1995.jp/hfa/index.html>

http://web.pref.hyogo.lg.jp/governor/documents/g_kaiken20150302_01.pdf

Priority 1: Understanding Disaster Risk

Major Initiatives

10 years after the Great Hanshin–Awaji Earthquake (1995~2004)

【Passing on the experiences and lessons learned from the earthquake】

- Establishment and operation of the Disaster Reduction and Human Renovation Institution(DRI)

【International DRR Cooperation】

- Invitation and cooperation of international DRR organizations, Donations project, etc.



Accumulation of DRR organizations (Kobe New Eastern City Center)

【Verification and recommendations of earthquake countermeasures】

- Verifying and announcing overall earthquake countermeasures

【Practical research for DRR】

- Research by the Disaster Reduction and Human Renovation Institution (DRI) and the University of Hyogo

【DRR education and learning at schools, communities, and home】

- Promotion of DRR at schools, establishment of “Environment and Disaster Mitigation Course” at Hyogo Prefectural Maiko high school

10 years during Hyogo Framework for Action (2005~2014)

【Establishment and release of hazard maps】

- Establishment and release of hazard maps (flood, storm surge, landslide, earthquake, tsunami)

【International DRR cooperation through UN】

- Invitation of UN World Conference on Disaster Reduction, (WCDR) contribution for UN Central Emergency Response Fund (CERF)



Hazard map (landslide)

【Promotion of DRR by women】

- Publishing a handbook for DRR knowledge and information from the viewpoints of mothers and children, etc.

【Promotion of professional education and research regarding DRR at universities etc.】

- DRR education/research at the prefectural univ. etc.
- Promotion of the utilization of E-Defense and the K-computer



E-Defense

Passing on the Experiences and Lessons Learned from the Great Earthquake

Disaster Reduction and Human Renovation Institution (DRH)



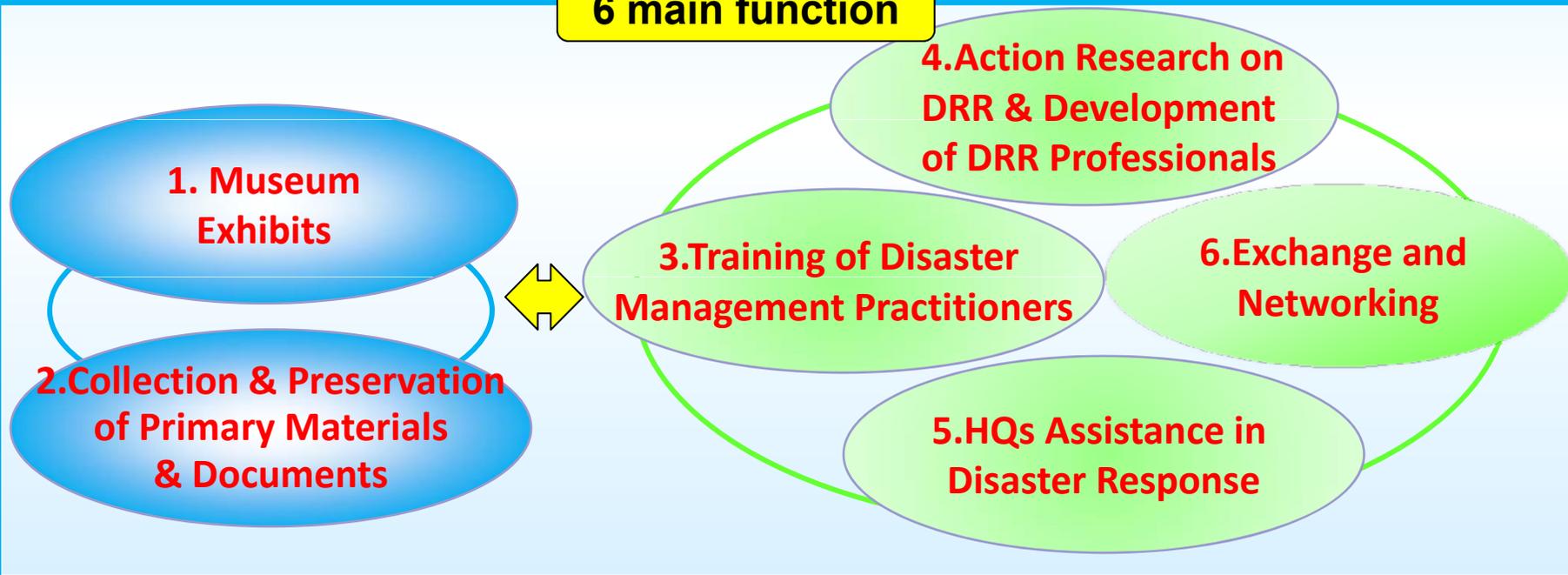
The outline of the DRI

Mission

Realizing a safe and secure civil society

- *Cultivating a Disaster Resilient Culture, reducing social risk and vulnerability*
- *Developing Policies for Disaster Risk Reduction*

6 main function



Experiences and lessons from the Great Hanshin-Awaji Earthquake

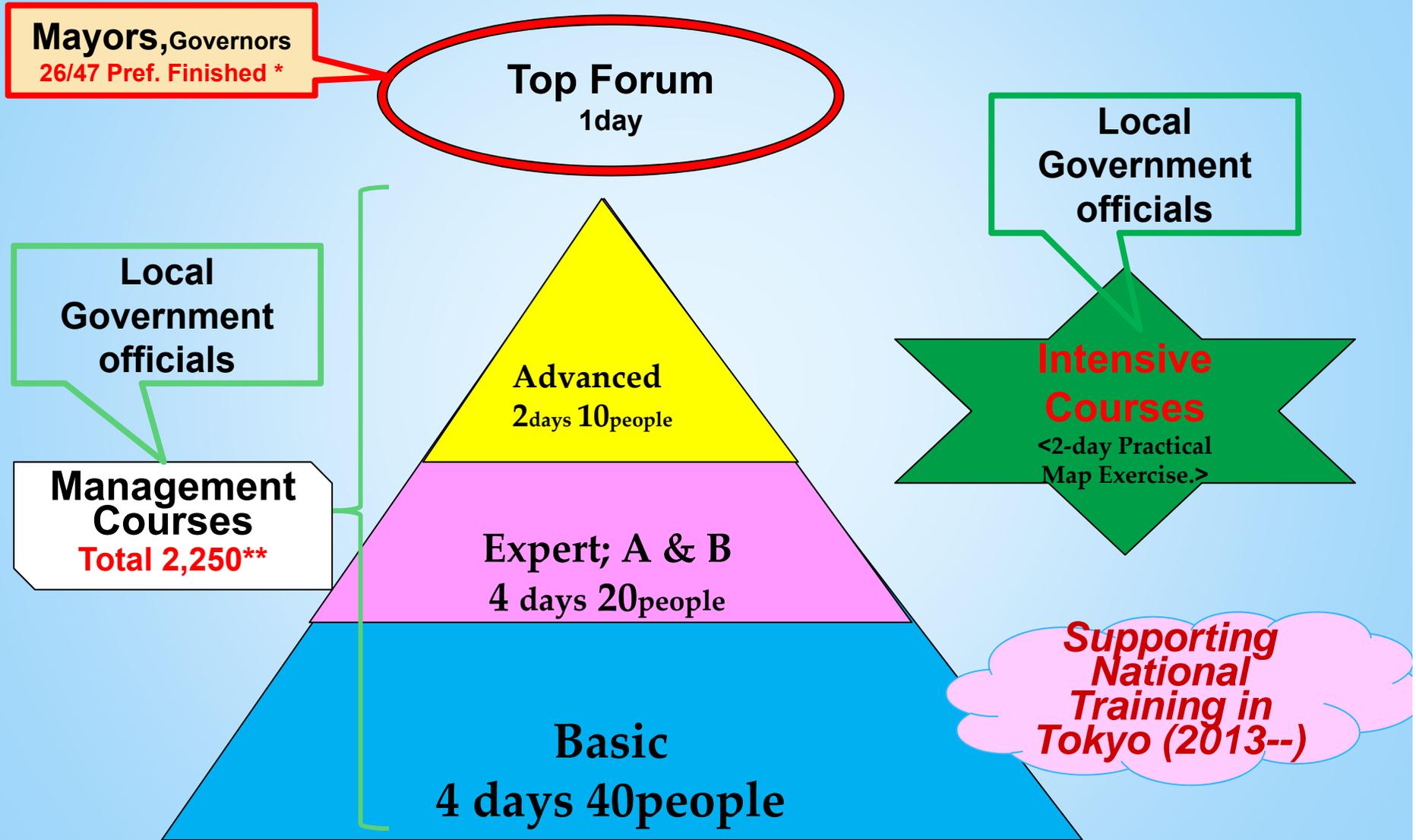
Museum Exhibit at DRI

World's Largest DRR Educational Museum

- 500,000+ visitors every year to learn Kobe Experiences
<Got 6.7mil. Visitors on 31 March 2015>
- 60% are school excursion students (Elementary, Junior high, High)
- 4% from abroad (Vietnam, Malaysia, Korea, Thailand, China, IDN, ...)
- 150 Volunteers (40: Story-tellers) support museum operation



Training of Local Governments Officials in charge of DM



* As of Mar. 2016 , ** 2015

Exchange and Networking

Disaster Reduction Alliance

Since Oct. 2002





Disaster Reduction Alliance (DRA)

18 Int'l DRR Related Institutions in HAT Kobe



DRI (Dis.Red.& Human Ren.Inst.)



WHO 



ADRC
(Asian Dis. Red. C)



OCHA
(UN Office for the Coord. of Hum. Affairs)



Int'l Recovery Platform

Education Center for Disaster Reduction (ECDR), University of Hyogo



Kansai Int. C

Hyogo Earthquake Engineering Research Center



*Hyogo Dis. Medical C.
Red Cross Kobe Hospital*



*Hyogo Eq. Memorial 21st Century Res. Inst.
Hyogo Institute for Traumatic Stress*



P2: Strengthening DRR Governance to manage disaster risk

Major Initiatives

10 years after the Great Hanshin–Awaji Earthquake (1995~2004)

【Enhancement of emergency management system】

- Creation of Superintendent for Emergency Management post, and establishment of the Hyogo Disaster Management Center

【Promotion of community participation】

- Establishing “the ordinance concerning the promotion of volunteer activities” and “the Ordinance on Promoting Prefectural Citizens’ Participation and Collaboration” etc.
- Supporting the development of voluntary disaster response organizations



Hyogo Disaster Management Center



Dispatching Hyogo special promoters of disaster management to communities

10 years during the Hyogo Framework for Action (2005~2014)

【Promoting initiatives by citizens】

- Establishing the “Ordinance to define January 17 as “Hyogo Safety Day,” and the establishment of “The Hyogo Safety Day Promotion Committee” etc.

【Development of region-wide emergency management system】

- DRR activities by the Union of Kansai Governments

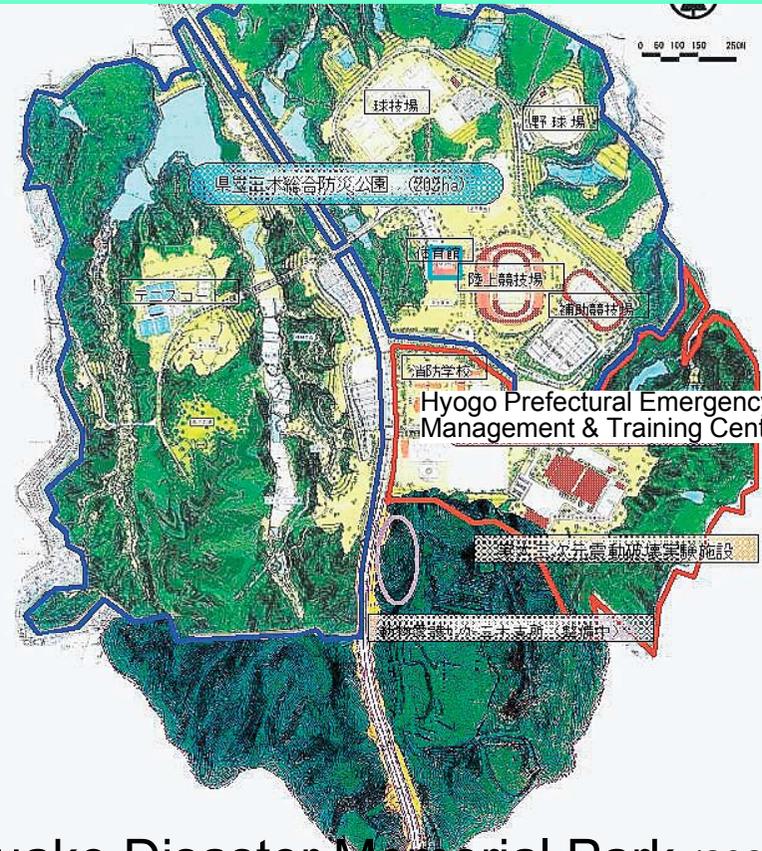


Kansai region-wide disaster imagination map exercise

Enhancement of emergency management system of Hyogo



Emergency Headquarters Control Room



Hyogo Prefecture Emergency Management & Training Center (54 ha)

Miki Earthquake Disaster Memorial Park (202ha)



Dis. Management Center



Storage warehouse (under the stand of the athletic stadium 5000m²)



Miki Emergency Management Base for all Hyogo

Stockpiling function



Disaster preparedness

Truck yard



Warehouse below the East Stand



Emergency food

P3: Investing in DRR for Resilience

Major Initiatives

10 years after the Great Hanshin–Awaji Earthquake (1995~2004)

【Seismic retrofitting programs for buildings and infrastructures】

- Promoting seismic retrofitting for housings (Seismic Retrofitting to Private Housing), government buildings, schools, hospitals, and infrastructures
- Development of Rokko Mountain Range Green Belt



Applying seismic retrofitting to schools

Shaking table test at the E-Defense



10 years during the Hyogo Framework for Action (2005~2014)

【General and systematic implementation of forest conservation and river management】

- Building disaster-resistant forest program utilizing “Prefectural Green Tax” revenues, and promoting fully covered forest management program
- General River Act, local comprehensive water control plan



Developing emergency disaster-prevention forests

【Tsunami Preparedness】

- Tsunami disaster damage mitigation infrastructure development 5-year plan



Tsunami Mitigation/Evacuation Station

E-Defense

The world's largest 3-dimensional full-scale earthquake testing facility

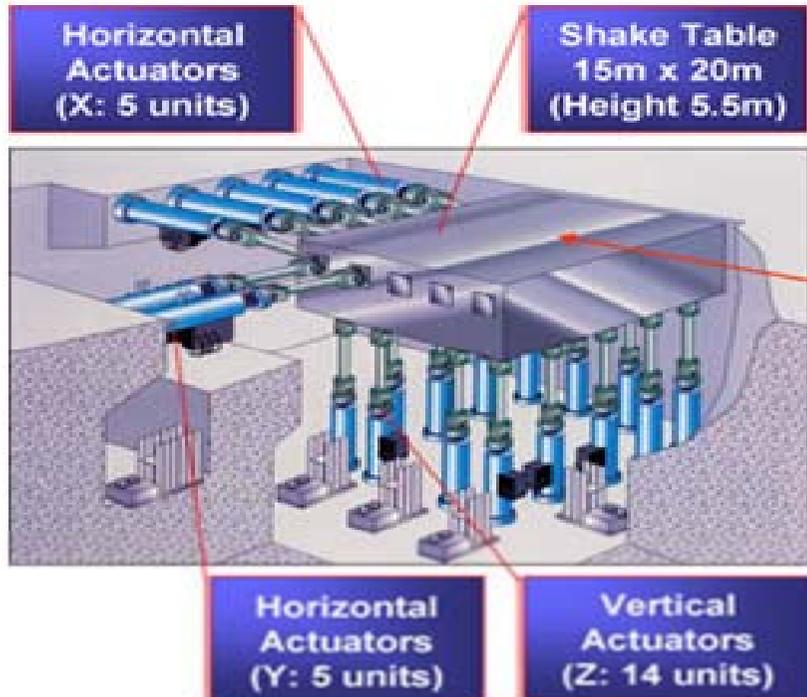
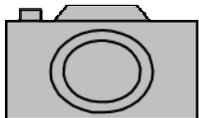


Table Size	20m x 15m	
Payload	12MN(1200tonf)	
Driving Type	Accumulator Charged/Electro-Hydraulic Servo Control	
Shaking Direction	X, Y - Horizontal	Z - Vertical
Max. Acceleration (at Max. Loading)	900cm/s²	1500cm/s²
Max. Velocity	200cm/s	70cm/s
Max. Displacement	±100cm	±70cm
Max. Allowable Moment	Overturning : 150MN-m	Yawing : 40MN-m

Reinforcement of Existing Buildings Built under the Old Building Code (-1981)



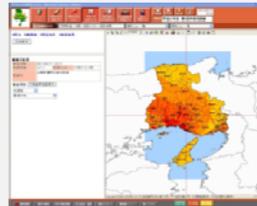
P4-1: Enhancing Disaster Preparedness for Effective Response

■ Major Initiatives

10 years after the Great Hanshin–Awaji Earthquake (1995~2004)

【Early warning measures】

- Establishment of Phoenix Disaster Management System that predicts earthquake damage and estimates necessary manpower and the amount of relief goods



Phoenix Disaster Management System

【Development of wide-area emergency management bases】

- Development of prefectural-wide emergency management bases and other 5 regional bases



Hyogo Prefectural Emergency Management and Training Center

【Enhancement of Emergency Medical System】

- Development of Hyogo Emergency Medical Center and emergency hub hospitals

【Practical disaster prevention drills】

- Implementation of practical drill such as information transmission, evacuation, rescue, etc.

【Cooperation with volunteers】

- Establishment of the Hyogo Volunteer Plaza, disaster, formulation of “Guideline for supporting voluntary relief activities”

【Relief system for victims】

- Implementing Mobile Healthcare Room, and developed the emergency healthcare system

10 years during Hyogo Framework for Action (2005~2014)

【Development of various disaster information delivery system】

- Development of Hyogo Disaster Net, Hyogo E-Net

【Promoting measures for those who need assistance at the time of disaster】

- Formulation of guidelines for those who need assistance, promotion of designating shelters for those who require assistance



Evacuation drill for those who require support

【Region-wide cooperation for mega disaster】

- Development of Kansai regional disaster management information system, formulation of guidelines for Providing and Receiving Wide-area Backup in the Kansai Region etc.



Portal site of the “Union of Kansai Governments”

P4-2: Enhancing “Build Back Better” in Recovery, Rehabilitation and Reconstruction (Creative Reconstruction: Hyogo)

■ Major Initiatives

10 years after the Great Hanshin–Awaji Earthquake (1995~2004)

【Developing mechanism to promote reconstruction】

- Reconstruction Plan, Reconstruction Fund
- Victims’ Reconstruction Support Council, Phoenix Citizen’s Recovery Network, the Great Hanshin–Awaji Earthquake Recon (‘Phoenix Plaza’)

Phoenix Citizen’s Recovery Network (volunteers for moving support)



【Actions to lead mature society】

- Supporting elderly (elderly independence support, etc.), providing mental health care (Hyogo Institute for Traumatic Stress, etc.)
- Supporting volunteer activities (Hyogo Volunteer Plaza, etc.)
- Creating new industry (New Industry Research Organization, Hanshin–Awaji Economic Revitalization Organization etc.)

10 years during the Hyogo Framework for Action (2005~2014)

【Remaining Issues】

- Elderly independence support
- Revitalizing communities
- Bringing back public interests



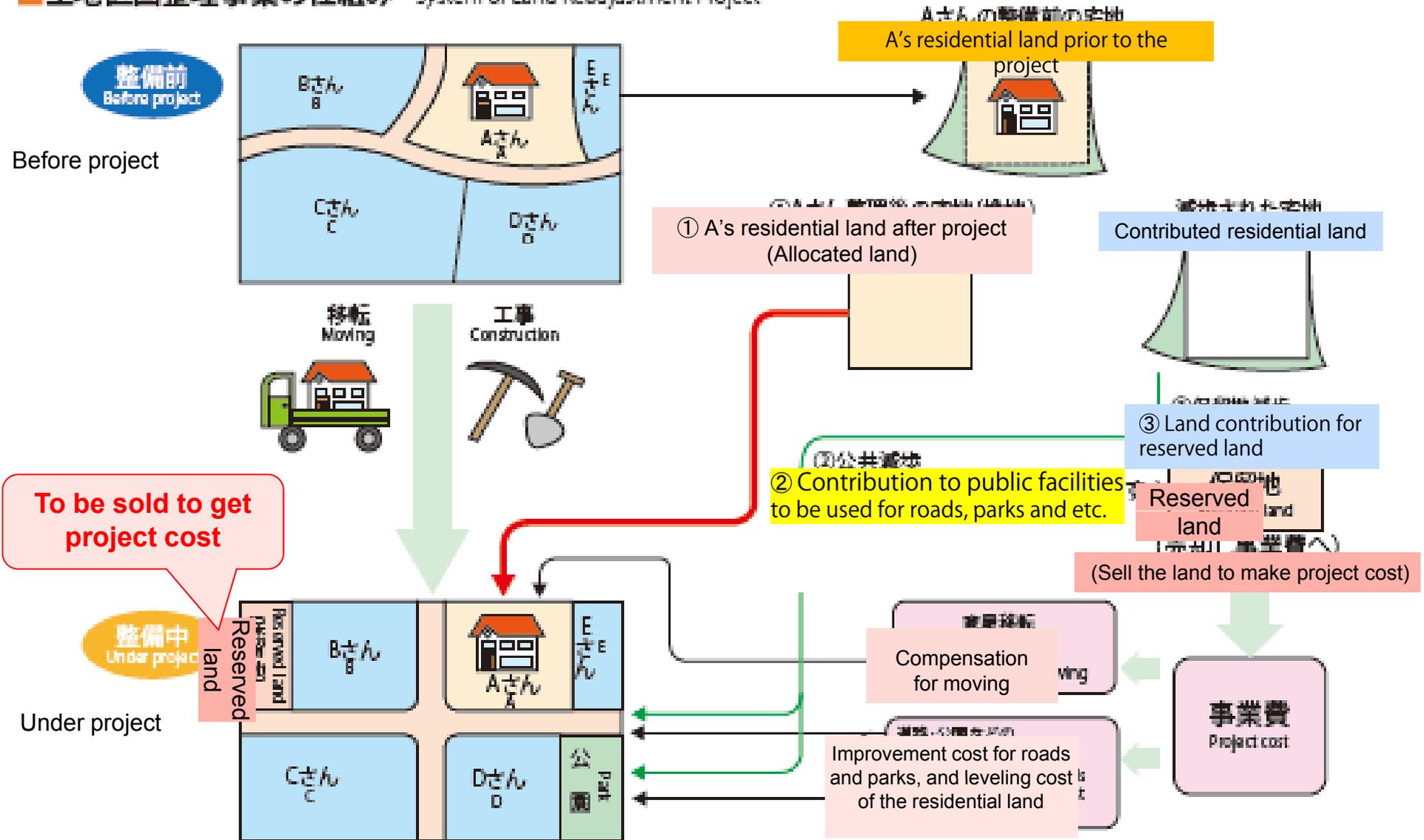
Revitalizing communities (reconstructed Shin–Nagata shopping street once completely destroyed by fire)

【Reconstruction supports for the Great East Japan Earthquake utilizing the experience of the Great Hanshin–Awaji Earthquake】

- Establishment of Reconstruction Fund
- Collaborating with volunteers
- Supporting those who require assistance at time of disaster (setting up shelters, monitoring and protecting the elderly)
- Mental health care
- Temporarily leased factories, shops, etc.

System of Land Readjustment Project

土地区画整理事業の仕組み System of Land Readjustment Project



Before Land Readjustment Project in Nishinomiya



Immediately after the Earthquake
(Nishinomiya City)

After Land Readjustment Project in Nishinomiya



After Land Readjustment
(Nishinomiya City)

Recommendations for promoting the Sendai Framework for DRR

Recommendation 1: Creative Reconstruction

Utilizing lessons from reconstruction into DRR

Creating disaster-resilient society

- Improving urban infrastructure, DRR capacity and living conditions
 - Wider streets to prevent fire from spreading
 - Parks to be utilized as evacuation sites and relief activities
 - Rivers, wells etc. that provide water for fire-fighting and daily life water just after disaster

Urban redevelopment projects



Just after the earthquake

Redeveloped



Promoting DRR through collaboration

- Improving DRR capacity in the community by independent DRR organizations and fire corps
- Promoting DRR activities by individuals
- Partnering with the private sector
- Encouraging women's participation in DRR activities



Civil movement to improve DRR capacity

Recommendation 2: International DRR cooperation by local governments

Sharing the experiences and the lessons learned from disaster

- **Accepting trainees in cooperation with international DRR organizations**



Training at Hyogo Disaster Management Center

Providing physical and personal support

- **Providing support by disaster-affected local government**



Supporting the operations of Bursa Disaster Training Center in Turkey (Lectures by Hyogo Official)



Tsunami Archive, Indonesia

Donation projects

- **Conducting projects using the donation to meet the needs of the affected areas**

DisasterArchive	Date of Occurrence	Support Contents
Turkey, Izumit Earthquake	1999	Scholarships for disaster-affected children
Taiwan, Chi Chi Earthquake	1999	Reconstruction of elementary school
India, Gujarat Earthquake	2001	Seismic retrofitting of schools
Attacks of Sep. 11th, 2001	2001	Providing higher education for victim's children
Southeastern Iran Earthquake	2003	Seismic retrofitting of schools, promotion of disaster education and seismic retrofitting technique training
Sumatra Earthquake	2004	School reconstruction, establishment of tsunami museum
China Sichuan Earthquake	2008	Hospital reconstruction
Typhoon Haiyan, the Philippines	2013	Construction of the typhoon-resistant residence

Recommendation 3: Enhancing DRR capacity at local government level

Enhancing DRR system

- Establishing the system and governance for DRR
- Practical emergency drills



Joint emergency drill

Improving the awareness and capacity of local government leaders

- Conducting DRR training for local government leaders



‘The Top Forum’ –Training for local government leaders

Enhancing DRR capacity in the community

- Implementing the systematic DRR education
- Providing DRR learning opportunities in the community and promoting DRR activities at home and by individuals



Hyogo Disaster Management Leader Training Course

Recommendation 4: Importance of DRR education and learning

Promoting DRR education in schools

- Publishing the disaster response manual for schools and supplementary material for DRR
- Training teachers for DRR education

Utilizing schools as a regional disaster management bases

- Promoting seismic retrofitting for schools
- Implementing disaster drills in cooperation with communities

Promoting spontaneous learning at community/home

- Encouraging DRR actions at home
- Promoting emergency drills and DRR events in the community

Training DRR professionals in universities, etc.

- Establishing special courses, departments and graduate schools for DRR

DRR education of Hyogo – applying and passing down the lessons of the Great Hanshin–Awaji Earthquake

Learning from disasters and cultivate the capacity to survive



Promoting DRR education of Hyogo– based on the area-specific characteristics



Improving the DRR system at schools

Improving DRR education at schools

Improving mental health care



Creating DRR maps (through walking around the community)



Education Center for Disaster Reduction, University of Hyogo

Recommendation 5: Identification and dissemination of the lessons learned from the disaster

Actions to pass on the recollections of the disaster

- Taking **continuous actions for DRR** by setting the day of the disaster as a milestone

Verification of the disaster and recommendations

- Providing information of the lessons to citizens after verification and analysis

Disseminating the experience and the lessons learned from disaster

- Developing the facilities/organizations as a main body to disseminate experience and lessons within Japan and to overseas

Preservation and utilization of the disaster remains

- Passing on the lessons to the next generation, by preserving and **utilizing the disaster remains**



The 1.17 Hyogo Memorial Walk



‘Passing Down’ –
The collection of
the lessons from
the Great Hanshin-
Awaji Earthquake



Nojima Fault Preservation
Museum



Disaster Reduction and Human
Renovation Institution



Thank you for your attention!!!



- **Disaster Reduction and Human Renovation Institution**
 - *Masahiko MURATA*

