



Disaster Management in Hyogo

-Lessons learnt from the Great Hanshin-Awaji Earthquake-

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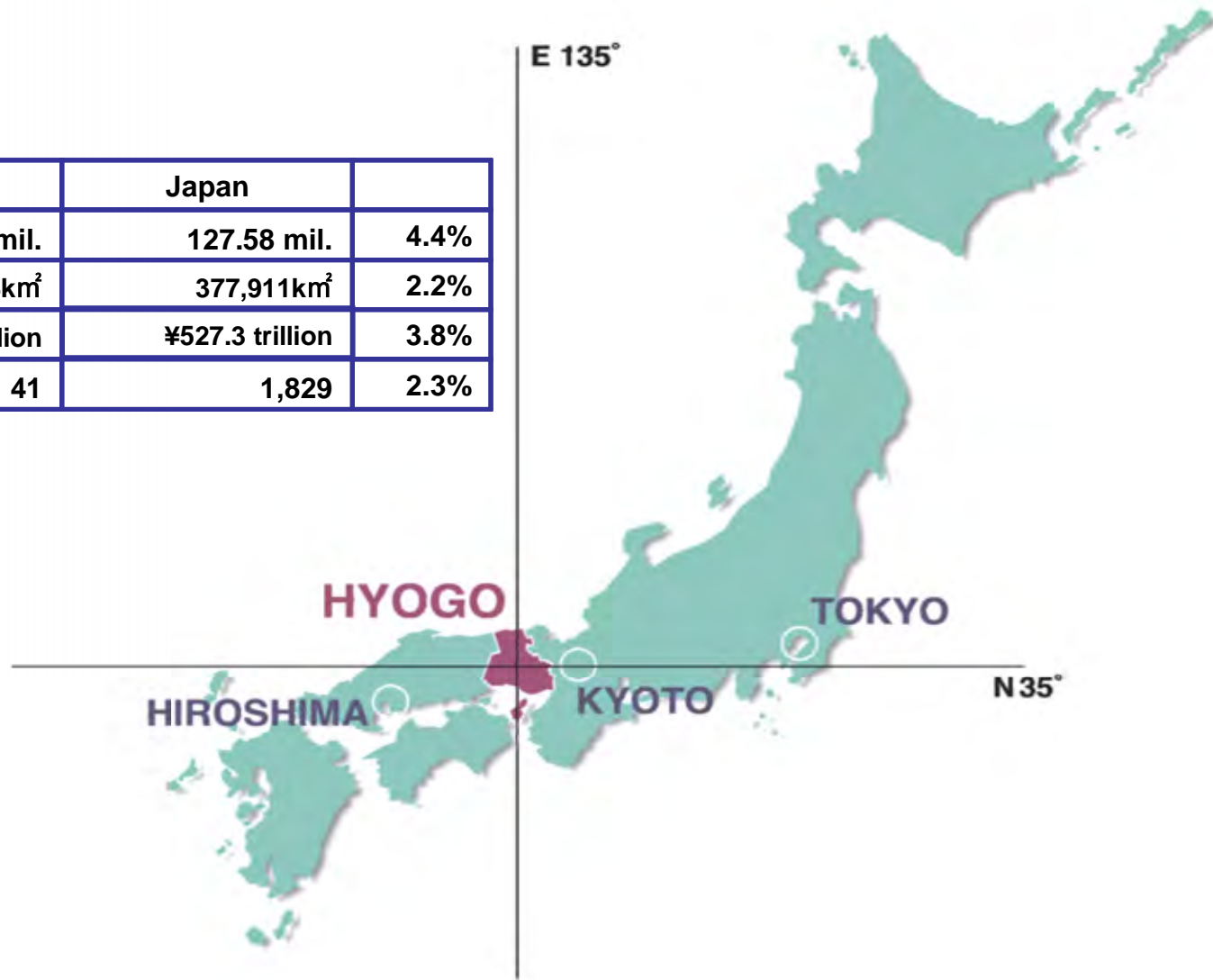
Contents of this Presentation

- Disasters in Japan and Hyogo
- The Great Hanshin-Awaji Earthquake:
Damage, Recovery and Lessons Learned
- Upgraded Disaster Management System and Activities in Hyogo after the Disaster
- Transfer of Live Lessons from the Great Disaster
- International Cooperation of Hyogo for Disaster Risk Reduction
- Against Future Disasters



Location of Hyogo

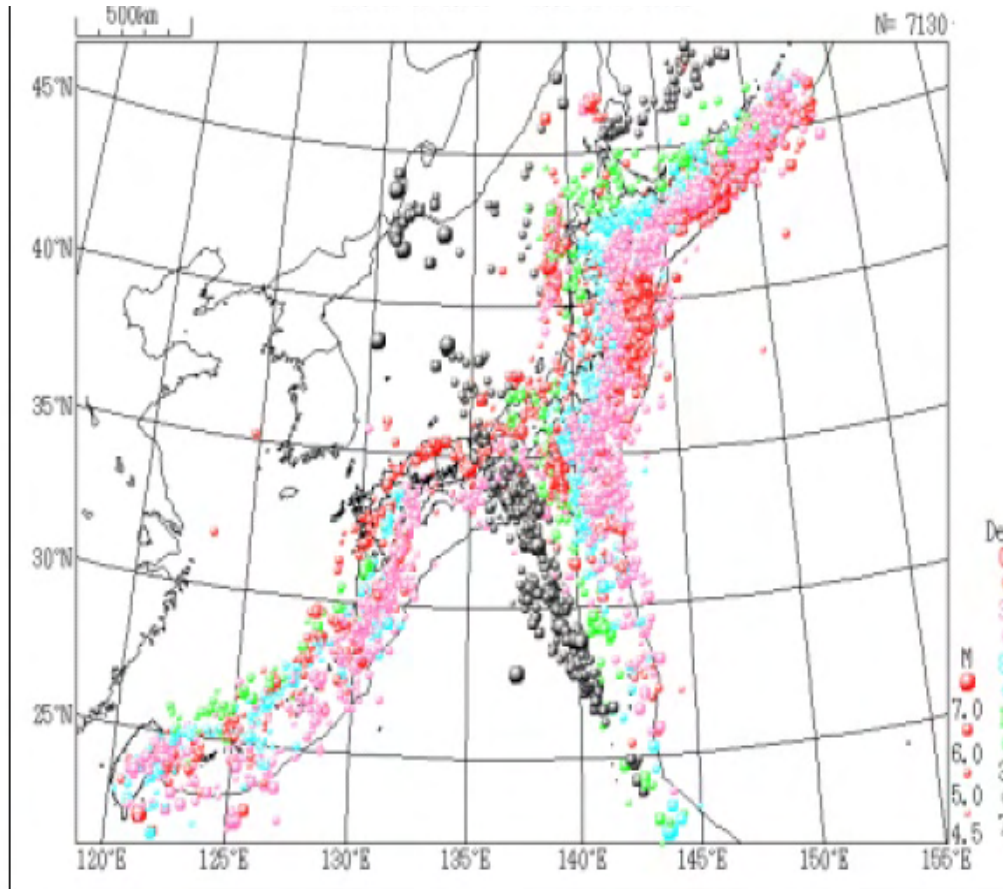
	Hyogo	Japan	
Population	5.59 mil.	127.58 mil.	4.4%
Area	8,394km ²	377,911km ²	2.2%
G D P	¥1.96 trillion	¥527.3 trillion	3.8%
Municipalities	41	1,829	2.3%



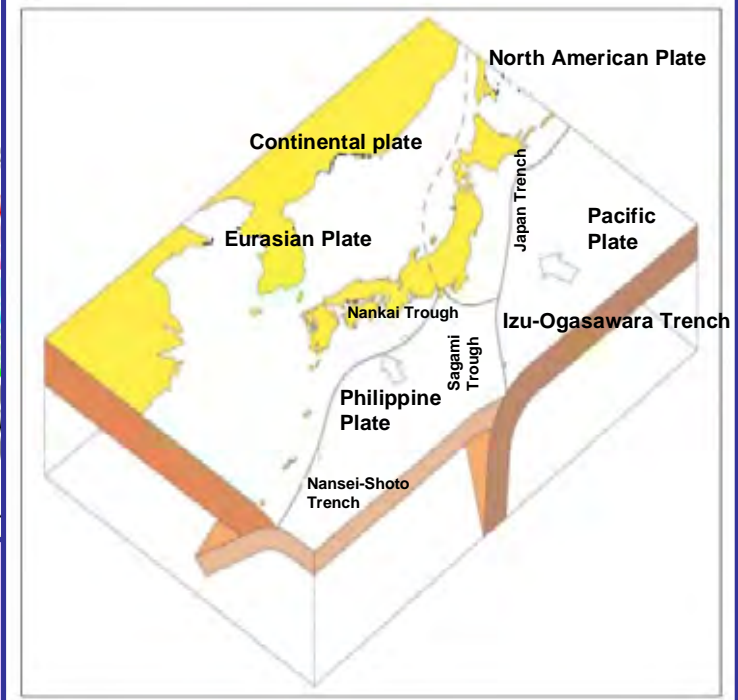


Earthquakes in Japan

Epicenter Map of Earthquakes Measured M 4.5 and larger
from 1970- 2000

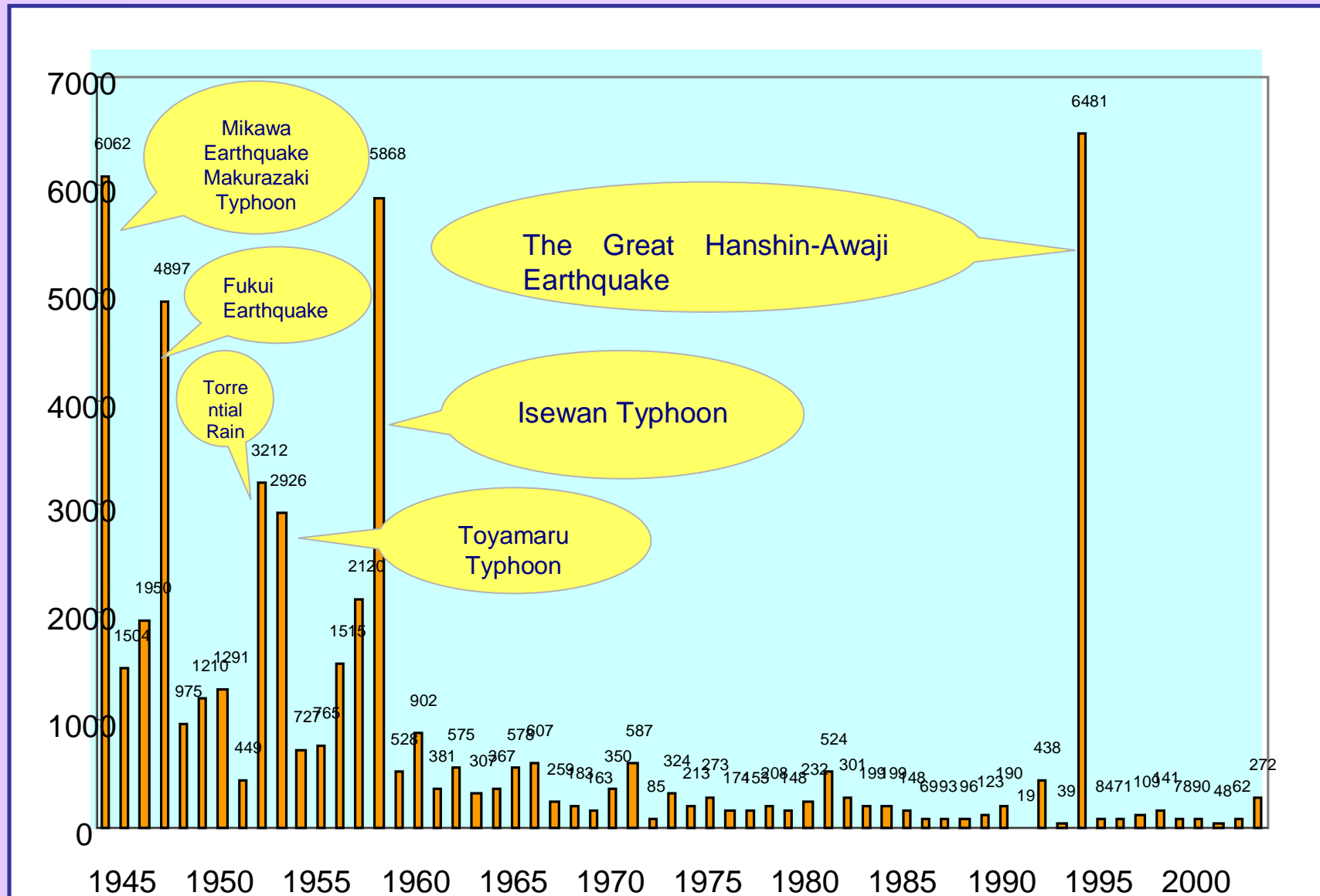


Plates surrounding Japan





History of Disasters in Japan



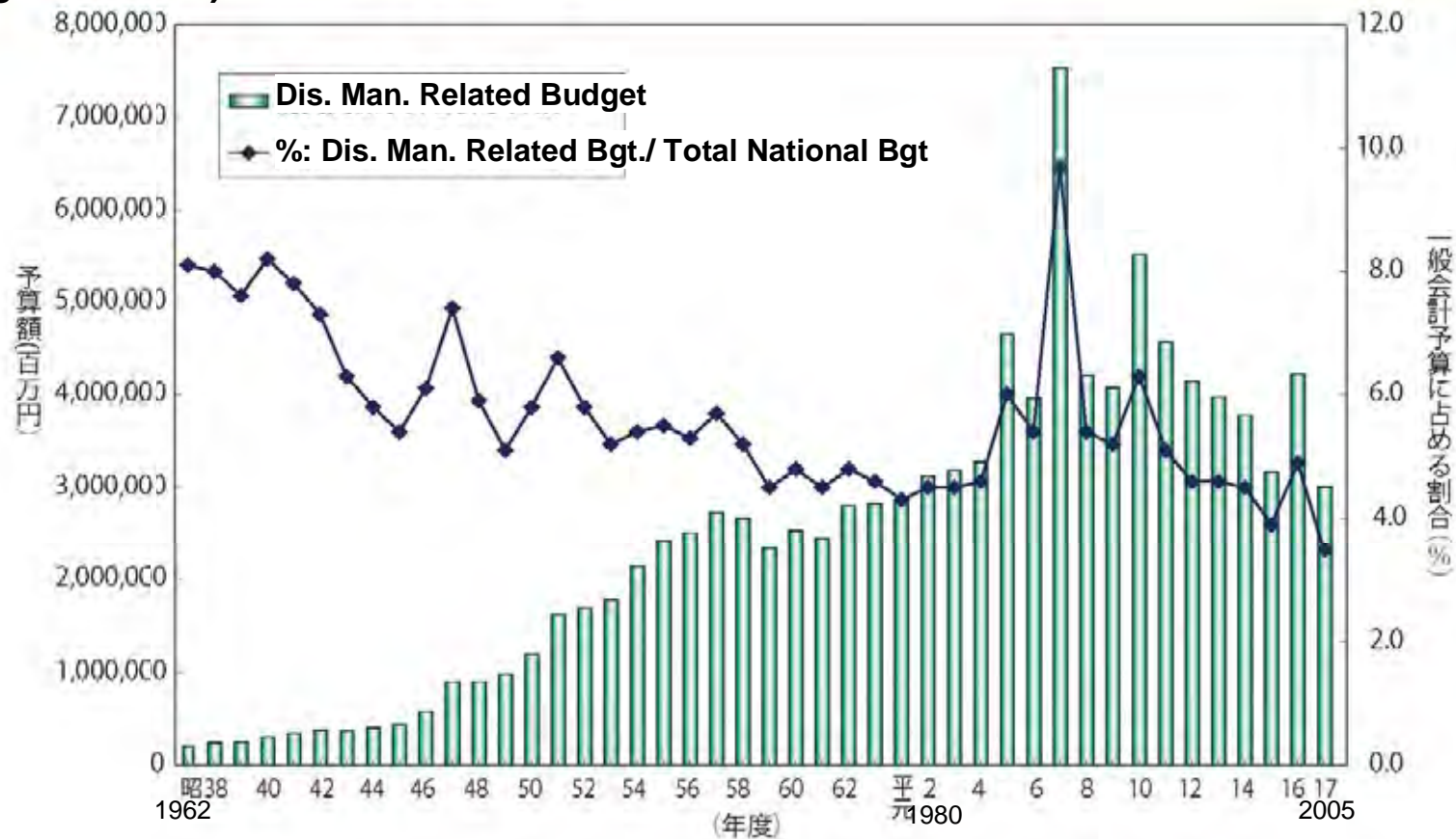


Disaster Management Related Budget in Japan

5-10% of National Budget are for Dis. Man.
 R&D, Dis. Preparedness, National land conservation, Dis. Recovery
 (more than ¥3,000bil. After 1980)

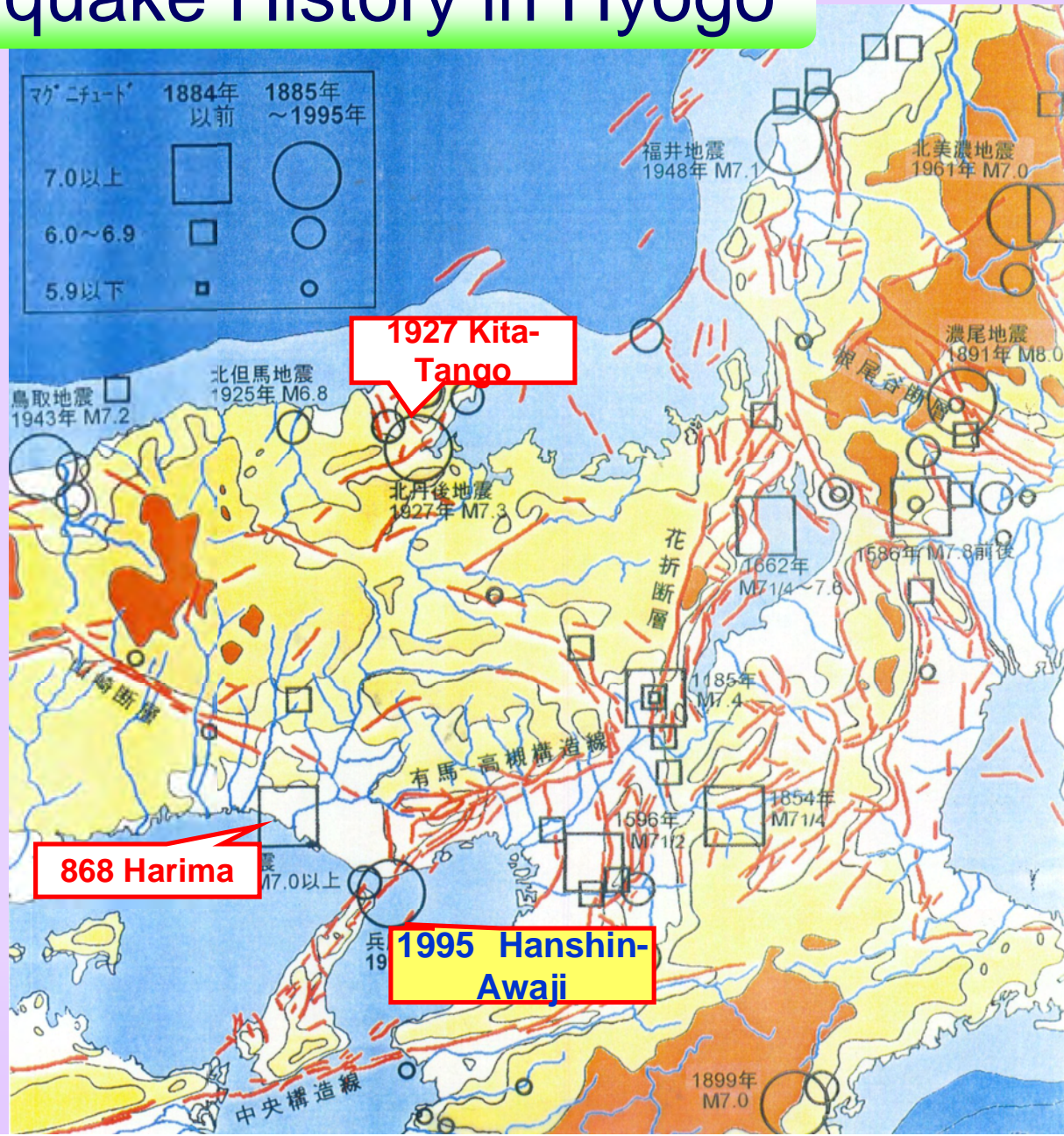
(Budget:Mil.JPY)

(% in the Total National Budget)





Earthquake History in Hyogo





The Great Hanshin-Awaji Earthquake

➤ Outline of the Damage ➤

5:46 a.m. on January 17, 1995

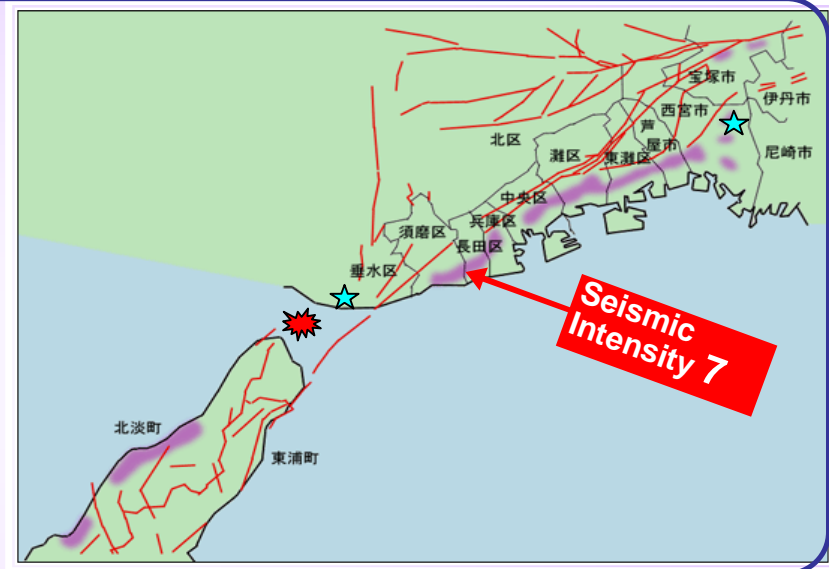


Scale : M 7.3

Dead : 6,434 Injured : 43,792

Financial damage: 10 tri¥(\$100bil)
(2.5% of national GDP)

Com/ Half destroyed: 249,180 bld'gs
Evacuees: 316,678 people at peak



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)



(Collapse)



(Collapse of the 1st floor)



(Broken glasses)



(Wreck)

Damaged Buildings (RC)



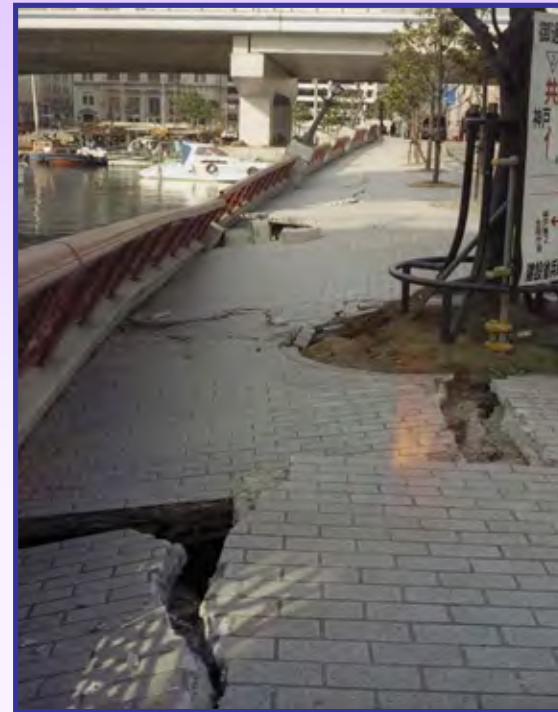
Complete collapse of the
6th floor



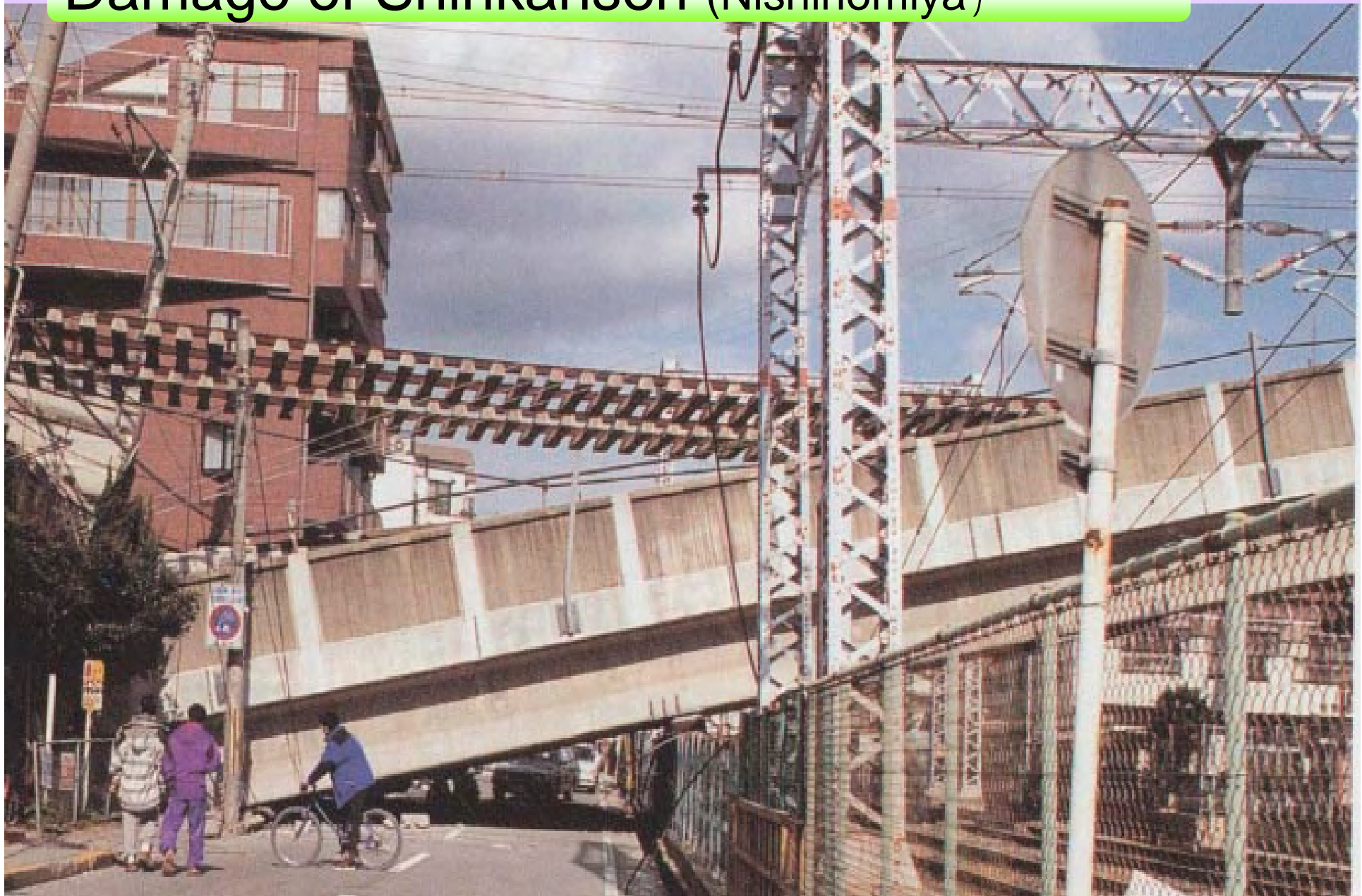
Damage on streets



地下鉄駅の崩壊による道路陥没



Damage of Shinkansen (Nishinomiya)





Damage of Shinkansen (Nishinomiya)

Re-opened within 3 months



Urban Disaster

→ Need Coordination for Rehabilitation



The GFA Eq. Reconstruction Plan (Hyogo Phoenix Plan)



“Creative Reconstruction:

Build Back Better than Before”

- **Key Principle: Creation of a Disaster-Resistant Metropolis Where People Can Live Safely and Securely**

- **Started 4 days after the disaster**
- **Adopted in July 1995 (took 6 months)**
- **Targeted completion: 2005**
- **Targeted areas: 10 Cities & 10 Towns**
- **Projects planned: 660**
- **Planned budget: ¥17Tri/\$170Bil. Invested ¥16.3 Tri:96%)**



Towards BBB Recovery

Quick Recovery of the Hanshin Express Way

高速道路の崩壊 (平成 7 年 1 月)
Collapsed highway (January 1995)



Photo : The Kobe Shimbun

高速道路の復旧工事
Restoration work on the highway



復旧した高速道路 (平成 8 年 9 月)
Restored highway (September 1996)



写真提供 : 共同通信社
Photo : Kyodo News

Towards BBB Recovery

Land Readjustment, Urban Redevelopment

Prefe



Fixed Point Observation Shin-Nagata 1995 2004

Fixed Point Observation Konan-Yamate 1997 2004





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>

Dis. Management of Hyogo has been upgraded after the GHA Eq.



- **Establishment of Initial Response System**
 - **Disaster Management Center**
 - **24-hour Monitoring and Quick-Response System**
(Standby lodgings)
 - **Phoenix Dis. Man. System**
- **Improvement of Dis. Man. Capabilities**
 - **Support of Voluntary Disaster Man. Activities**
 - **Support Team by School Teachers (EARTH)**
- **Develop. of Emergency Man. Bases**
- **Improvement of Eq. Resistant houses and Public Buildings**



Establishment of Advanced Initial Response System

24-hour Monitoring and Response system

- Established the Hyogo Prefecture Dis. Man. Center
 - Seismic Resistant Structure
 - Headquarters Control Room
 - Operation Room
 - Media Conference Room
- Stand-by lodging for 76 officials near the government building



Disaster Management Center



Standby lodging



Establishment of Advanced Initial Response System

Information Gathering and Dissemination System

- Phoenix Disaster Management System

334 terminals at Pref. & Municipal, Gov't offices, Police, SDF, Hospitals ...

Dis. Related information (Meteorological, geological, river monitoring info)

Gather information promptly and share it with related organizations

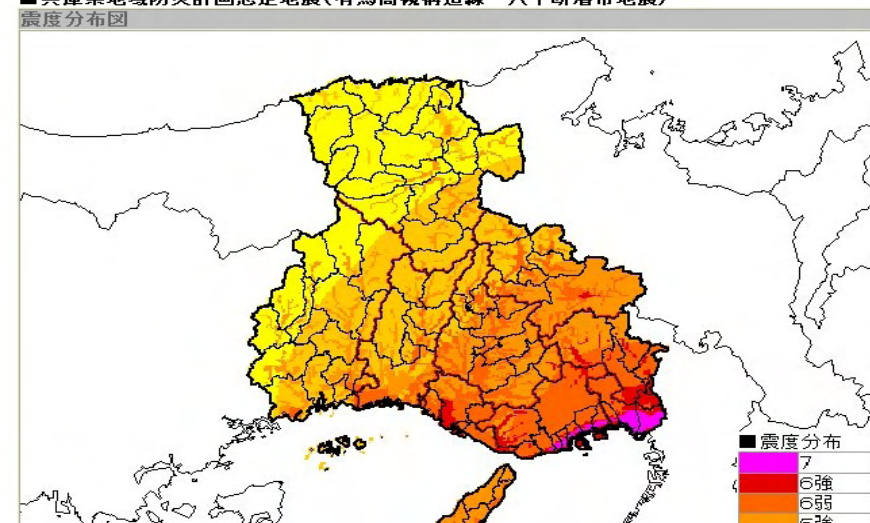
Speed up initial response by quick damage and needs estimation

- Hyogo Emergency Net

Send emergency information to citizens by E-mails



■兵庫県地域防災計画想定地震(有馬高槻構造線一六甲断層帯地震)
震度分布図

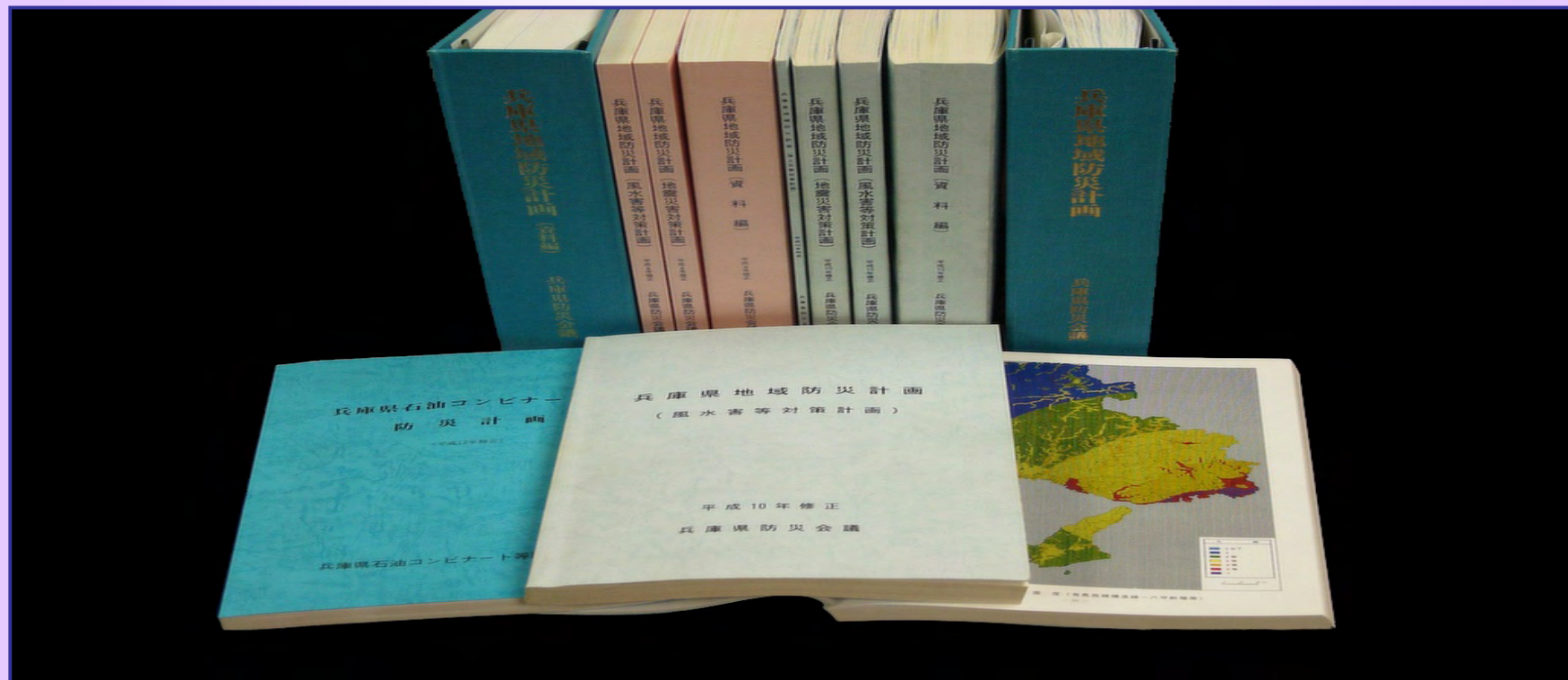




Enrichment of Regional Disaster Management Plans

Formulation of prefectural disaster management plans that correspond with various types of disasters

Storm & flood, Earthquake, Major Accidents, Nuclear-related and Marine Accidents, etc.





Development & Networking of Disaster Management Bases



Tajima Regional
Emergency
Management Base

Tajima District
Administration
Office

Nishi-Harima
District
Administration
Office

Nishi-Harima Regional
Emergency Management
Base



Miki Earthquake
Disaster Memorial Park



Disaster Management Drills

Emergency management drills among police headquarters, fire defense headquarters, SDF, medical organizations etc.

Citizens also participate in the drills

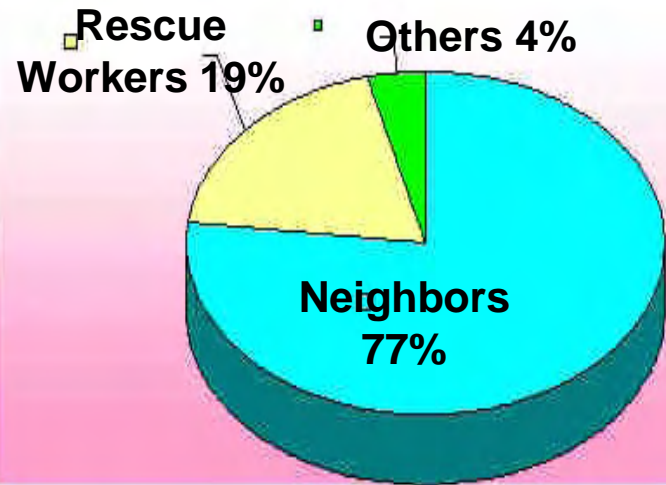
January 17th has been designate
“Hyogo Safety Day”





Improve Capacity for Community Disaster Management

About 35,000 people who could not escape alone were rescued by:



Community-based Dis. Man. Groups

27.4%(1995) 94.7%(2005)



Support of Volunteers' Activities

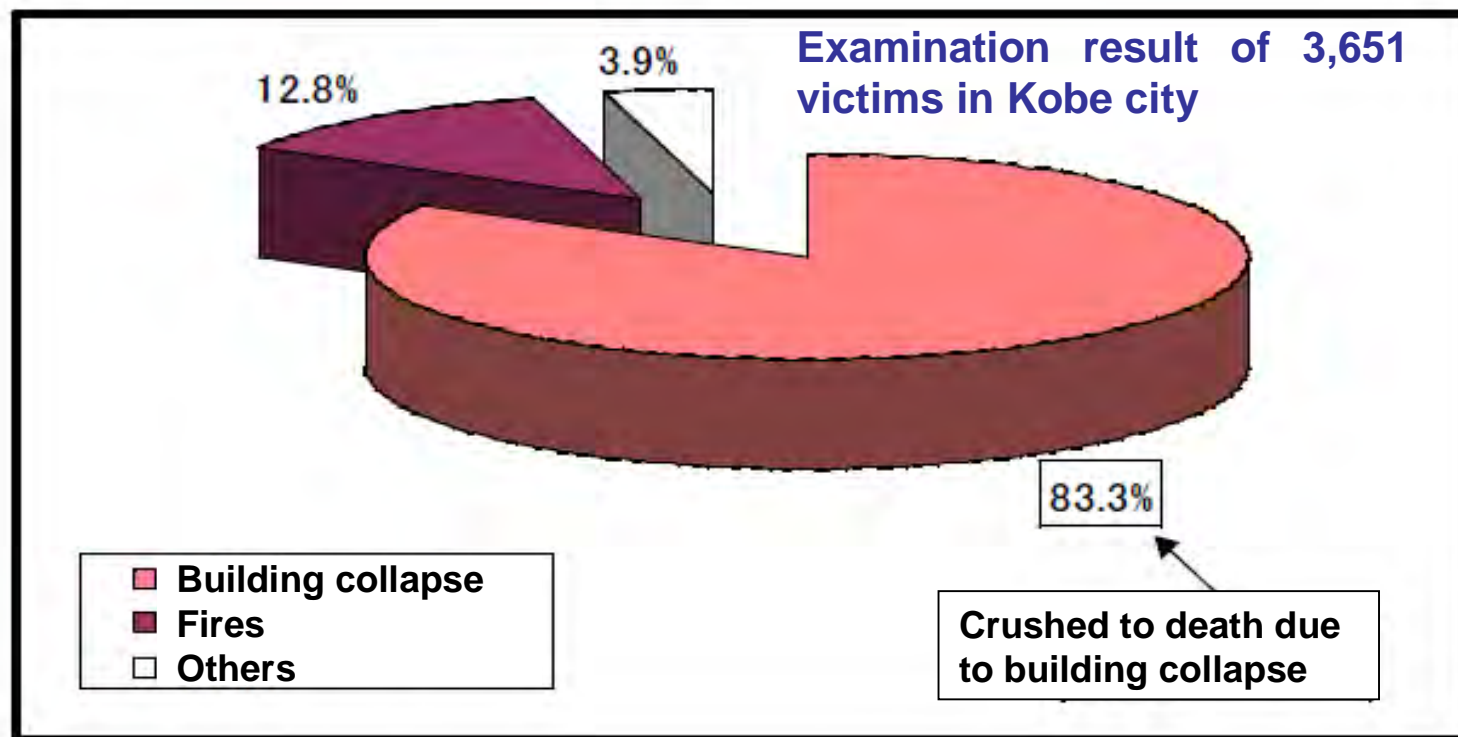
Formulating a system for support measures to expand volunteers' activities, triggered by the earthquake

- Regulation for the Support of Volunteer Activities undertaken by citizens
- Establishment of the Hyogo Voluntary Fund (¥10 bil./\$100mil.)
- Opening of the Hyogo Volunteer Plaza
- Registration of about 800 veteran volunteers



Importance of Making Houses Quake-Resistant

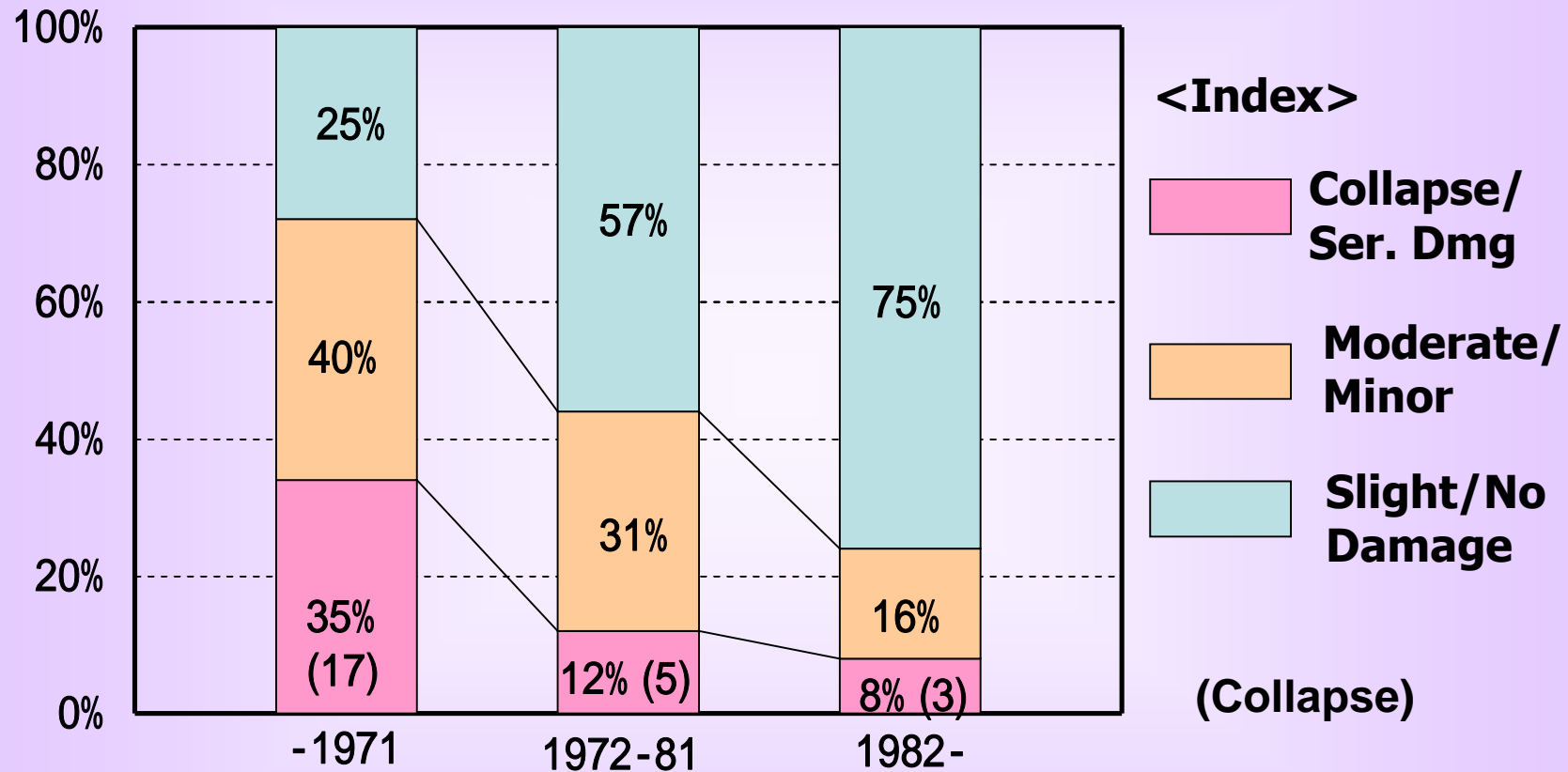
More than 80% of the victims in Kobe city were killed by building collapse





Importance of Making Houses Quake-Resistant

<Data from building survey in Central Kobe: 923bldgs>



**For upgrading eq. resistance of houses:
Subsidize part of the cost of eq. resistance evaluation and retrofitting work for private houses**

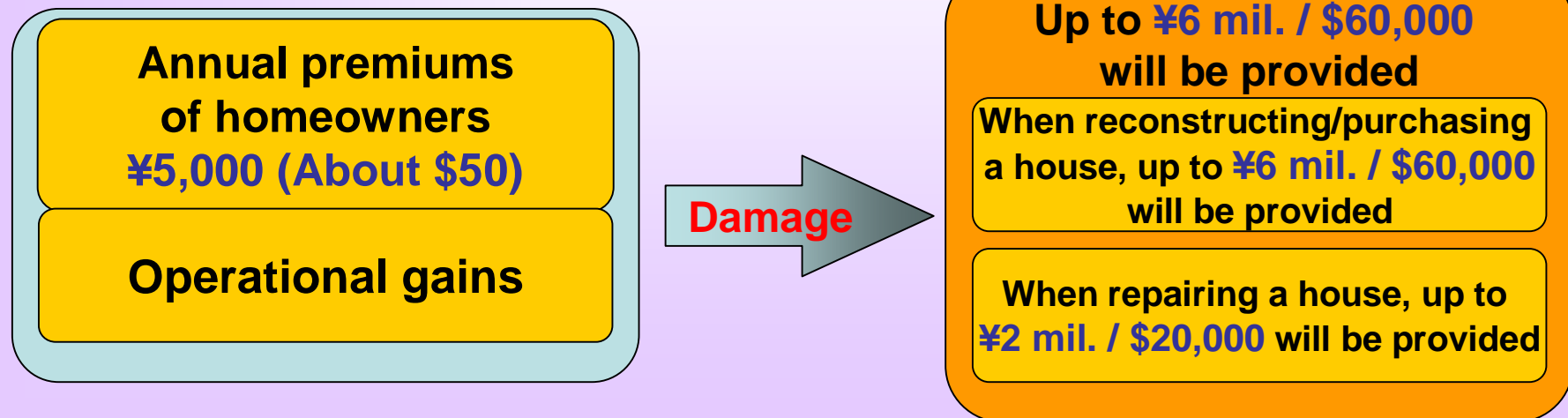


Measures to Support Livelihood Recovery

Phoenix Mutual Aid System for Housing Reconstruction

A complete new system with an idea of “mutual aid,” a framework for mutual support among homeowners, to overcome the limited resources in both “self support” such as savings and earthquake insurance, and the “public support” from the government

Regardless of the size, structure and aging of the houses, by paying fixed annual payment, applicants can receive up to 6 mil. Yen for reconstruction in case of disaster.





Transfer Live lessons to the World and the Next Generation Disaster Reduction and Human Renovation Institution (*DRI*)



Museum Exhibit

World's Largest DRR Educational Museum

500,000+ visitors every year to learn Kobe Experiences

<Got 3mil. Total visitors on 10 June '08>

More than half are students, 5% from abroad

Supported by 160 voluntary staff





International Cooperation of Hyogo for Disaster Risk Reduction

Hosting of the UN World Conference on Disaster Reduction (WCDR)

- Total of about 44,000 participants from 168 countries/regions
- Adopted the Hyogo Framework for Action, an international disaster reduction strategy for the 21st century
- Issued the Common statement of the Special Session on the Indian Ocean Disaster
- Establishment of the International Recovery Platform

Developing of an International Core for Disaster Reduction & Humanitarian Support

- Establishment of the Disaster Reduction and Human Renovation Institution (DRI) in the Kobe New Eastern City Center
- Collaboration among disaster-related organizations such as UNISDR, OCHA, WHO, Asian Disaster Reduction Center, IRP etc.

Knowledge and material support for disaster victims and recovery

- Donation of relief goods
- Conduct and cooperate for DRR research with related organizations
- Provide technical knowledge on recovery of damaged area

UN World Conference on Disaster Reduction 2005

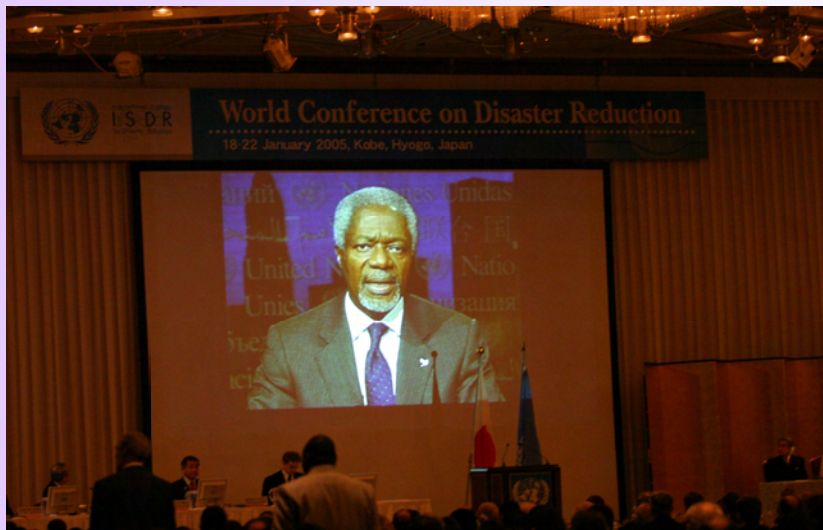
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Establishment of the International Recovery Platform (IRP)



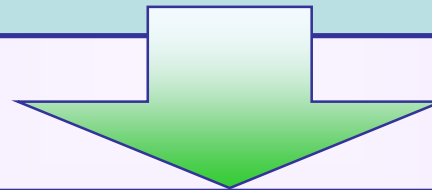


Adoption of the Hyogo Framework for Action (HFA)



World common goal for disaster reduction (2005 - 2015)

1. Comprehensive consideration to disaster risks at the stage of development planning in order to attain sustainable development
2. Fostering organizations, systems and regional communities to improve the capacity to deal with disasters
3. Systematic management of disaster risk alleviation at the stages of emergency relief and subsequent reconstruction



Priority action by each country to achieve goals (Practical action plans for 5 categories)

1. Strengthen institutional basis for disaster prevention
2. Identify, assess and monitor disaster risks and enhance early warning
3. Promote the use of knowledge and education of disaster prevention to build a culture of safety and resilience at all levels
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response at all levels



International Core for Disaster Reduction and Humanitarian Support

- DRI in the Kobe New Eastern City Center (HAT-Kobe)
- Home to many international institutions related to disaster reduction, medicine, health, and environment, such as ISDR, OCHA & WHO



- WHO Kobe Centre
- APN Centre
- EMECS

JICA Hyogo International Centre

- IRP
- UNISDR
- ADRC
- EDM
- UNOCHA
- UNCRD
- Hyogo Earthquake Memorial Research Institute

- Hyogo Emergency Medical Center
- Japan Red Cross Society Hyogo Chap.
- Hyogo Institute for Traumatic Stress

Disaster Reduction & Human Renovation Institution (DRI)



Knowledge Sharing (Dispatch of Experts)

Year	Name of disaster	Notes
2005	Workshop in Thailand	Presentation on disaster reduction/disaster medicine for the Governor of Phuket (Another presentation given by IRP)
2005	Workshop in Indonesia	Presentation on the experience of earthquake disaster, for national and regional public officials (JICA project; another presentation given by IRP)
2005	Pakistan Earthquake	Coordination of medical support, research on disaster damage and international support
2005	Workshop in 1 year commemoration of Indian Ocean Tsunami, Phuket, Thailand	Presentation on the experiences of earthquake disaster for regional public officials and university students (invited by the Phuket Municipality)
2006	Java Indonesia Earthquake	Preliminary research on reconstruction assistance for affected area and medical assistance
2006	Workshop in Taiwan	Presentation on the experience of earthquake disaster for regional public officials

(*) Quoted only after 2005



Relief Goods/ Financial Support

Year	Name of disaster	Notes
2005	Iran Earthquake	500 blankets
2005	Sumatra Indonesia Earthquake (Indonesia)	500 blankets and 1,000 antiseptics
2005	Hurricane Katrina (USA)	Financial Assistance of ¥1 million each for US federal government and Louisiana State government
2005	Pakistan Earthquake (Pakistan/India)	Financial assistance of ¥1 million each for the governments of Pakistan and India 500 blankets for the Pakistan government
2006	Leyte Philippine Landslide	Financial assistance of ¥1 million for the Philippine government
2006	Java Indonesia Earthquake (Indonesia)	Financial assistance of ¥1 million for the Indonesian government 1,000 blankets for the government of the Yogyakarta Special Province

(*) Quoted only after 2005



Recovery Donations from Hyogo Citizen

Year	Name of Disaster	Amount (Unit: thousand yen)	Projects
2001	India Earthquake	174,914	Construction and renovation of earthquake-resistant model school
2001	9.11 Attacks on the US	85,495	Scholarship for higher education of family members of terrorism victims
2003	Iran Earthquake	86,542	Seismic retrofitting of schools and promotion of related education for residents and training for construction workers
2004	Sumatra Indonesia Earthquake	92,669	Aid for a school reconstruction project in Sri Lanka / Aid for the foundation of a museum for Tsunami disaster in Indonesia
2005	Hurricane Katrina	23,950	Art-therapy sessions at school, field trip to art museum., etc.
2005	Pakistan Earthquake	39,602	High School reconstruction
2006	Java Indonesia Earthquake	33,695	Seismic retrofitting of an elementary school and reconstruction of kindergarten

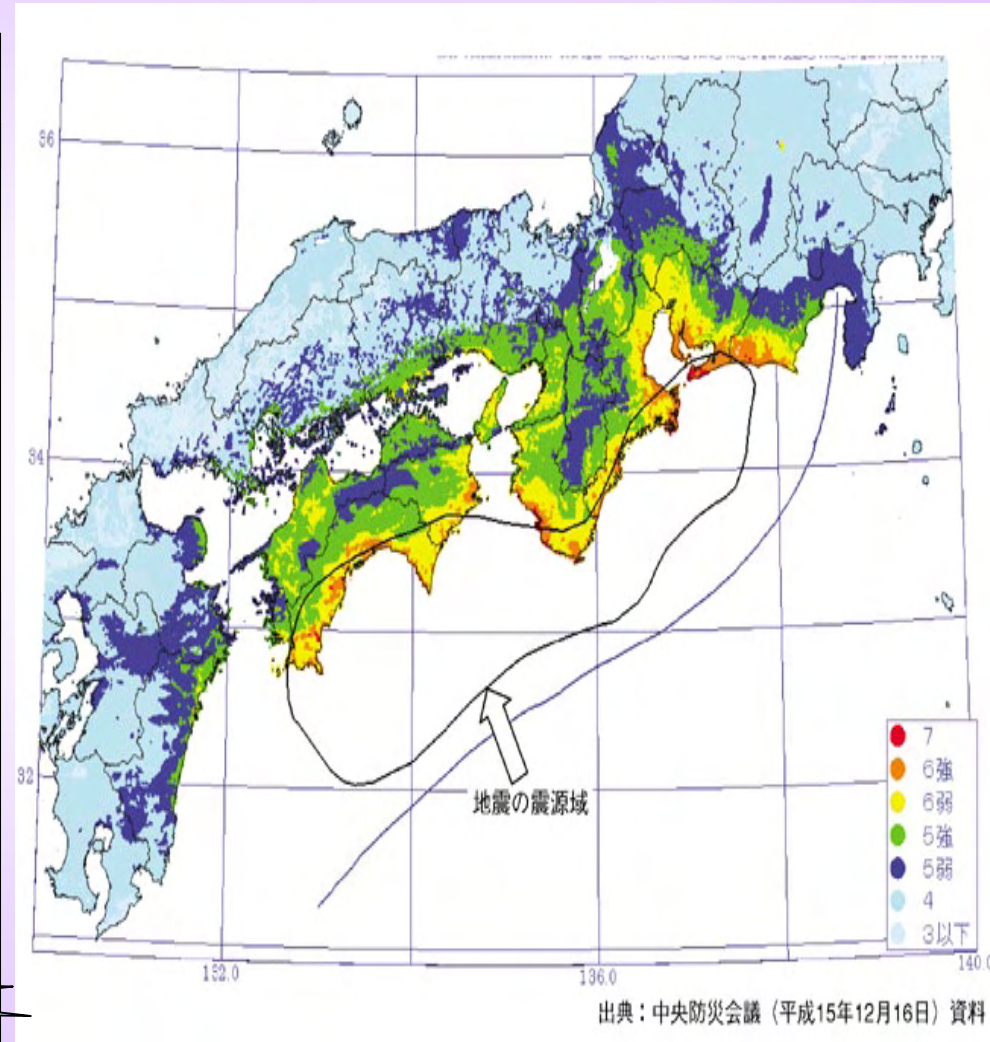
(*) Quoted only after 2001



Against future disasters: Preparing for Tonankai & Nankai Earthquakes

Year	Nankai Earthquake	Tonankai Earthquake	Tokai Earthquake
1605	Keicho Earthquake (M 7.9)		
		102 Years	
1707	Hoei Earthquake (M 8.4) Dead: 5,038		
		147 Years	
1854	Ansei Tokai Earthquake (M 8.4)		
	Ansei Nankai Earthquake (M 8.4) Dead: 2,658		90 Years
1944			
1946	Tonankai (M 7.9) Dead: 1,251		
	Nankai (M 8.0) Dead: 1,330		59 Years
2005			
	Next earthquake?		

: Seismic slip distribution

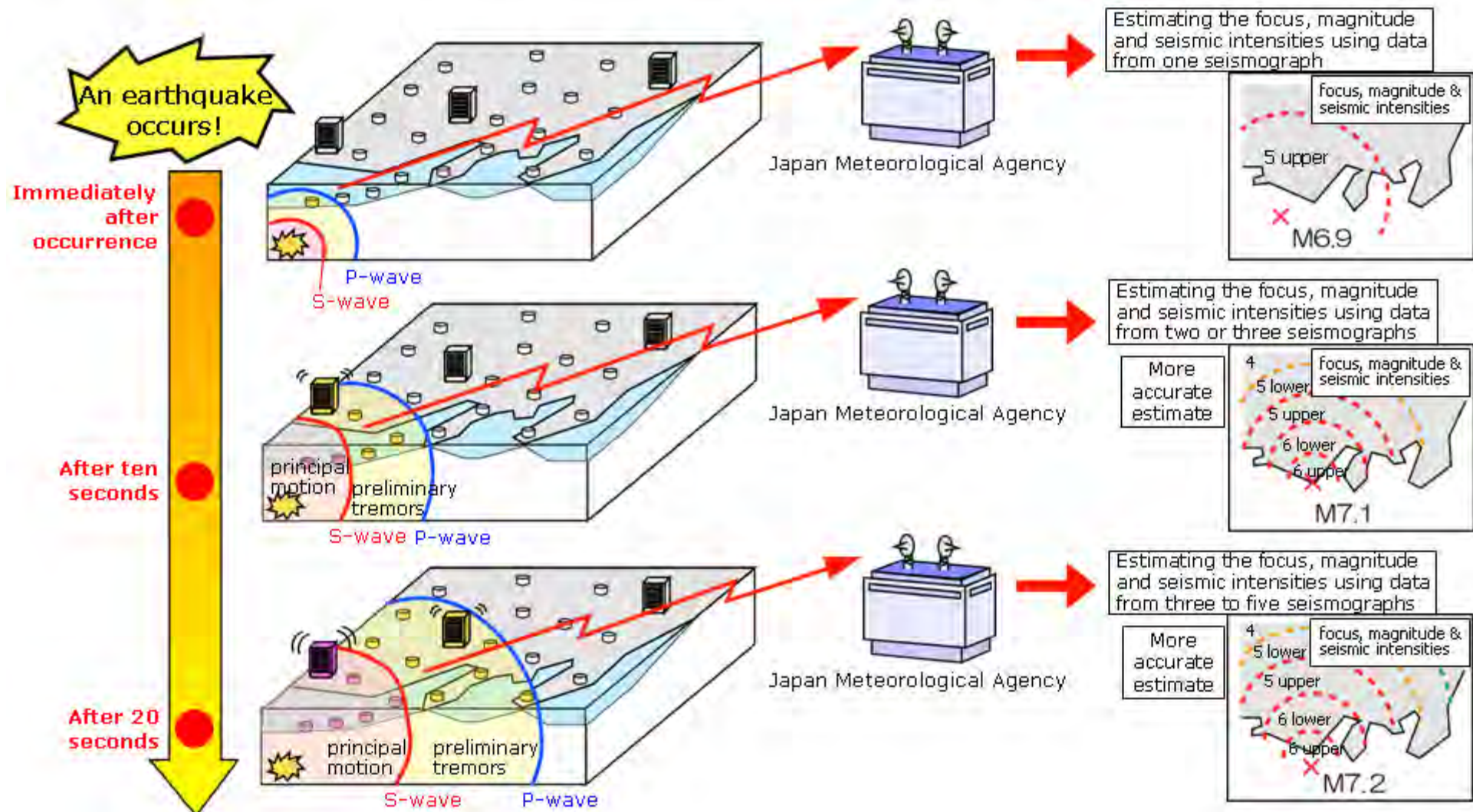




Earthquake Early Warning Information by JMA

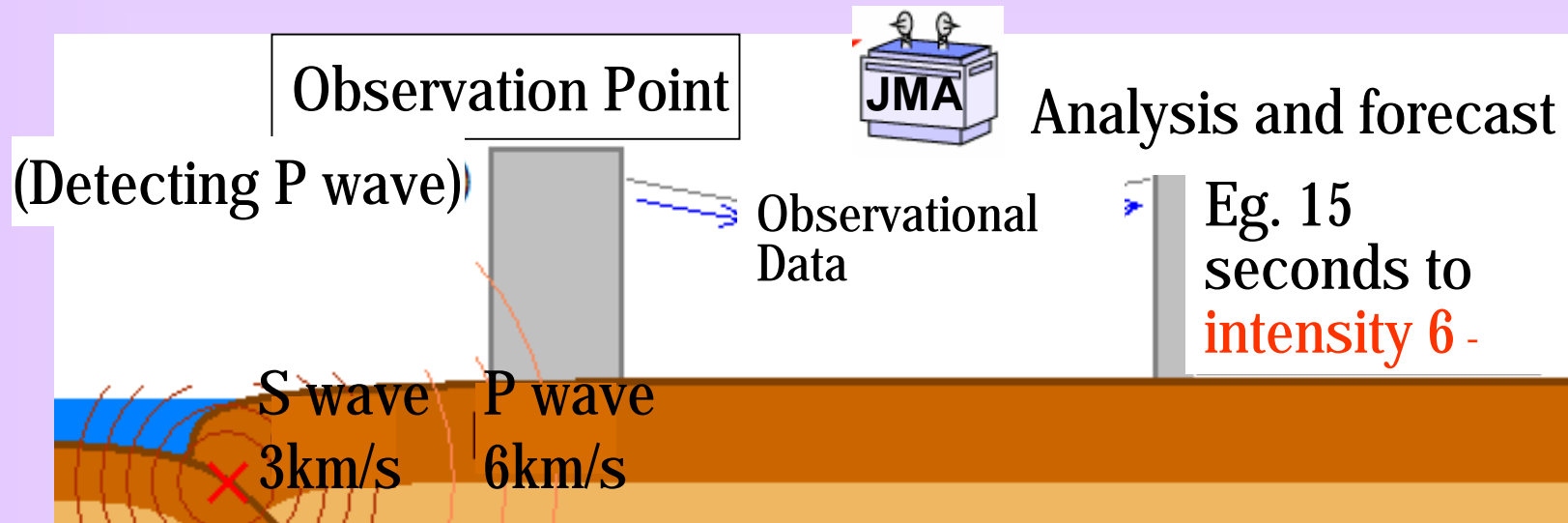


Earthquake Early Warning Information by JMA

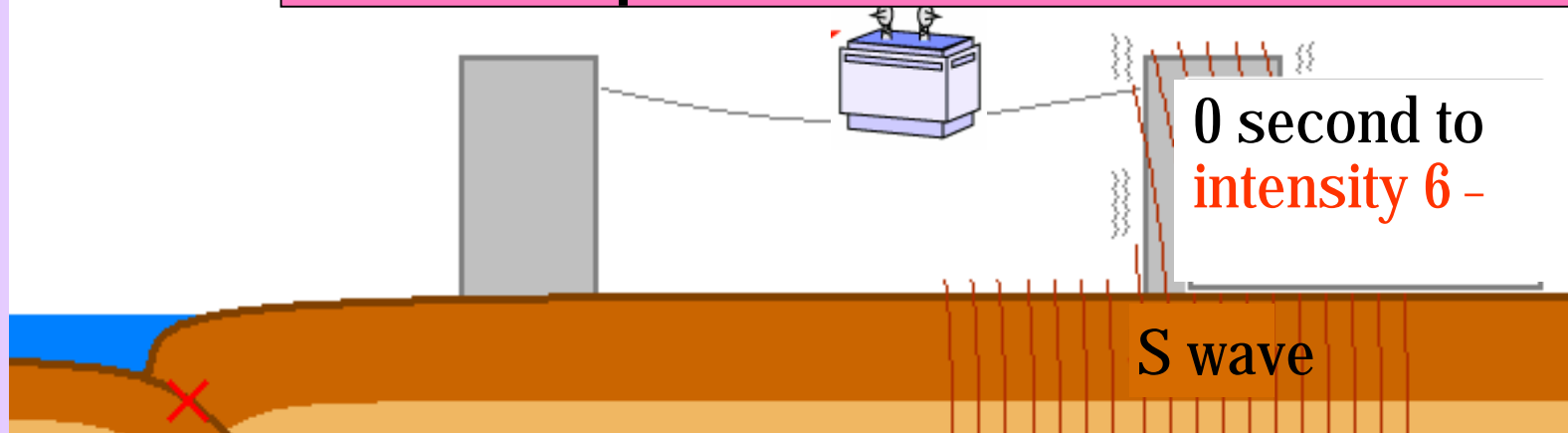


The EEW system provides advance announcement of the estimated seismic intensities and arrival time of S-wave

Earthquake Early Warning Information by JMA



Not an Eq. Prediction but an Early Warning after an Eq. occurs



The EEW system provides advance announcement of the estimated seismic intensities and arrival time of S-wave

Utilization Image of EEWI (1)



Trains

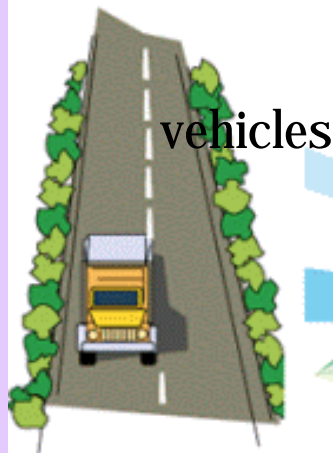


Closing of floodgates against tsunami



Ensure safety and evacuation of people in facilities

Emergency stop for safety



vehicles



Control of aircraft taking off and landing



Traffic and traffic lights control

Shipping control against Tsunami



Utilization Image of EEWI (2)

緊急地震速報の活用イメージ (2)

Interruption of works to avoid mistakes
<Eg. Surgery at Hospital>



Quick and accurate dissemination of earthquake information to residents etc...

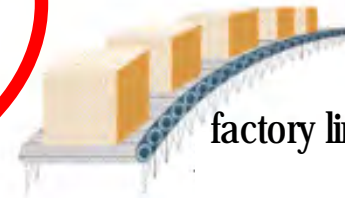
Control of usage of general calls, ensure emergency communication lines



Ensure safety of residents



Interruption of works to protect workers



factory lines



Ensure evacuation and safety of public institutions (hospitals, schools)

Elevator



Emergency stop for safety

gas

electricity



Early Warning System is not perfect

Niigata Chuetsu Eq. M6.8 D13Km

2004.10.23 05.56 pm

Compact YUREDASU System worked (1sec), but

**Bullet Train Derailed at 200km/h
<only 8Km from the Epicenter>**

Shinkansen TOKI : Last car





Thank you very much for your attention.



Masahiko MURATA

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Hyogo Pref. Government