

Tsunami Disaster Mitigation System in Japan

- 1. Bitter Tsunami Experienced**
- 2. Tsunami Warning and Mitigation System**
- 3. Outline of Disaster Management System**
- 4. New Challenges against Tsunamis**

Historical Damaging Tsunamis along Japanese Coast (in last 150 years)

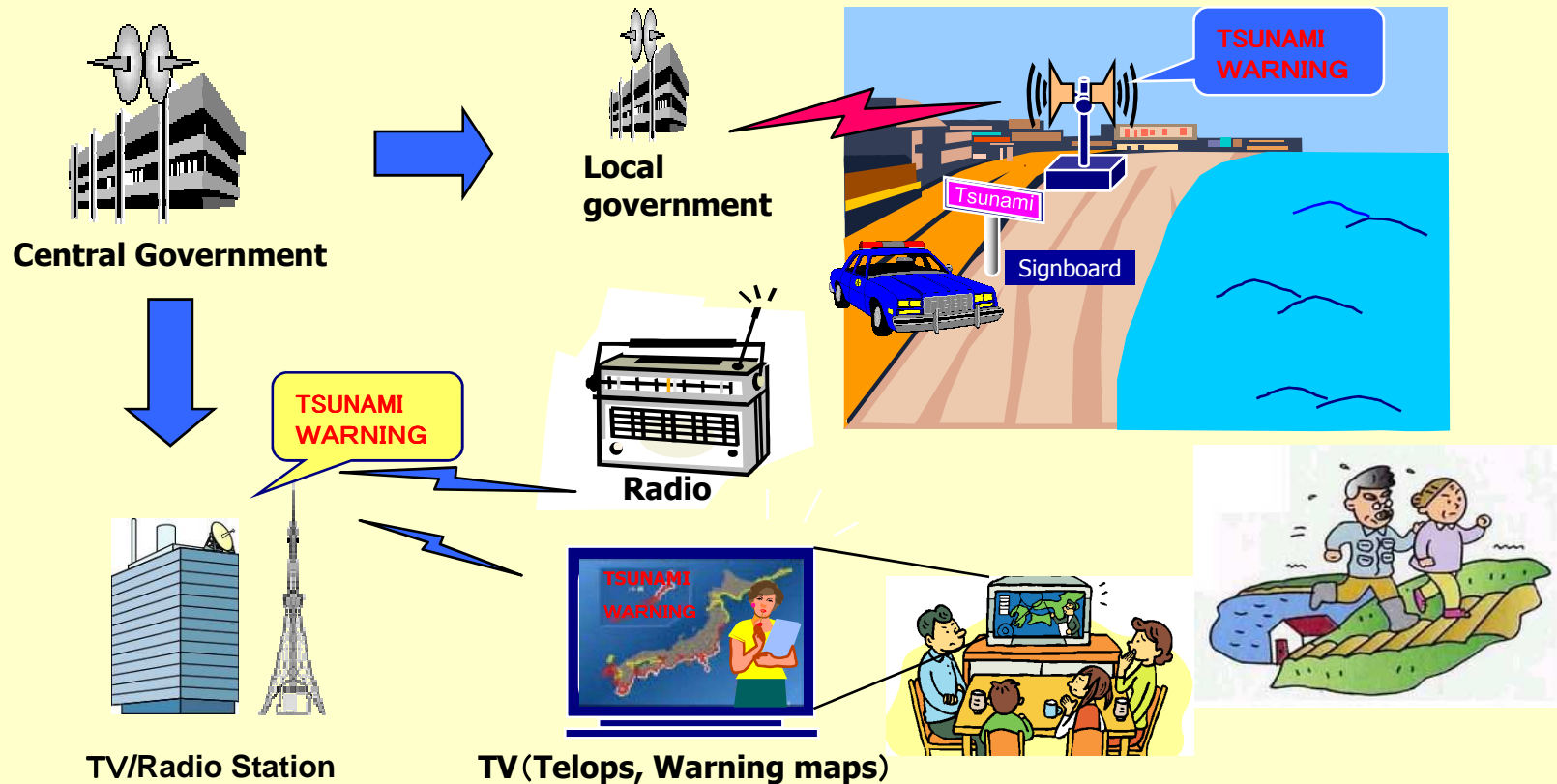
Name (Magnitude)	Year	Dead or Missing
Meiji-Sanriku Earthquake and Tsunami (M8.5)	1896	22,000
Showa-Sanriku Earthquake and Tsunami (M8.1)	1933	3,064
Tonankai Earthquake (M7.9)	1944	1,251 ¹⁾
Nankai Earthquake (M8.0)	1946	1,443 ¹⁾
Chile Earthquake (Mw9.5) ²⁾	1960	142
Tokachi-Oki Earthquake (M7.9)	1968	52 ¹⁾
Nihonkai-Cyubu Earthquake (M7.7)	1983	104 ¹⁾
Hokkaido-Nansei-oki Earthquake (M7.8)	1993	230 ¹⁾

1) The number includes dead or missing from earthquakes.

2) Tsunami generated at far off Japanese coast.

Tsunami Warning System Elements

Communication & Transmission of Tsunami Warning to Localities & Civil Defense Authorities



NHK TV Screen Image

showing Seismic Intensity by Miyagi-ken Earthquake on 26 July 2003

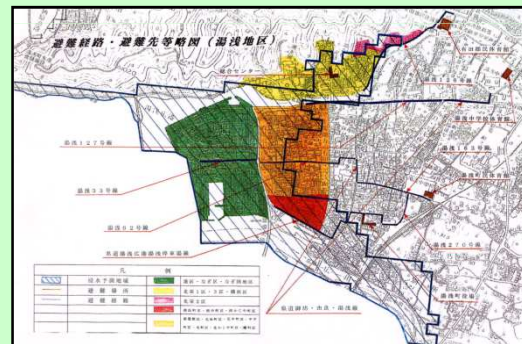


within 5 minutes
after the
Earthquake
with/without
Tsunami Warnings

Promoting Basic Knowledge about "TSUNAMI" Disaster



Safe Evacuation Route



Understanding of Hazardous Areas

Appropriate Risk Awareness of Local Communities

+



Early Warning

||



Safe Evacuation

Tsunami Evacuation Route Sign 1



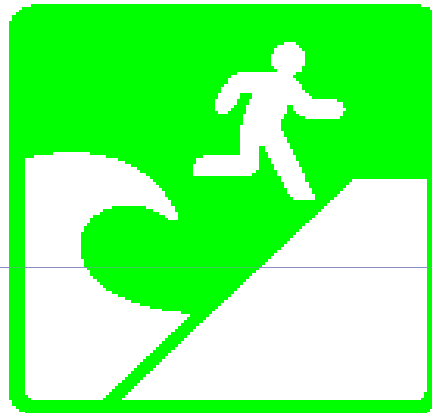
Pictogram on Tsunami

Tsunami Hazard Area



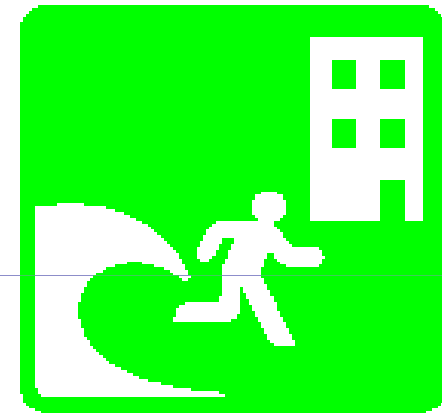
There is a high possibility to be flooded in this area when earthquake occurs.

Tsunami Evacuation Area



Safe place/hill for evacuation against Tsunami.

Tsunami Evacuation Building



Building for evacuation against Tsunami.

Sign of Previous Tsunami Height (2)

Inundated level of previous Tsunami



Tsunami Evacuation Map



Tsunami countermeasures taken by local municipalities and communities (1)



Evacuation drill on Tsunami
(Taro Town, Iwate Pref.)



Group session on evacuation plan
(Urado-District, Kochi Pref.)

Tsunami countermeasures taken by local municipalities and communities (2)



Check of the dangerous points
(Nansei-Town, Mie Pref.)



Training for supplying food
(Yawatahama-city, Ehime Pref.)

Tsunami countermeasures taken by local municipalities and communities (3)



Meeting on the disaster map
(Bungo-Takada-city, Oita Pref.)



Drill for disaster management with maps
(Hyga-city, Oita Pref.)

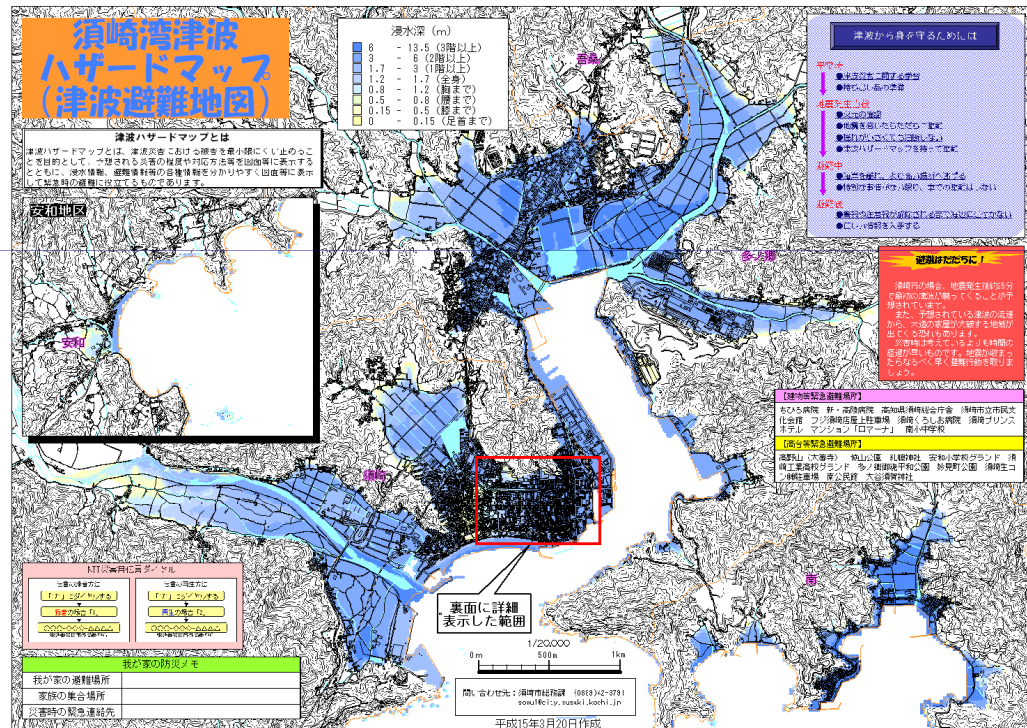
Tsunami Hazard Maps

Purpose

- Identifying and showing vulnerable areas
- Enhancing people's awareness

- Showing information on disaster risks and evacuation routes, etc.

- Letting residents in coastal areas and visitors know the hazard map through various opportunities
- Tsunami drills

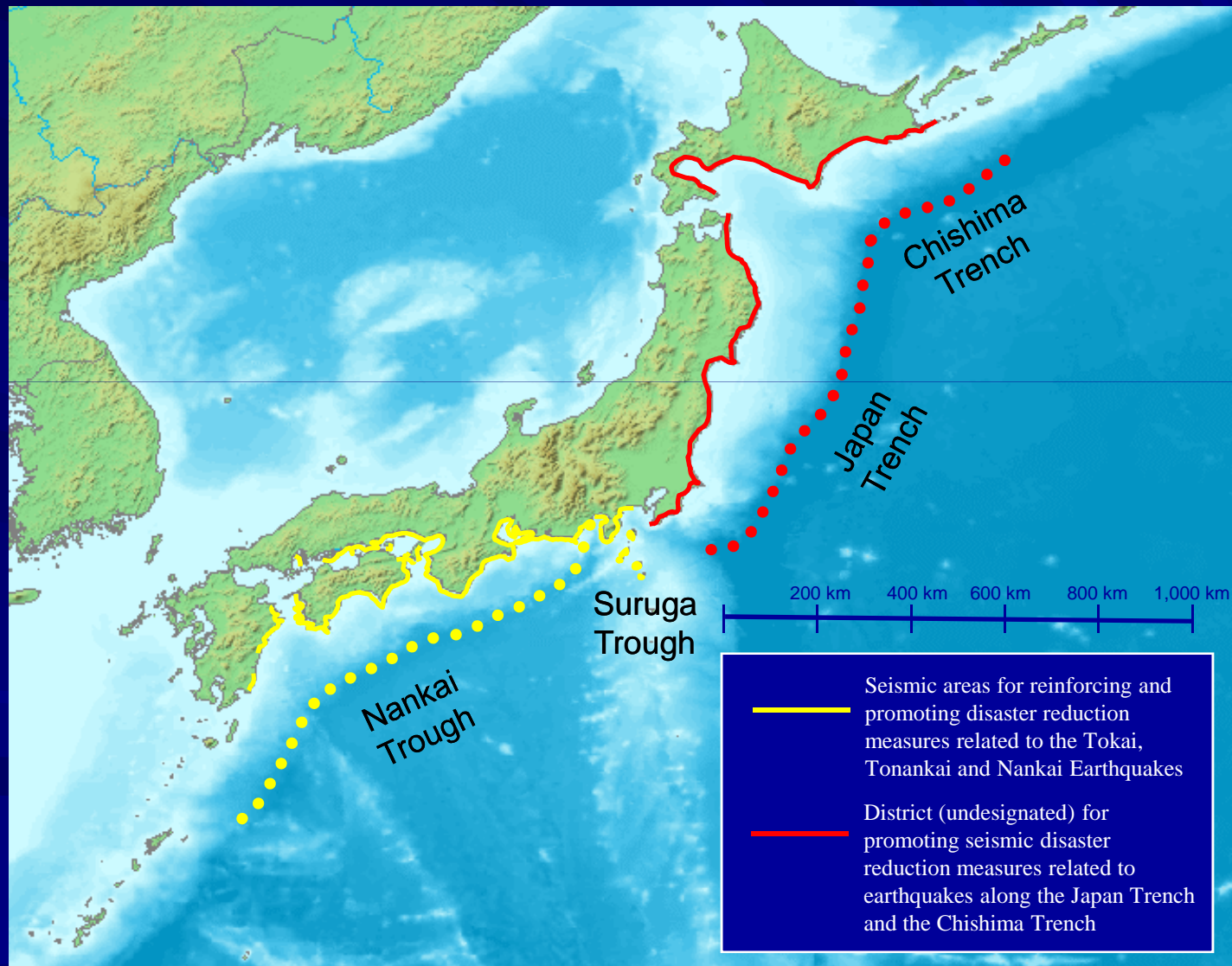


Tsunami Hazard Map (Susaki City)

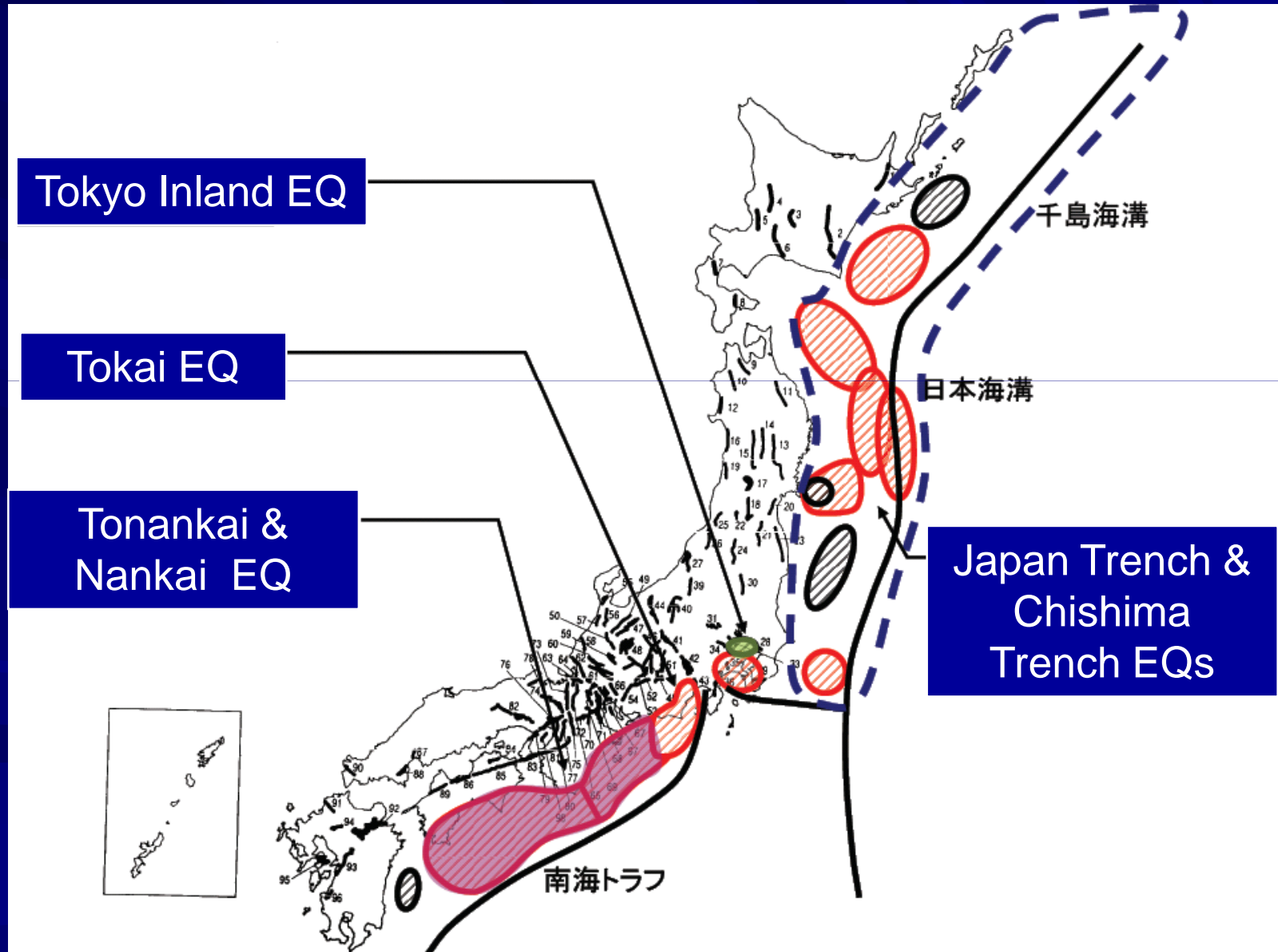
National Government prepared a guideline for help local authorities to make and use hazard maps.

4. New challenges against Tsunamis

Japan and its major seacoasts



Possible large-scale earthquakes and tsunamis in Japan



Estimation of damage caused by possible EQs

(by technical investigation committees of Central Disaster Management Council)

(Maximum cases)	Tokai EQ	Tonankai Nankai EQ	Kobe EQ 1995
Victims (persons)	9,200 (7,900 by strong tremors)	18,000 (8,600 by tsunamis)	6,436
Houses destroyed	260,000	360,000	105,000
Economic loss (billion yen)	37,000	57,000	10,000

Earthquake Disaster Risk Reduction Strategy

(formulated by Central Disaster Management Council on 30 March 2005)

Setting an overarching goal
for disaster risk reduction in the next decade

To halve the estimated death toll and economic loss

Tokai EQ

- **Death toll : 9,200 persons → 4,500**
- **Economic Loss : 37 trillion yen → 19 trillion yen**

☆ Strategic goal (ex.)

- Increase the ratio of retrofitted houses : 75% (2003) → 90% (2015)

Tonankai & Nankai EQ

- **Death toll : 17,800 (8,600 by tsunamis) → 9,100**
- **Economic Loss : 57 trillion yen → 31 trillion yen**

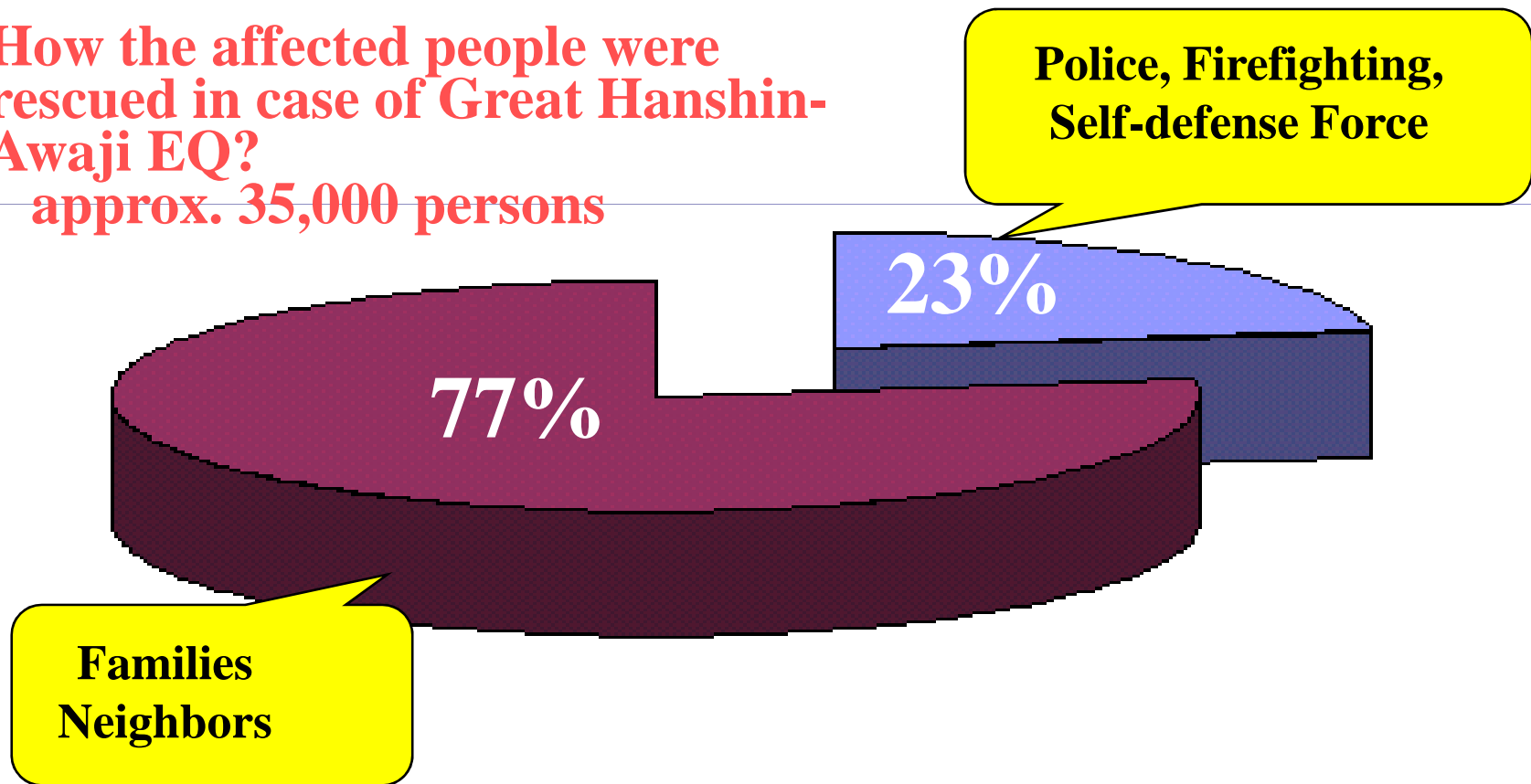
☆ Strategic goal (ex.)

- Every municipality at risk is expected to develop hazard maps in 2015

Communities – last resort

Need to build communities resilient to disasters, including through enhancing public awareness and developing hazard mapping

How the affected people were rescued in case of Great Hanshin-Awaji EQ?
approx. 35,000 persons



THANK YOU