Early Warning

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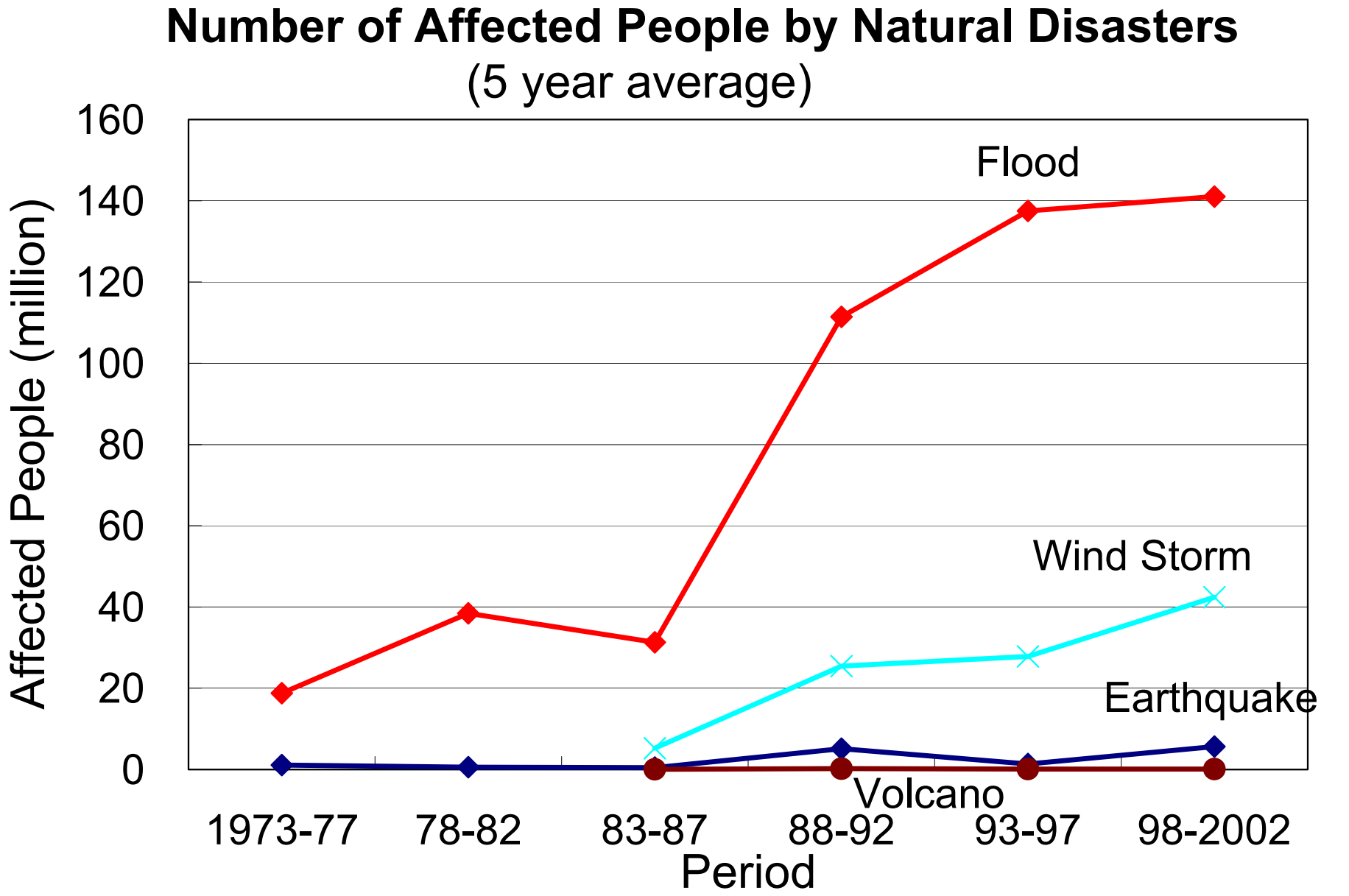
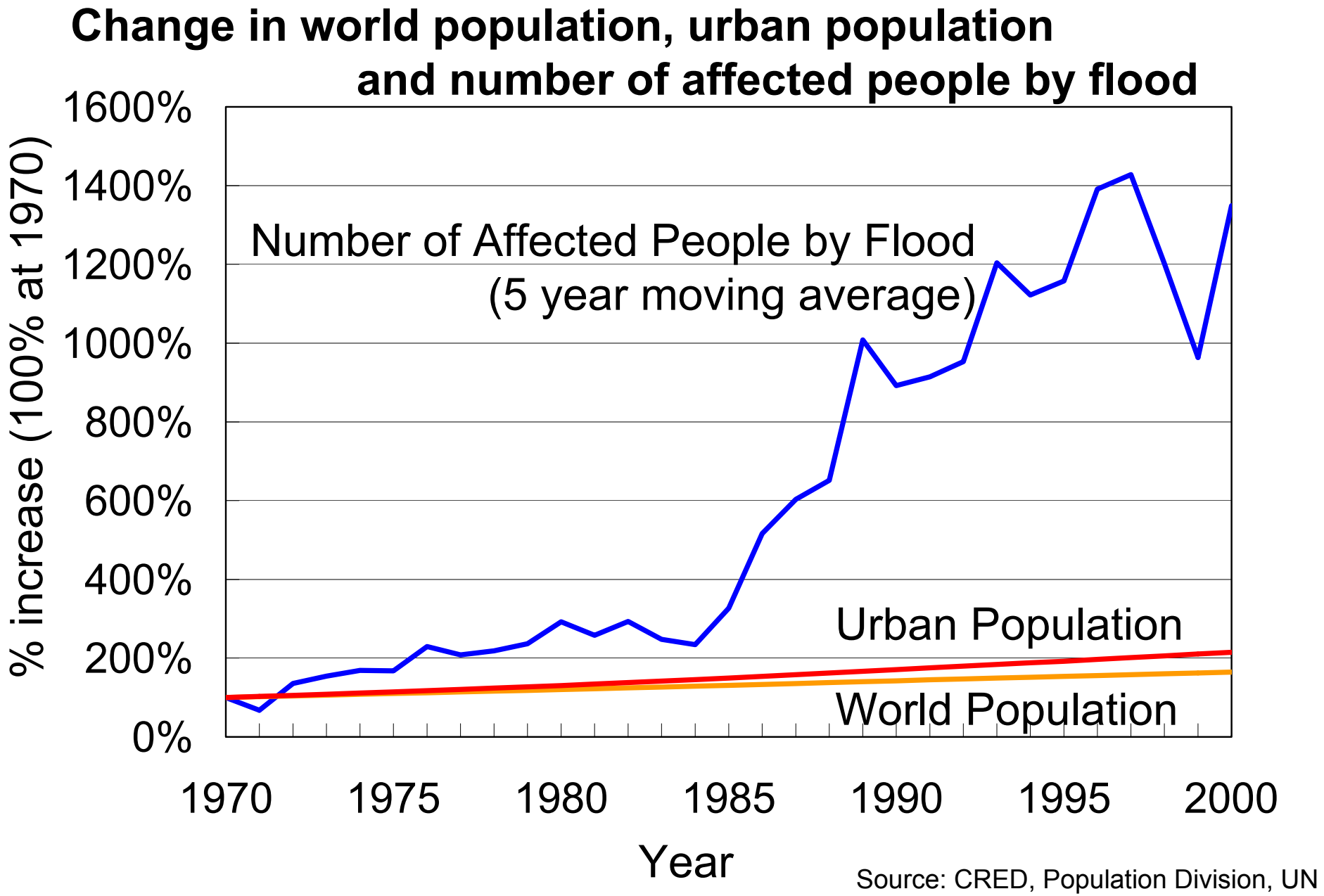
Increasing Disasters



Source: World Disasters Report, International Federation of Red Cross and Red Crescent Societies

Disaster damage increase faster than population growth



Source: CRED, Population Division, UN

Can early warning work to reduce human loss?

Human loss by natural disasters in the world

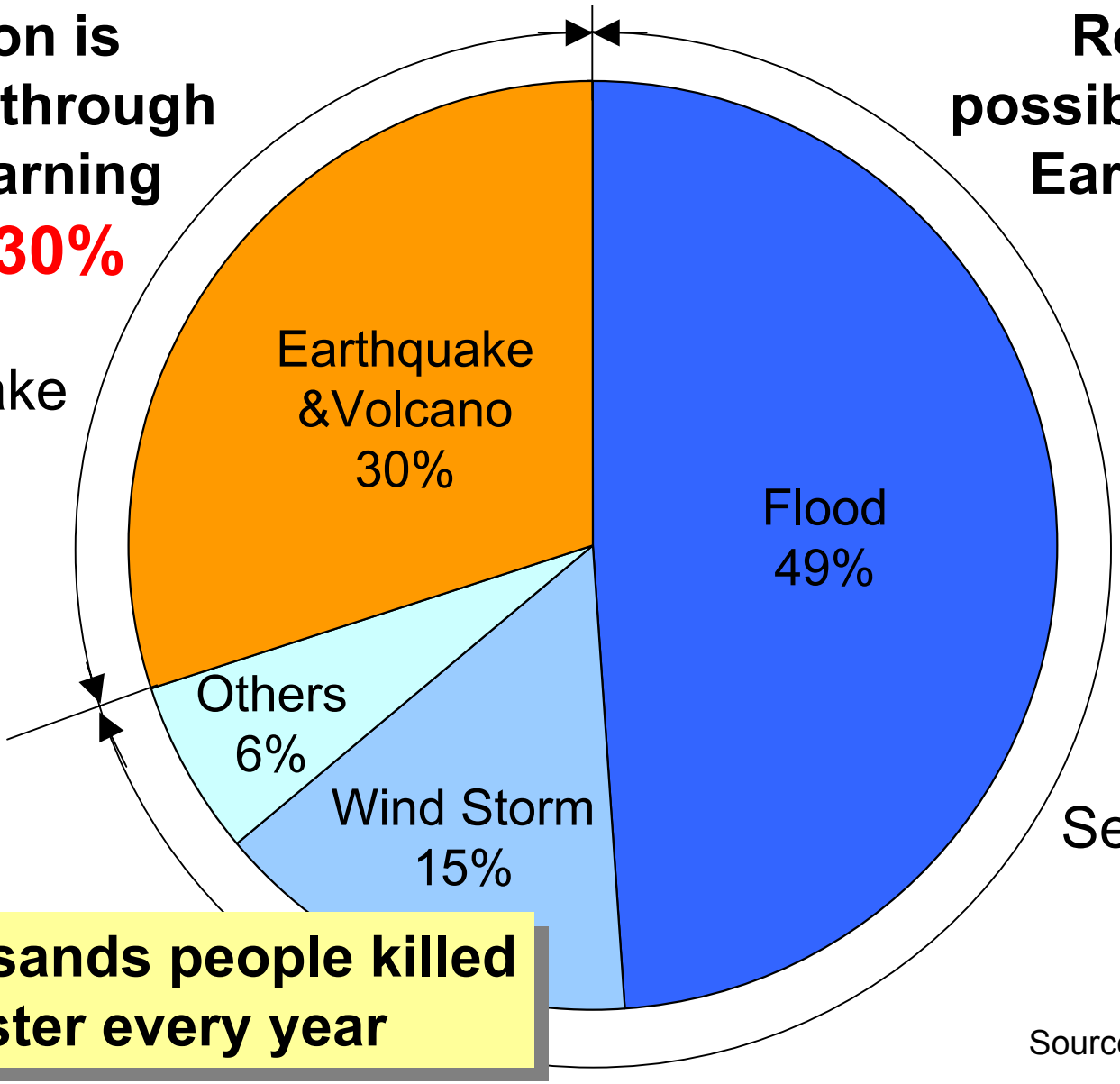
Reduction is difficult through Early Warning

30%

Earthquake
Volcano
…

Reduction is possible through Early Warning

70%



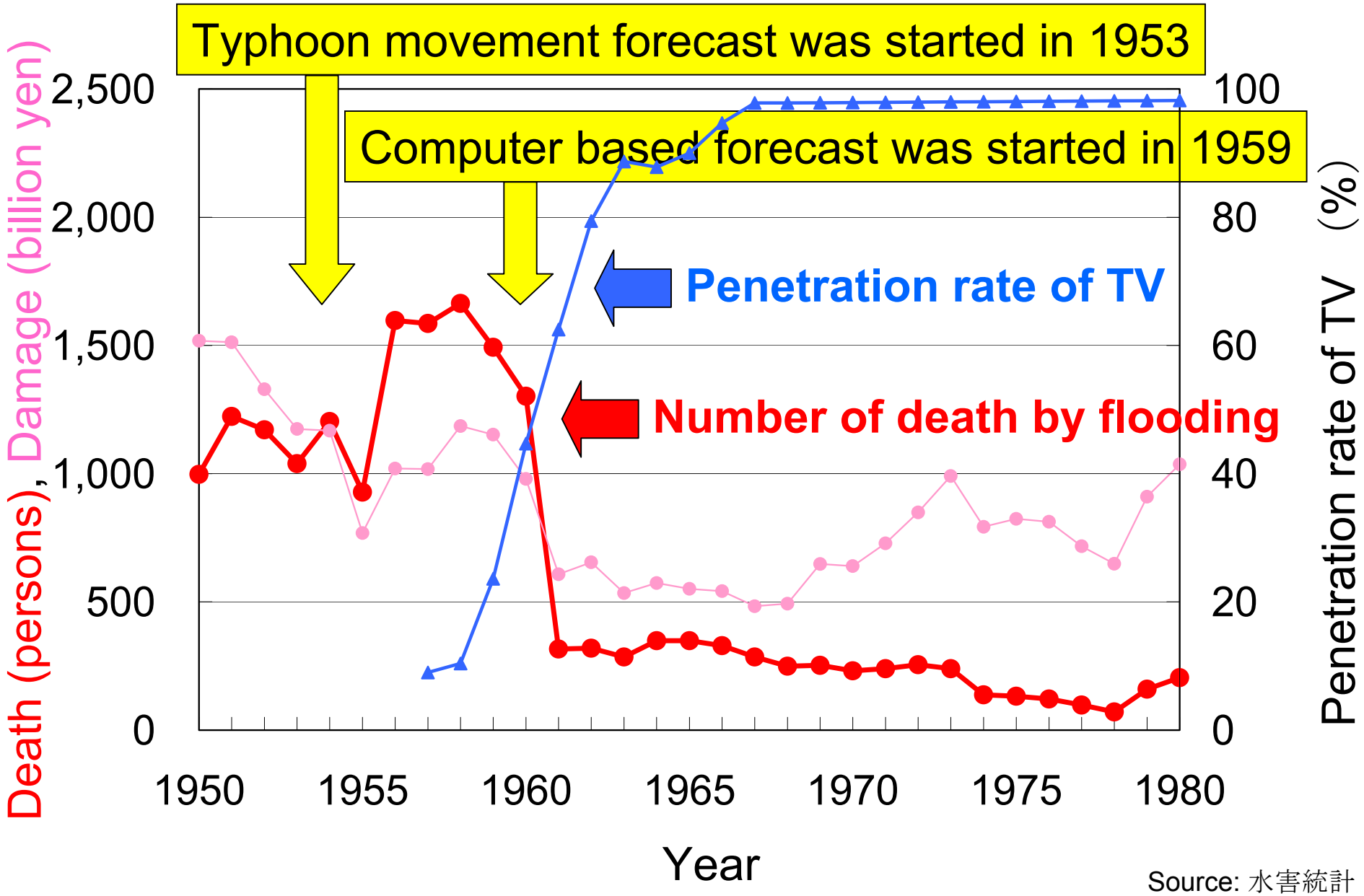
Flood
Wind Storm
Sedimentation

40 thousands people killed by disaster every year

Source: World Watch 2001

Human loss can be reduced dramatically by Early Warning.

Human loss has been reduced dramatically (Case of Japan)

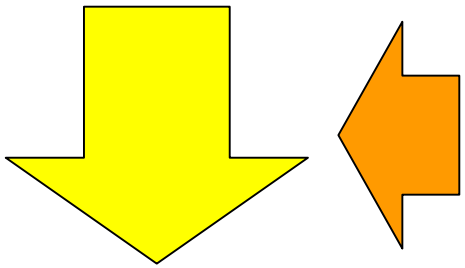


Source: 水害統計

Human loss has been reduced dramatically by Early Warning (Case of Bangladesh)

1991 Cyclone in Bangladesh

Maximum Wind Speed: 225km/hr
Number of Death: **138,882**



-Accurate and timely forecasting system
-Adequate proper warning dissemination operation
-Social mobilization and awareness raising
-Proper coordination among government agencies

1997 Cyclone in Bangladesh

Maximum Wind Speed: 220km/hr
Number of Death: **134**

Source: State of the Environment, Bangladesh 2001, UNEP

Human loss can be reduced dramatically by Early Warning (Case of Sumatra)

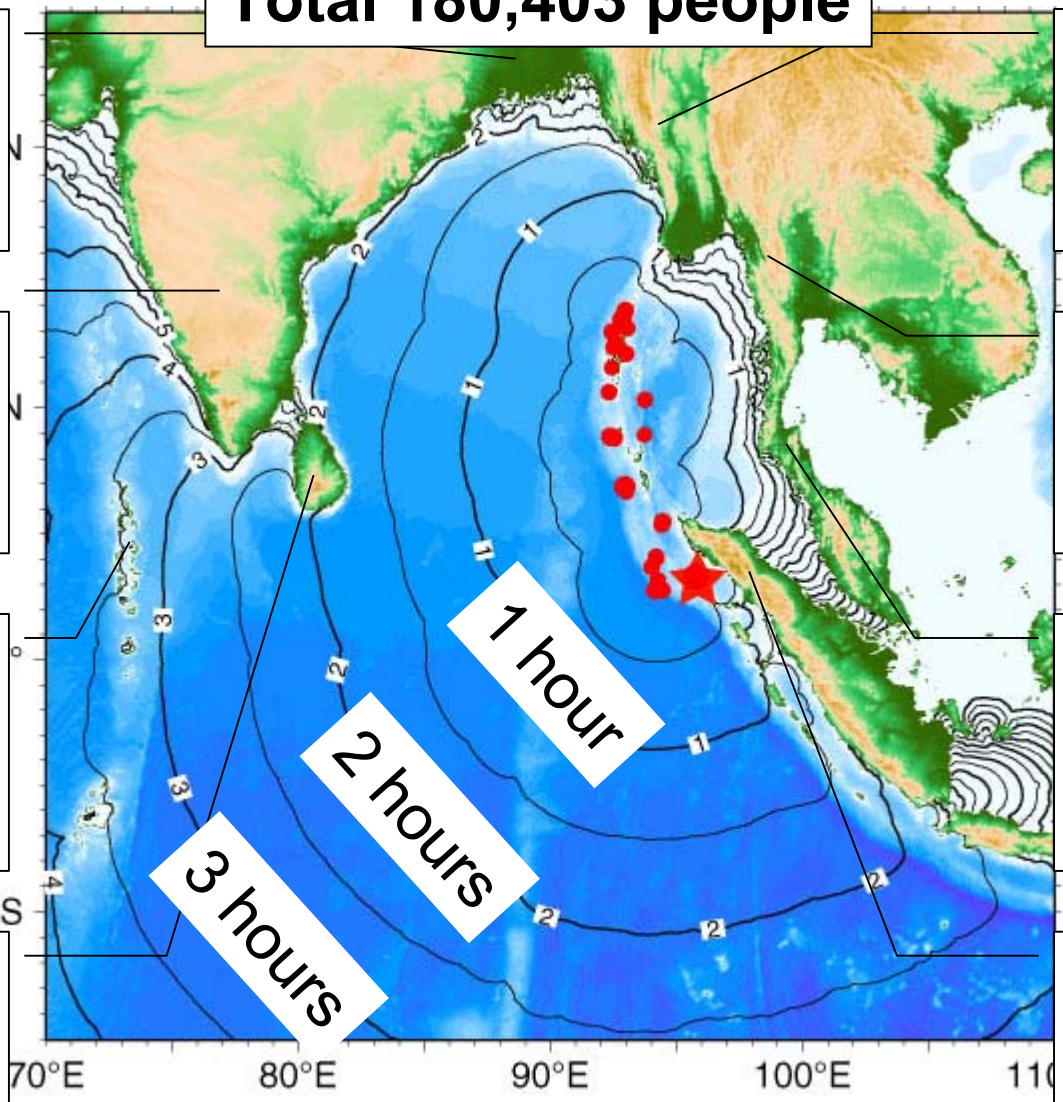
Total 180,403 people

Bangladesh
2
2.5 hours

India
15,955
2.5 hours

Maldives
74
3.5 hours

Sri Lanka
36,970
2 hours



Myanmar
59
1 hour

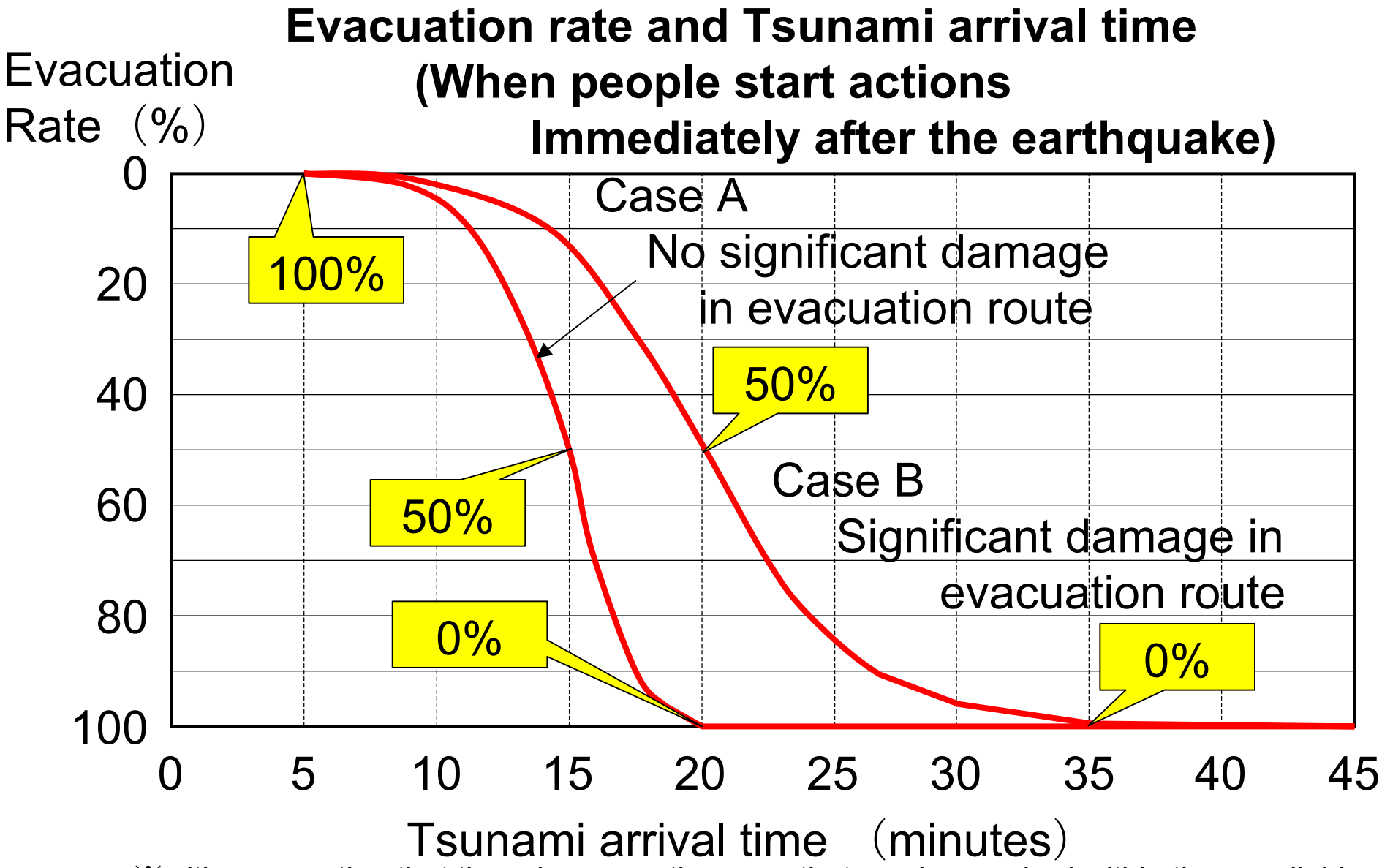
Thailand
8,699
3 hours

Malaysia
74
2 hours

Indonesia
118,570
30 minutes

As of January 10, 2005

Can Early Warning be effective per se?



※with assumption that there is evacuation area that can be reached within time available

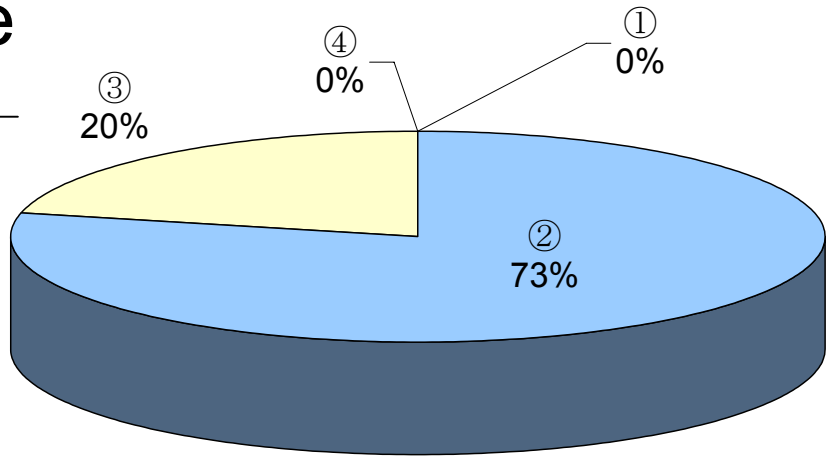
Source:中央防災会議の東南海・南海地震等に関する専門調査会の第10回資料

Can Early Warning be effective per se?

Main reasons for spread of human damage

- No information available at time of disaster
- No awareness that evacuation is necessary
- No knowledge of evacuation area
- No evacuation area available

Number of people who have (not) evacuated and their reasons in doing so



1. Voluntarily evacuated and evacuated when directives issued
2. Not evacuated because they judged evacuation was not necessary
3. Not evacuated because they did not know how to do and not evacuated because necessary information was not available
4. Not evacuated because the area was already flooded

For Early warning to be effective…

3 Major components are required

1. Information collection/dissemination system

2. Investment on essential evacuation infrastructure

3. Education/awareness raising of citizens

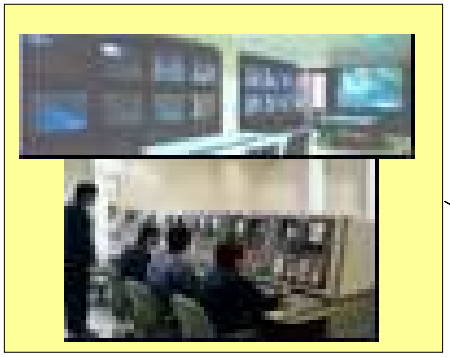
1. Information Collection/Dissemination System

Radar Observation

Monitor Camera

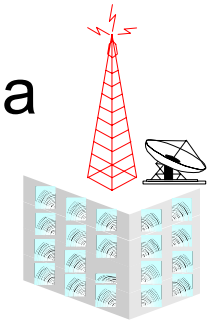
Integrated system is great …

Remote-control
Monitoring/Operation



Local Government

Media



River User

Real-time Information

Resident

Information collection/dissemination system

But Simple/Easy technology is effective Enough in many cases

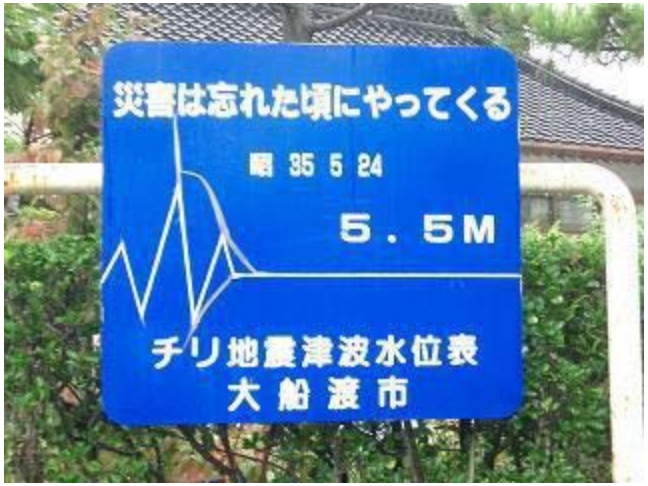
Rainfall equipment with alarm unit

Dissemination of alerting information

Infrastructure for Evacuation (Japan)

Tsunami Evacuation building

Signs showing evacuation site



Display of past Tsunami water level

Infrastructure for Evacuation （Bangladesh）

Cyclone Shelter

-Built in areas in needs based on analysis of past damages
-Used for schools & community activities in ordinary days

Killa

-Small hill for livestock to evacuate
-Close to shelters
-Reduce number of people who “do not escape”

Cyclone Shelter

Weather Radar

-Detect cyclone, forecast
-Cover the entire nation
-Cyclone information through radio

We need investment, but in small scale.

Flood Hazard Map

Flood Hazard Map is defined as:

a map in which flooding information, shelter location and evacuation route are indicated

How effective are Flood Hazard Maps?

1. Quicker evacuation

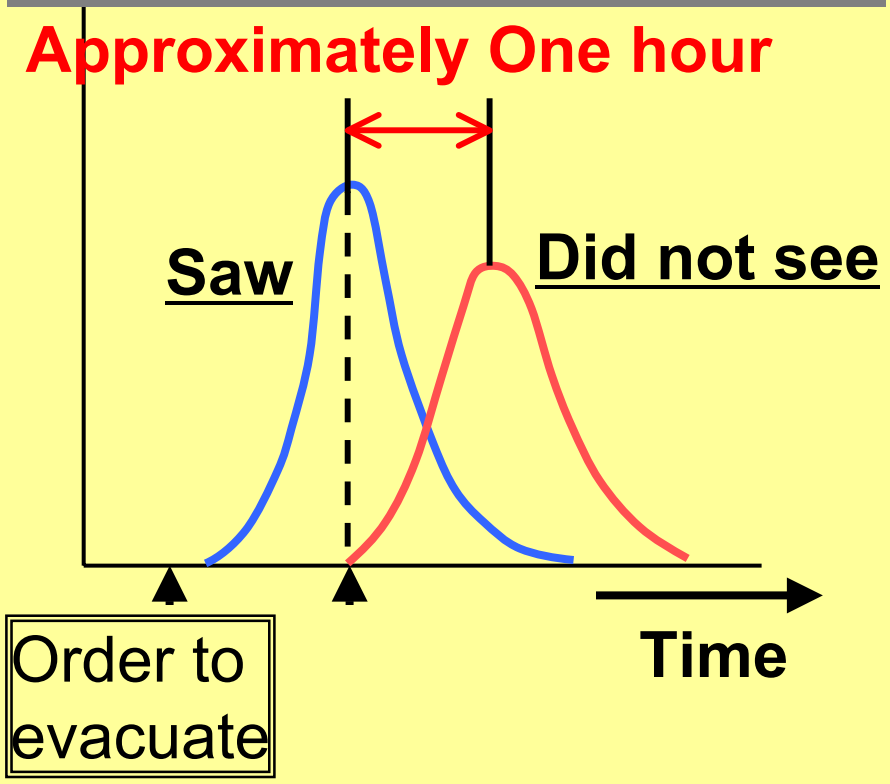
2. Higher evacuation ratio

3. Correct direction/route to evacuate

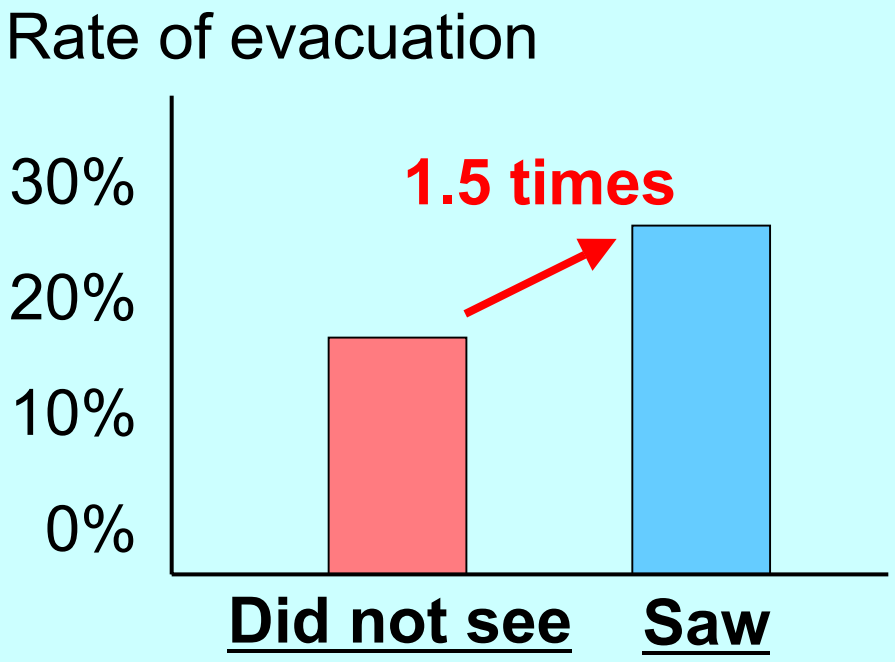
Effectiveness of flood hazard maps

In case of Koriyama City, Japan in 1998 flooding

Number of evacuated people after evacuators difference



Rate of evacuation six hours after advice to evacuators



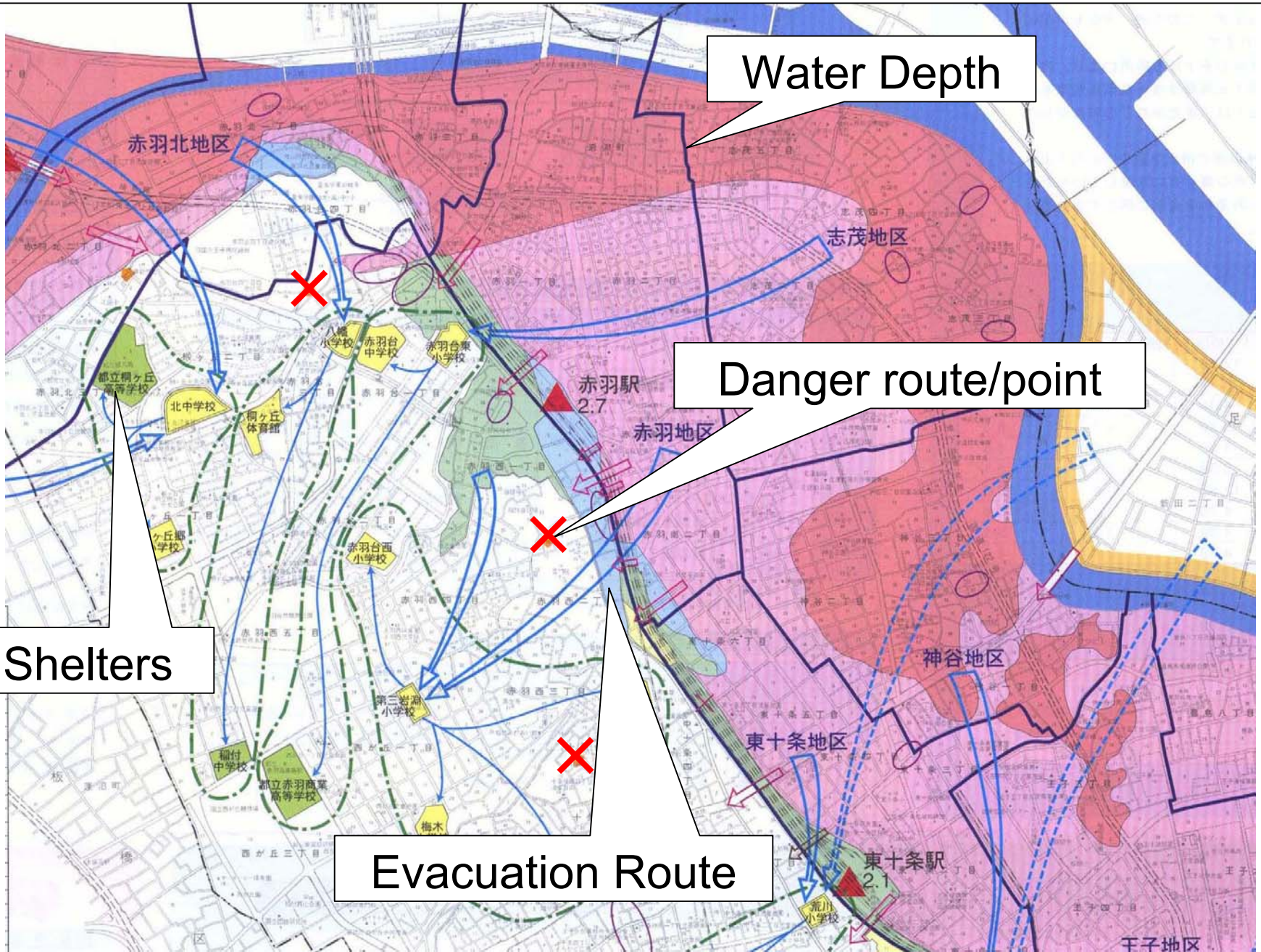
Hazard Map

Source: ”Survey Report on Local Residents’ Reactions in the Rainstorm in Koriyama at the End of August 1998”, Katada Laboratory, Faculty of Engineering, Gunma Univ.

Community Participation is essential for Flood Hazard Mapping

Process to make Flood Hazard Mapping

Flood Hazard Map (example of Tokyo, Japan)



Conclusion

- Loss of life by disasters can be reduced dramatically by effective early warning

- For effective early warning three components are essential

- Information collection/dissemination system
- Investment on essential evacuation infrastructure
- Education/awareness raising of citizens

Final Message

International community should set a target to halve loss of life by water disasters by 2015.

"50 by '15" (50% reduction by 2015)

This is achievable by effective early warning.