

# *Water-related Disaster Management in Japan / Japan Water Agency*

*October 6, 2008*

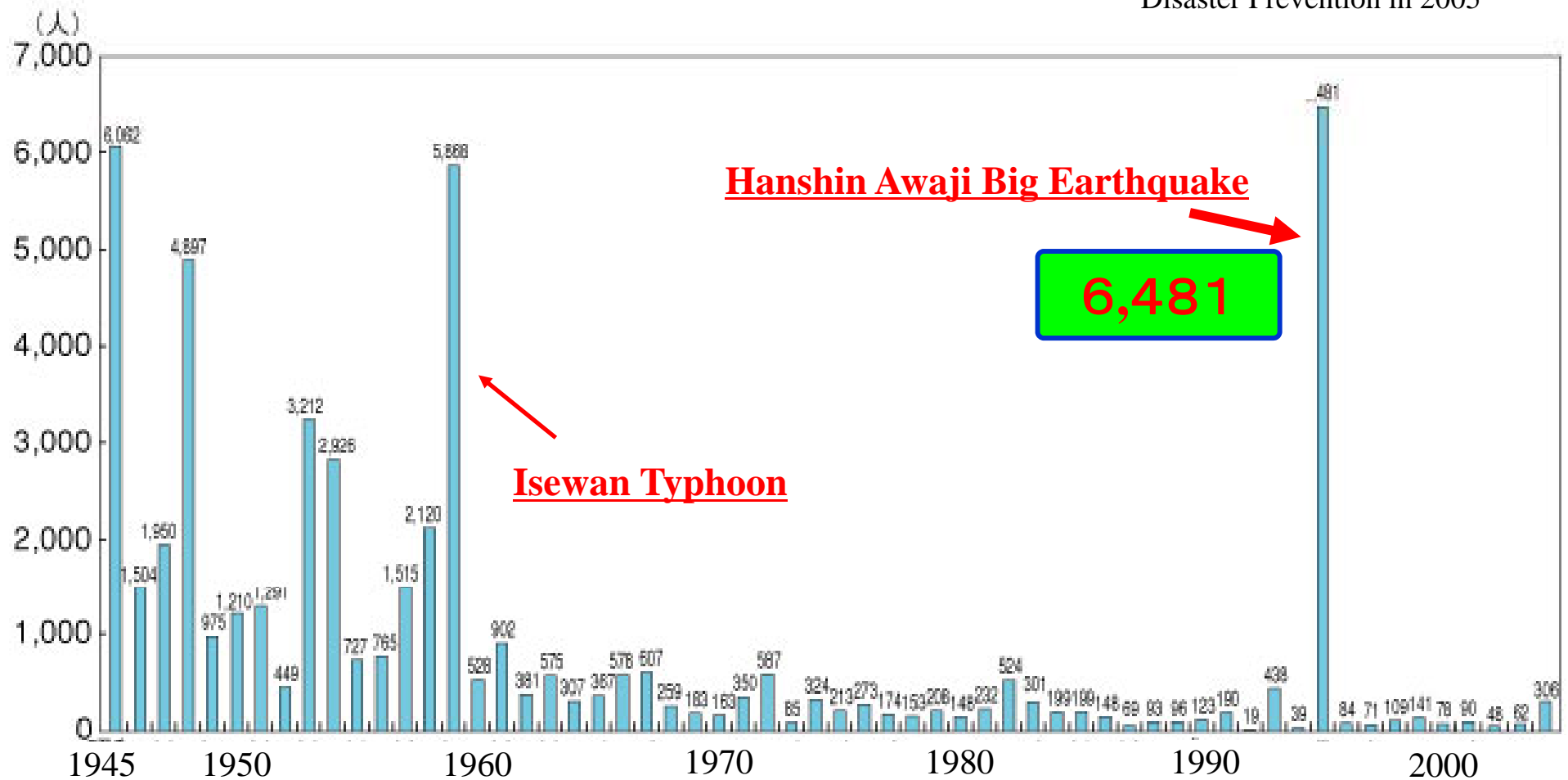
*Michio Ota  
International Affairs Division  
Japan Water Agency (JWA)*

# **Major Concerns about Natural Disaster in Japan** つつb

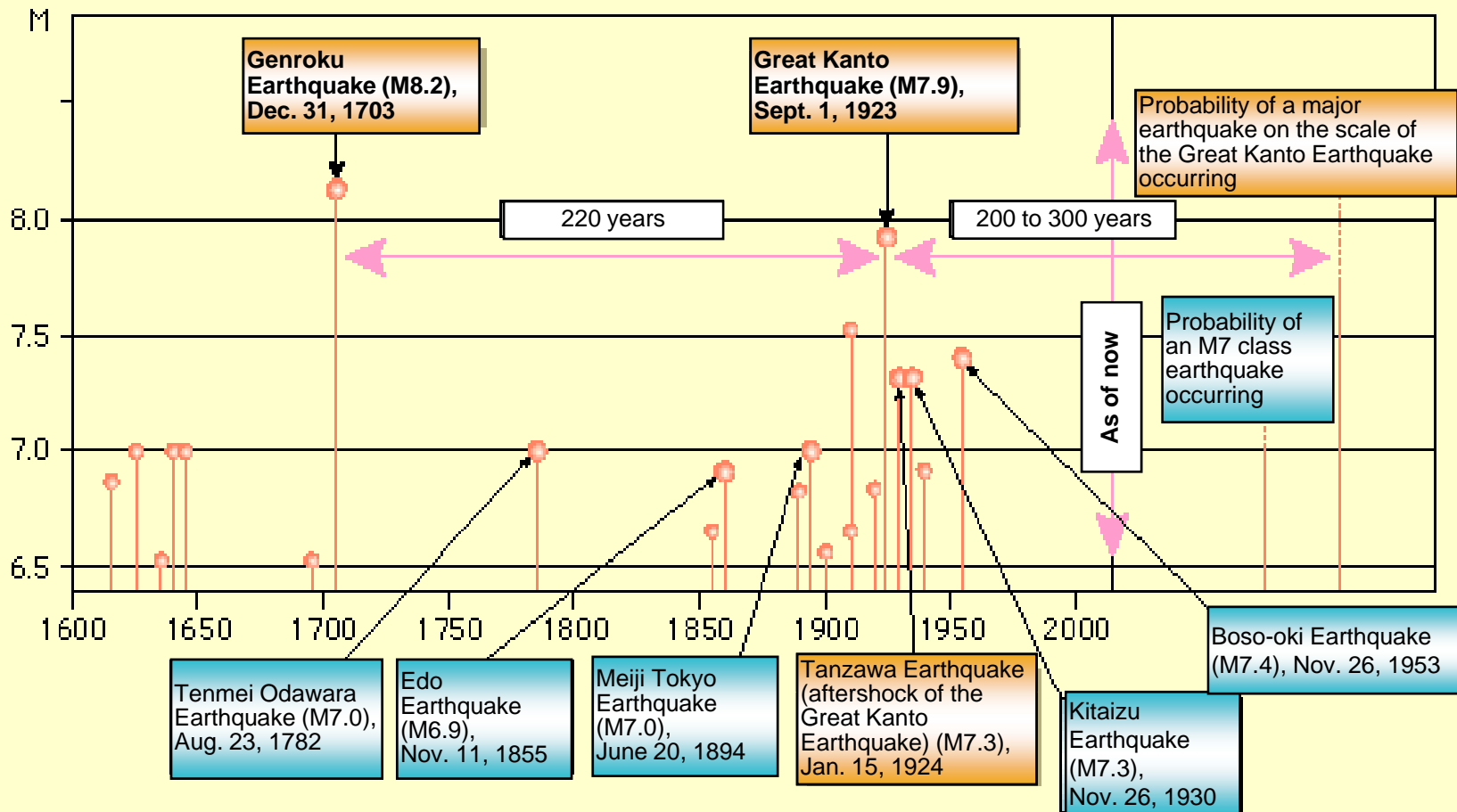
- 1. Earthquake**
- 2. Wind & Flood**
- 3. Land Slide**
- 4. Volcanic Eruptions**

# ◇ Casualties and Missing people due to Natural Disasters in Japan

Source: White book on  
Disaster Prevention in 2005

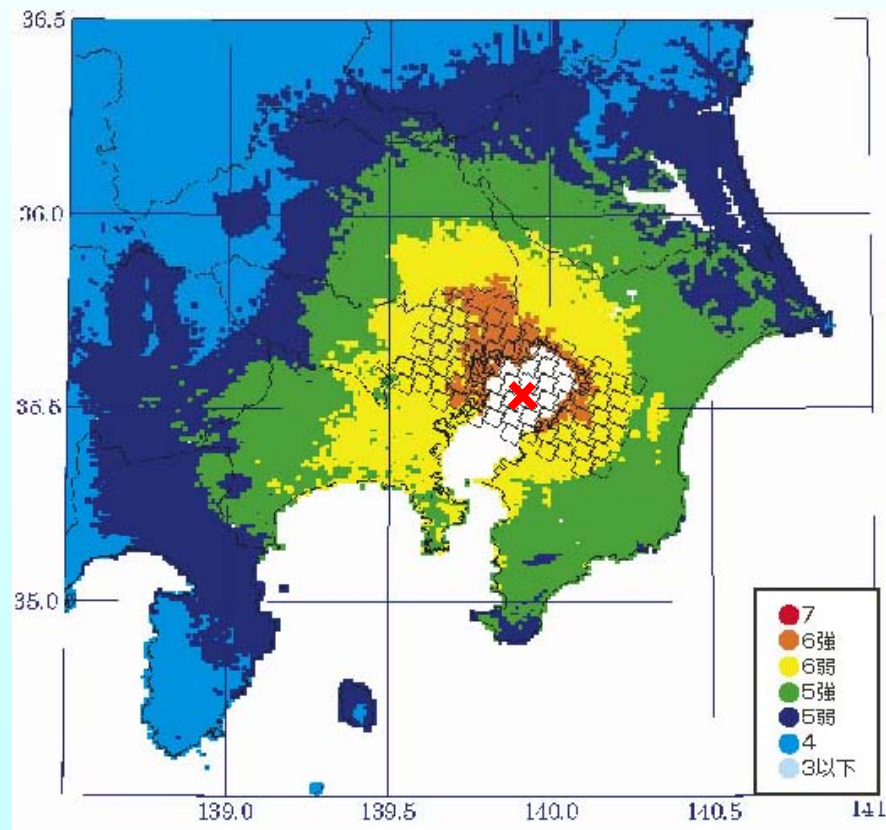


# Major Earthquakes in South Kanto in the Past 4 Centuries

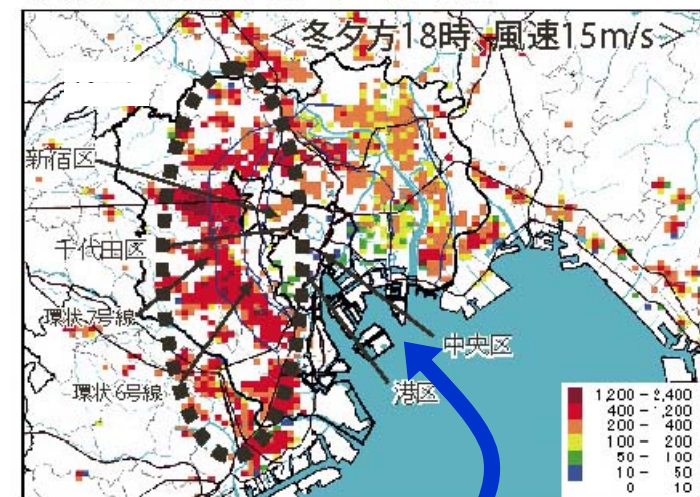


## ◇ Anticipated Damage due to Tokyo Metropolitan Earthquake

- M=7.3
- Casualties in building collapse and spreading fire  
Wind Velocity 15m/s 11,000 persons, 3m/s 7,300 persons
- Economic loss 112trillion yen



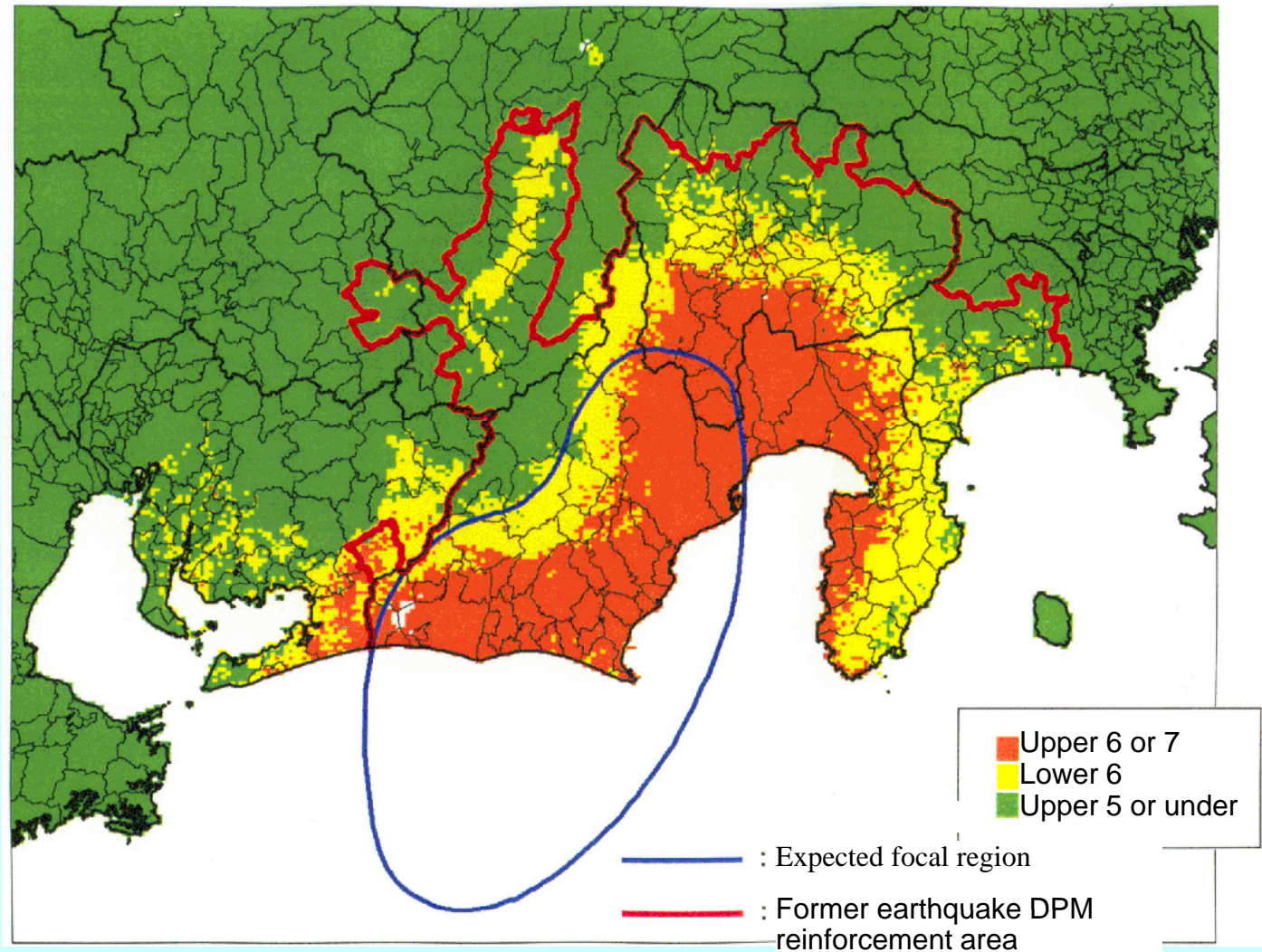
### Distribution of spreading fire



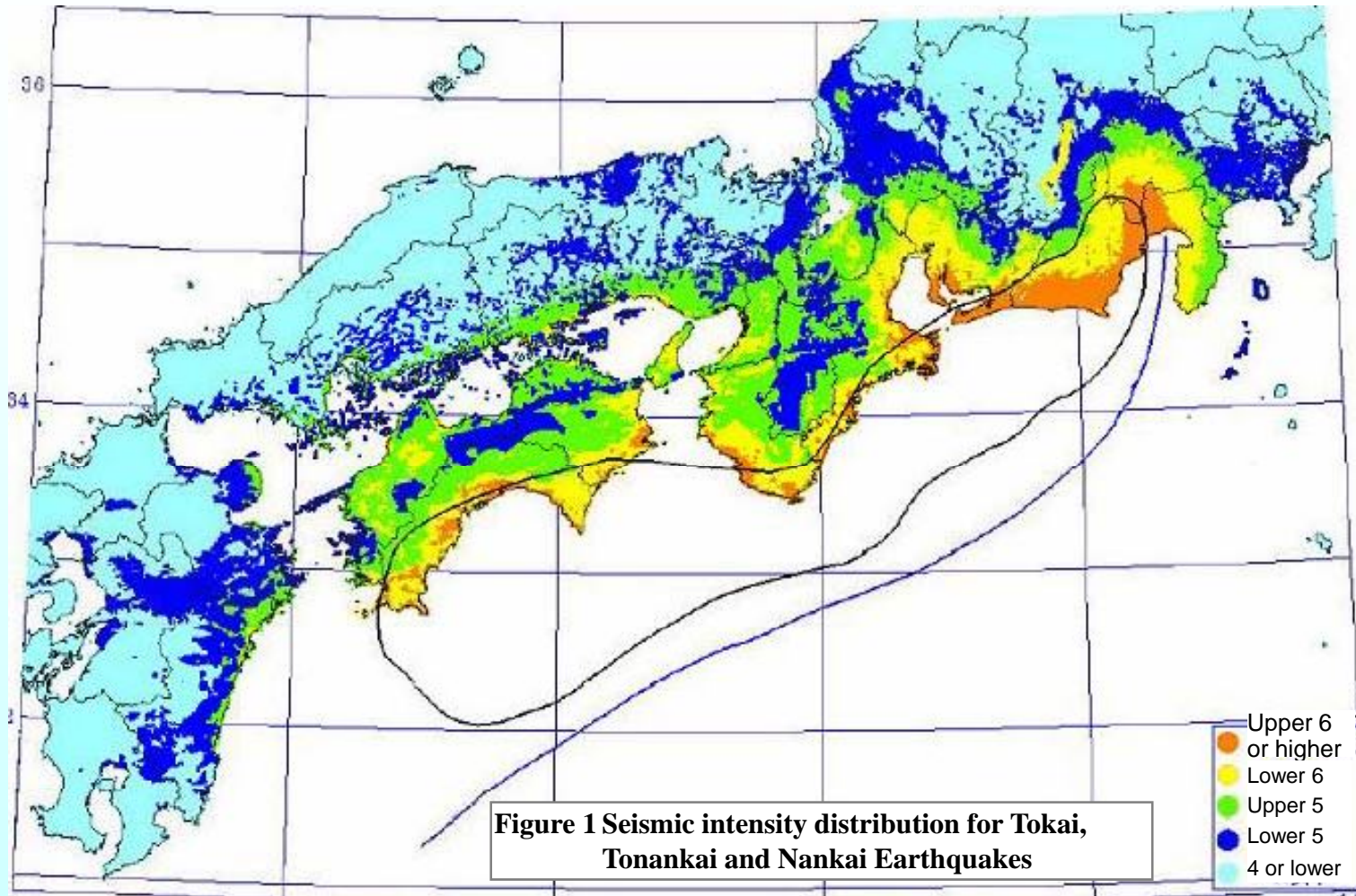
# ***Focal Region and Expected Seismic Intensity Distribution of Tokai Earthquake***

Expected seismic intensity distribution based on the newly estimated focal region

- M=7.0
- Casualties  
9,200
- Economic loss  
32 trillion yen

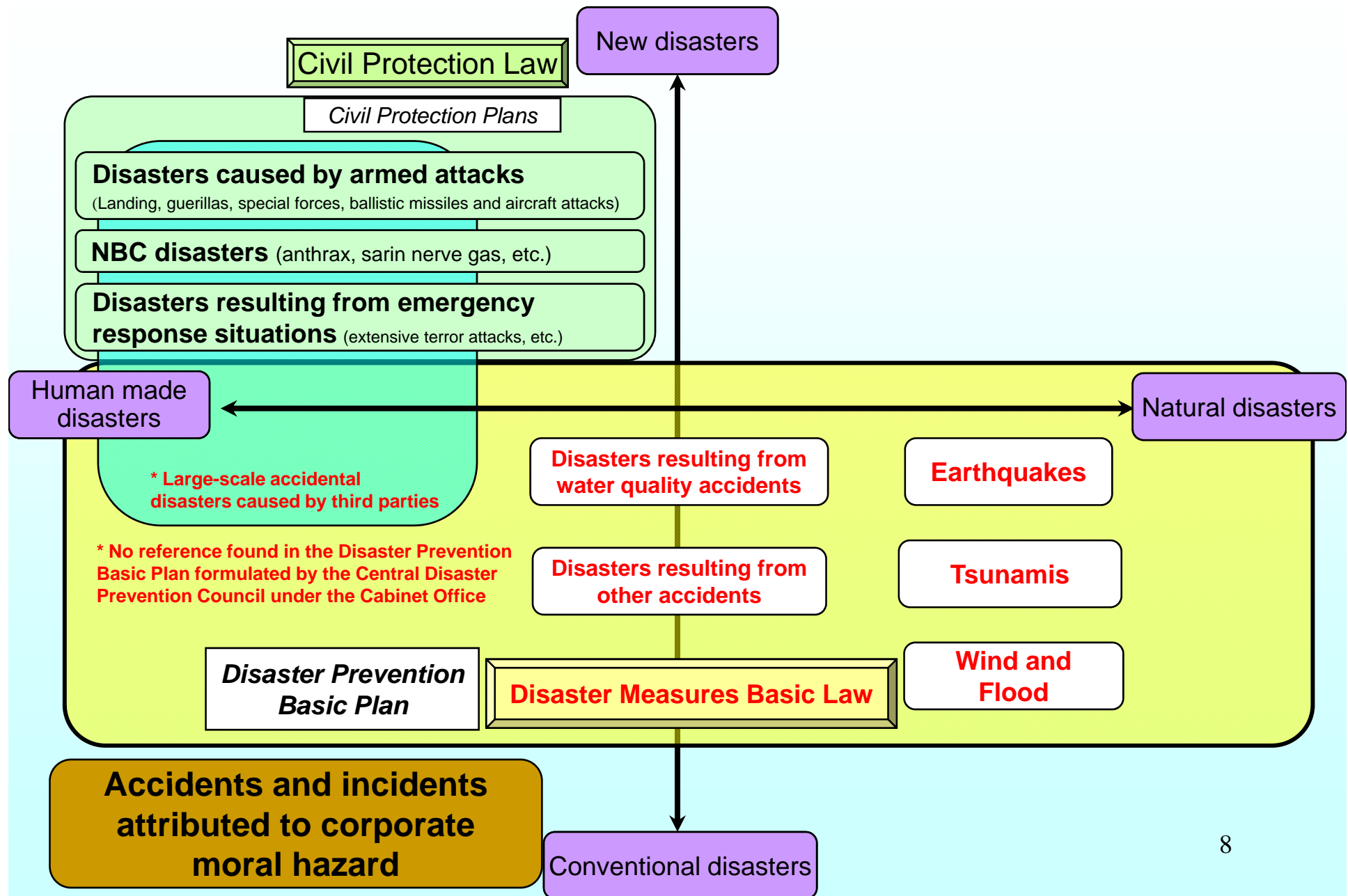


## Seismic Intensity Distribution Expected for Tokai, Tonankai, and Nankai Earthquakes



- **M=8.7**
- **Casualties 17,800 persons**
- **Economic loss 57 trillion yen**

# System of Operations of Risk Management and Disaster Prevention





## **Civil Protection Law**

“the Law concerning the Measures for Protection of the People in Armed Attack Situations etc.”

1. Aimed at protecting the lives, bodies, and property of the people in armed attack situations etc
2. Specifies the responsibilities and roles of the national government, local governments, and designated public institutions etc. in armed attack situations etc.
3. Stipulates in specific terms measures related to evacuation of residents, measures related to relief of evacuated residents etc., and measures related to response to armed attack disaster.
4. In emergency response situations, measures equivalent to the civil protection measures in armed attack situations etc.
5. When implementing civil protection measures, the people's fundamental human rights shall be respected.



**Civil Protection Law**

“the Law concerning the Measures for Protection of the People in Armed Attack Situations etc.”

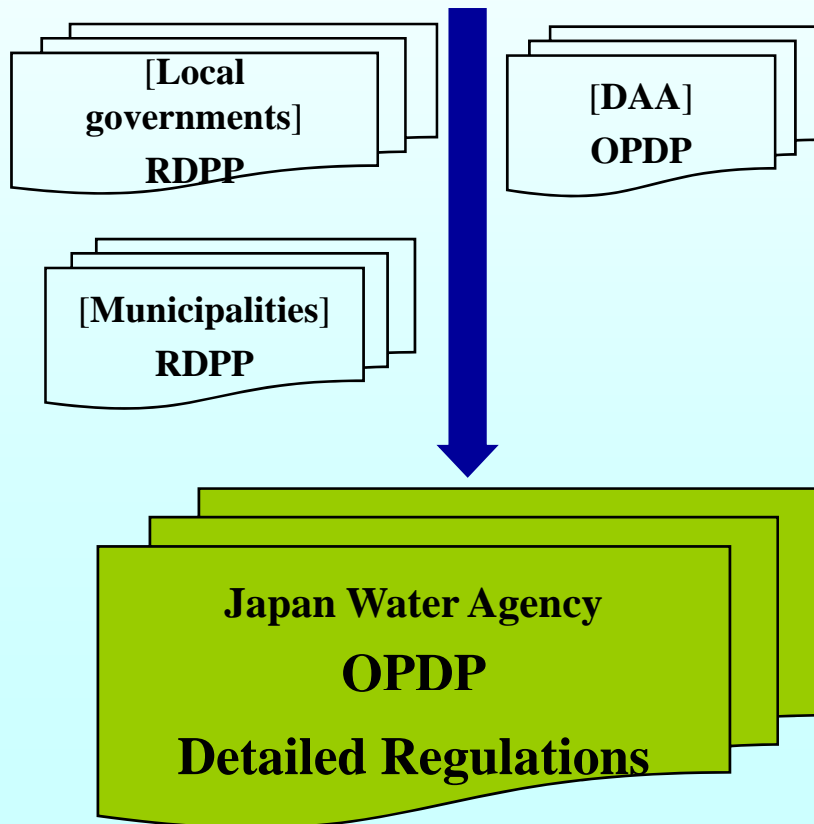
6. The “Basic Guidelines for Protection of the People” based on the Civil Protection Law describe
  - A) types of anticipated armed attack situations,
  - B) measures to be taken in accordance with the type of armed attack situations, such as evacuation, relief, or response to armed attack disaster,
  - C) examples of armed attack situations as well as basic policies related to the implementation of civil protection measures.

## Disaster Measures Basic Law

(enacted in 1961 in the wake of Isewan typhoon in 1959)



## Disaster Prevention Basic Plan (Central Disaster Prevention Council)



1. Establishment of the disaster prevention system
2. Formulation of disaster prevention plans
3. Prevention of disasters
4. Emergency measures against disasters
5. Post-disaster recovery, etc.

1. Local governments, municipalities prepare Regional Disaster Prevention Plans (RDPP).
2. Designated administrative agencies (DAA) prepare the Operation Plan for Disaster Prevention (OPDP) in terms of their operations.
3. DAAs cooperate with local governments and municipalities in disaster prevention operations.
4. DAAs contribute to disaster prevention in the light of their publicity and public welfare through their operations.

1. Anti-earthquake measures (earthquake disaster prevention)
2. Measures against wind and flood disasters
3. Measures against water quality accidents
4. Measures against major accidents due to third parties
5. Measures against other accidents and disasters

## ■ JWA Operation Plan for Disaster Prevention and Detailed Regulations

### Organization & Operation

1. a criterion for issuance of preparedness for disaster prevention
2. installation of Disaster Prevention Headquarters
3. formations of Disaster Prevention Headquarters and their duties etc.

### Earthquakes

### Wind and Flood disasters

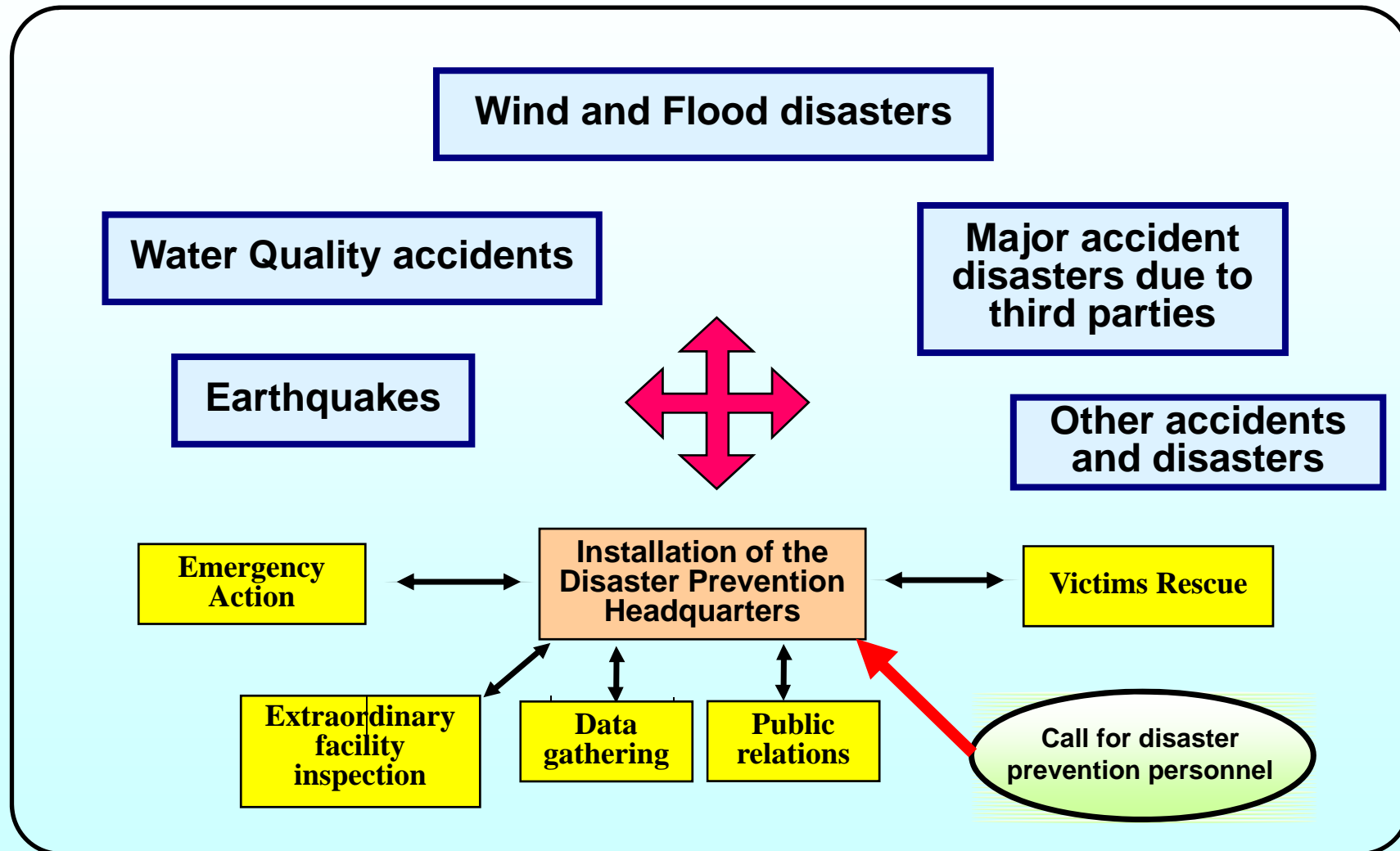
### Water Quality accidents

### Major accident disasters due to third parties

### Other accidents and disasters

1. Implementation of safety-check for facilities at the time of earthquake occurrence
2. Implementation of safety-check for facilities and surrounding area at the time of flood
3. Information collection and development of contact system
4. Establishment of a means of communication
5. Coordination with institutions concerned
6. Development of system for urgent restoration
7. Determent of secondary disaster prevention
8. Implementation of disaster prevention training etc.

## ❖ Overview of the Disaster Alert in JWA

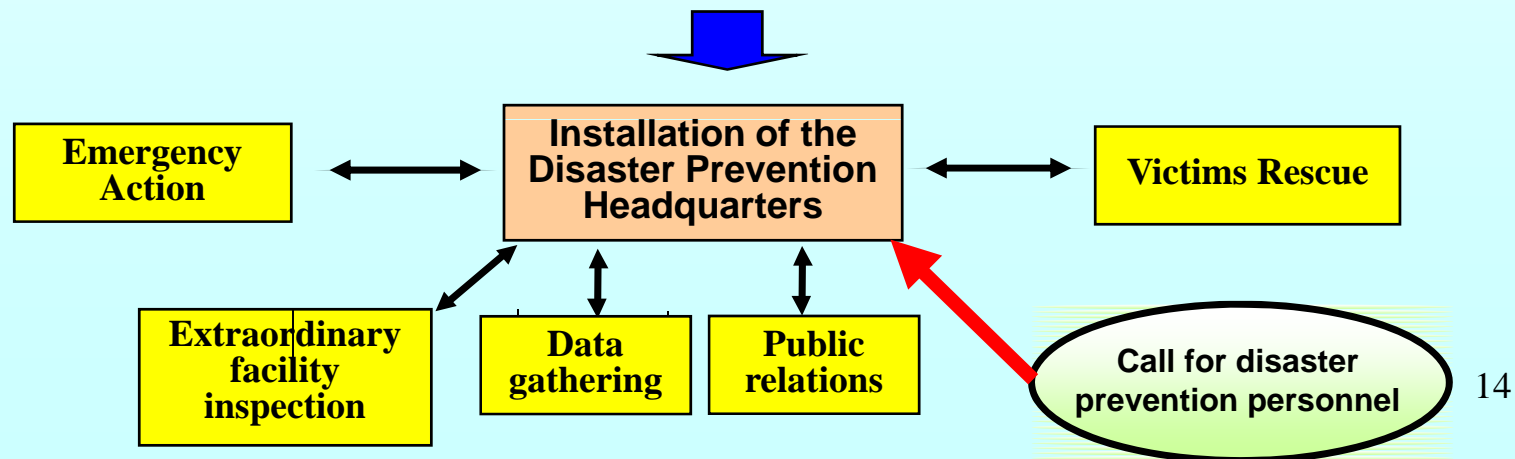


## ❖ Overview of the Disaster Alert in JWA

### Earthquake

[Major criteria for an alert issuance]

1. Announcement of a tremor at intensity level 4 of Japan Meteorological Agency (JMA) scale at the reference point.
2. The seismometer at or near the foundation ground of the facility indicates the maximum acceleration of more than or equal to 25 gals.



## ❖ Disaster Prevention Operation in the wake of an Earthquake

### ❖ Measures against Earthquakes Disasters

#### ★ Collection of earthquake information

- With the use of reports on television, radio, etc.

#### ★ Gathering at the headquarters

- (1) Check the earthquake information and the criteria for issuing a disaster alert
- (2) After confirming that the intensity is level 4 and that safety is ensured around themselves, **personnel shall immediately gather at the Disaster Prevention Headquarters.**
- (3) If any personnel are remotely stationed and unable to gather, they **shall phone the Disaster Prevention Headquarters to report where they are.**
- (4) **Make use of the disaster emergency message dial (171) service to record safety information.**

#### ★ Inspection of facilities

- Check the damage caused to the facilities and their surrounding areas.
- Ensure procurement of raw water.



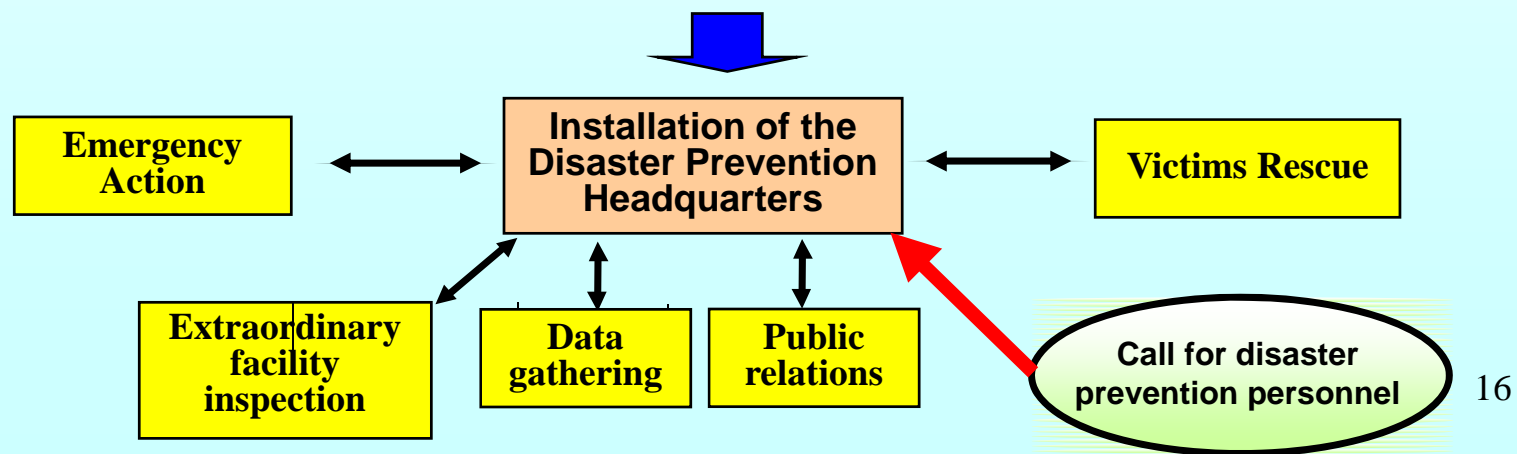
Collapse of an expressway after the Hanshin Awaji Earthquake

## ❖ Overview of the Disaster Alert in JWA

### Wind and Flood disasters

[Major criteria for an alert issuance]

1. A weather advisory or warning issued by the JMA or a relevant observatory organization.
2. It is deemed necessary by the team leader after an alert is issued within the regional bureau or after a level 1 alert is issued.



## ❖ Disaster Prevention Operation in the Wake of a Wind and Flood Disaster

### ❖ Measures against Wind and Flood disasters

#### ★ Collection of weather information

##### - Weather data equipment

(MICOS, JWA weather information and water management information)

##### - Weather reports on the media

(such as television and radio)

#### ★ Inspection of facilities

- (1) Inspection of the dam control equipment and other facilities
  - (2) Formulation of a discharge plan
  - (3) Operation for warning, surveillance and discharge
  - (4) Report on the circumstances to relevant institutions
  - (5) Check on damage caused to the surrounding areas
- The dam facility and the reservoir
  - Roads and the lake level
  - Downstream rivers

#### ★ Check the river safety

For prevention of damage caused to the downstream zone by a discharge from the dam



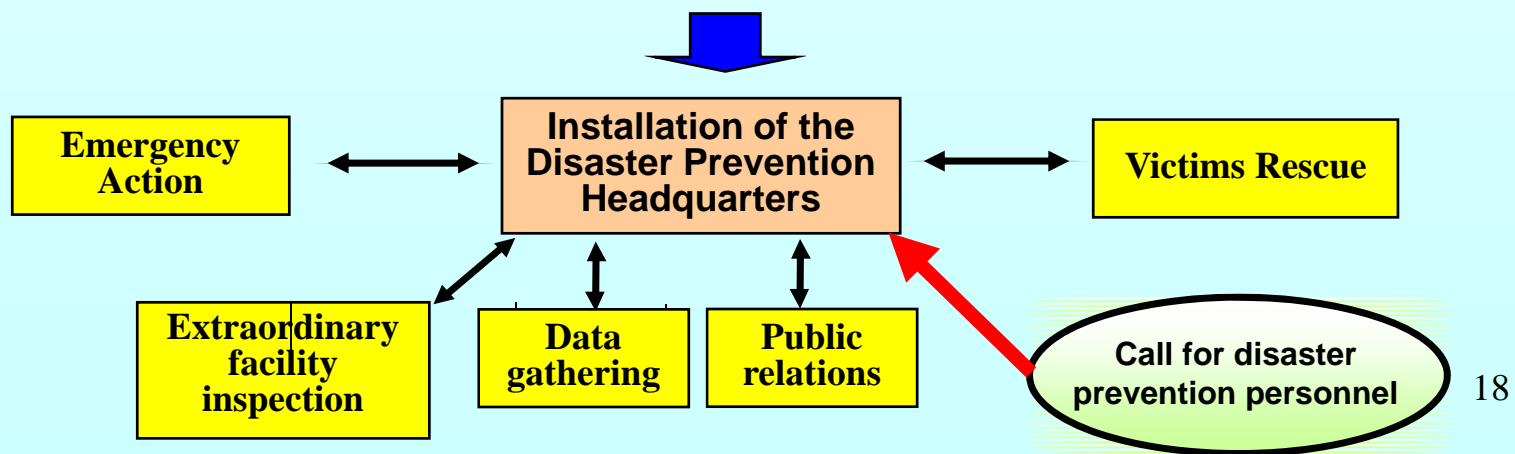
A water discharge from the spillway  
of the Sameura Dam

## ❖ Overview of the Disaster Alert in JWA

### Water Quality accident

[Major criteria for an alert issuance]

1. Attention or vigilance to occurrence of a disaster is required.
2. It is deemed necessary by the team leader in light of the data from relevant institutions.



❖ Disaster Prevention Operation in the Wake of a Water Quality Accident (Oil Spill)

- ❖ Measures against Water Quality accidents      - oil spills into the water channel

★ Communication of information to relevant institutions

- Quick report to the liaison council for prevention of water pollution, composed of government officials and water users
- Report to waterworks - oil spill volume and the expected time when the oil reaches the waterworks



Installation of an oil fence



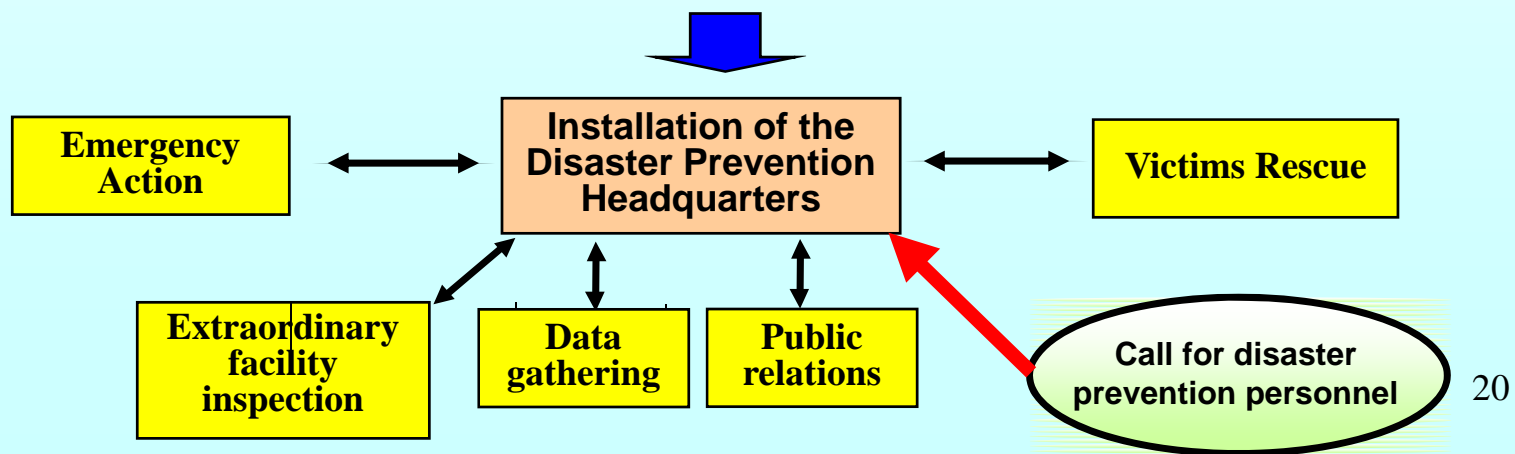
Oil removal using oil mats

## ❖ Overview of the Disaster Alert in JWA

### Major accident disasters due to third parties

[Major criteria for an alert issuance]

1. Attention or vigilance to occurrence of a disaster is required.
2. It is deemed necessary by the team leader in light of the data from relevant institutions.

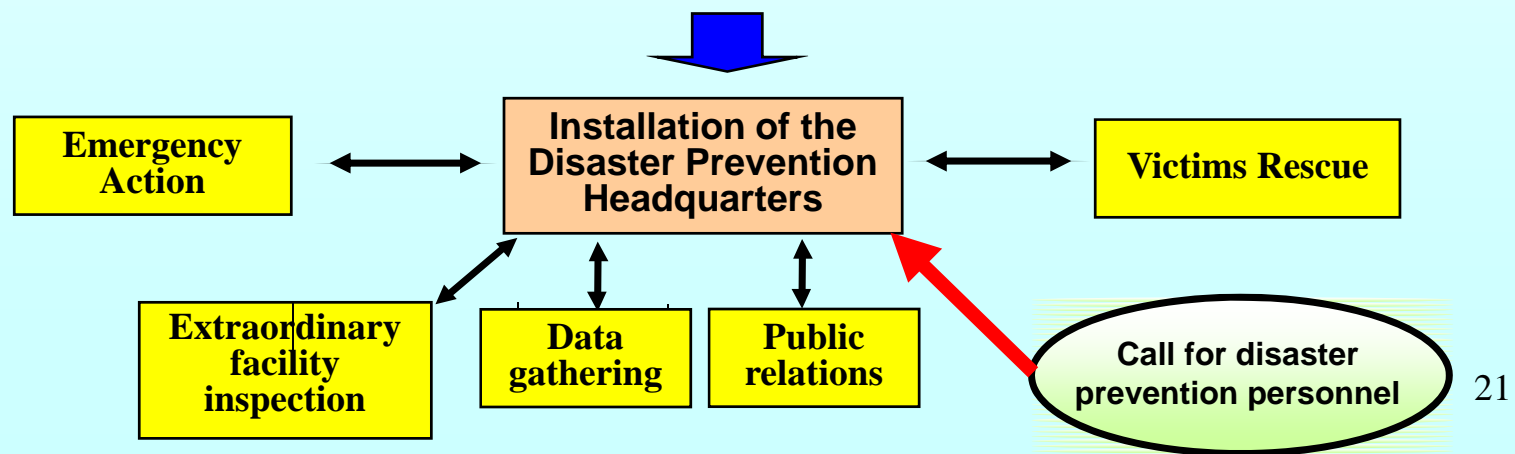


## ❖ Overview of the Disaster Alert in JWA

### Other accidents and disasters

[Major criteria for an alert issuance]

1. Attention or vigilance to occurrence of a disaster is required.
2. It is deemed necessary by the team leader in light of the data from relevant institutions.



❖Reference: Overview of Disaster Prevention Drills

**Dam Flooding Response Drill:**

Implemented in collaboration with the state government before the flood season

**Flood Drill:**

Implemented in collaboration with the river administrator and local people

**Earthquake Disaster Prevention Drill:**

Implemented both in collaboration with the state government and independently by the Japan Water Agency

**Water Pollution Prevention Drill:**

Implemented jointly with the river administrator, local governments and water users

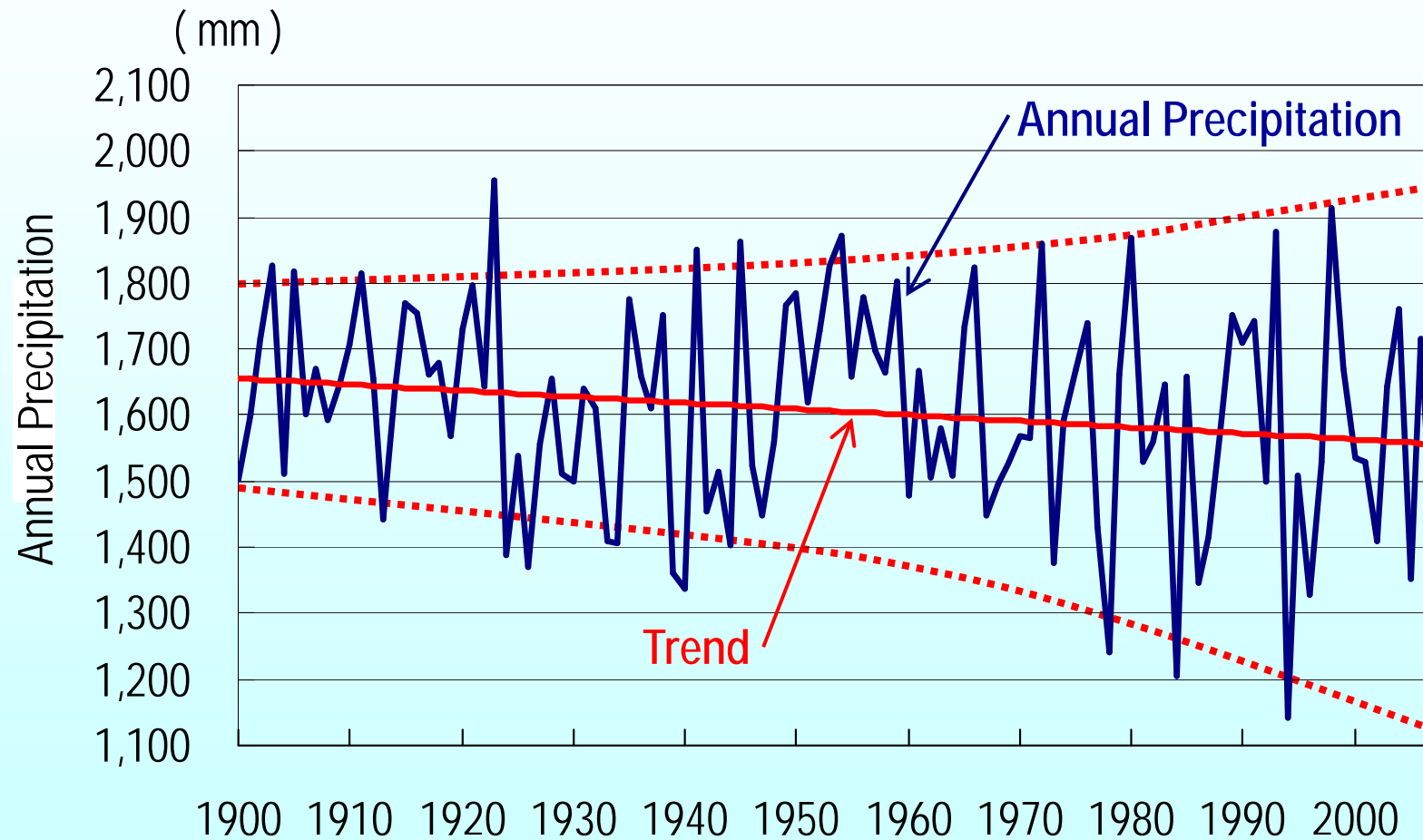


**Disaster Prevention Drill**

# Wind and Flood Disasters In Japan

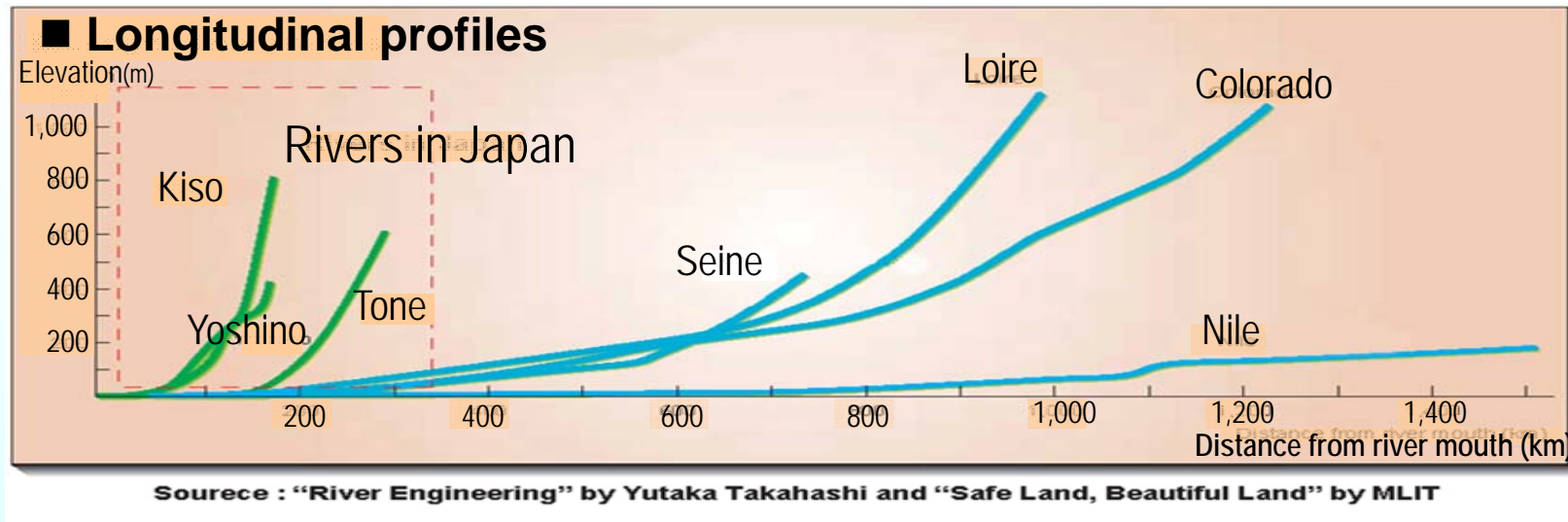
# Fluctuations of Precipitation

Precipitation is getting fluctuated

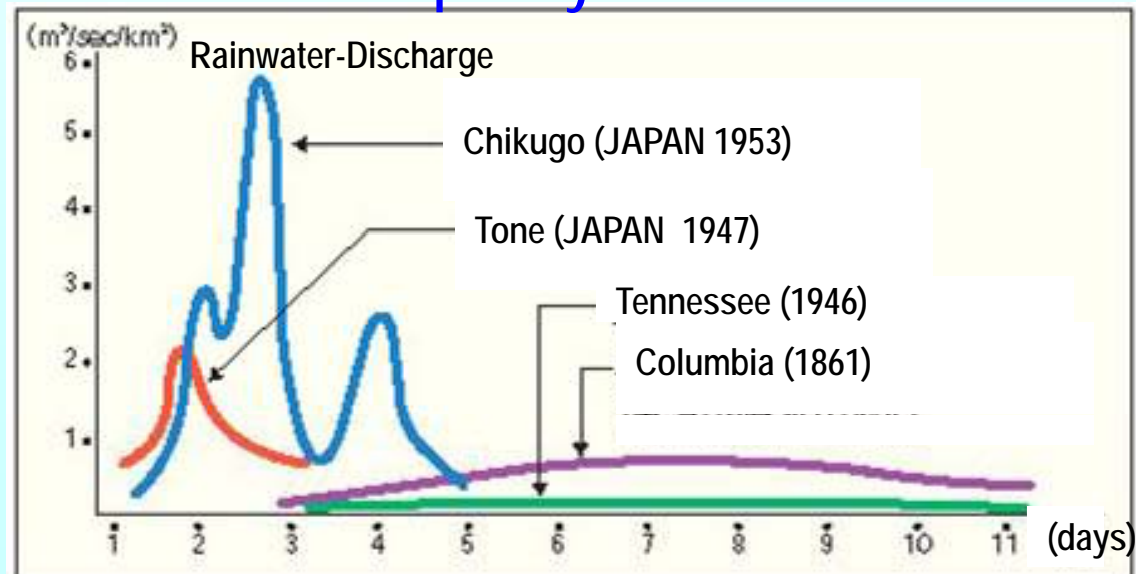


# Characteristics of world rivers

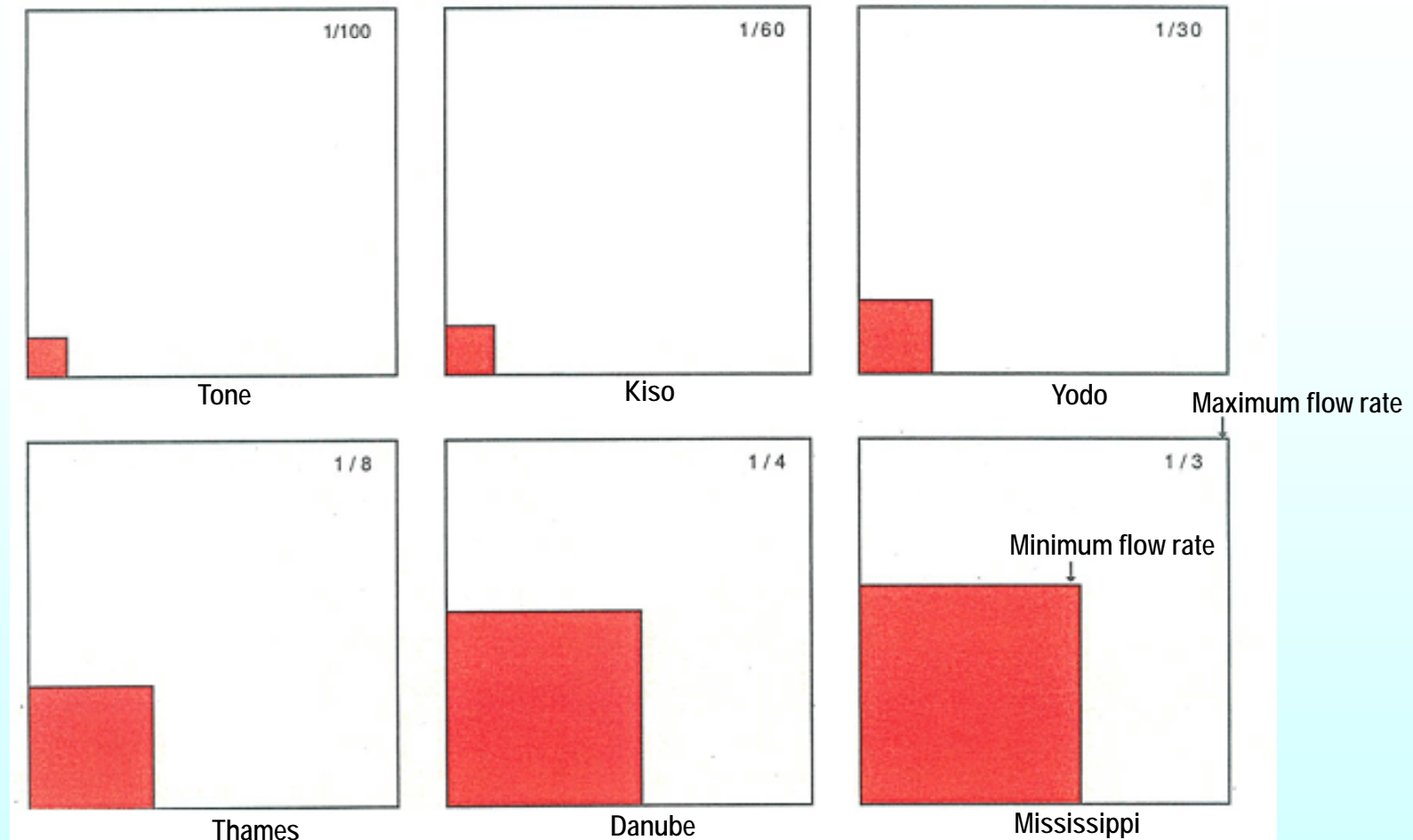
The rivers are remarkably steeper than continental rivers.



The rainwater that falls on mountains quickly flows down to the sea.



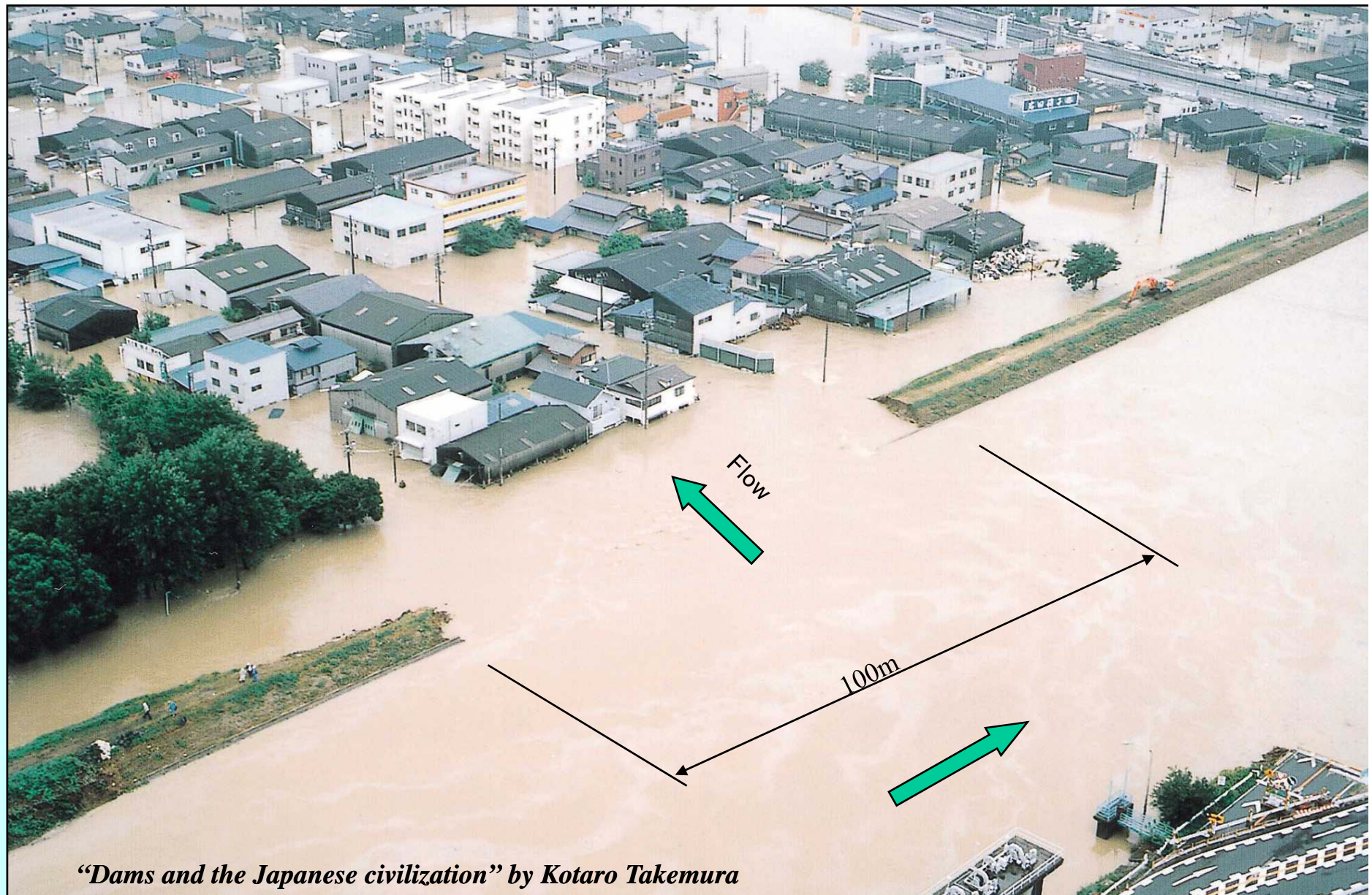
## Comparison of the maximum and the minimum flow rate



**Japanese rivers have big difference between their maximum and minimum flow rates. It takes only a moment to get a massive flood, but water pulls out instantly as well.**

Data source: Flow Volume Annual Report ("Ryuryo Nenpo") (1984~1993) for Japanese rivers, White Paper on Water Resource ("Mizushigen Hakusho") 1995 for foreign rivers

## ***Breached Dike in Shinkawa River in Nagoya City***



*“Dams and the Japanese civilization” by Kotaro Takemura*

## ***Inomori-cho, Tenpaku-ku, Nagoya city***



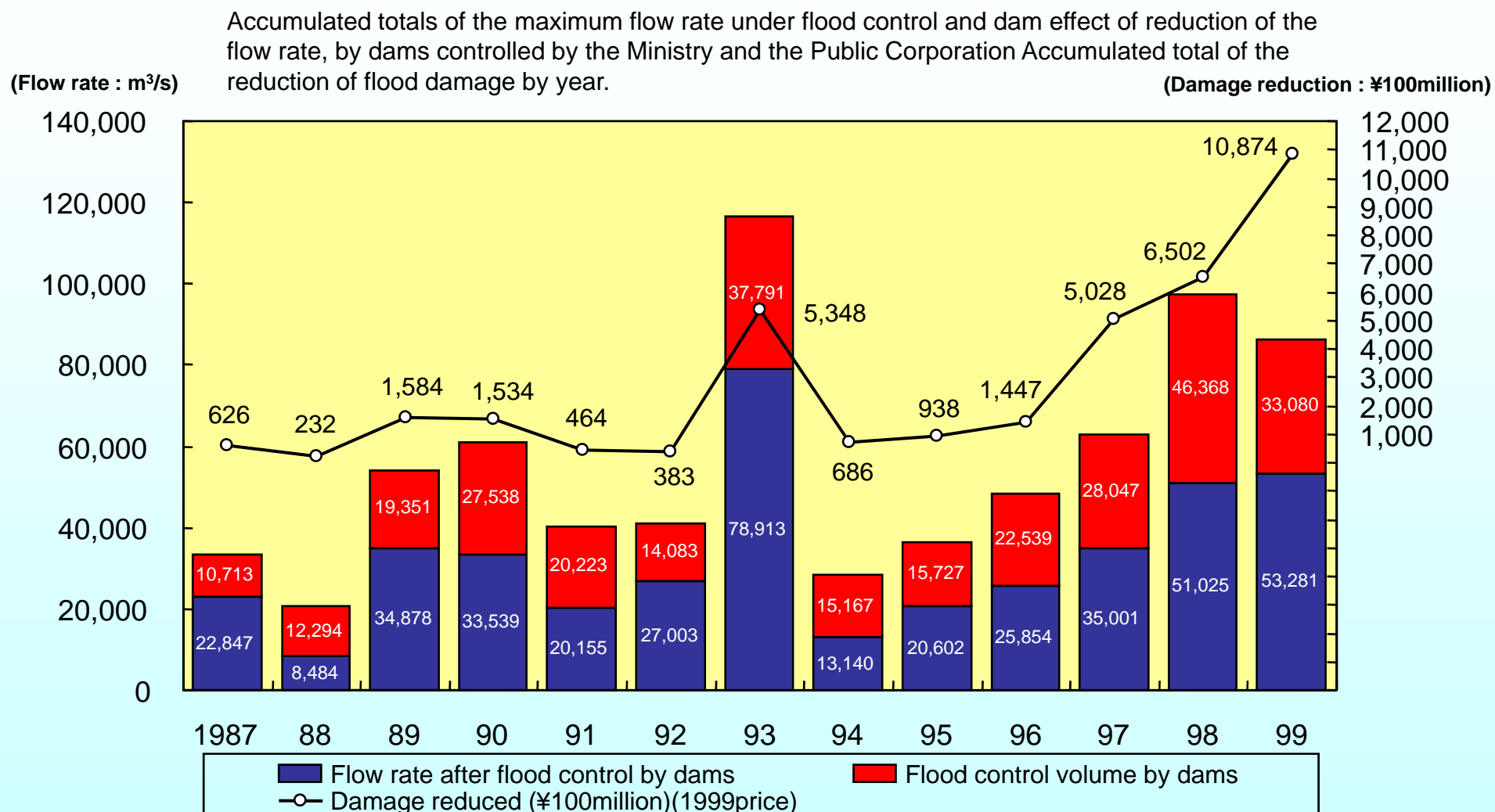
Normal condition  
(Sep. 26, 2004, around 14:00)



Struck by the disaster  
(Sep.12, 2004, around 6:00)

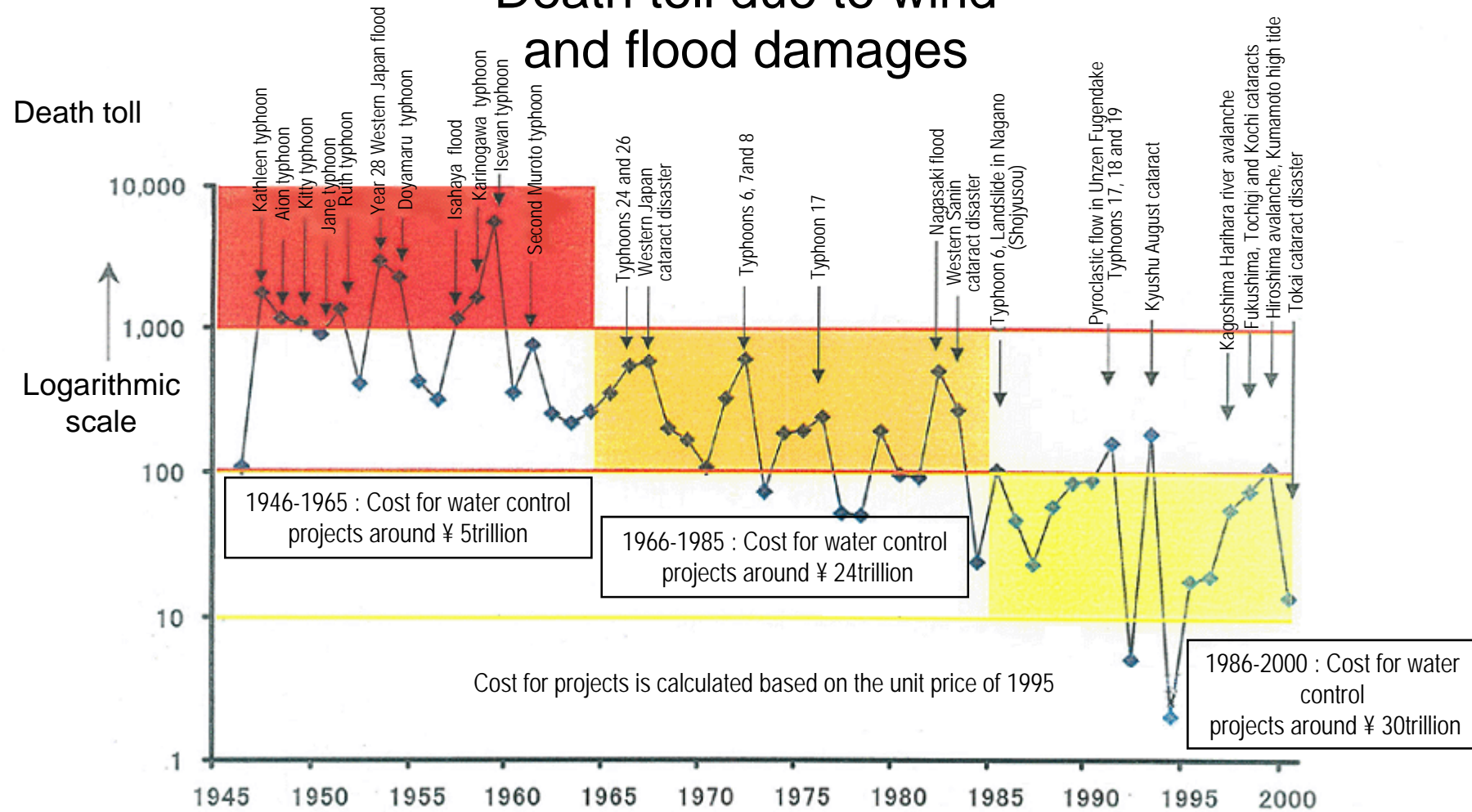
*“Dams and the Japanese civilization” by Kotaro Takemura*

## Flood control by dams and assumed flood damage reduction (estimation)



*“Dams and the Japanese civilization” by Kotaro Takemura*

# Death toll due to wind and flood damages



## **Further countermeasures against flood disaster**

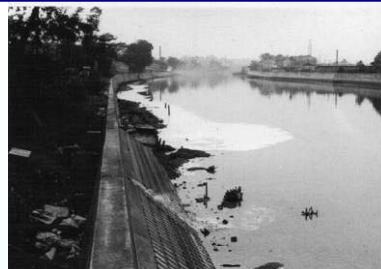
1. Effective utilization of existing flood control facilities
2. Land utilization to minimize flood damages
3. Sharing information about flood disasters with local residents
  - a. forecast of precipitation and river water level
  - b. risk allowance
4. River improvement and flood control dam construction

*Thank you  
for your attention !*

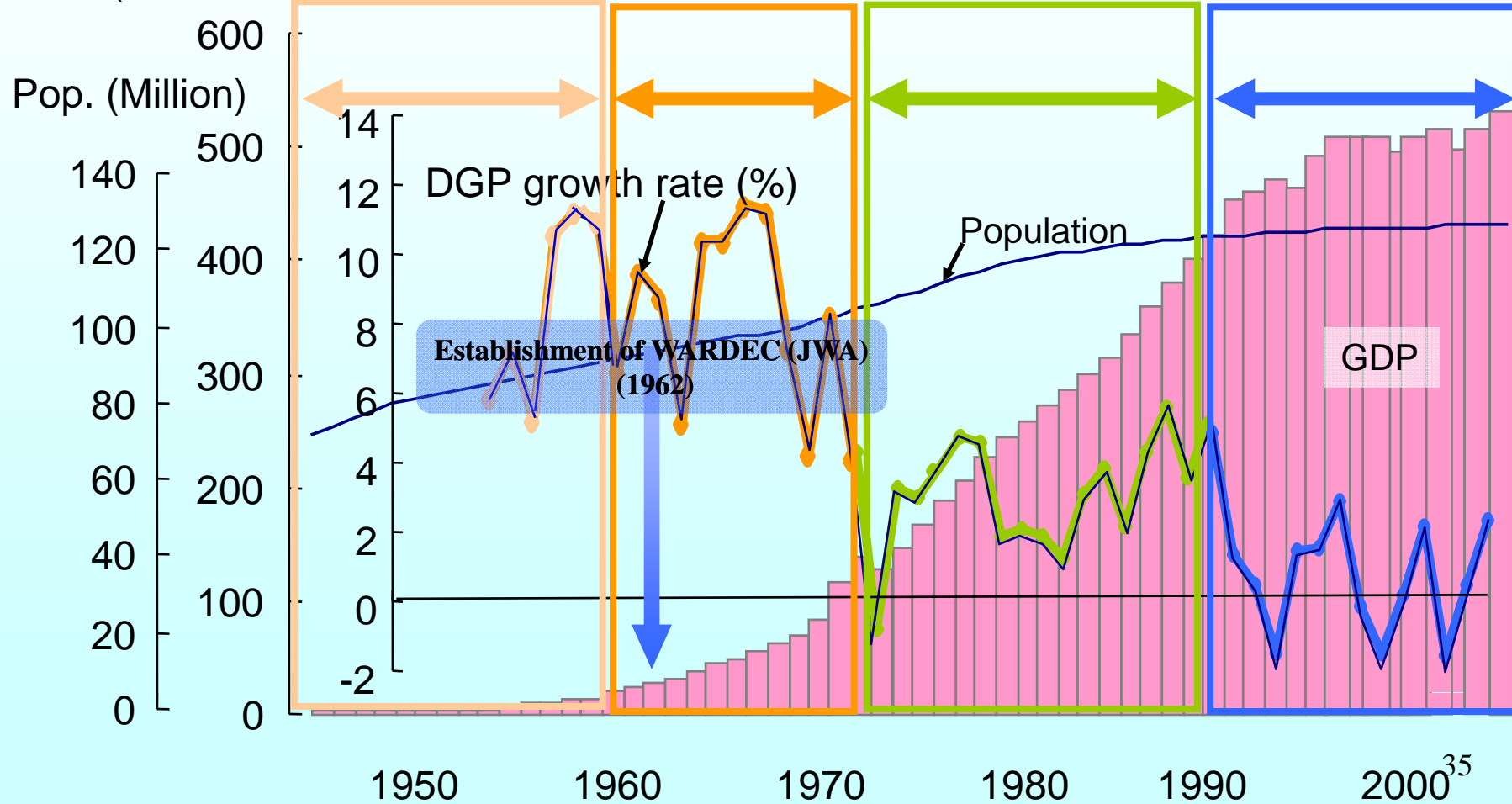


What is Japan water Agency (JWA) ?

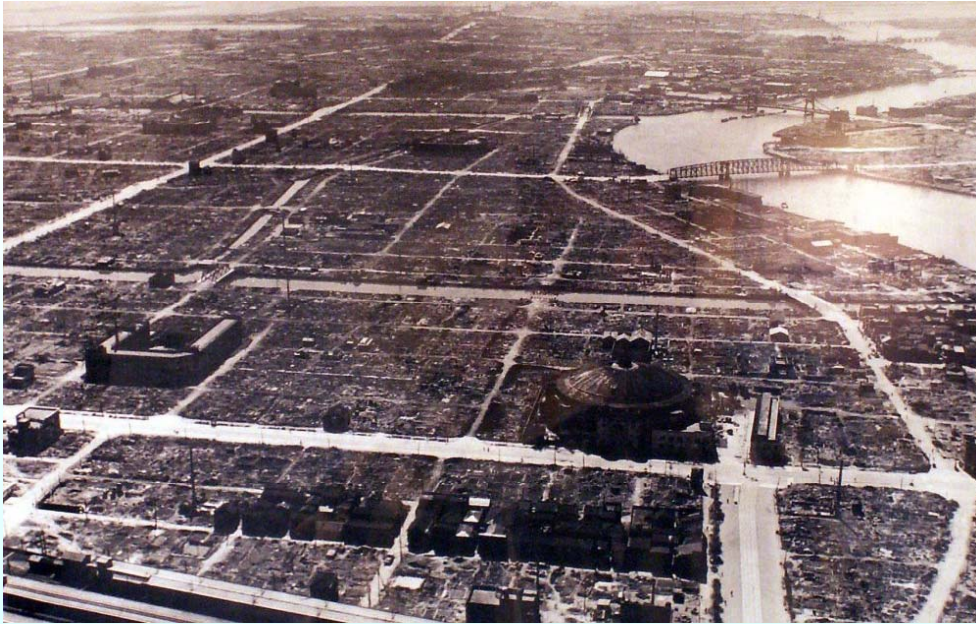
## 4 Periods according to the change of Economic Condition



GDP (Trillion YEN)



## Postwar Reconstruction Period (1945 - 1960)



Bombed Tokyo in 1945

Tokyo area hit by Kathleen Typhoon in 1947



## (2) High-Level Economic Growth Period (1960 - 1973)



Shin-kansen Super Express



Tokyo Olympic



Kashima Seaside Industrial Area

### (3) Period of Stable Growth and the "Bubble" Economy (1973 - 1990)



Drought in Fukuoka, 1978

( Photo: Nishi-nihon Newspaper Company )



Tokyo Waterfront City

## (4) Post-"Bubble" Period (1990 -)



The Great Hanshin Earthquake



Kamikouchi, NAGANO



Tokyo Waterfront City



Aichi EXPO, 2005

## Activities of JWA

### 1. Water Resources Development Promotion Law

Water Resources Development Basic Plan (“Full Plan”) for each river system



### 2. Japan Water Agency Law

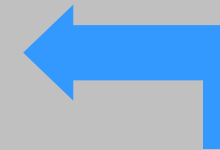
#### JWA's activities

**New construction and reconstruction of *Water Resources Development Facilities* and operation of those completed structures**

#### Water utilization

- Domestic Water
- Industrial Water
- Irrigation Water

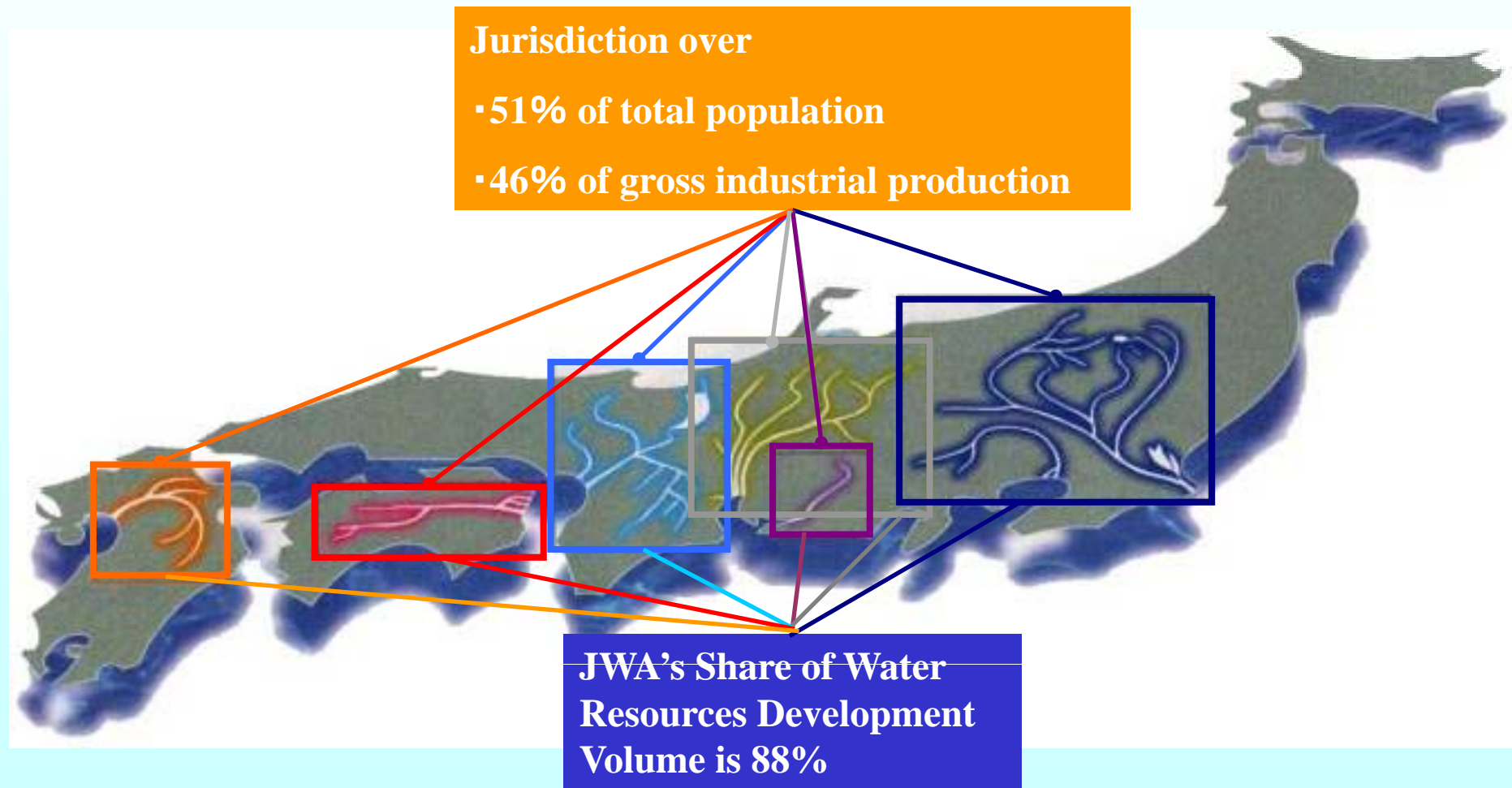
#### Flood control



Ministers  
supervising  
JWA's  
activities

**JWA is only organization in Japan for unified execution of water resources development and management**

**—Supply water resources to core areas in Japan and Execute flood control measures—**





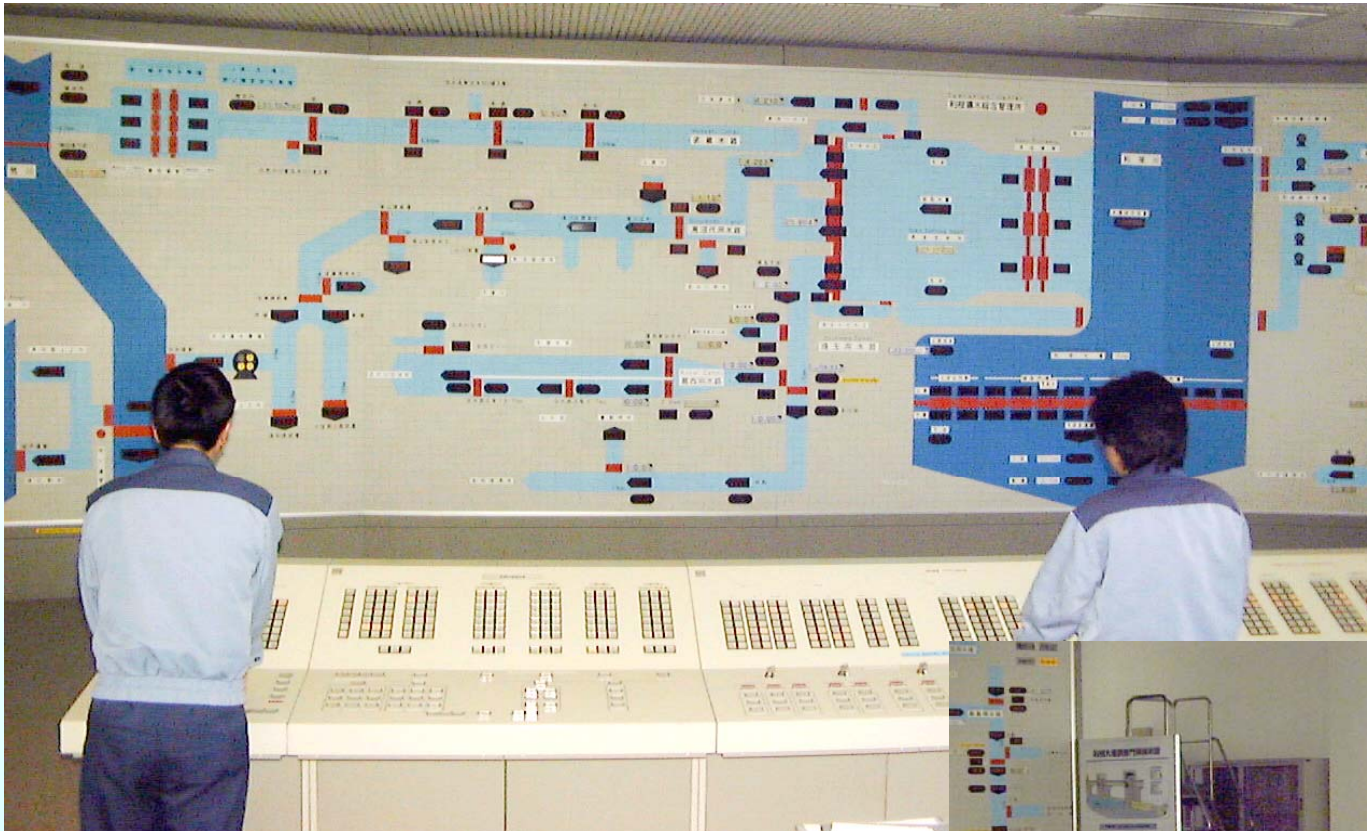
*Yagisawa Dam*



*Aichi Canal*

**Nagara River Estuary Barrage**





**Operation Room in The Tone  
Canal Control Center**



# *Observation of Dam and Reservoir*

Inspection of  
Water Quality  
and Dam Safety

