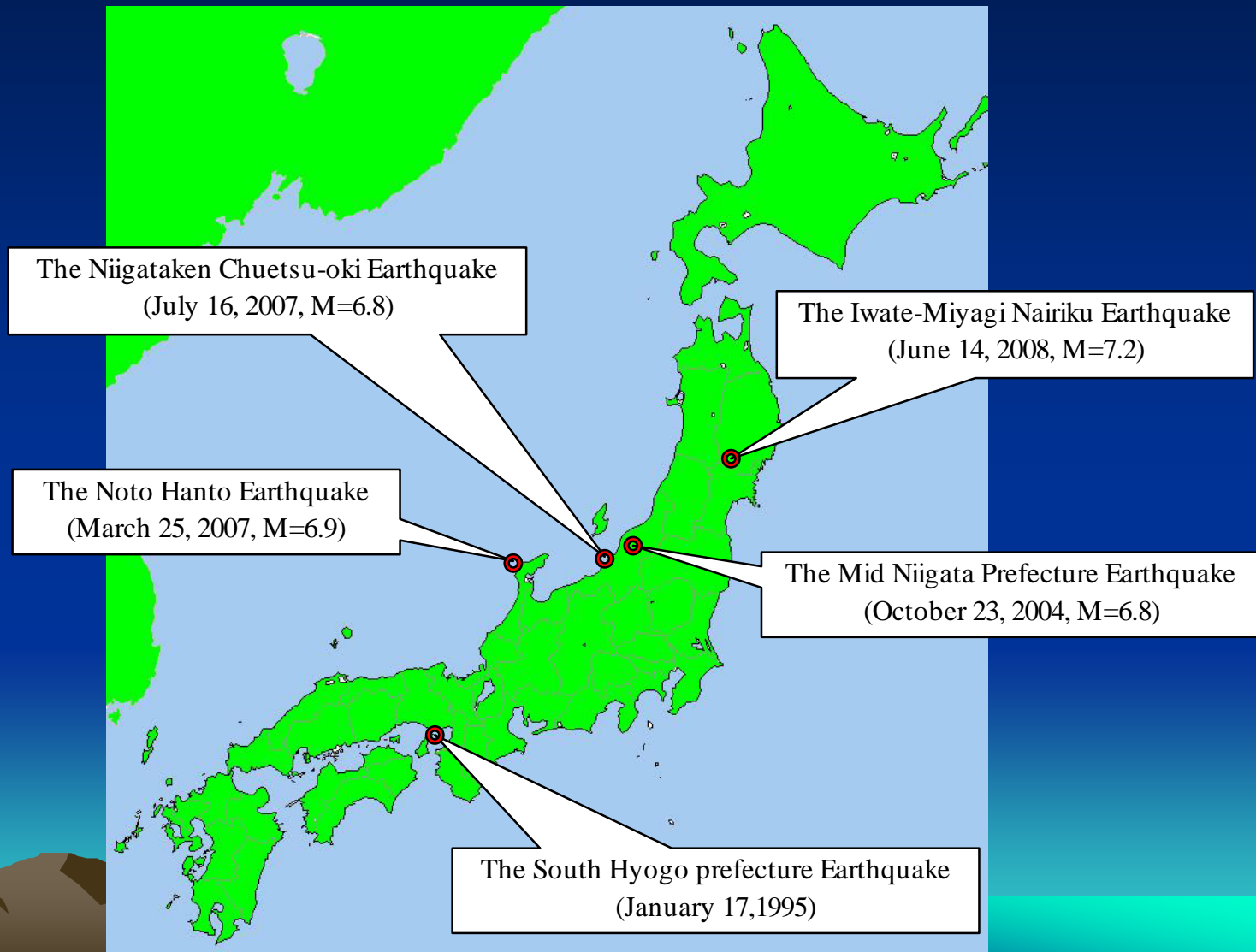




# **The present status, problems and promoting procedures for the measures against earthquake of water supply facilities**

**Munetaka Abe and  
Yasushi Taguchi**

# Four large scale earthquakes after the Great Hanshin Awaji earthquake (1995)



# Table-1.Four large scale earthquakes after the Grate Hanshin AwaJi Earthquake(1995)

Name of Earthquake	Occurred year	Seismic center	Scale Seismic intensity	Damage of water facilities	
				Damages of water supply	Days of suspension
The Mid Niigata Prefecture Earthquake	2004 (Heisei 16)	Mid land in Niigata prefecture	M=6.8 SI= 7	129,750 houses	30 days
The Noto Hanto Earthquake	2007 (Heisei 19)	Noto peninsula in Ishikawa prefecture	M=6.9 SI=6over	13,328 Houses	13 days
The Niigataken Chuetsu-oki Earthquake	2007 (Heisei 19)	By the Sea of Japan in West side of Niigata prefecture	M=6.8 SI=6over	58,961 Houses	20 days
The Iwate-Miyagi Nairiku Earthquake	2008 (Heisei 20)	South inland in Iwate prefecture	M= 7.2 SI=6	5,560 houses	60 days

# The damages of water pipe bridge by the Niigataken Chuetsu-oki Earthquake





# The damages of road by the Niigataken Chuetsu-oki Earthquake



# The damages of road by the Niigataken Chuetu-oki Earthquake





# The damages of the Maturube Big Bridge by the Iwate-Miyagi Nairiku Earthquake





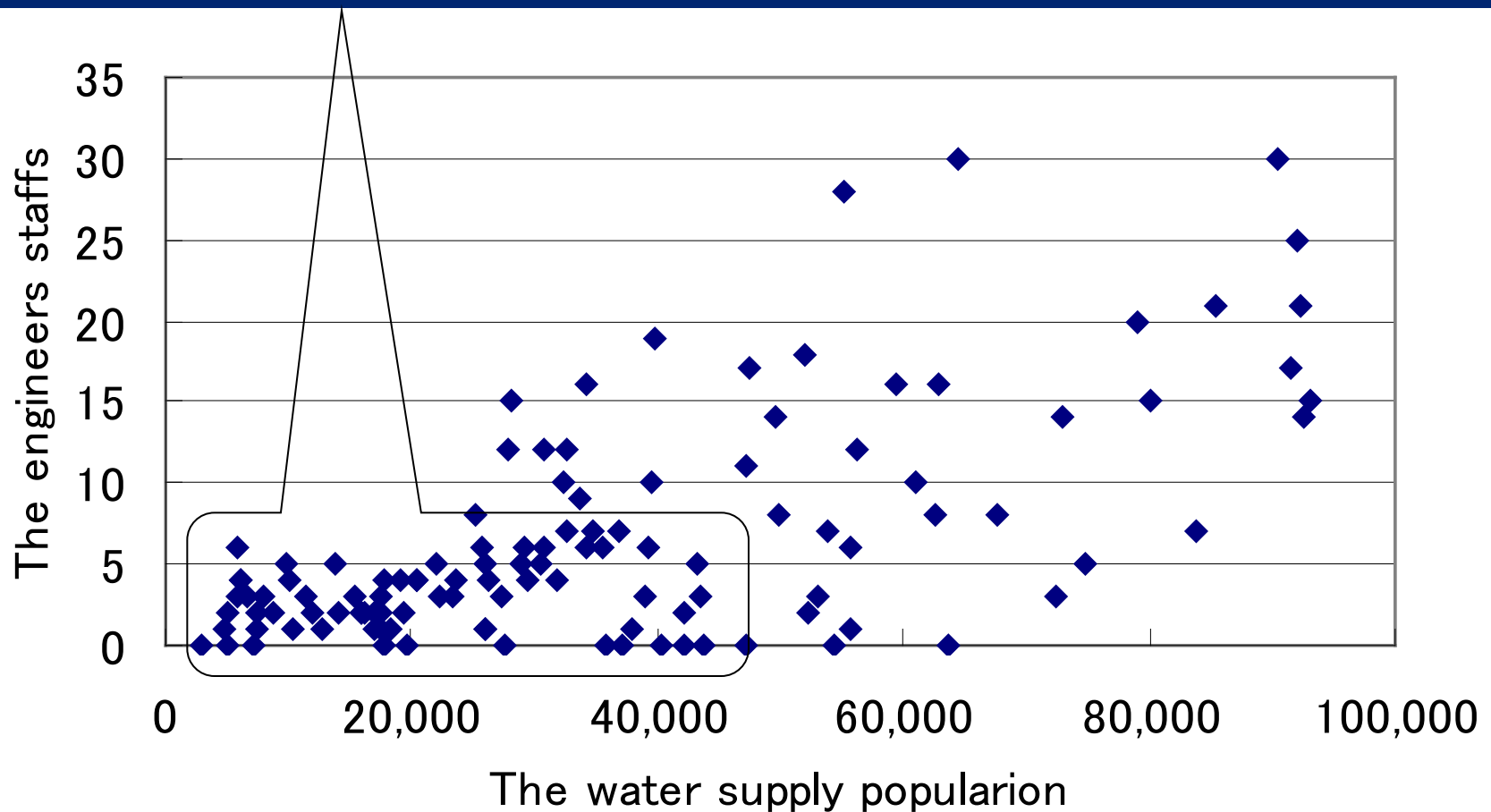
# The ground collapse by the Iwate· Miyagi Nairiku Earthquake





# Population served and engineering staffs of small/middle scale waterworks

**Number of engineering staffs of  
waterworks utilities  
( population served < 50,000)**



# The issues and measures of restrain of water supply facilities after an earthquake

## 1. The countermeasures concerning of securing the fund for anti-seismic measures

### 1.1 The revision of water tariff

Change of the water price	Water works utilities (110)
The water price down	41 (37%)
The water price raise	69 (63%)



## 1.2 The application of the state subsidy

The answers for questionnaire survey	182 water utilities
The water utilities working on the anti-seismic proof	42 water utilities (23%)
The water utilities using the state subsidy	5 water utilities (2.7%)

## 1.3 Another way of financing plan

- a. Revenue bond
- b. General account
- c. PFI: Private Finance Initiative



## 2. Promoting the comprehension for the anti-seismic measures to the water works staff

<b>The Object</b>	<b>The promoting measures of realizing the anti-seismic measures</b>
<b>Staffs of the water utilities</b>	<b>To offer a simple documents to understand the anti-seismic proof</b>
	<b>To hold a workshop and meeting about anti-seismic proof</b>
	<b>To hold a meeting with same supposed earthquake</b>
<b>Water customers</b>	<b>A substantial HP and publicity</b>
	<b>Practicing a trainings for disaster and delivery lesson</b>
	<b>Practicing a questionnaires and adopting the monitor system in each water utilities</b>

# 3. Measures of practicing of anti-seismic measures

- 3.1 Basic view of measures of preparing for anti-seismic measures
- 3.2 Entrusting the job of anti-seismic measures
- 3.3 The techniques and methods of effective anti-seismic construction



# The practicing flow of the anti-seismic measures planning

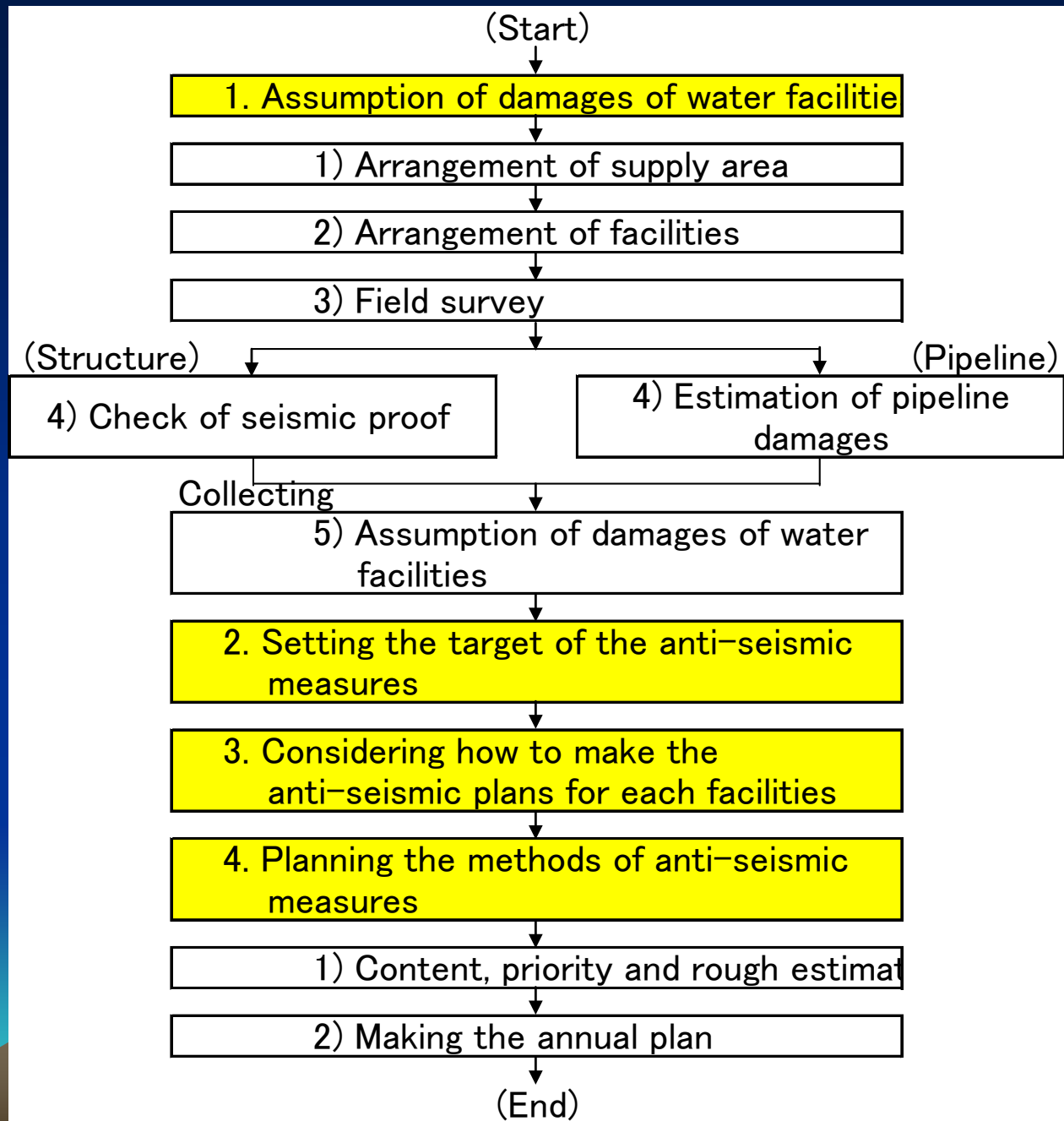


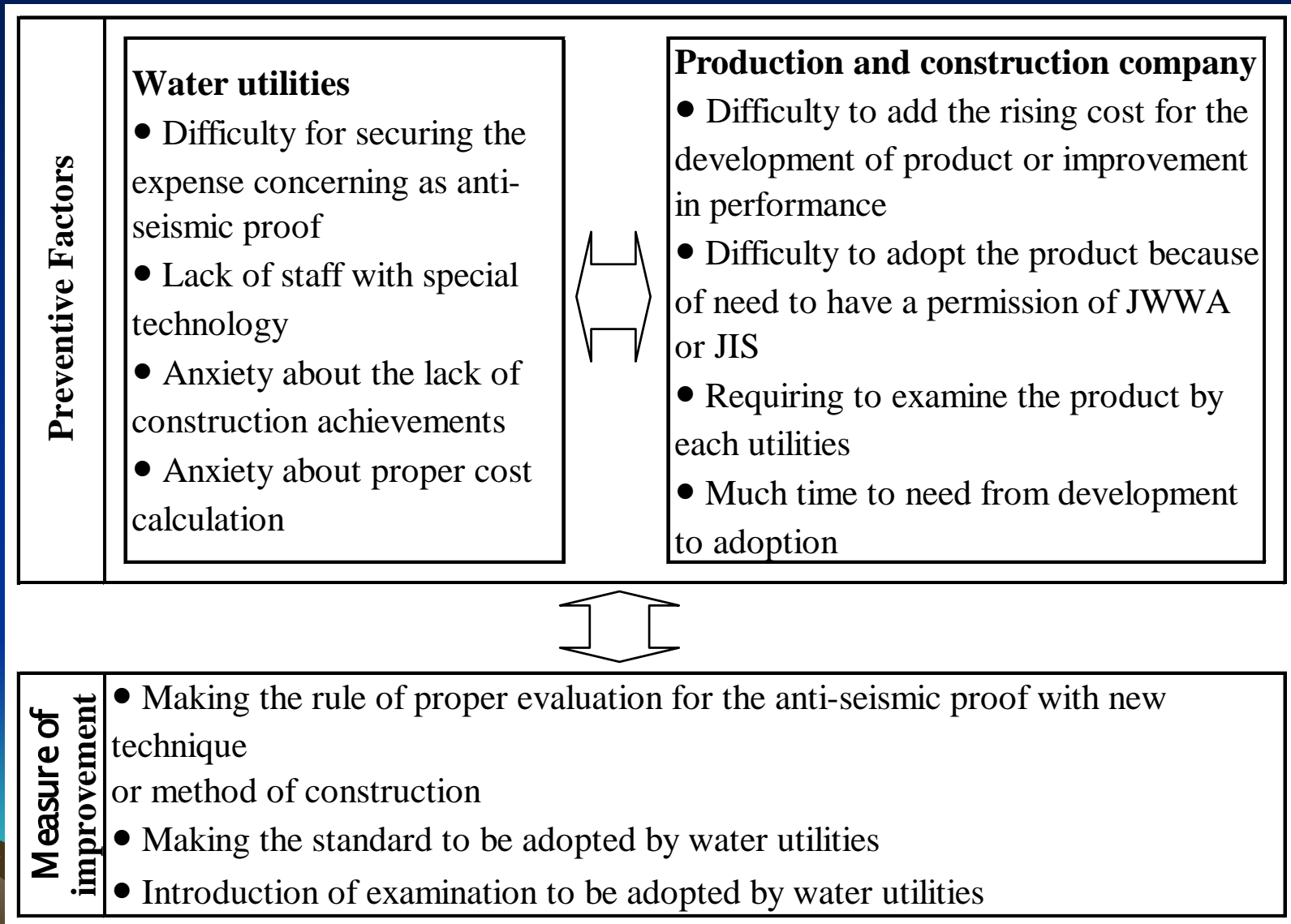
Figure-2

## 3.2 Entrusting the Job of anti-seismic measures

- 1) Lacking factors to entrust the jobs to the
  - company
  - a. Securing the fund to entrust
  - b. Lacking of manpower
- 2) Promoting outsourcing
  - a. Maintenance a entrusting procedure of the
    - document
    - b. Maintenance of the existent document
    - c. PR from the receiver (consultant) to entrust



# 3.3 The techniques and methods of effective anti-seismic construction



# Conclusion

- 1. To solve the problems or issues
- 2. Significance to practice
- 3. A long-term plan
- 4. Practicing the emergency business

***Thank you for your  
kind attention.***

