Adaptation to the climate change in the Japanese water supply system

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Topics

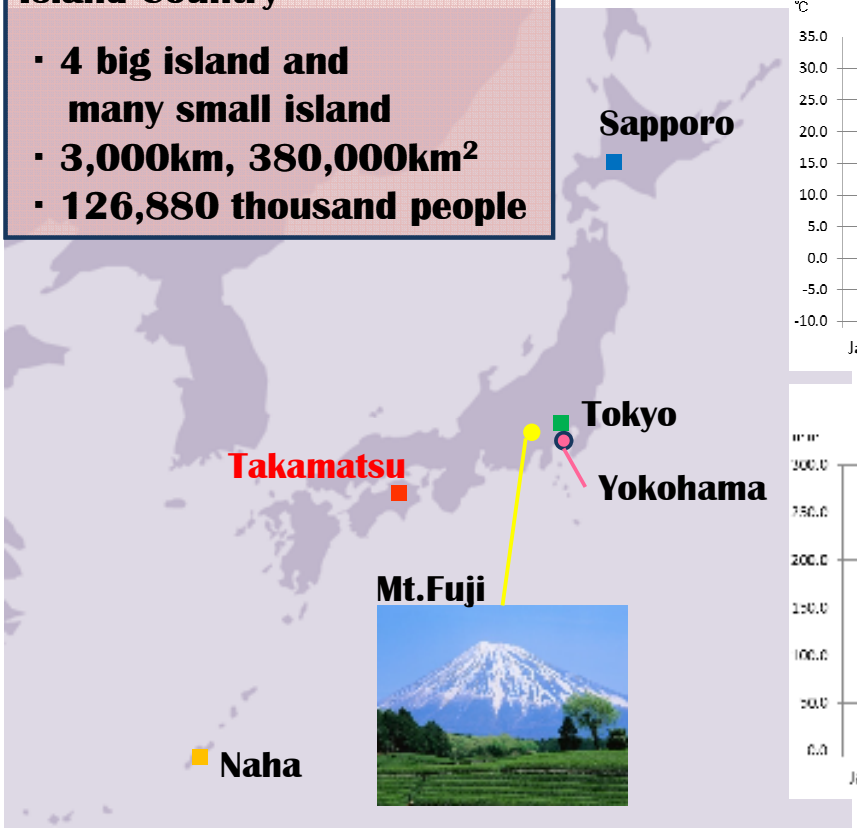
1. Outline of water supply in Japan
2. Influence of the climate change in the water supply
3. Action for the climate change in Japan

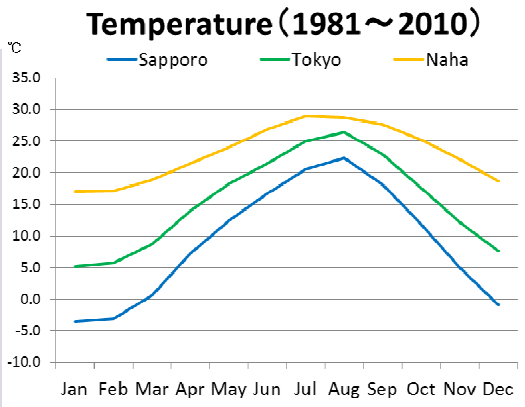
1. Outline of Water Supply in Japan

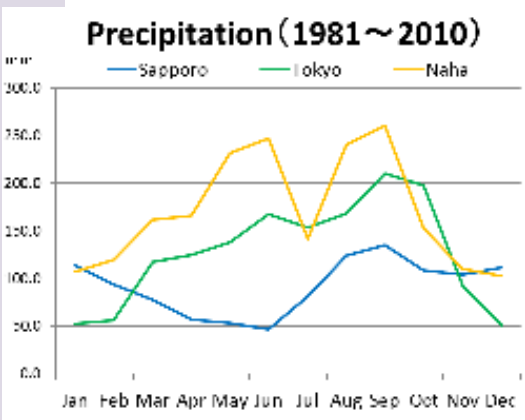
General Information of Japan

Island Country

- 4 big island and many small island
- 3,000km, 380,000km²
- 126,880 thousand people





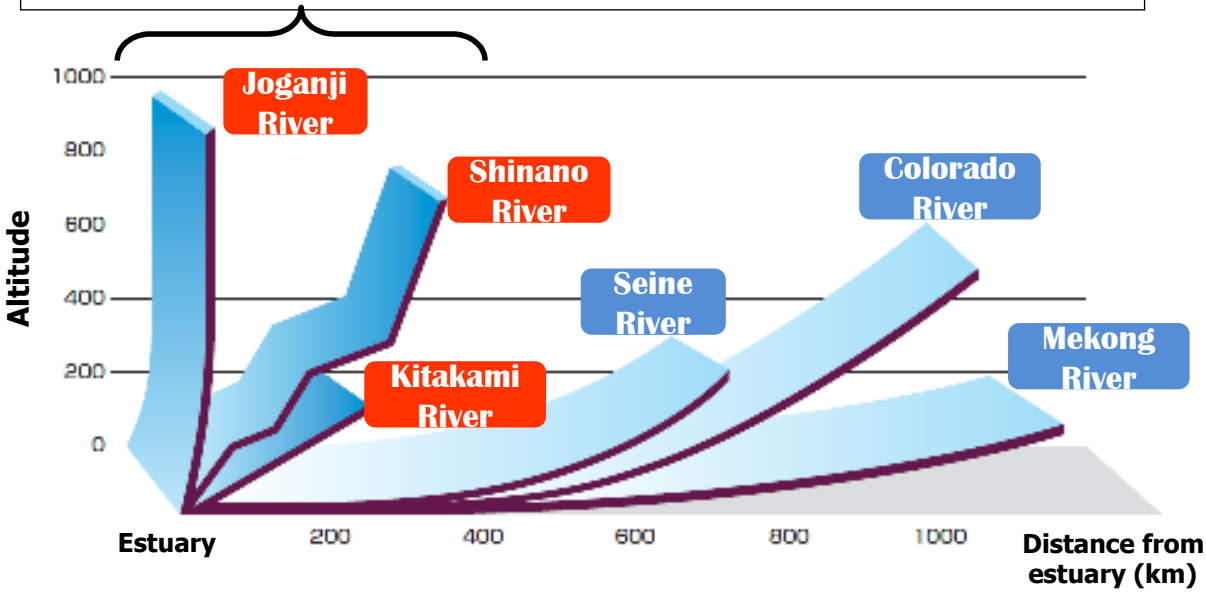


General Information of Japan

○ River gradients of Japan and the World

【Characteristic of Rivers in Japan】

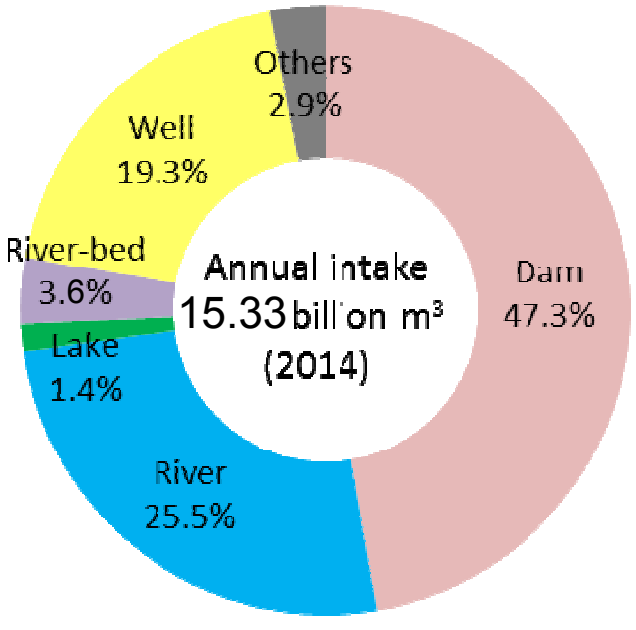
The length is short, the inclination is steep. So, the water of the river flows out to the sea.

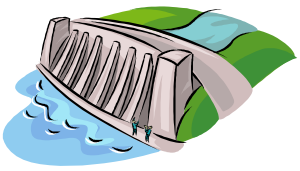


http://www.mlit.go.jp/river/pamphlet_jirei/kasen/gaiyou/panf/gaiyou2005/pdf/c1.pdf

Water sources of water supplies

In Japan, we have secured to the water necessary for National Consumer Affairs and economic activities, by the dam.





Administration

○ In Japan, the administration of the water supply is carried out based on laws and ordinances.

【Laws and ordinances related to water supply】

The Waterworks Law, The Cabinet Order, The Ordinance of the Ministry

○ Japanese administration has 3 layers.

【National Government】 Ministries related to water (5 Ministries)

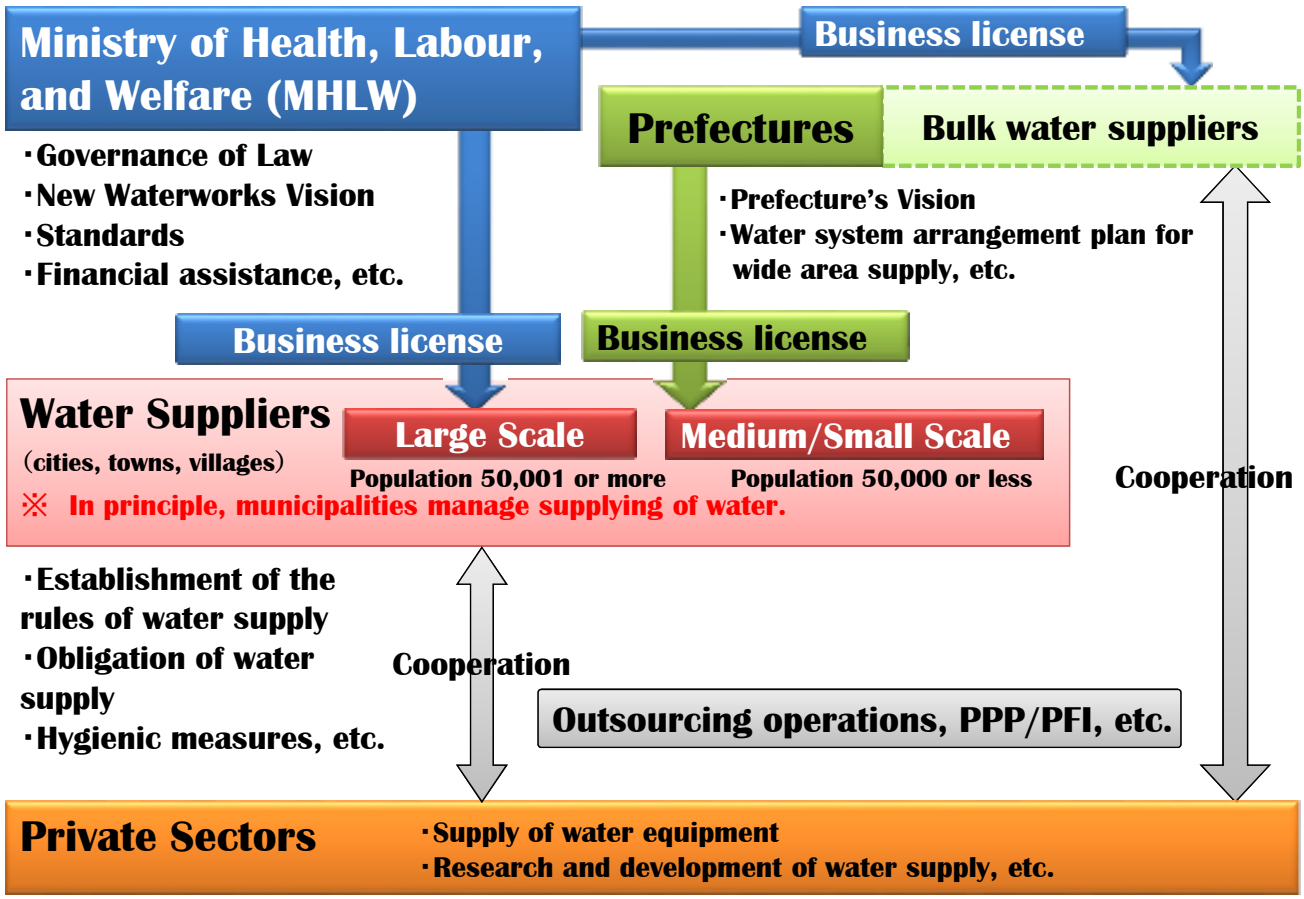
1	Ministry of Health, Labour and Welfare	Water supply
2	Ministry of Environment	Water Environment
3	Ministry of Land, Infrastructure and Transport	River Control Water Resource Sewerage system
4	Ministry of Economy, Trade and Industry	Industrial water
5	Ministry of Agriculture, Forestry and Fishery	Agricultural water

【Prefecture】 47 prefectures

【Cities, Towns and Villages】 1,718 communities （As of October 10, 2016）

*Prefecture, cities, town and village is the Local Government.

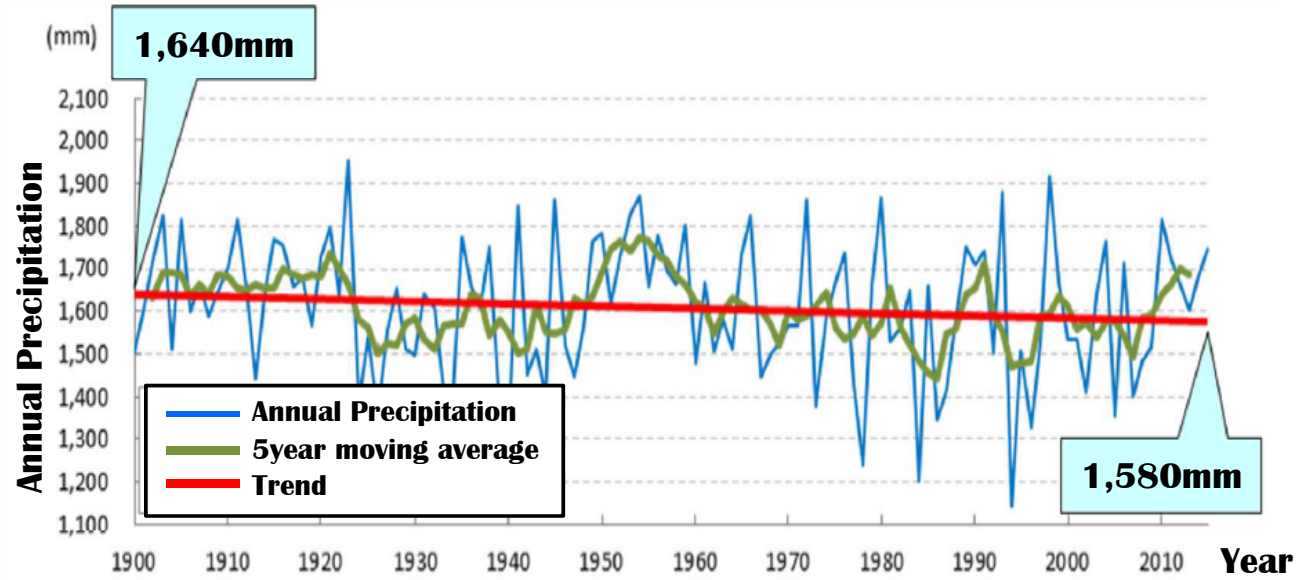
Stakeholders in Water Supply Sector



2. Influence of the climate change in the water supply

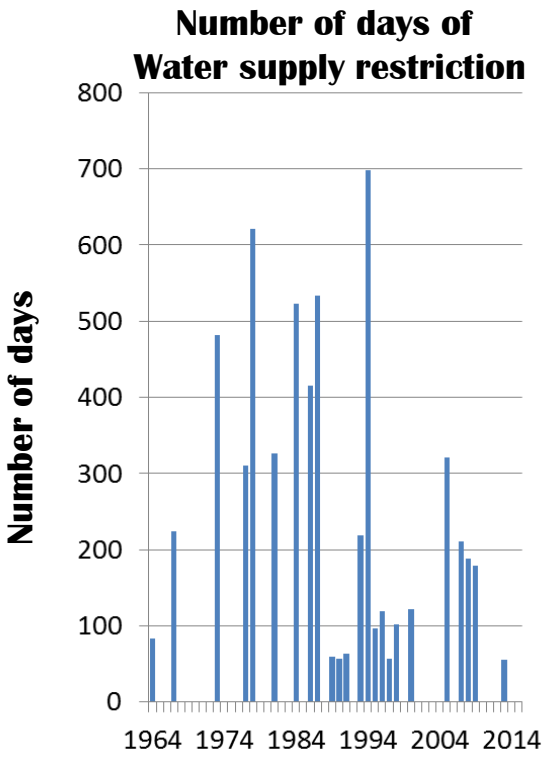
Increase of the Water shortage risk

- Year of low rainfall increase from about 1965
- Difference of precipitation between low rainfall year and high rainfall year is increasing in recent 20-30 years

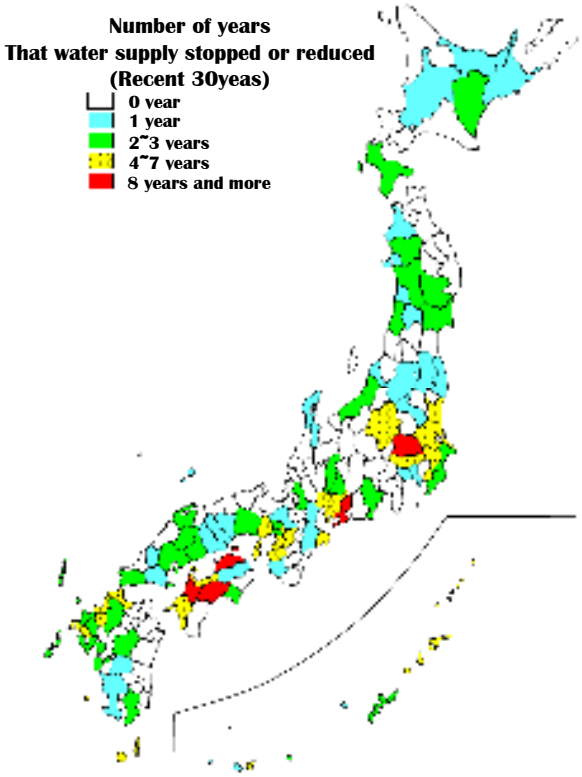


The current state of Japanese water resources in 2016(Ministry of Land, Infrastructure and Transport)

Total number of days of Water supply restriction



Made by MHLW based on
The current state of Japanese water resources in 2016
(Ministry of Land, Infrastructure and Transport)



The current state of Japanese water resources in 2016
(Ministry of Land, Infrastructure and Transport)

Countermeasures to water shortage

●Set up the network of water shortage

Ministry of Health, Labour and Welfare established “The network of water shortage" constructed in MHLW, JWWA and the local government and carried out communalization of the shortage of water information.

●Each local government called for saving water through various mediums

Government office

Appeal to passing traffic and the visitor to the Government office for saving water


(Saitama city)


(Tokorozawa city)

Website, Twitter

Provide information using website and Twitter

(Tokyo)


(Saitama Prefecture)

Road

Appeal for saving water with a public car and electric light pole

(Saitama city)

Poster, Digital Signage

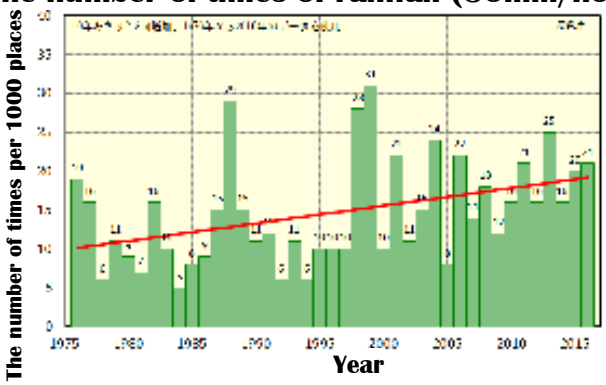
Appeal for saving water using poster and Digital Signage


(Saitama Prefecture)


(Kawagoe city)

Rise in turbidity of the river

The number of times of rainfall (80mm/hour)



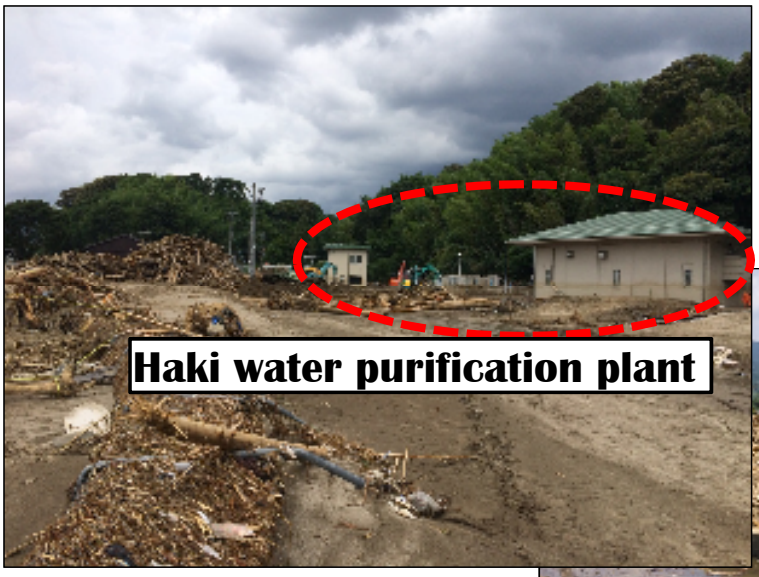
(Japan Meteorological Agency)

Typhoon, heavy rain and Damage of the large-scale suspension of water supply

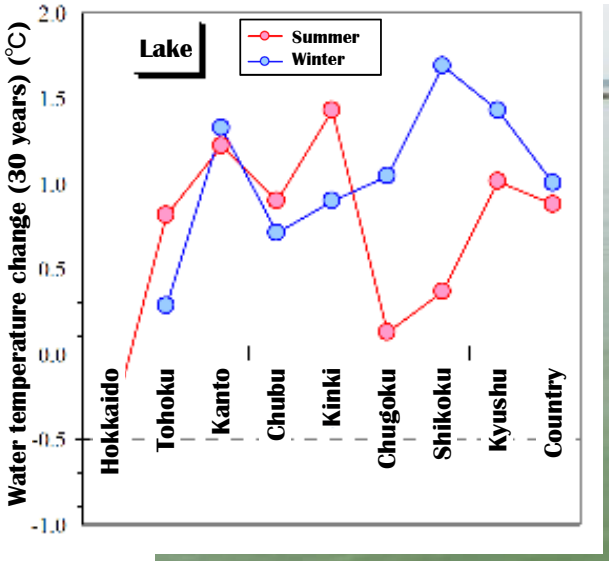
Timing of the appearance	Area	The number of houses that cut off water supply	The maximum days that cut off water supply
2010.6~7	Yamaguchi, Akita, Hiroshima, etc	About 17,000	6
2011.7	Niigata, Fukushima	About 50,000	68
2011.8~9	Wakayama, Mie, Nara, etc	About 54,000	26
2012.7	Fukuoka, Oita, Kumamoto	About 12,000	About 1 month
2013.7	Yamagata, Yamaguchi, Shimane, etc	About 64,000	17
2014.7~8	Kochi, Nagano, Hiroshima, Hokkaido, etc	About 55,000	36
2015.7	Kagawa, Kagoshima, etc	About 2,000	10
2015.9	Ibaraki, Tochigi, Fukushima, Miyagi	About 9,300	11

damage by the flood

2017.7 Heavy rain at North-Kyushu



Declining quality of water with increase in temperature

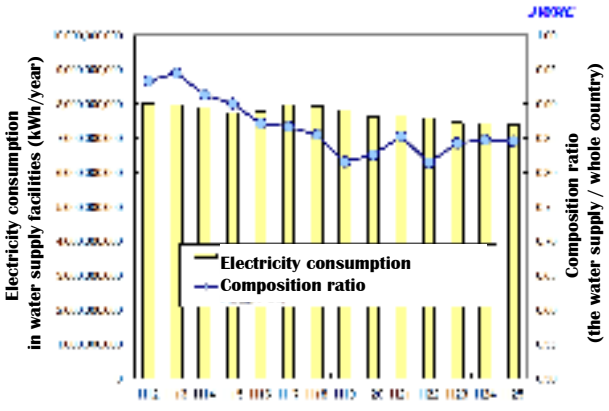


H23.7 Kasumigaura
(Kasumigaura river office, Ministry of Land, Infrastructure and Transport)

15

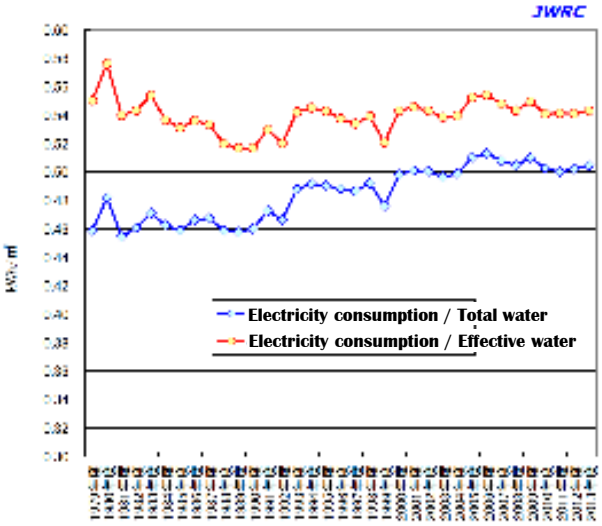
Energy saving and Clean energy

Electricity consumption in water supply facilities



Water hot news #496(Japan Water Research Center)

Electricity consumption per unit quantity of water in the water supply



Water hot news #496(Japan Water Research Center)

16

3. Action for the climate change in Japan

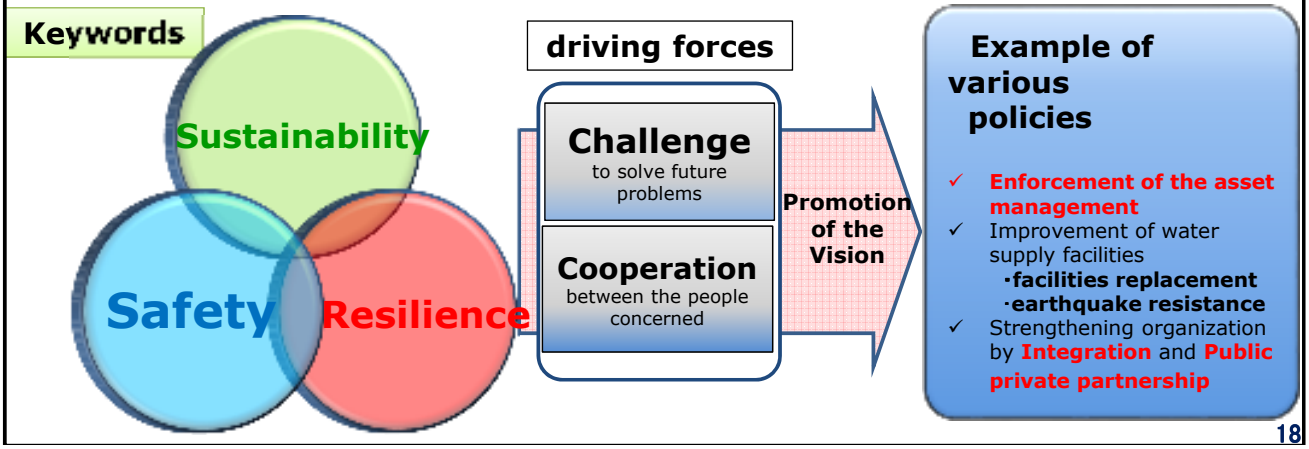
Release of the New Waterworks Vision

(Former) Waterworks Vision was published (June, 2004)

- Experience of large-scale damage of the water supply facilities by the Great East Japan Earthquake (March, 2011)
- The concern that business management becomes much severer by the arrival of the population decline society.

New Waterworks Vision (March, 2013)

【Concept】Succession of reliable water supply to the future alongside communities



Adaptation to the climate change

Risk management

- Promotion effective measures for various risk factor
- Hardware measures (Advancement of water purification, The use of plural water resources, Reorganization of water intake system, etc)
- Software measures (Formulate the manual for a crisis, training, Establish a method to share information in the people concerned of the basin, etc)
- Promote a water security plan by integrated approach
- Formulate the BCP

Environment

- Carry out the water source maintenance that cooperated by a basin unit
- Saving energy (High efficiency apparatus, Inverter control a pump, etc)
- Renewable energy (Small hydroelectric generation, Photovoltaic power generation, Biomass generation, Geothermal power generation)

Human resources and Organization

- Secure human resources, Succeed to technology

Communication with inhabitants

- Cooperate with inhabitants at the time of a disaster
- Develop effective reporting and strategic publicity work

Thank you for your kind attention.

Safety

Idealized image of water supply	・Water supply to be able to drink in peace ・Appropriate water quality management system ・Measures by integrated approaches
Immediate goals	Maintaining continuous safe water supply of all water supply system in collaboration with stakeholders
Direction of the action	○ Preserving and securing good water source ○ Maintenance of the water supply facilities according to water source ○ Water quality management in the clean water processing ○ Establishment of public information, well-known system to distribute the information of water quality

Resilience

Idealized image of water supply	・Crisis management ・Appropriate facilities replacement, earthquake resistance ・Flexibility against disaster
Immediate goals	All water utilities complete earthquake resistance of pipelines, distributing reservoirs and water purification plants, concerned with the prime water supply bases
Direction of the action	○ Carrying out earthquake resistance of all the water supply facilities stepwisely ○ Reinforcement of the facilities which become the water supply base to enable essential water supply at the time of disaster ○ Securing of water supply means that emergency restoration activity and emergency water supply can be carried out by cooperation with the person concerned at the time of disaster

Sustainability

Idealized image of water supply	· **Trust by the nation** · **Stability of business base for the long-term future** · **Measures based on population decline society**
Immediate goals	**All water utilities carry out the asset management**
Direction of the action	○ **Careful management and operation of all the water supply facilities** ○ **Replacement of aging facilities** ○ **Reinforcement of the financial base for sustainable management** ○ **Securing the staffs having specialty to be engaged in essential duties**