

# *Outline of the Water Resources Policy in Japan*



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**Ministry of Land, Infrastructure and Transport**

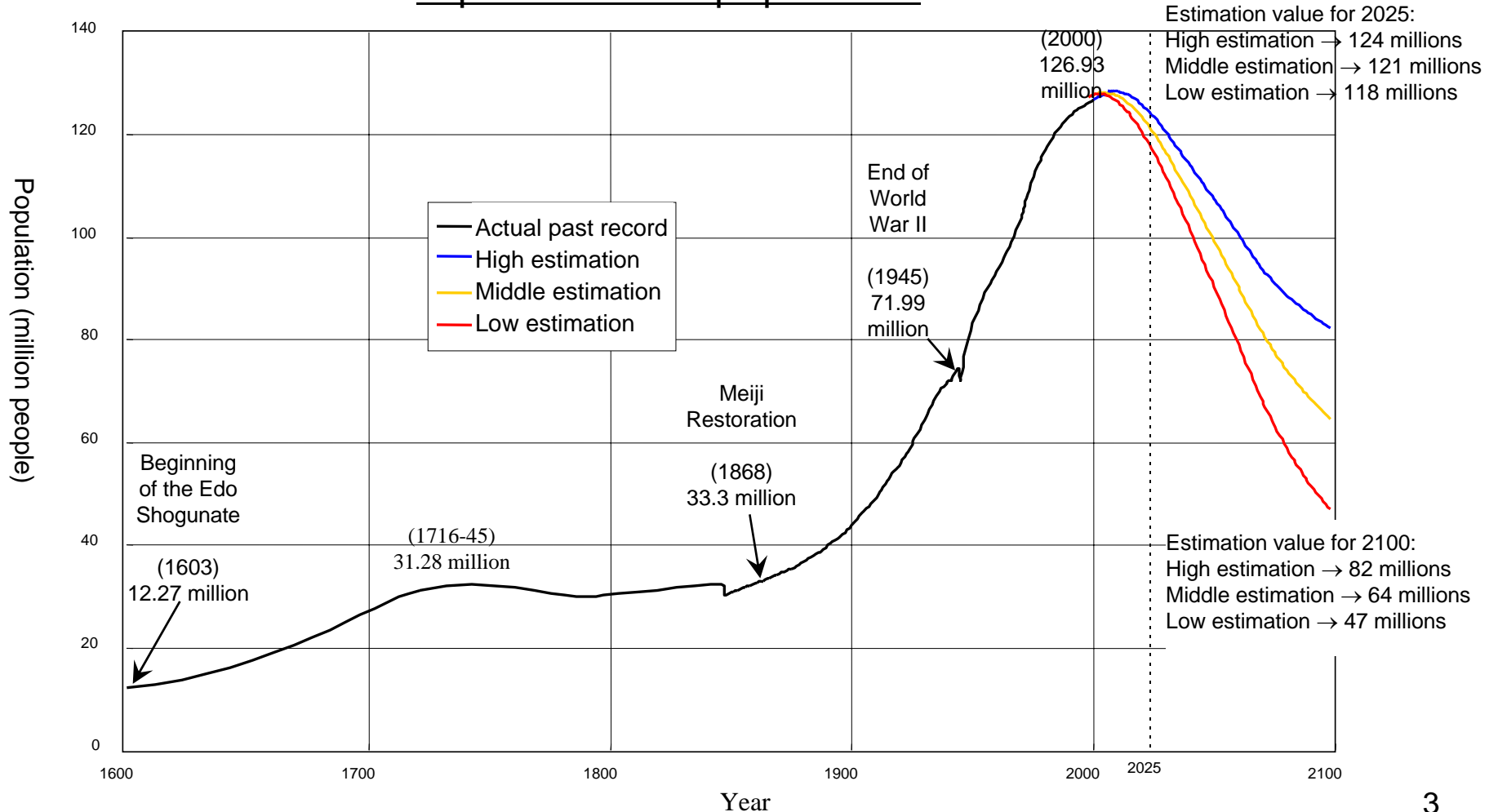
# 1. Basic Facts and Figures

- 1-(1) Transition and estimation of Japanese total population
- 1-(2) Percentage distribution of employed persons by industry
- 1-(3) Trends in DID area
- 1-(4) Migration between Three Metropolitan Areas and Non-Metropolitan Areas
- 1-(5) Concentration of Population and Industry in the “Pacific Belt Zone”
- 1-(6) Trends in water supply use
- 1-(7) Economic Growth Rate of Japan(1956~2004)
- 1-(8) Precipitation and Amount of Water Resources
- 1-(9) State of Water Use
- 1-(10) Water Resources Balance in Japan

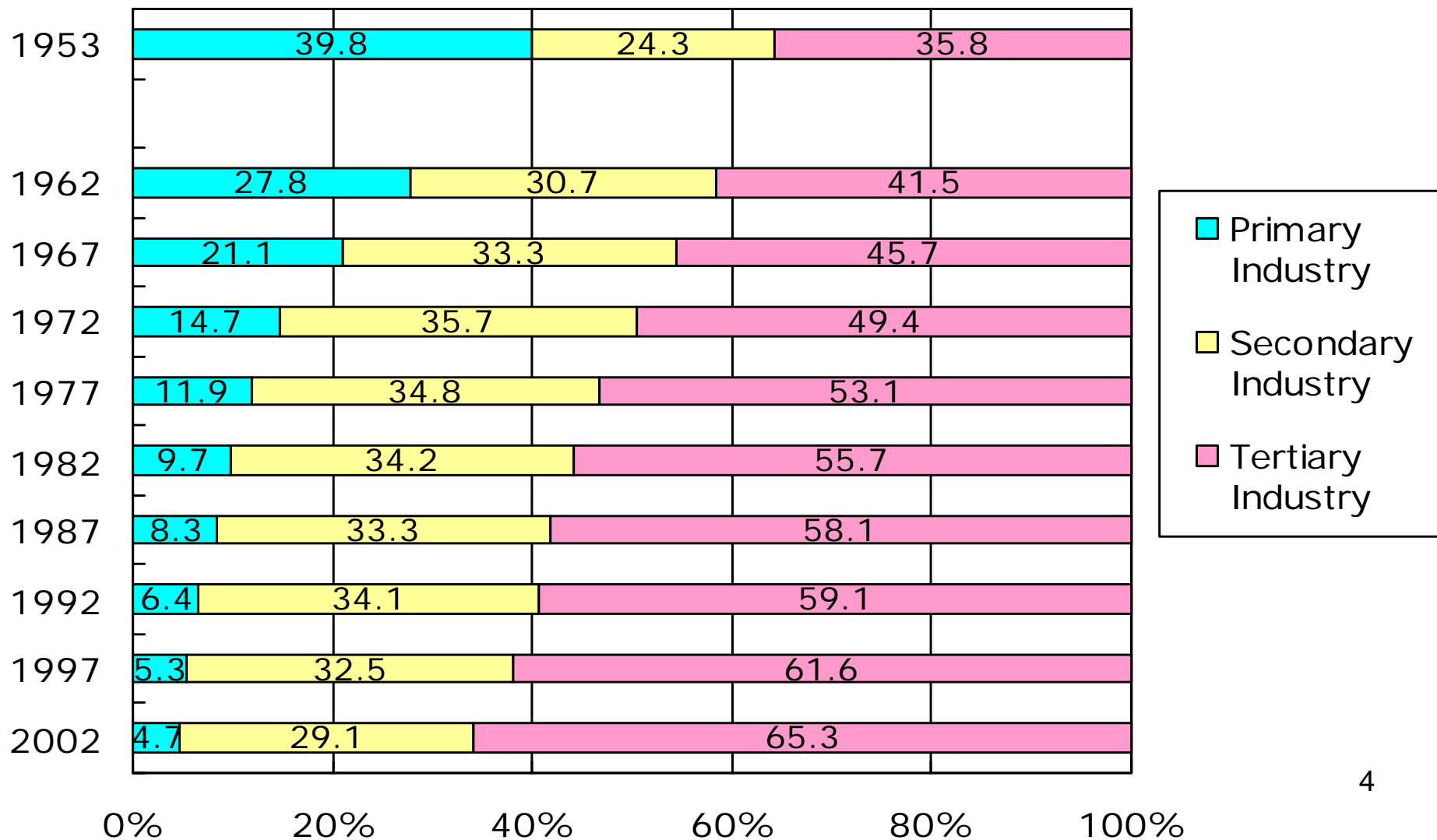
# 1-(1) Transition and estimation of Japanese total population

Japanese total population reached its peak in 2005, and has begun to decrease.

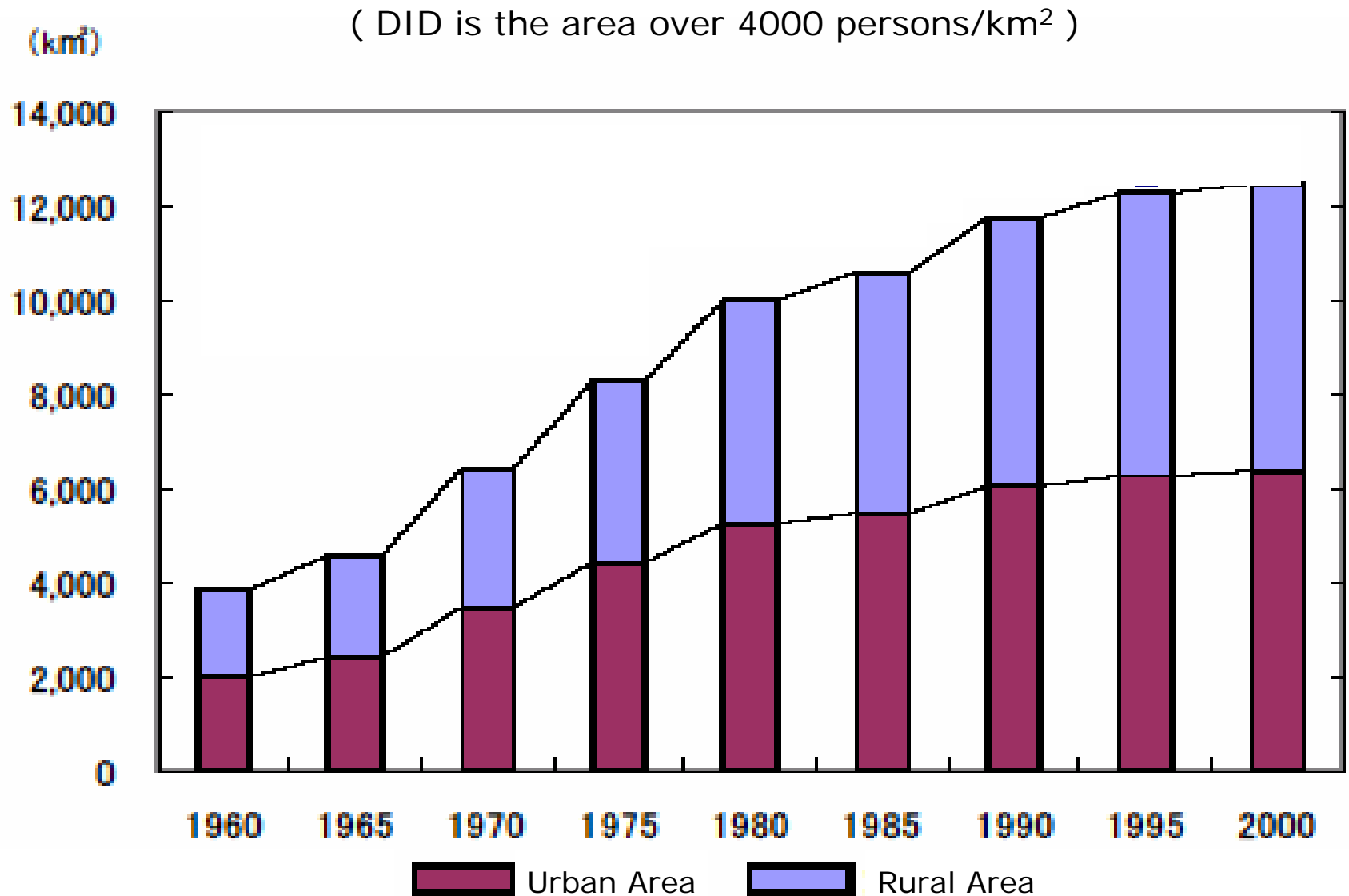
## Japanese total population



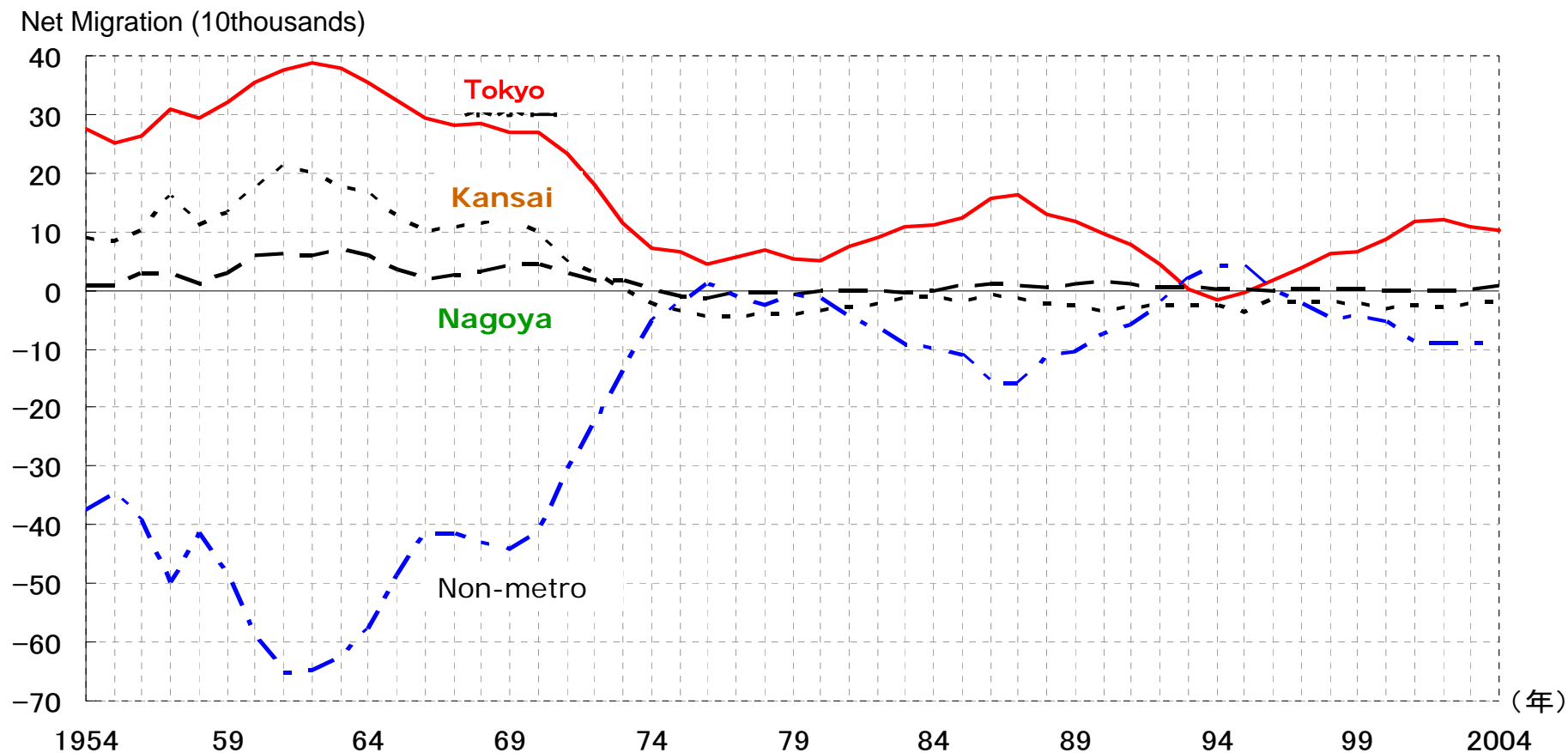
# 1-(2) Percentage distribution of employed persons by industry



# 1-(3) Trends in the DID (Densely Inhabited District) area



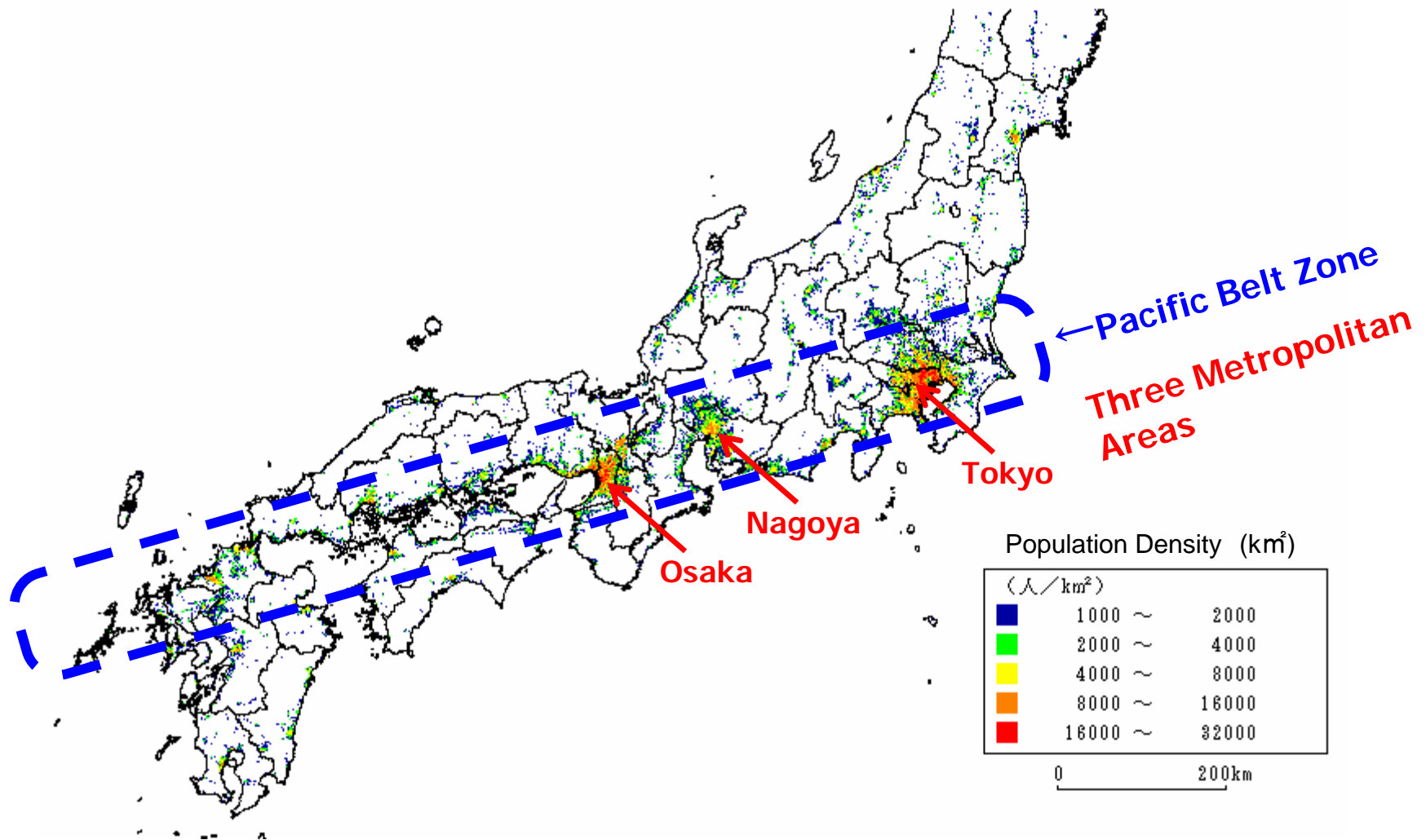
# 1-(4) Migration between Three Metropolitan Areas and Non-Metropolitan Areas



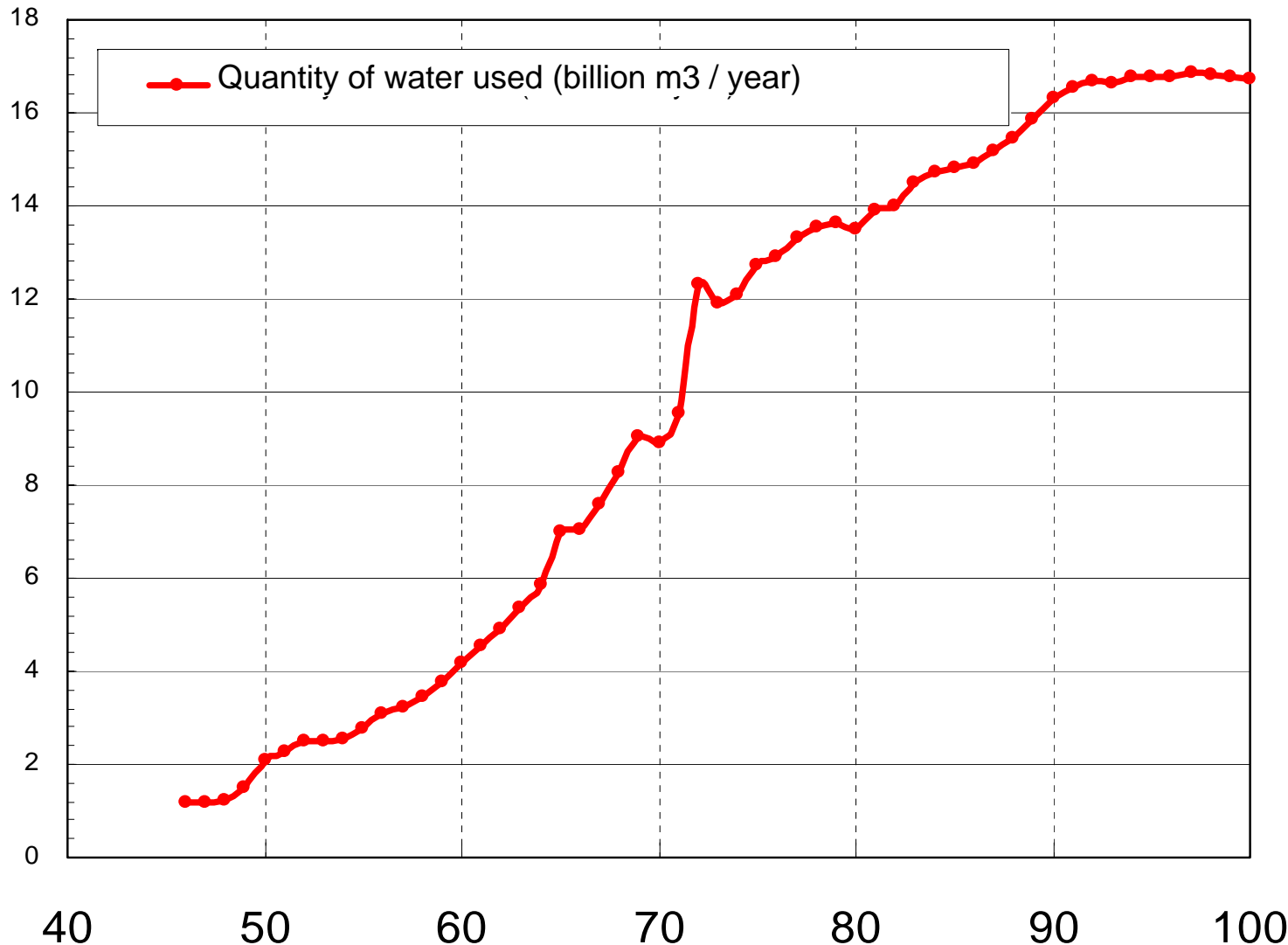
Three metro areas: **Tokyo** Area, **Kansai** Area and **Nagoya** Area  
 Non-metro areas: Other than the 3 major city areas

**Tokyo** Area: Saitama, Chiba, Tokyo and Kanagawa  
**Kansai** Area: Kyoto, Osaka, Hyogo and Nara  
**Nagoya** Area: Gifu, Aichi and Mie

# 1-(5) Concentration of population and Industry in the "Pacific Belt Zone"



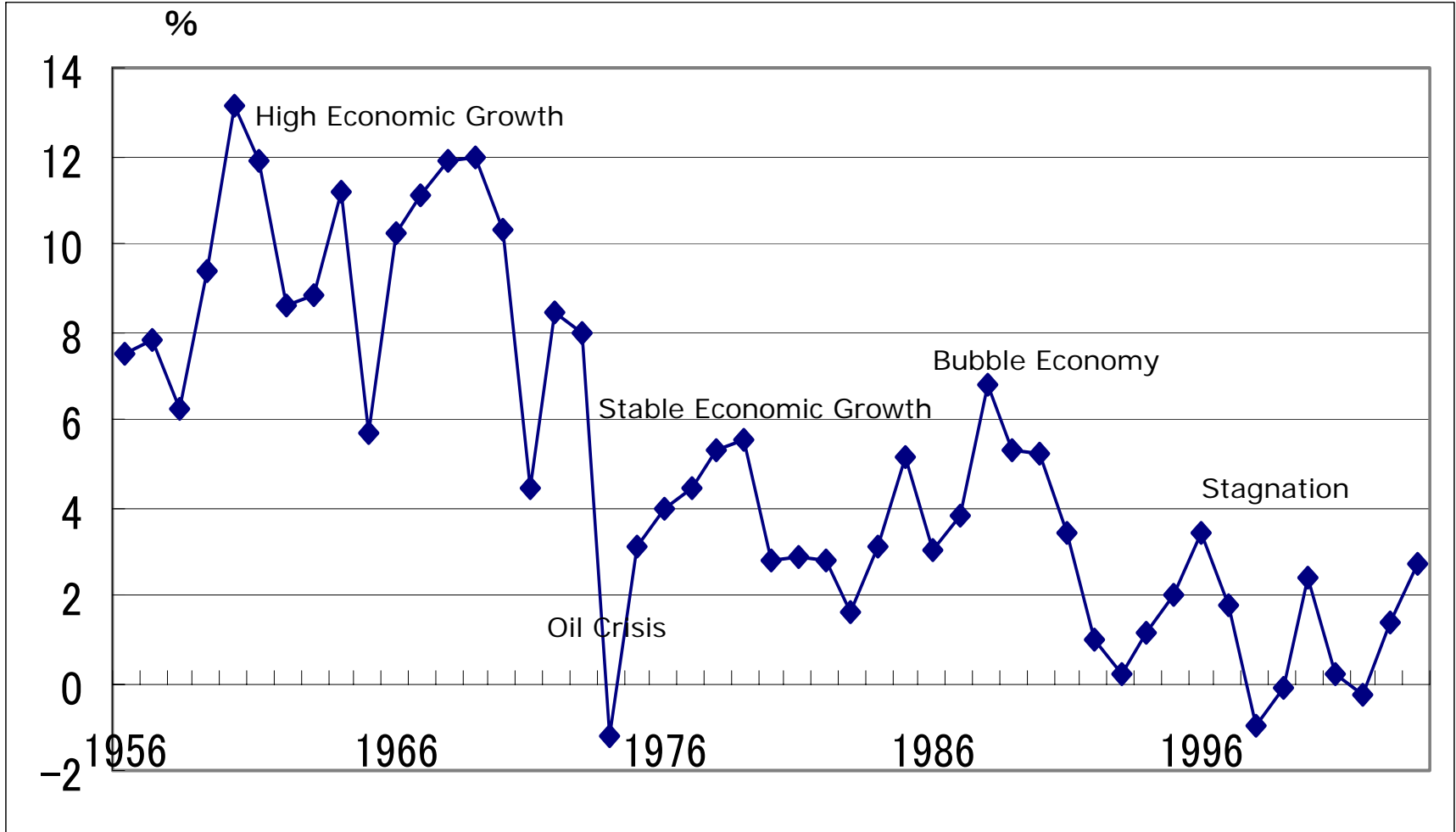
# 1-(6) Trends in water supply use



Source: 1946-1964: Annual Water Supply Quantity (Waterworks Statistics)  
Source: 1965-2000: Annual Intake Quantity (Water Supply Statistics)



# 1-(7) Economic Growth Rate of Japan(1956~2004)

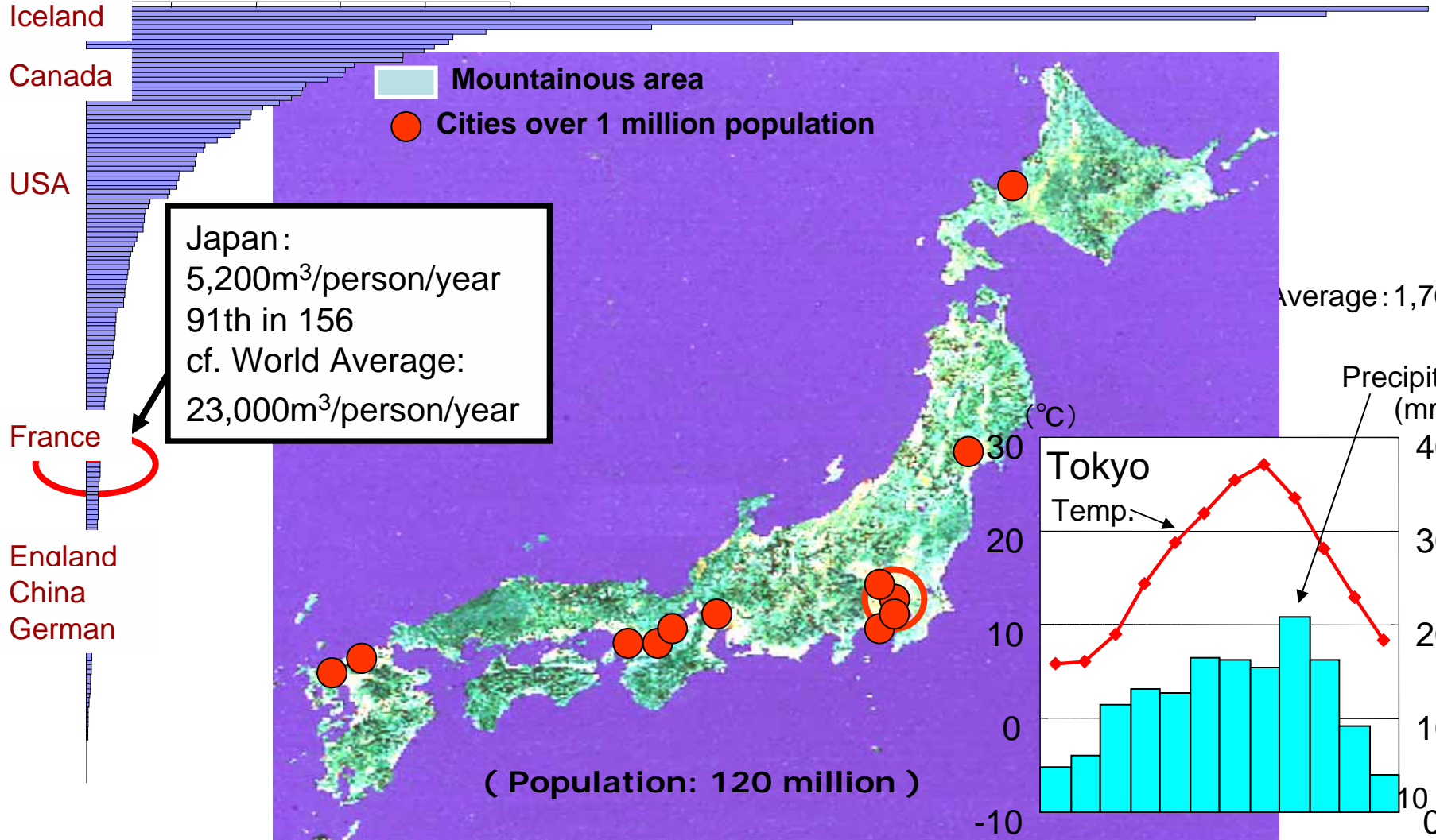


# 1-(8) Precipitation and Amount of Water Resources

World Order of Water Resources Per Capita

(1000m<sup>3</sup>/yr per capita)

0 20 40 60 80 100



Japan:  
 5,200m<sup>3</sup>/person/year  
 91th in 156  
 cf. World Average:  
 23,000m<sup>3</sup>/person/year

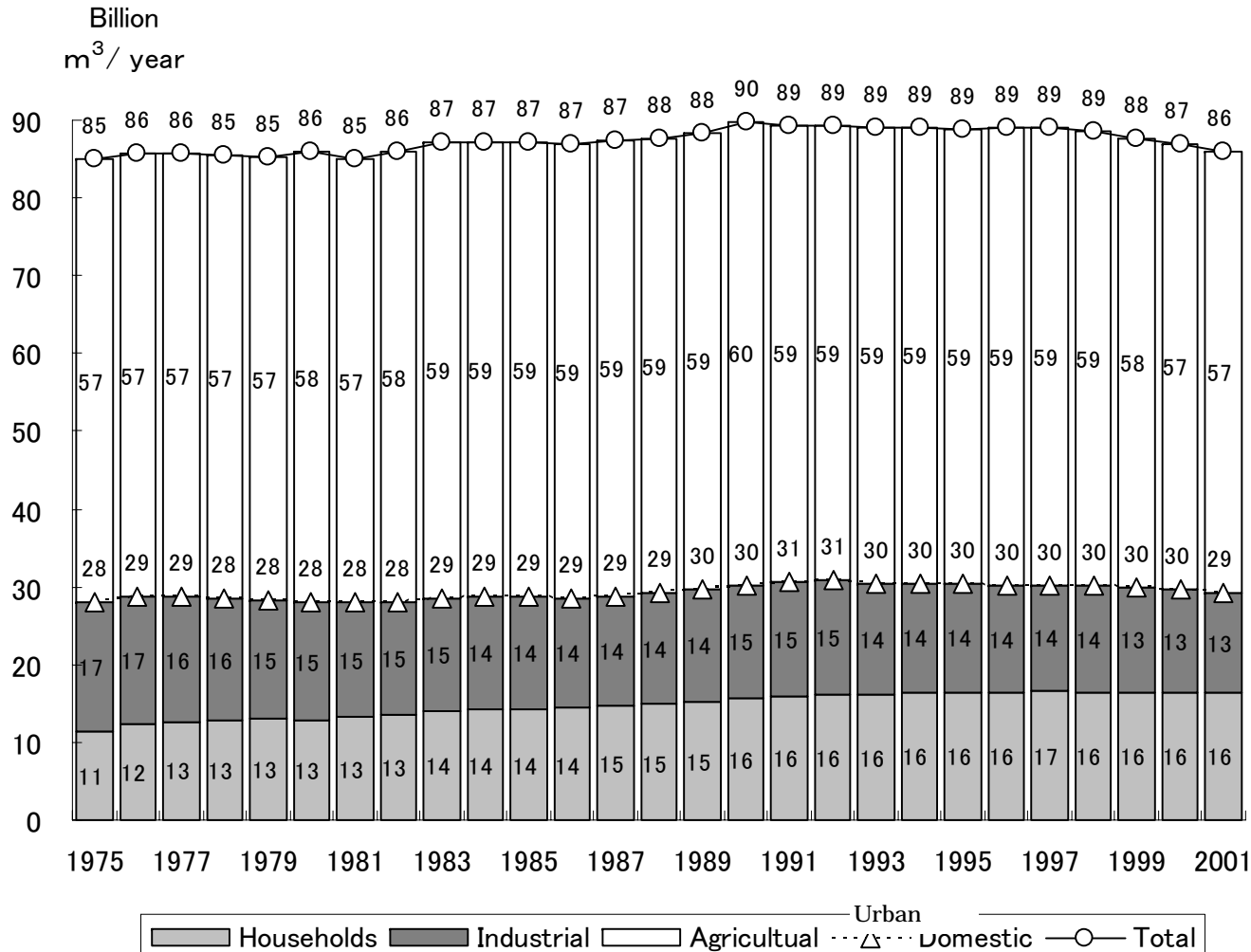
( Population: 120 million )

1 2 3 4 5 6 7 8 9 10 11 12

# 1-(9) State of Water Use

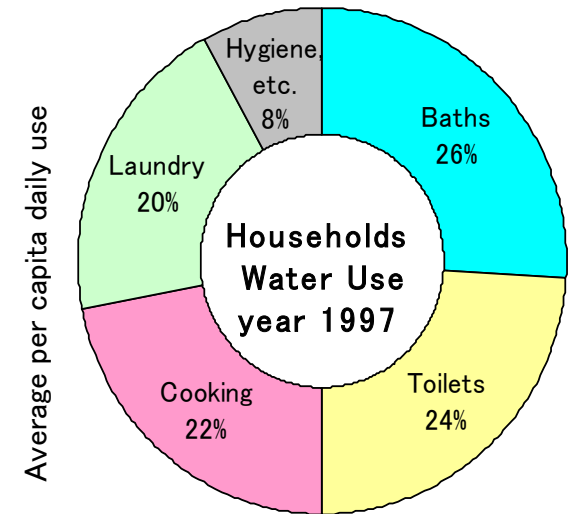
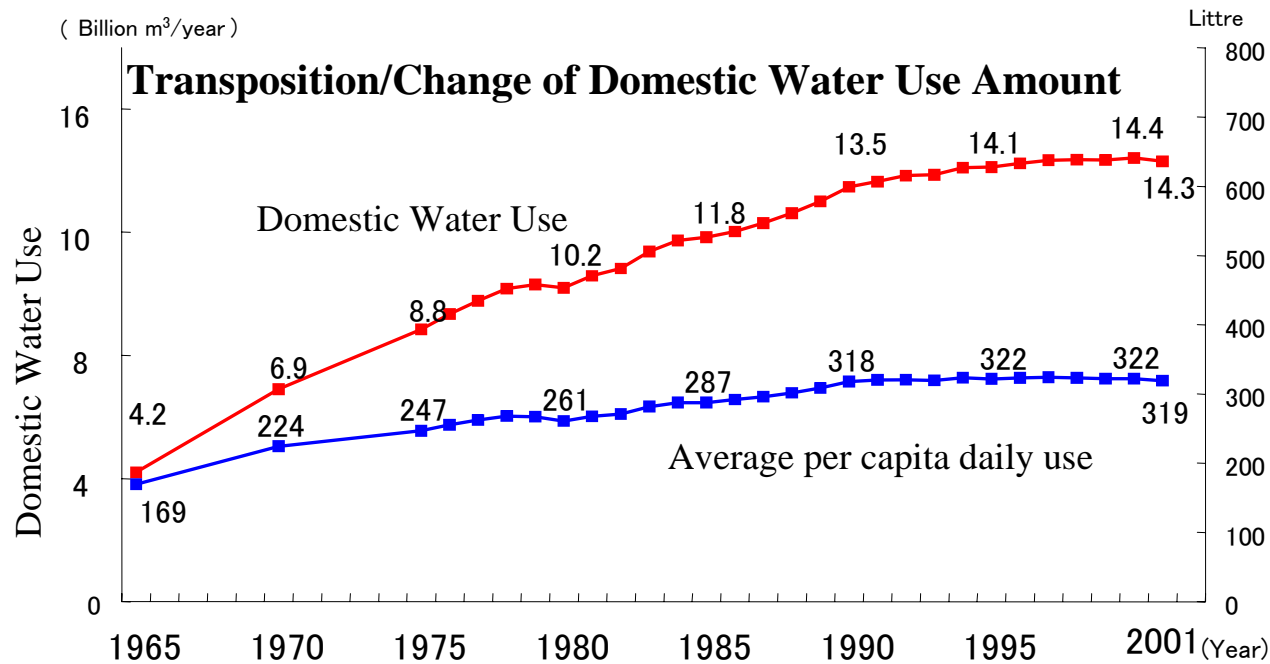
(Only fresh water base, this chart doesn't count for, for example, recycled water)

- 1) Water use is approximately 85.9 billion m<sup>3</sup> per year and remained static, recently
- 2) A large proportion of water use is for the purpose of agriculture ( 2 / 3 of total)



# 1-(9) State of Water Use ( Water for Domestic Use)

- 1) **Increase by roughly three times** due to the population increase and expansion of economic activities over 35 years in the period **between 1965 and 2001**,
- 2) Roughly **doubled of the daily per capita amount of domestic water** in the same time due to changes in the lifestyle (e.g. dissemination of flush toilets and baths in each family),
- 3) Recently, the trend of "households" remained static, and
- 4) Main proportion of households is by **baths, Toilets, Cooking and Laundry**.

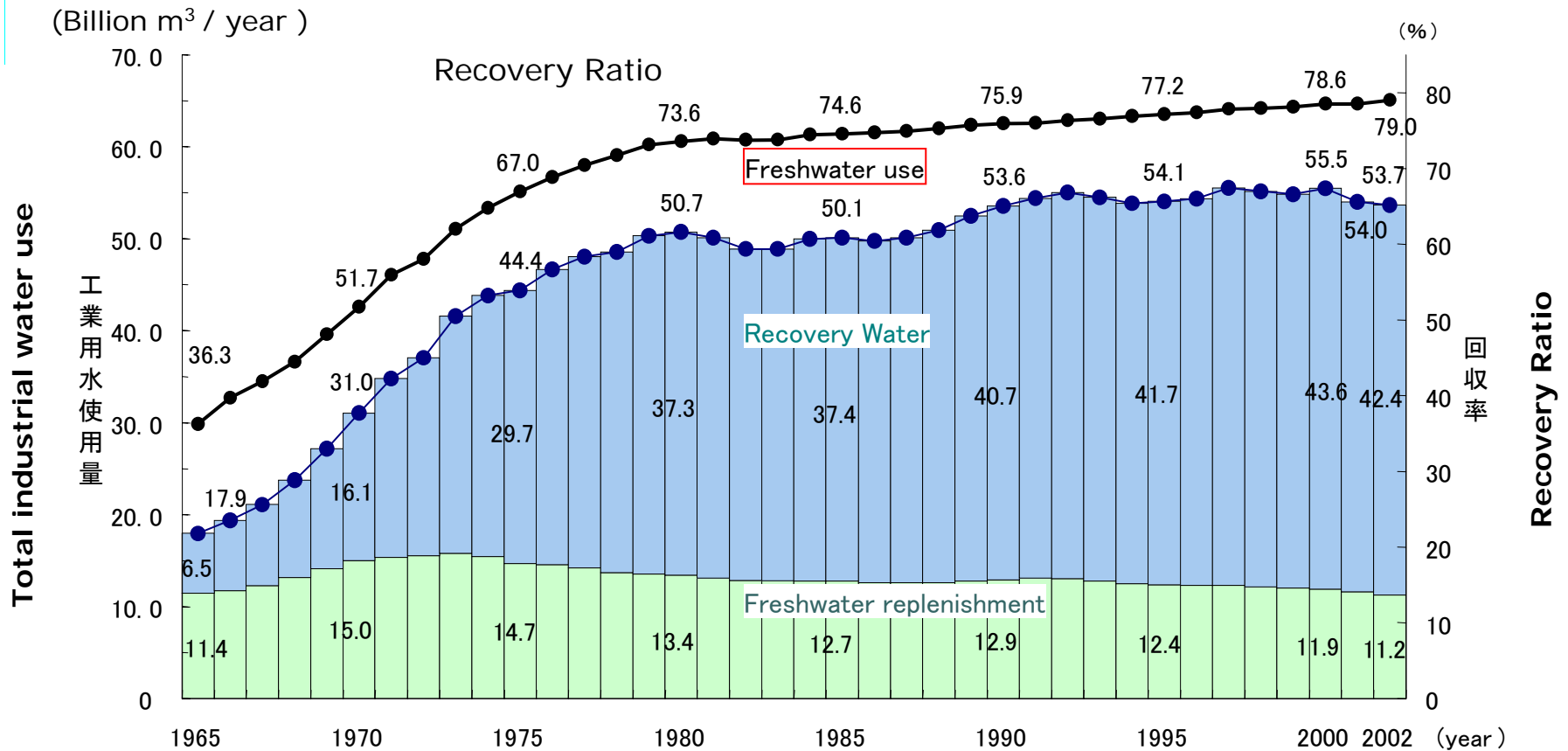


Note) 1. Figure after 1975 were surveyed by Water Resources Department, MLIT  
 2. Based on effective water volume

Note) Data from the survey by bureau of Waterworks, Tokyo gov.

# 1-(9) State of Water Use ( Water for Industrial Use)

- 1) **Increase roughly by three times between 1965 and 2002** for 37 years due to expansion of economic activities
- 2) Due to **advances in Water recycling**, the amount of water, required to be newly taken in from rivers etc. has been **decreasing or remained static in trend since 1973**.
- 3) Proportion of **recovery ratio** per the amount of water for the recycling use of water is **79 %**.

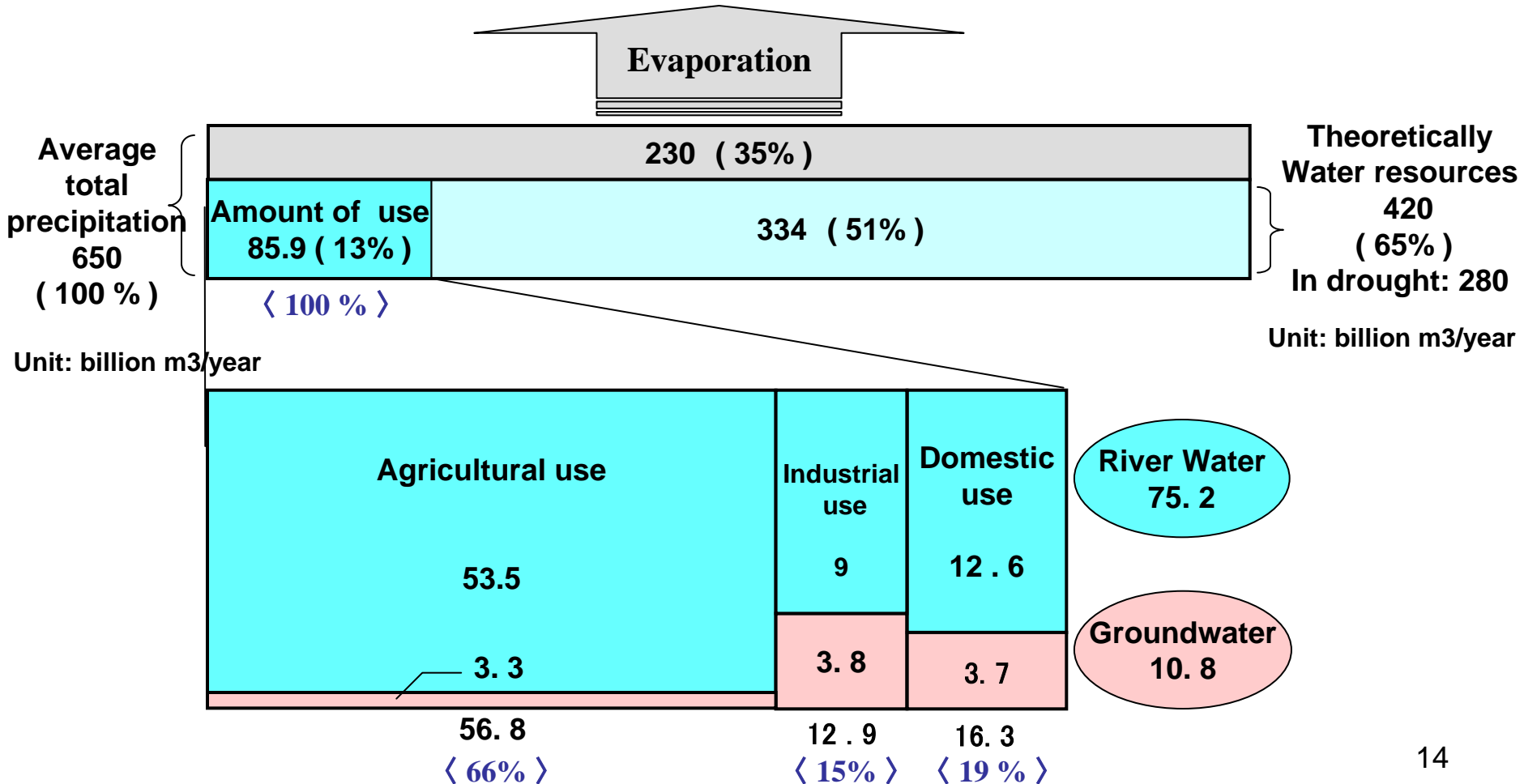


Note) 1. "Census of Manufactures" by Ministry of Economy, Trade and Industry

2. Figures are for businesses with 30 or more employees

# 1-(10) Water Resources Balance in Japan

- 1) Annual precipitation in Japan is approximately 650 billion m<sup>3</sup>, of which approximately 230 billion m<sup>3</sup> (35%) is lost through evaporation.
- 2) The remaining 420 billion m<sup>3</sup> is theoretically the maximum amount that can be used by human. i.e. water resources. In the year of drought: it becomes reduced until 280 billion m<sup>3</sup>
- 3) The amount of water actually used (intake amount in 2001) is approximately 85.9 billion m<sup>3</sup>. (around 13%)



Reference : Water Resources in Japan, Water Resources Department, MLIT (2004)

## 2. General Review of Japanese Water Resources Policy

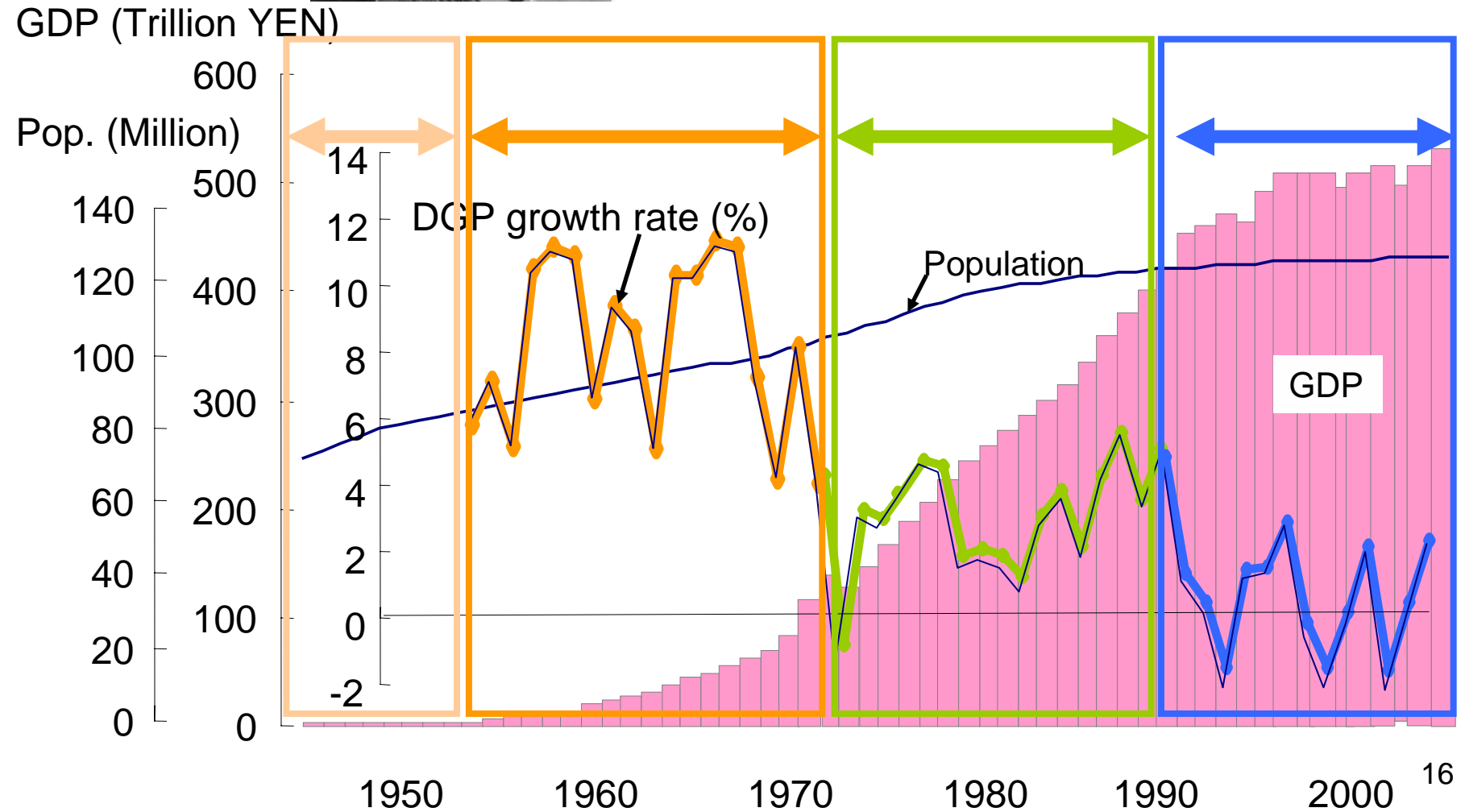
2-(1) Postwar Reconstruction Period (1945 - 1960)

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

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

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

# 4 Periods according to the change of Economic Condition





## 2-(1) Postwar Reconstruction Period (1945 - 1960)



Bombed Tokyo in 1945

Tokyo area hit by Kathleen Typhoon in 1947



## 2-(1) Postwar Reconstruction Period (1945 - 1960)

Urgent issues: national land conservation, increase of food production, expansion of industrial production, power development, etc.

Stable food supply to cope with the rapid increase in population



Land Improvement **Law** (1947)

Promotion of power development (hydroelectric power, etc.)



Electric Power Development Promotion **Law** (1952)

Measures to cope with the increased demand for water for domestic use



Waterworks **Law** (1957)

Measures to cope with the increased demand for industrial water



Industrial Water Supply Business **Law** (1958)

Promotion of nationwide national land development



Comprehensive National Development **Law** (1950)

Comprehensive implementation of flood control measures and measures to meet demand for municipal water and other new water uses



Specified Multipurpose Dam **Law** (1957)

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



Shin-kansen Super Express



Kashima Seaside Industrial Area

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

### Promotion of development to meet the rapid increase in water demand

New issues arise (water pollution, ground subsidence etc.)

### Promotion of water resource development

Legal and organizational mechanisms for promotion



Water Resources Development Promotion **Law** (1961)  
Water Resources Public Corporation **Law** (1961)

Mechanism to implement the rapid development of water resources in the areas with remarkable increase in water demand, such as Tokyo metropolitan area

Basic Plan for Water Resource Development (Full **Plan**)

For major 7 rivers

(For detail information, see p.35-40)

Coordination with new water use

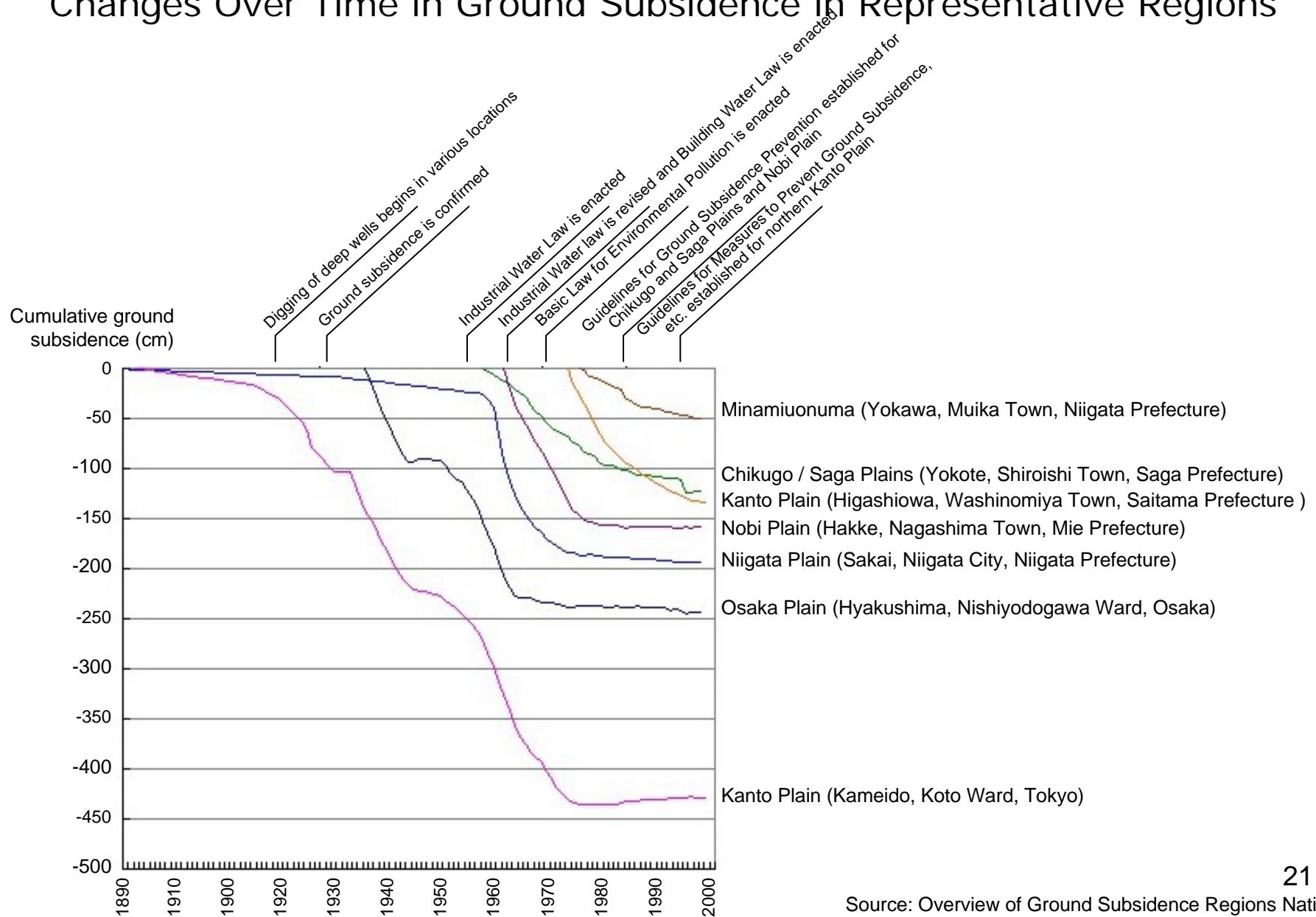
Integrated river management between flood control and water use



Revision of River **Law** (1964)

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

### Changes Over Time in Ground Subsidence in Representative Regions



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



Dirty foam in the Tama River around 1970

Photo: Environment Bureau,  
Tokyo Metropolitan Government <sup>22</sup>

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

Promotion of development to meet the rapid increase in water demand

**New issues arise (water pollution, ground subsidence etc.)**

### Measures to prevent ground subsidence

Industrial Water **Law** (1956)

Restrictions on the pumping of groundwater for industrial water use in designated regions (by prefectural governor)

Building Water **Law** (1962)

Restrictions on the pumping of groundwater for building water use in designated regions (by prefectural governor)

### Measures to preserve water quality

Water Quality Conservation **Law** /  
Factory Effluent Control **Law** (1958)

Water Pollution Control **Law** (1970)

Revision of Sewerage **Law** (1970)  
**Law** for Environmental Pollution (1967)

Basic **Law** for Environmental Pollution (1967) → Revised in 1970

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



Drought in Fukuoka, 1978

( Photo: Nishi-nihon Newspaper Company )



Tokyo Waterfront City



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

Change to the Stable Economic Growth thorough "oil shock (1973, 1979)"

**Continuous increase in water demand for urban / domestic use,**  
and frequent occurrence of water shortages.

**Change of inhabitants consciousness around the reservoir area**

**Need for a nationwide water demand and supply plan,  
based on a comprehensive, long-term perspective**

Long-Term Water Demand and  
Supply **Plan** (1978)

Basic approach and prediction of water demand and  
supply in 1985 and 1990 with a view to 2000

Water Demand in the 21st  
Century (1982)

Estimates of water demand and supply in 2000 and 2010

National Comprehensive **Plan**  
for Water Resources (1987)  
(Water Plan 2000)

- 3 objectives:

- (1) Creation of a stable water supply mechanism
- (2) Improvement of the safety level relating to water shortages
- (3) Creation of new water use society

- Prediction of water demand and supply with  
approximately 2000 as the target year

**Streamlining of water resource development such as dam construction, etc.**

Special Measures **Act** for  
Reservoir Area (1973)  
(For detail information, see p.46, 47)

"Promoting reservoir area" and "Lifestyle Reconstruction"  
as well as "usual compensation for property rights"

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

Change to the Stable Economic Growth thorough "oil shock (1973, 1979)"  
Continuous increase in water demand for urban / domestic use,  
and **frequent occurrence of water shortages.**  
Change of inhabitants consciousness around the reservoir area

### Measures to deal with frequent water shortages

Frequent water shortages within a short period of time

"Takamatsu Desert" (1973),  
Fukuoka Drought (1978),  
National Winter Drought (1984),  
Western Japan Winter Drought (1986),  
Tokyo Metropolitan Winter Drought (1987)



Government Offices  
Conference on Water  
Shortages (1987)

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



Kamikouchi, NAGANO



Tokyo Waterfront City



Aichi EXPO, 2005

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

New issues: coping with diversification of public attitudes and socioeconomic changes

- Economic globalization
- Sluggish economic growth and reduced rate of population increase

### Dealing with diverse needs

Increased interest in the environment



Basic Environment **Law** (1993)  
Environment Impact Assessment **Law** (1997)  
Revision of the River **Law** (1997)

Interchange among water uses  
Effective use of existing facilities



New efforts to secure water resources

- Optimization of facility management
- Diversion of water use rights to different applications
- Reuse of reclaimed water and other

### Measures to meet new demand

New National Comprehensive **Plan**  
for Water Resources  
(Water Plan 21) (1999)  
( Revise of "Water Plan 2000" )  
(For detail information, see p.41)

Decreased safety level for water use due to medium and long-term fluctuations in climate conditions



Aimed at constructing a sustainable water use system

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

New issues: coping with diversification of public attitudes and socioeconomic changes

- Economic globalization
- Sluggish economic growth and reduced rate of population increase

### Need for comprehensive efforts

Government Offices Conference on the Establishment of a Healthy Hydrological Cycle (1999)

Interim report on basic matters regarding the approach to future efforts and cooperation, etc.

### Others

Law for the Focused Planning of Social Infrastructure Improvement (2003)

Revision of "Comprehensive National Land Development Law"



"National Land **Sustainable** Plan **Law**" (2005)

## 3. Governmental Organizations related to water issues

3-(1) Jurisdictional Responsibilities as Specified in Laws  
Relating to the Establishment of Individual Ministries

3-(2) Roles of Individual Ministries in Water Administration

### 3-(1) Jurisdictional Responsibilities as Specified in Laws Relating to the Establishment of Individual Ministries

#### Ministry of Health, Labor and Welfare

- **Domestic water** supply

#### Ministry of Agriculture, Forestry and Fisheries

- **Agricultural** use of land, water and other resources
- **Agricultural** water use
- **Land improvement** projects (projects related to **irrigation** drainage, land readjustment, land reclamation, agricultural lands and the facilities necessary for their preservation and use, and maintenance / promotion of the use of agricultural land, such as restoration of agricultural facilities from disaster)
- **Afforestation** and flood control measures for forest land, construction / improvement of forest roads and other forest development

#### Ministry of Economy, Trade and Industry

- Assistance and supervision for **industrial water** system projects
- Planning, drafting and promotion of basic policy relating to **hydroelectric** development

### 3-(1) Jurisdictional Responsibilities as Specified in Laws Relating to the Establishment of Individual Ministries

#### Ministry of Land, Infrastructure and Transport (MLIT)

- Planning, drafting and promotion of Basic Plan for **Water Resource Development** as well as other **comprehensive and fundamental policies relating to water demand and supply**
- Planning, drafting and promotion of measures for reservoir areas
- **Sewer** systems
- **Management of rivers**, streams and water surfaces (improvement, use, conservation etc.)
- Construction and management of facilities for the development and use of **water resources**
- Planning, drafting and promotion of policies relating to **flood control** and **water use in river basins**

#### Ministry of the Environment

- Establishment of **environmental** standards
- Regulations to prevent **pollution**
- Treatment of excreta and wastewater using septic tanks
- Establishment and regulation of **standards, guidelines, policy and plans** relating to clerical procedures and projects (treatment of wastewater using sewer systems and other facilities, conservation of rivers, lakes and marshes, environmental impact assessments etc.) **from the standpoint of environmental conservation**



# 3-(2) Roles of Individual Ministries in Water Administration

Ministry of Health, Labor and Welfare

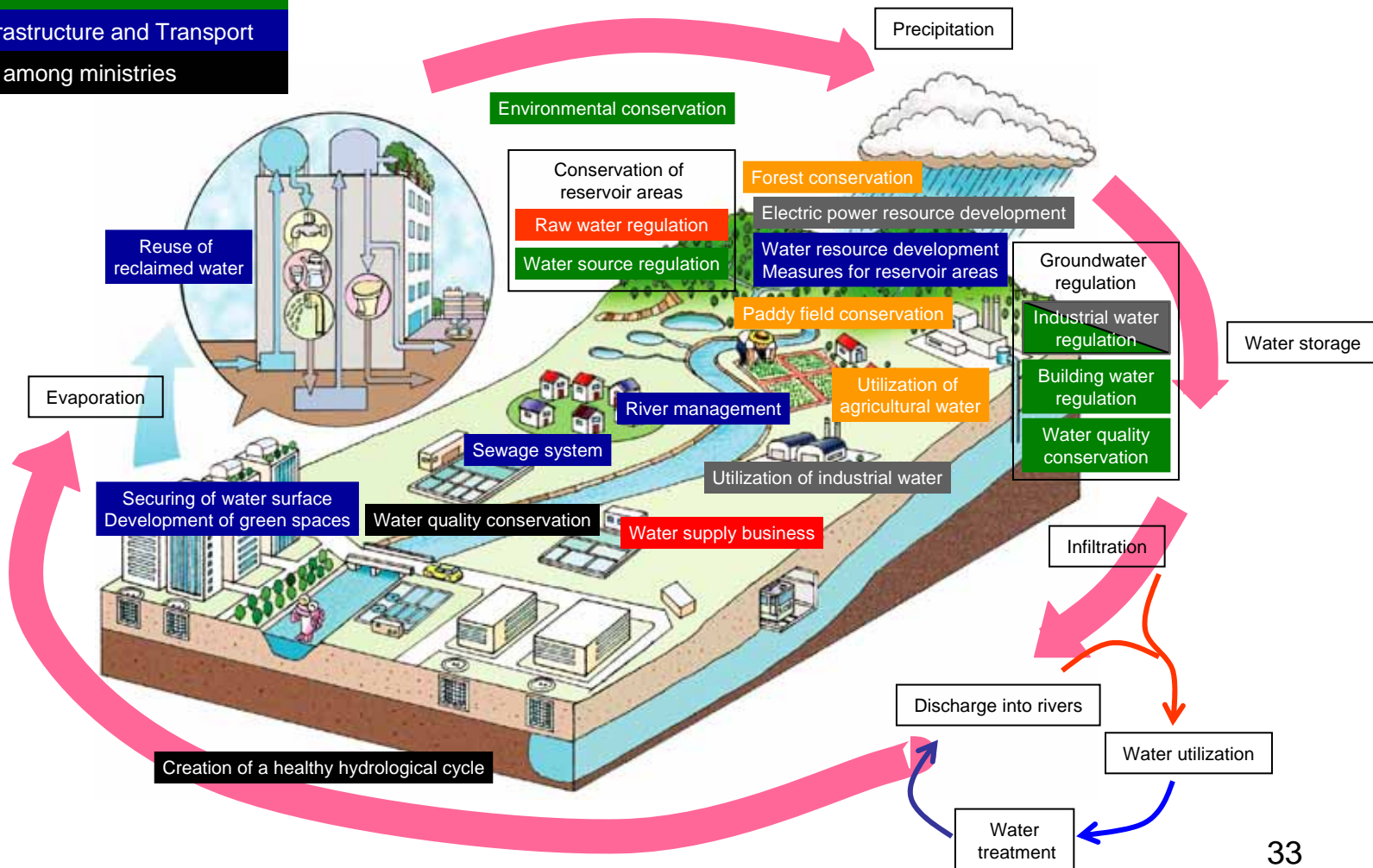
Ministry of Agriculture, Forestry and Fisheries

Ministry of Economy, Trade and Industry

Ministry of the Environment

Ministry of Land, Infrastructure and Transport

Cooperation among ministries



## 4. Task for the Water Resources Policy

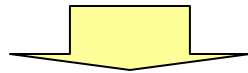
- (1) Long-Term Plans for Water Resources
- (2) Sound Hydrological Cycle
- (3) Ground Subsidence
- (4) Waste Water Reusing
- (5) Public Awareness and Educational Activities
- (6) Reservoir Area Development Measures
- (7) Response to International Water Resource Problem

# 4-(1) Long-Term Plans for Water Resources (History of Enactment of the two "Water Laws")

Social trends

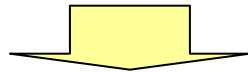
## ■ Post-war period (since 1950)

- Remarkable industrial development
- Dramatic increase and centralization of urban population
- Increased standard of living



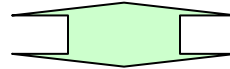
## ■ Tokyo metropolitan area

- (Tone River system, Yodo River system, etc.)
- Dramatic increase in water demand
  - Serious water shortages



Needs

- Securing of a stable supply of water
- Comprehensive and efficient development in river systems



Issues prior to establishment of the two laws

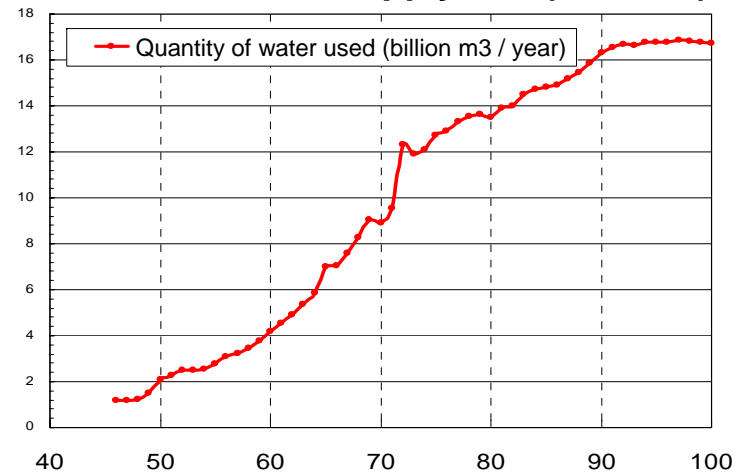
## ■ Insufficient supply and difficulty in smooth achievement of consensus

- Although the Law on Specially Designated Multipurpose Dams was enacted in 1957, supply was unable to keep up with demand for various uses in river systems extending over a wide area; moreover, coordination among stakeholders was difficult

## ■ Insufficient funds for water resource development

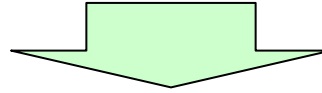
- As in the past, national funds were provided for flood control
- During postwar reconstruction, in addition to expenditures of national funds, public corporations and financial corporations were set up for residences and roads ; treasury loans and investment were also employed

Trends in water supply use (national)



Source: 1946-1964: Annual Water Supply Quantity (Waterworks Statistics)  
Source: 1965-2000: Annual Intake Quantity (Water Supply Statistics)

( From the previous page )



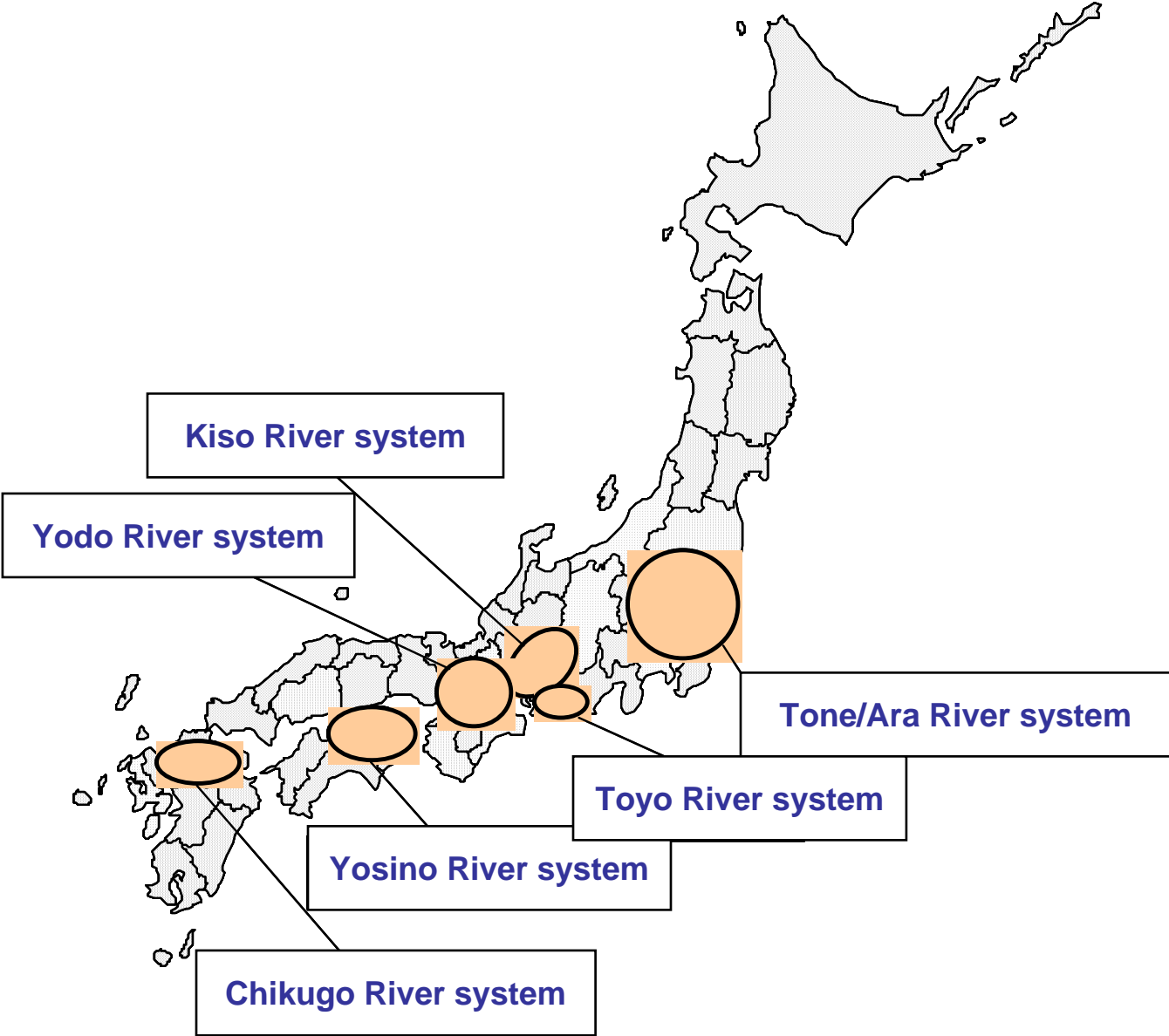
**■ Establishment of Water Resources Development Promotion Law (1961)**  
(Basis for streamlining the comprehensive development and use of water resources)

- Designation of important wide-area regions (designation of river systems extending over multiple prefectures)
- The national government designates water use plans for the entire river system and facilitates consensus-building among multiple stakeholders

**■ Water Resources Public Corporation Law (1961)**  
(To supply water in an efficient manner to meet urgent needs)

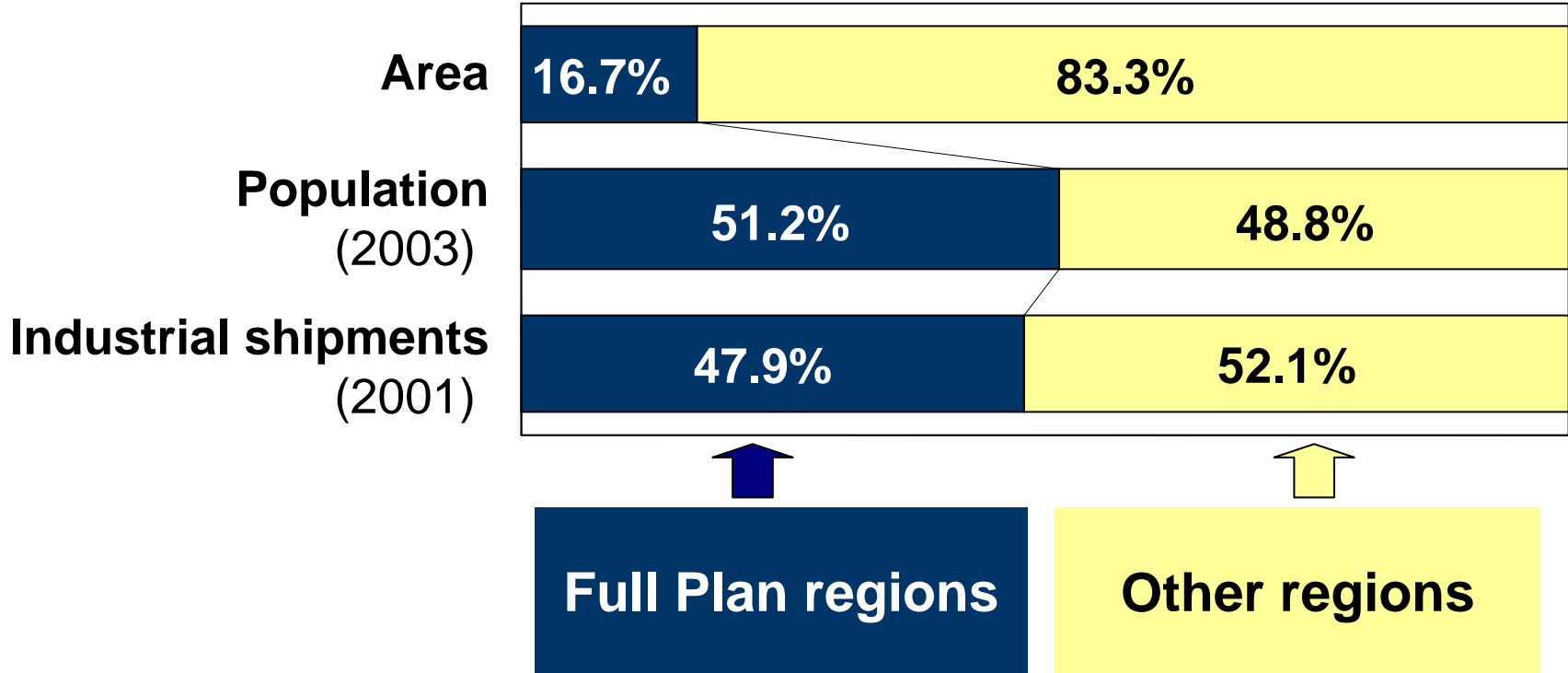
- Up-front investment by the national government through treasury investment and loans
- Promotion and operation of integrated projects in river systems

# 4-(1) Long-Term Plans for Water Resources (Designated "Full Plan" River Systems)



# 4-(1) Long-Term Plans for Water Resources

(Ratio of Area, Population, and Industrial Shipments for Full Plan River Systems)



## 4-(1) Long-Term Plans for Water Resources (Overview of "Full Plans")

	Tone River system / Ara River system	Toyo River system (Note 1)	Kiso River system (Note 1)	Yodo River system	Yoshino River system (Note 1)	Chikugo River system (Note 1)
River system designation	April 1962 (Tone River system) December 1974 (Ara River system)	February 1990	June 1965	April 1962	November 1966	October 1964
Plan finalized	August 1962 (Phase 1 plan) July 1970 (Phase 2 plan) April 1976 (Phase 3 plan) February 1988 (Phase 4 plan) (Note 4)	May 1990 (Phase 1 plan) February 2006 (Phase 2 plan)	October 1968 (Phase 1 plan) March 1973 (Phase 2 plan) March 1993 (Phase 3 plan) June 2004 (Phase 4 plan)	August 1962 (Phase 1 plan) September 1972 (Phase 2 plan) August 1982 (Phase 3 plan) August 1994 (Phase 4 plan)	March 1967 (Phase 1 plan) April 1992 (Phase 2 plan) February 2002 (Phase 3 plan)	February 1966 (Phase 1 plan) January 1981 (Phase 2 plan) January 1989 (Phase 3 plan) April 2005 (Phase 4 plan)
Target year	Fiscal 2000	Fiscal 2015	Fiscal 2015	Fiscal 2000	Fiscal 2010	Fiscal 2015
Water development quantity (Note 2)	Approximately 117m <sup>3</sup> /s	Approximately 0.5m <sup>3</sup> /s	Approximately 6.6m <sup>3</sup> /s	Approximately 49m <sup>3</sup> /s	-	Approximately 2.6m <sup>3</sup> /s
Facility construction (Note 3)	34 projects Takizawa Dam, etc.	2 projects Shitara Dam Toyogawa Canal Phase 2	2 projects Tokuyama Dam Aichi Canal Phase 2	15 projects Kawakami Dam, etc.	1 project Emergency reconstruction of Kagawa Canal facility	6 projects Oyama Dam, etc.

### Notes

1. Completely revised to reflect the report of the Survey Planning subcommittee, Council for Water Resources Development (December 2000).
2. New water development quantity of water resource development facilities noted in the existing Basic Plan for Water Resource Development.
3. All projects noted in the existing Basic Plan for Water Resource Development.
4. Phase 3 and subsequent plans are plans for the Tone River system and Ara River system.

(As of the end of February 2006)

# 4-(1) Long-Term Plans for Water Resources (~Examples of Facilities, TONE River System~)

Water Source Facility

Canal Facilities

Water Users



Yagisawa Dam



Gunma Canal



Agricultural and domestic water in Gunma Prefecture

Tone driving Canal (Tone weir)



Agricultural water in Saitama and Gunma prefectures



Musashi water canal



Asagiri water purification plant (Tokyo)



# 4-(1) Long-Term Plans for Water Resources (Water Plan 21 (1999))

- Established based on the "Grand Design of National Land in the 21st Century" (Fifth National Comprehensive Development Plan) (1998) that aimed at the formation of a multi-axial national land configuration
- Cultural aspects of water added with the establishment of a healthy hydrological cycle as the main pillar

## Basic objective

### Basic objective (target years: 2010 – 2015)

#### Deployment of measures toward the achievement of basic objectives

##### **Construction of a sustainable water use system**

- Evaluation and security of water use stability
- Emergency water measures
- Securing of good quality water
- Water resources and energy consumption
- Water resource development and environmental conservation

##### **Conservation and improvement of the water environment**

- Waterfront environments / coexistence with nature
- Conservation and recharging of water resources
- Conservation of spring water and groundwater
- Securing of environmental water

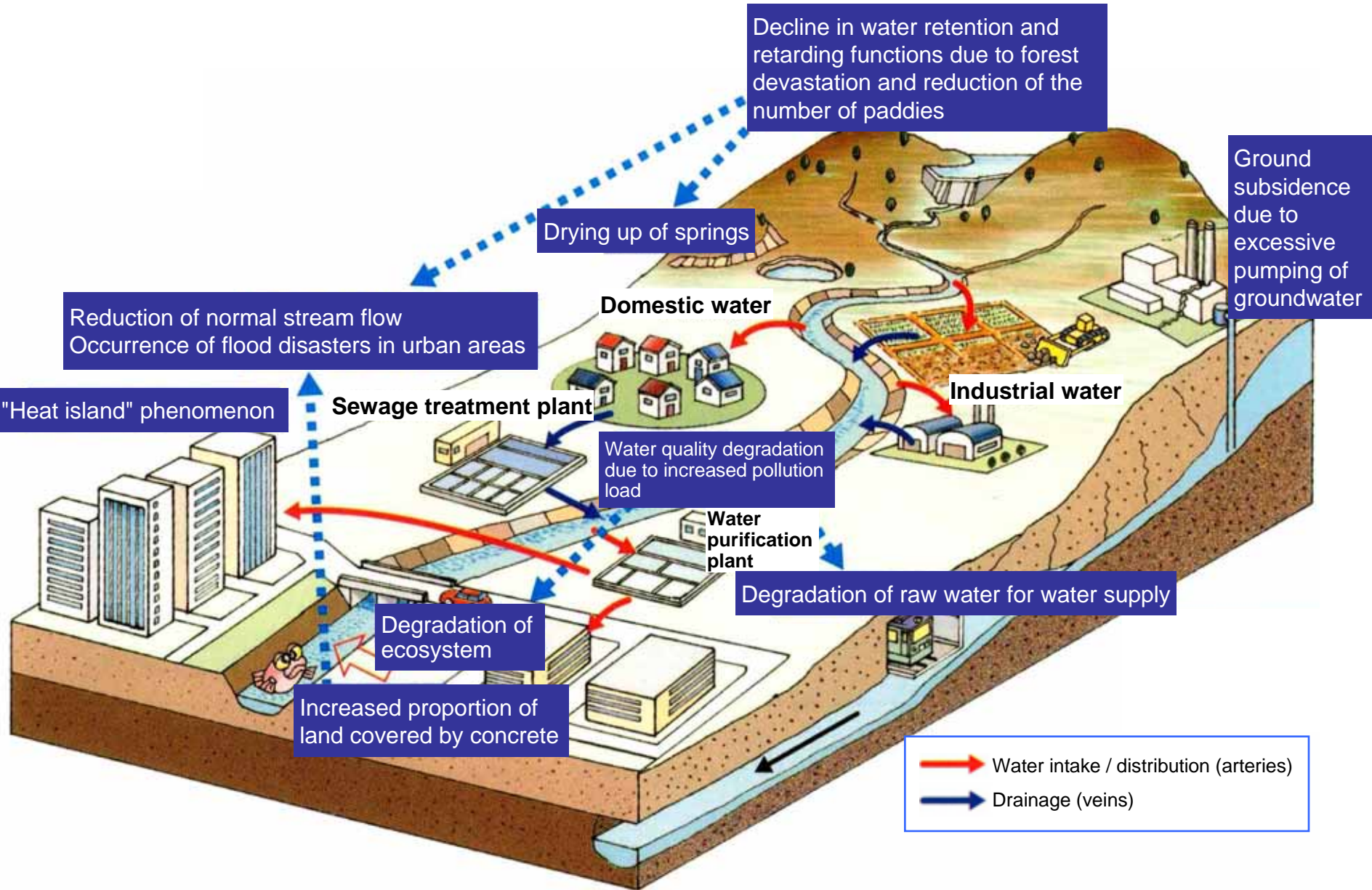
##### **Restoration of / education regarding water culture**

- Promotion of regional cooperation through water
- Restoration and conservation of water culture
- Signs of new water culture

##### **Considerations for implementation of plan**

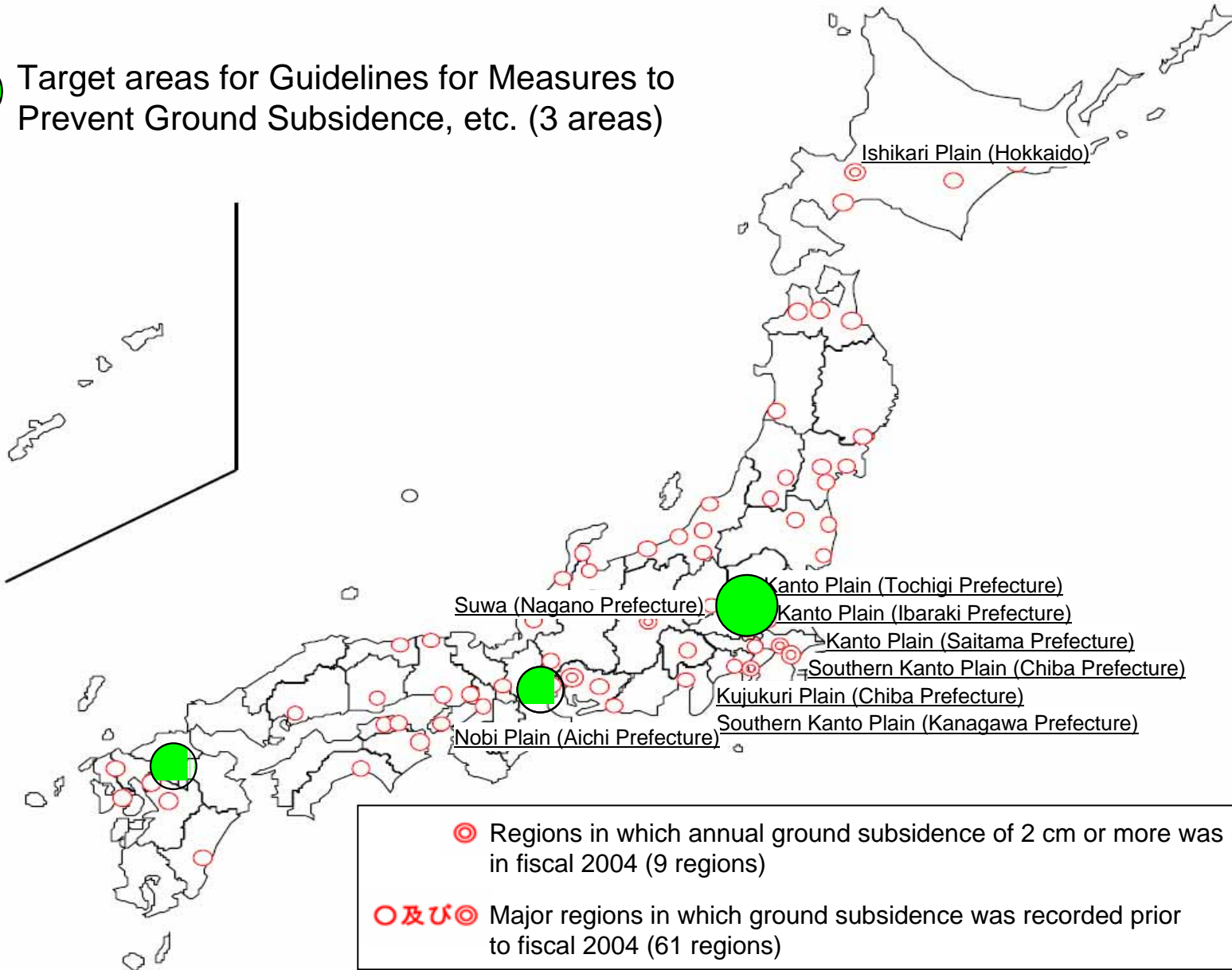
- Importance of regional planning
- Participation and liaison
- Promotion of research and technical development
- International cooperation

## 4-(2) Issues related to the sound Hydrological Cycle



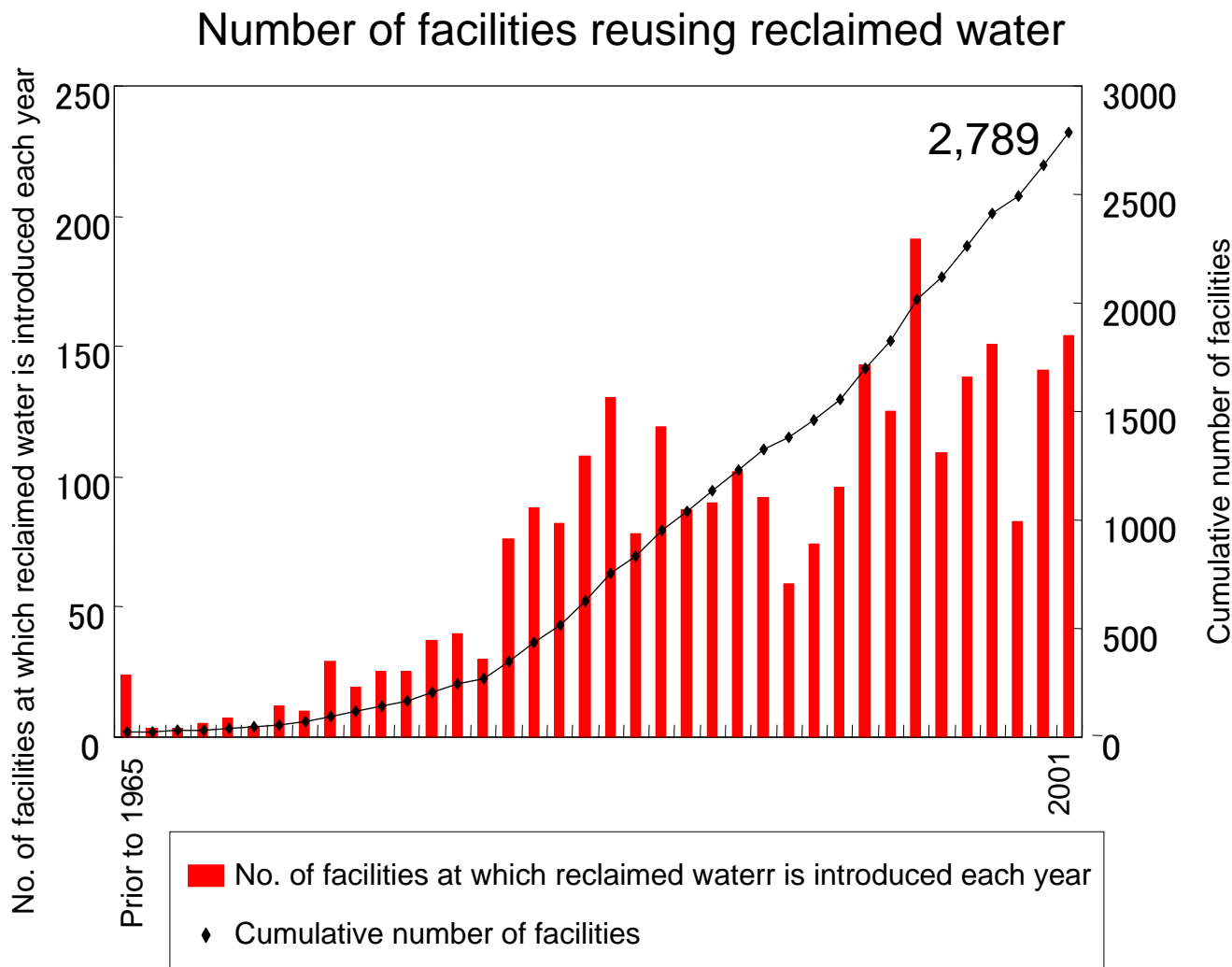
## 4-(3) Overview of Ground Subsidence Areas Nationwide

● Target areas for Guidelines for Measures to Prevent Ground Subsidence, etc. (3 areas)



Note: According to "Overview of Ground Subsidence Areas Nationwide" (Ministry of the Environment)

# 4-(4) Trends in the Number of Facilities Reusing Reclaimed Water



## 4-(5) Public Awareness and Educational Activities

- Various events are held during "Water Day" (August 1) and "Water Week" (August 1 - 7).
- On World Water Day (March 22), established by the United Nations, educational activities relating to water resource conservation and development, etc. are held.

**Objective of Water Day and Water Week**  
**To increase public awareness and understanding of the finite nature of water resources and the importance of water resource development**



Symposium on Water Resource Studies  
(on UN World Water Day)



Top: Water exhibition (Water Week)  
Bottom: Sumida River Regatta (Water Week)

## 4-(6) Reservoir Area Development Measures

(Measures in Accordance with the Special Measures Act for Reservoir Areas)

Measures to stimulate local communities and help residents rebuild their lives in connection with dam construction

### Objective

To initiate planned construction of living environments in reservoir areas, industrial infrastructure etc., in order to promote dam, etc. construction and ensure water resource development and national land conservation

### Target projects for improvement planning

24 projects (land improvement, erosion control, flood control, road, small water supply system, sewer system, forest road, sports and recreation facility, etc.)

### Major steps

- Measures to help residents rebuild their lives
- Special measures relating to the proportion of national subsidies, etc.
- Burden of other local public organizations with regard to improvement projects
- Steps to correct unequal taxation under the real estate tax etc.
- Steps to stimulate reservoir areas

### Status of implementation

#### Dams, etc. designated

94 dams and 1 lake and marsh water level regulation facility  
(Kasumigaura)

#### Improvement plans finalized

87 dams and 1 lake and marsh water level regulation facility  
(Kasumigaura)

#### Scale of improvement plans

Project expenses  
: approximately JPY  
¥1.2 trillion

Progress  
: approximately 70%

(as of the end of January 2006)

# 4-(6) Reservoir Area Development Measures

(Measures to Help Rebuild Lives, etc. by Means of Reservoir Area Development Fund)

Implementation of measures to help rebuild lives and regional stimulation measures (to supplement the Special Measures Act for Reservoir Areas)

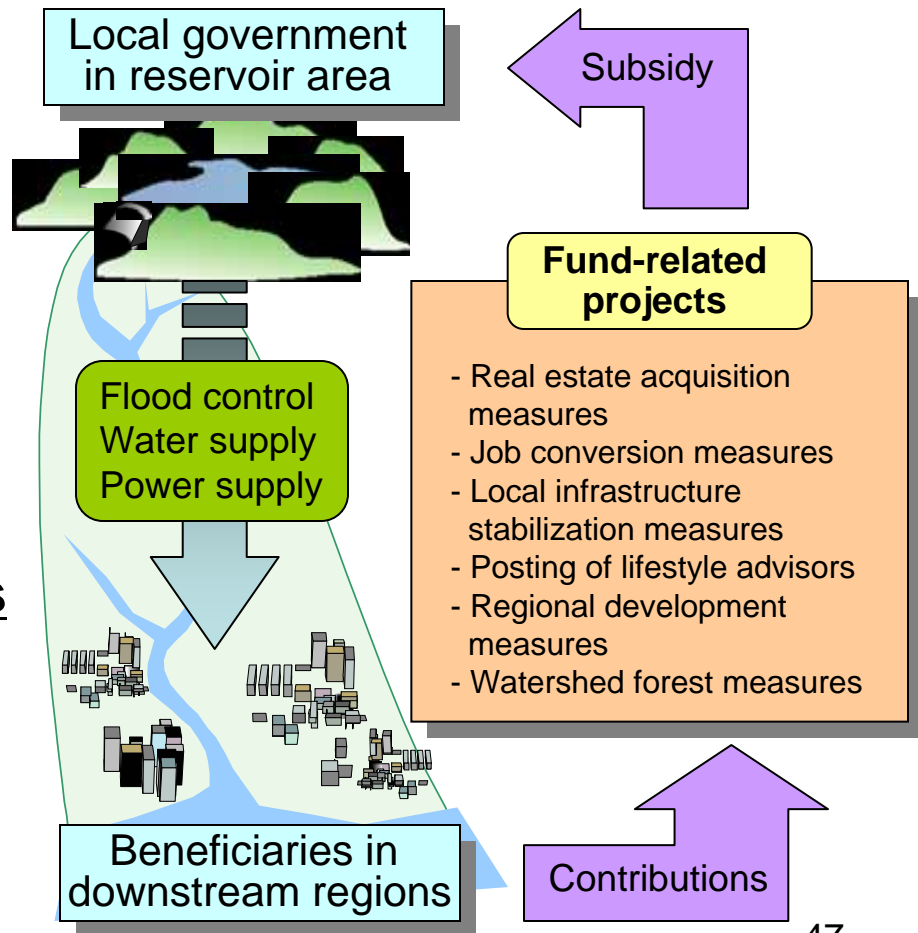
## Designated river system

- Tone River / Ara River Reservoir Area Fund
- Kisosansen Reservoir Area Fund
- Yodo River Reservoir Area Fund
- Chikugo River Reservoir Area Fund
- Yoshino River Reservoir Area Fund
- Toyo River Reservoir Area Fund

## National establishment permits for other than designated river systems

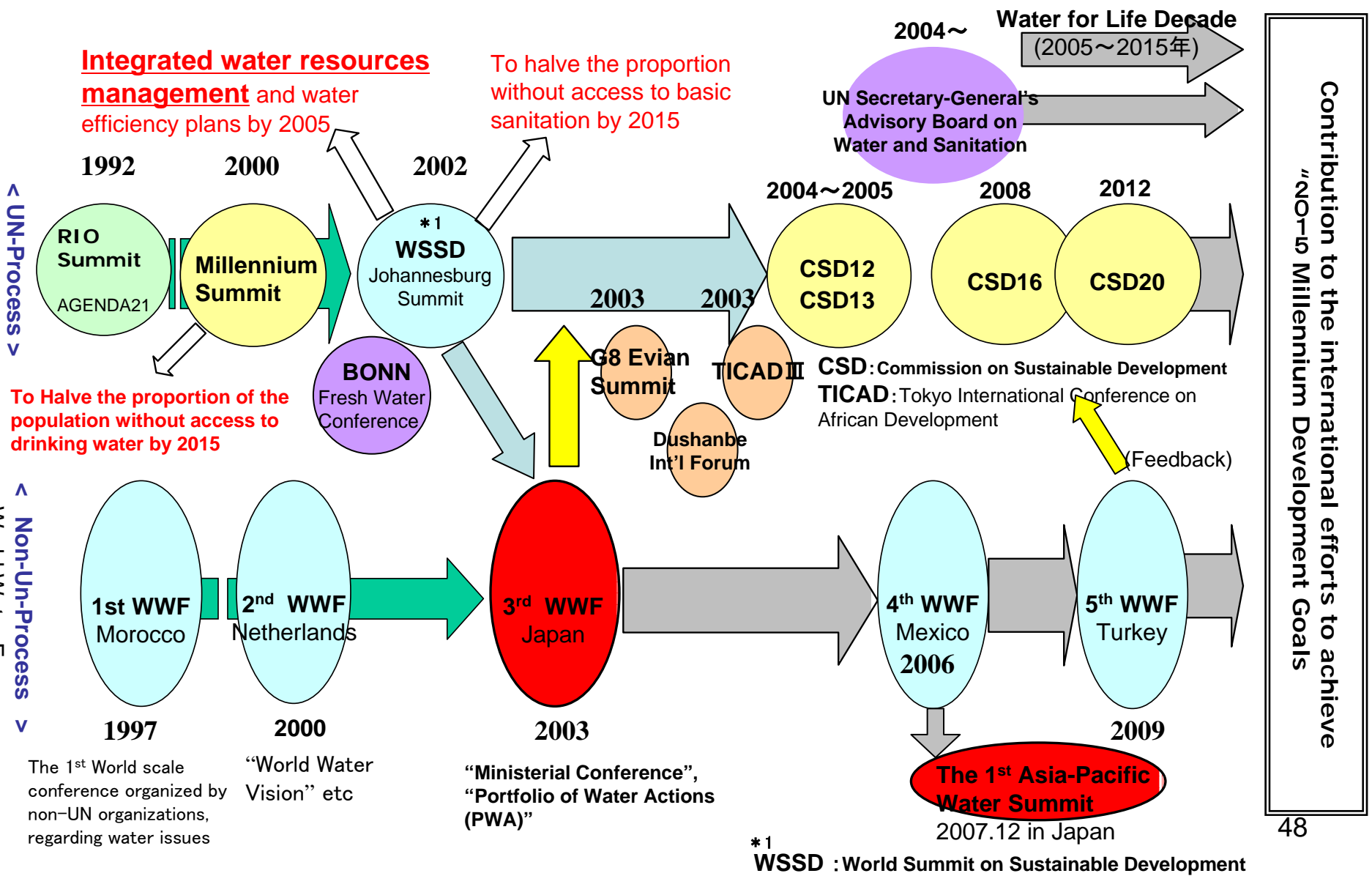
- Kino River Reservoir Area Fund
- Yahagi River Reservoir Area Fund

## Reservoir areas within a single prefecture



# 4-(7) International Water Resource Problems

(Flow of International Discussion on Water)





## 4-(7) International Water Resource Problems (International exchange)

- Continuous execution of technology exchange with China and Korea in water resource field
- Beginning of activity for better practice of integrated water resource management (IWRM) in the Asian monsoon region.

### 1. Bilateral exchange

- (1) Japan-China Water Resource exchange conference, since 1985
- (2) Japan-Korea National Land Planning conference, since 1993~



The 9<sup>th</sup> conference in Korea, Sep. 2002

### 2. Multilateral exchange

#### Network of Asian River Basin Organizations (NARBO)

- The Objective is to strengthen the capacity and effectiveness of River Basin Organizations.
- The **NARBO** Secretariats are Japan Water Agency etc



The 1<sup>st</sup> NERBO General Meeting in Feb. 2004

# Afterthoughts

As a result of rapid modernization in Japan, we polluted rivers,...



Dirty foam in the Tama River  
around 1970



Rubbish in the Tama River 50  
around 1970

Photo: Environment Bureau,  
Tokyo Metropolitan Government

# Afterthoughts

However, we have made a great deal of efforts to recover them



Elementary school children in the Tama River today



Tama river (today)