

Financial Management: Finance and Tariffs



No. T6 Ver. 1

Municipal Bond issued by Kyoto City in 1909
Source: Kyoto City Waterworks Bureau

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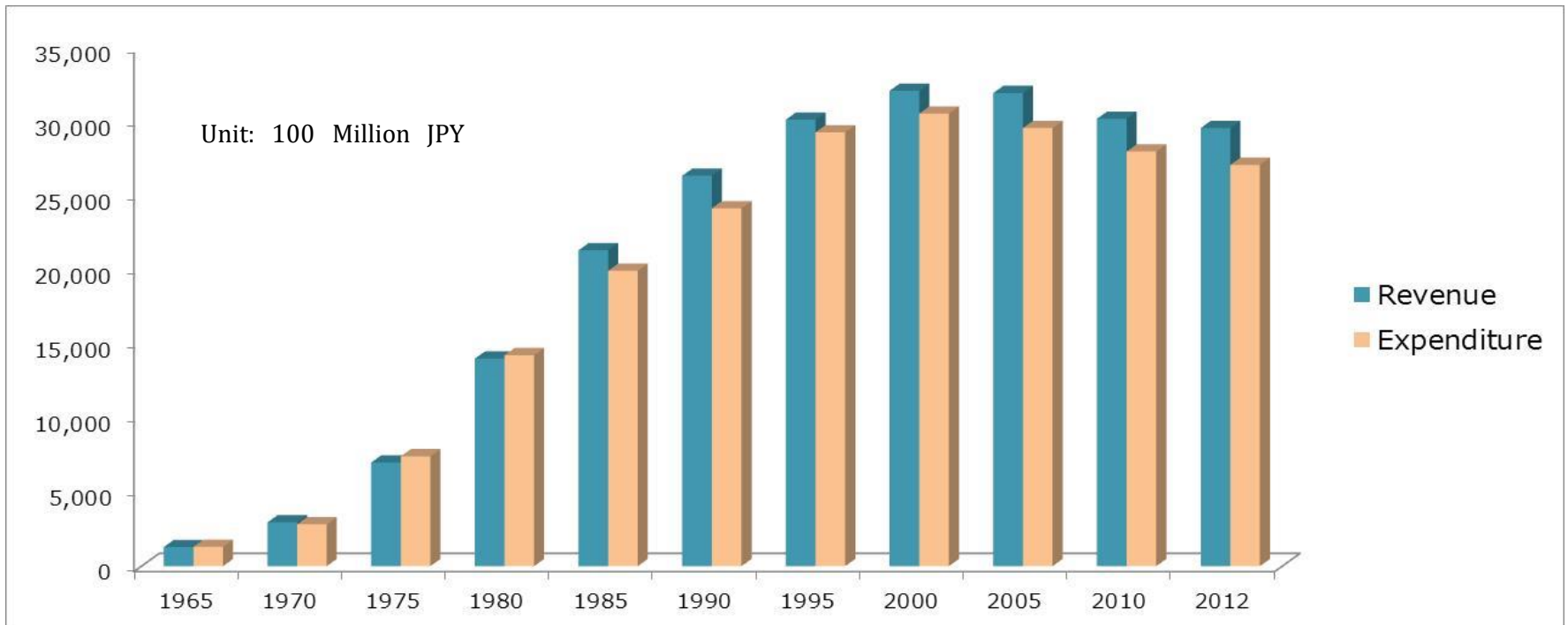
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- 3. Water Tariff Setting**
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1. Introduction

Total Revenue
(water tariffs, etc.)



Total Expenditures
(repayment of long-term loans, payment of interest, operation and maintenance costs, administrative expenses, etc.)



Source: Based on information from JWUA, "The Outline of Water Supply," 1st ed. 1986, and 6th ed. 2015.

Change in Total Revenue and Expenditure of Water Utilities in Japan

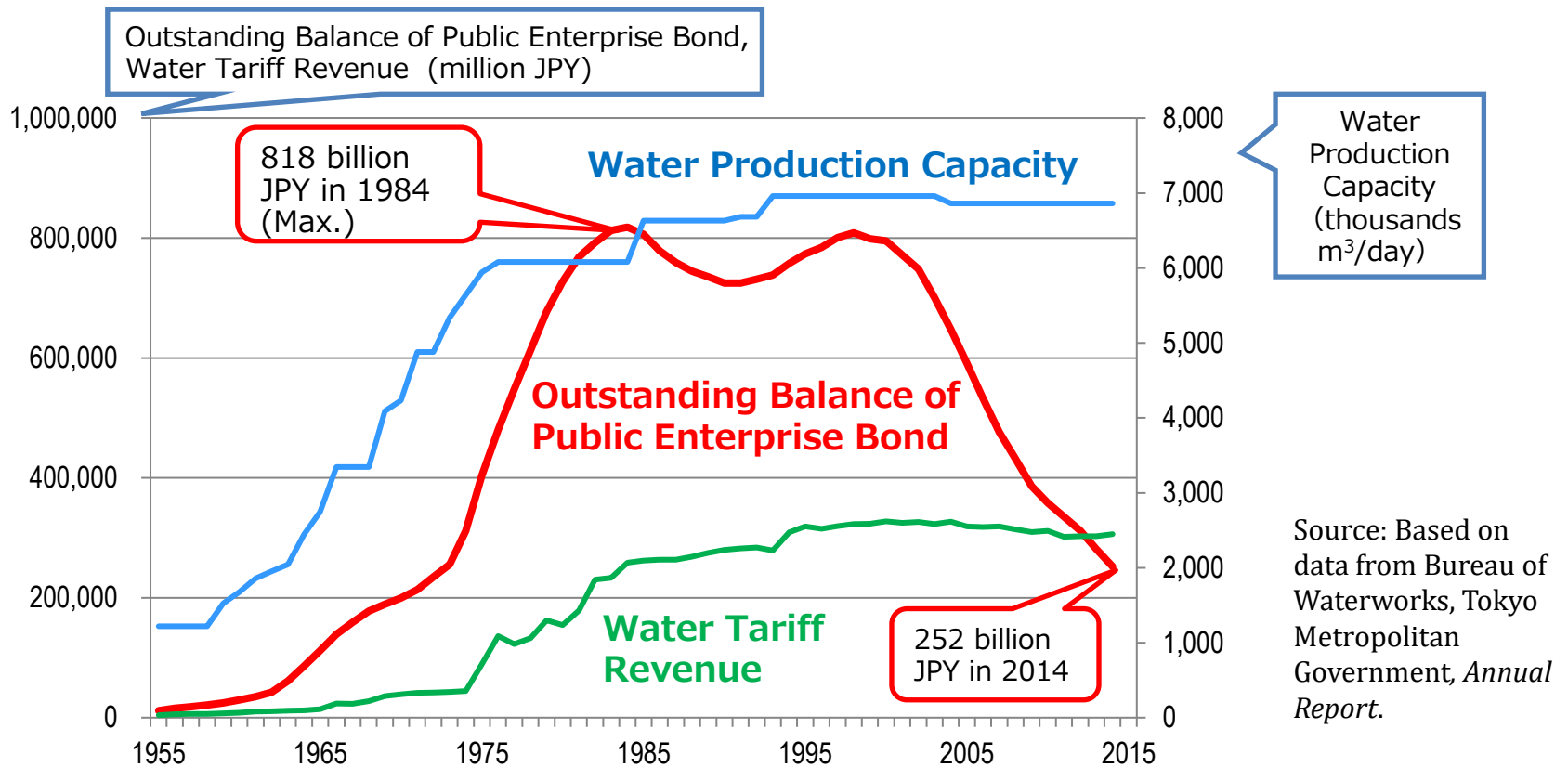
1. Introduction

Frequently asked questions from participants of the water supply training courses

- Q1. How did Japanese water utilities **finance water supply development** during the period of high economic growth?
- Q2. Have Japanese water utilities been able to **achieve full cost recovery**?
- Q3. How do Japanese water utilities determine **water tariffs**?
- Q4. How do Japanese water utilities serve **low-income group**?
- Q5. How do Japanese water utilities achieve **almost 100% bill collection**?

2. Financing Water Supply Development

The balance of the bonds and water tariff revenue increases during the expansion of facilities because the population served increases. The balance of the bonds gradually levels off after the expansion of facilities.



Changes of the Balance of Public Enterprise Bonds, Water Tariff Revenue and Water Production Capacity of Bureau of Waterworks, Tokyo Metropolitan Government

Source: Based on data from Bureau of Waterworks, Tokyo Metropolitan Government, *Annual Report*.

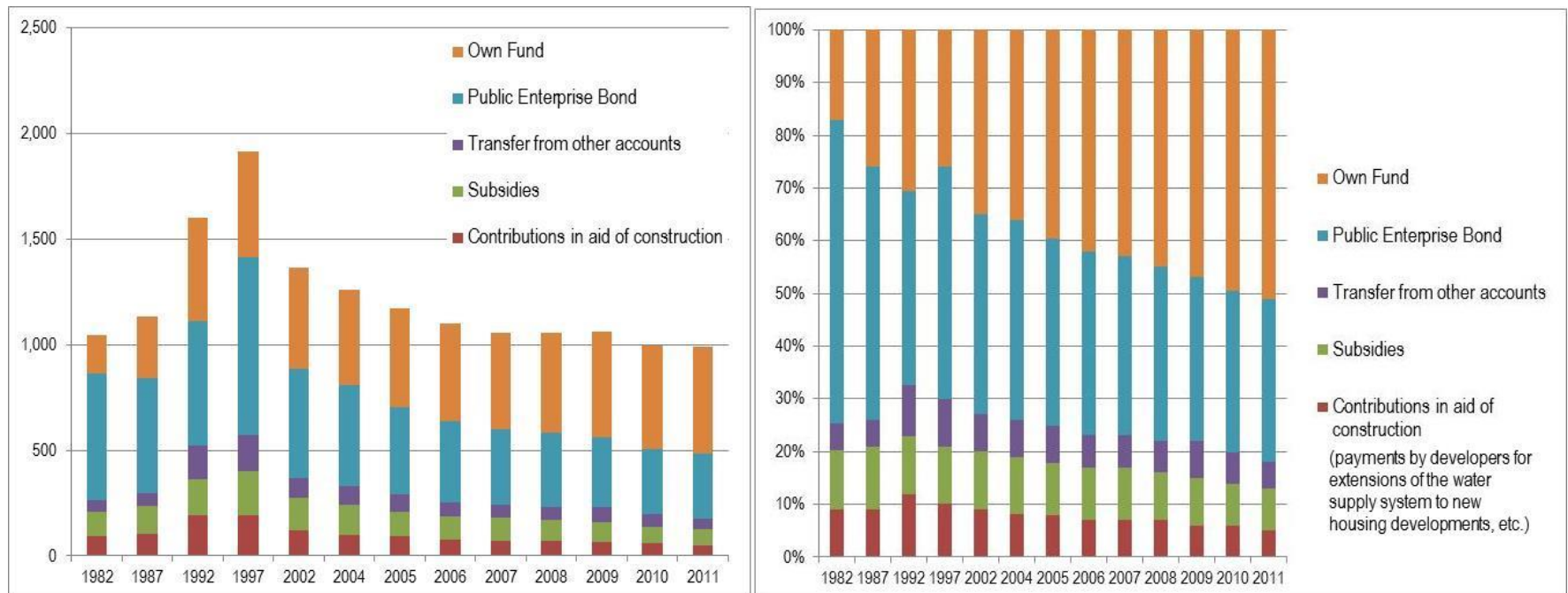
2. Financing Water Supply Development

Main funds : Municipal Bonds (Public Enterprise Bonds) and Subsidies

⇒ Japanese water supply coverage rate* increased from 26.2% in 1950 to 80% in the 1970s and 90% in the 1980s. (*served population / total population)

(Billion JPY)

(composition ratio)



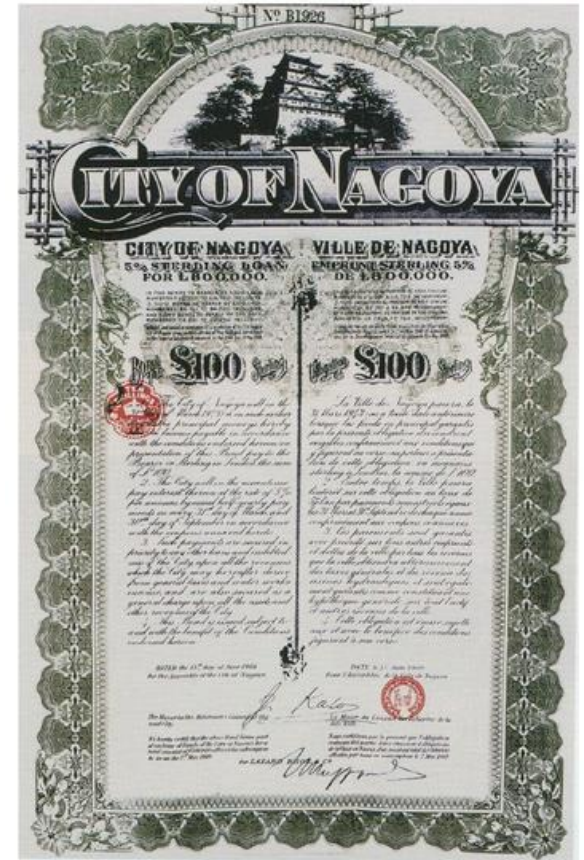
Source: Based on information from Ministry of Internal Affairs and Communications, *Issues on Public Financial Plan: Appendix*, 2013, http://www.soumu.go.jp/main_content/000266902.pdf

Financial Sources for Construction of Water Supply Facilities

2. Financing Water Supply Development

(1) Municipal Bonds (Public Enterprise Bonds)

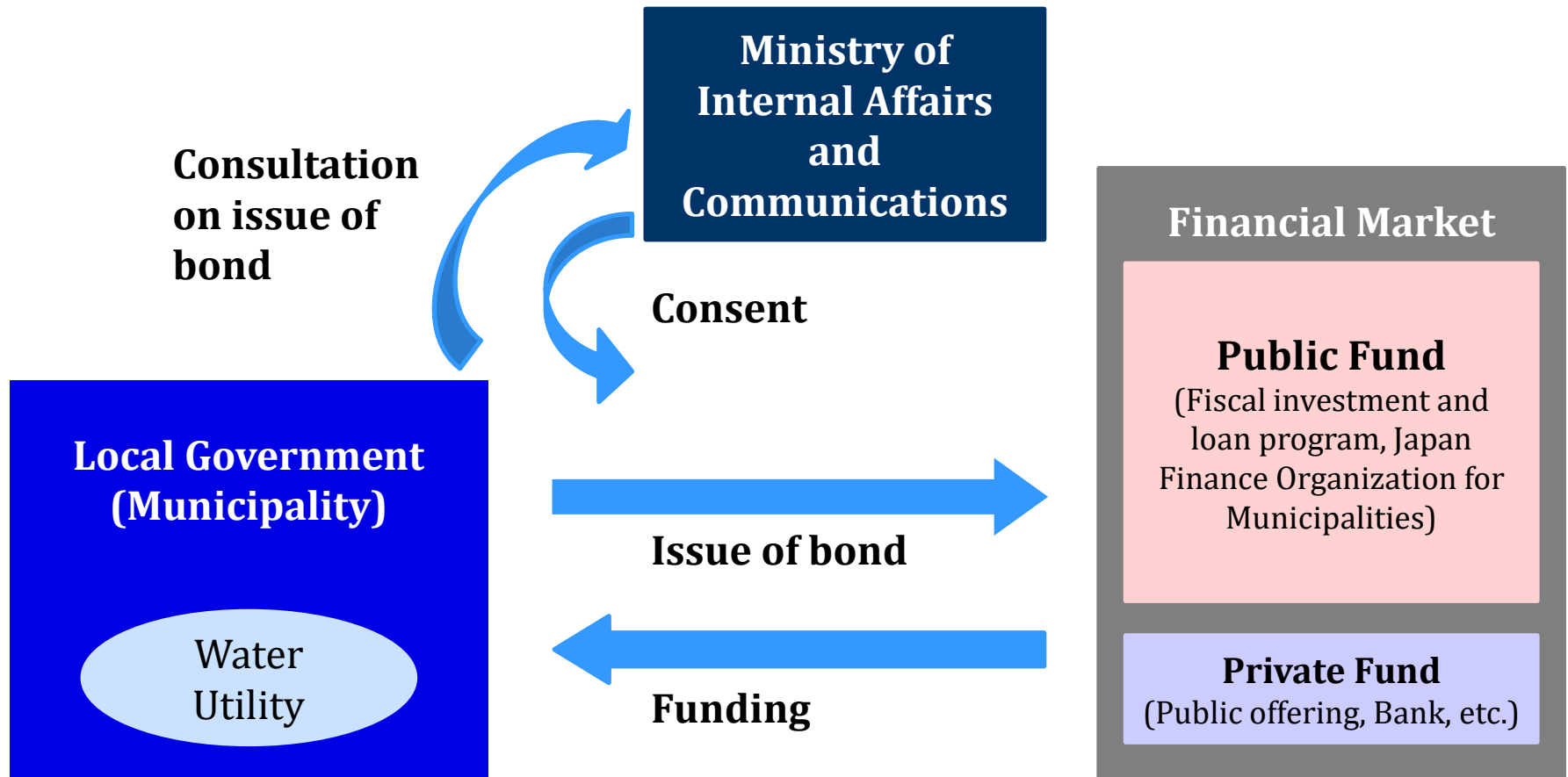
- Long-term debt obligations issued by local governments for public projects including water supply development.
- The principal and interest payments are covered by revenues generated by water tariff.
- Based on the user-pay principle it is reasonable to **share the liability of facility construction with future beneficiaries** by long-term repayment of the bond over the life of the facilities.



Source: Nagoya City, "Nagoya City History in Taisho and Showa Period," 1955.

2. Financing Water Supply Development

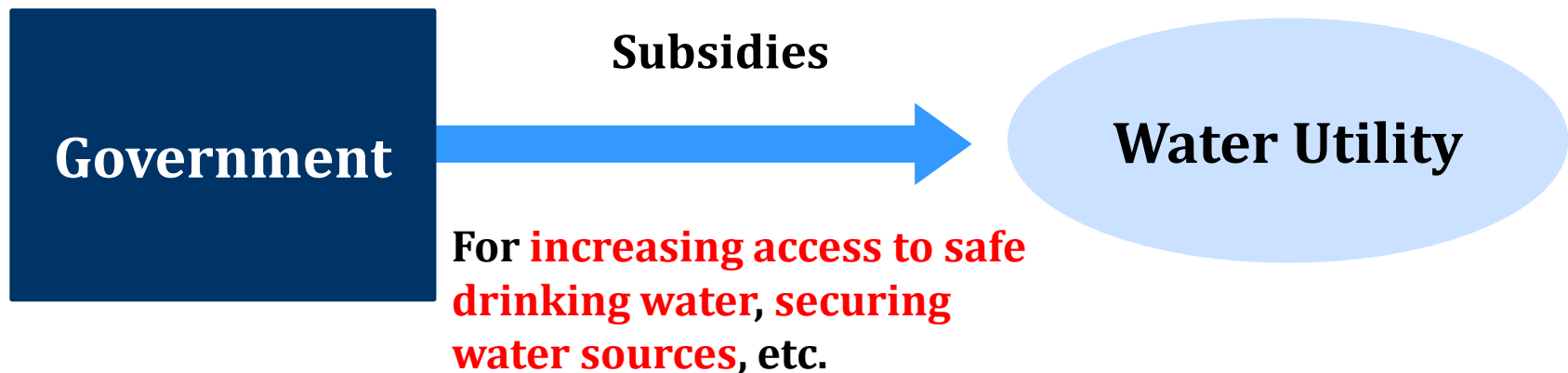
Scheme of Municipal Bonds (Public Enterprise Bonds)



2. Financing Water Supply Development

(2) Subsidies for Urban Water Supply Developments

- Water utilities generally strive for cost recovery by setting appropriate tariffs, however it has proven difficult to develop new facilities without some subsidies.
- The government has **set subsidies with clear targets and invested in accordance with well defined policy goals**. Subsidies are not normally used to cover operational costs which should be fully covered by revenue from water tariffs.



2. Financing Water Supply Development

(2) Subsidies for Urban Water Supply Developments

Period	Target	Rate of grant	Purpose
1888- 1900-	Three prefectures, and five port cities, Others	1/3 1/4	Improve public health and reduce incidents of infectious diseases in major cities and port cities.
1907- After World War II (1945) - 1954	All major cities	1/4	Increase access to piped water. Post war reconstruction.
1954 -1966	Abolishment of subsidies for urban water supply	-	When the urban water supply coverage reached 50%, subsidies were abolished. Government subsidies were shifted to Small-Scale Public Water Supply System development in rural areas.
1967	Restoration of subsidy system for water resources development, facility development, and for consolidation of water utilities	1/2 or 1/3, 1/4	The subsidy system was restored based on the decision that it was not appropriate to have water utilities alone shoulder the increased costs.
1978-2009	Development of laboratories	1/4	Improve water quality testing in small and medium scale waterworks.

* Other subsidies : Development of advanced water treatment facilities, rehabilitation of old deteriorated pipelines, reinforcement of earthquake preparedness, development of automatic monitoring system for water source, etc.

2. Financing Water Supply Development

(3) Subsidies for Small Scale Public Water Supply

The Water Supply Division of the Ministry of Health and Welfare (MHW) persuaded the Finance Division of MHW to establish the subsidy by stating that **“the costs of improving water supply would be offset by economic benefits such as a reduction in health care costs.”**



Subsidies for Small Scale Public Water Supply System in rural areas started in 1952.



180 Small Scale Public Water Supply System were developed in 1952. After that, 500 Small Scale Public Water Supply System were developed every year.

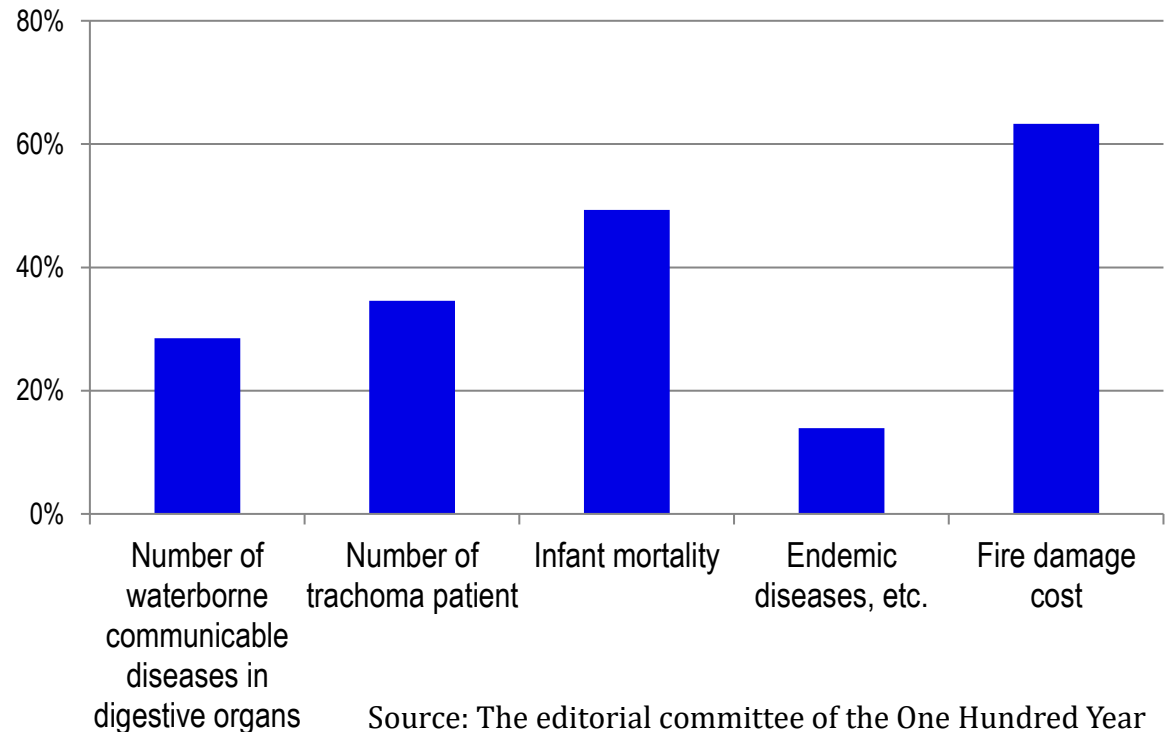
2. Financing Water Supply Development

Benefit of Rural Water Supply Development

Benefit of installing water supply facilities after 5 years of operation:

- **Decrease of waterborne diseases**
- **Decrease of infant mortality rate**
- **Decrease of damages from fires**

etc.



Source: The editorial committee of the One Hundred Year History of Modern Water Supply, "One Hundred Year History of Modern Water Supply," Nihon Suido Shimbunsha, 1988.

Reduced Incidence of Diseases and Infant Mortality, etc.

(Information presented by the Water Supply Division of MHW in 1957. 100% represents the level that existed before construction.)

2. Financing Water Supply Development



In order to cover villager's share, they plan to sell some of these cedar trees from the community grove.

Volunteer work by villagers for Small Scale Public Water Supply Development

Villagers paid their share of the costs by selling their trees



Source: Susumu Hani, the film "*Water in Our Life*," 1952

2. Financing Water Supply Development

(4) Private Sector Finance

Stagnating economic environment and the critical financial deficits of national and local governments



Act on Promotion of Private Finance Initiative (PFI Act) in 1999

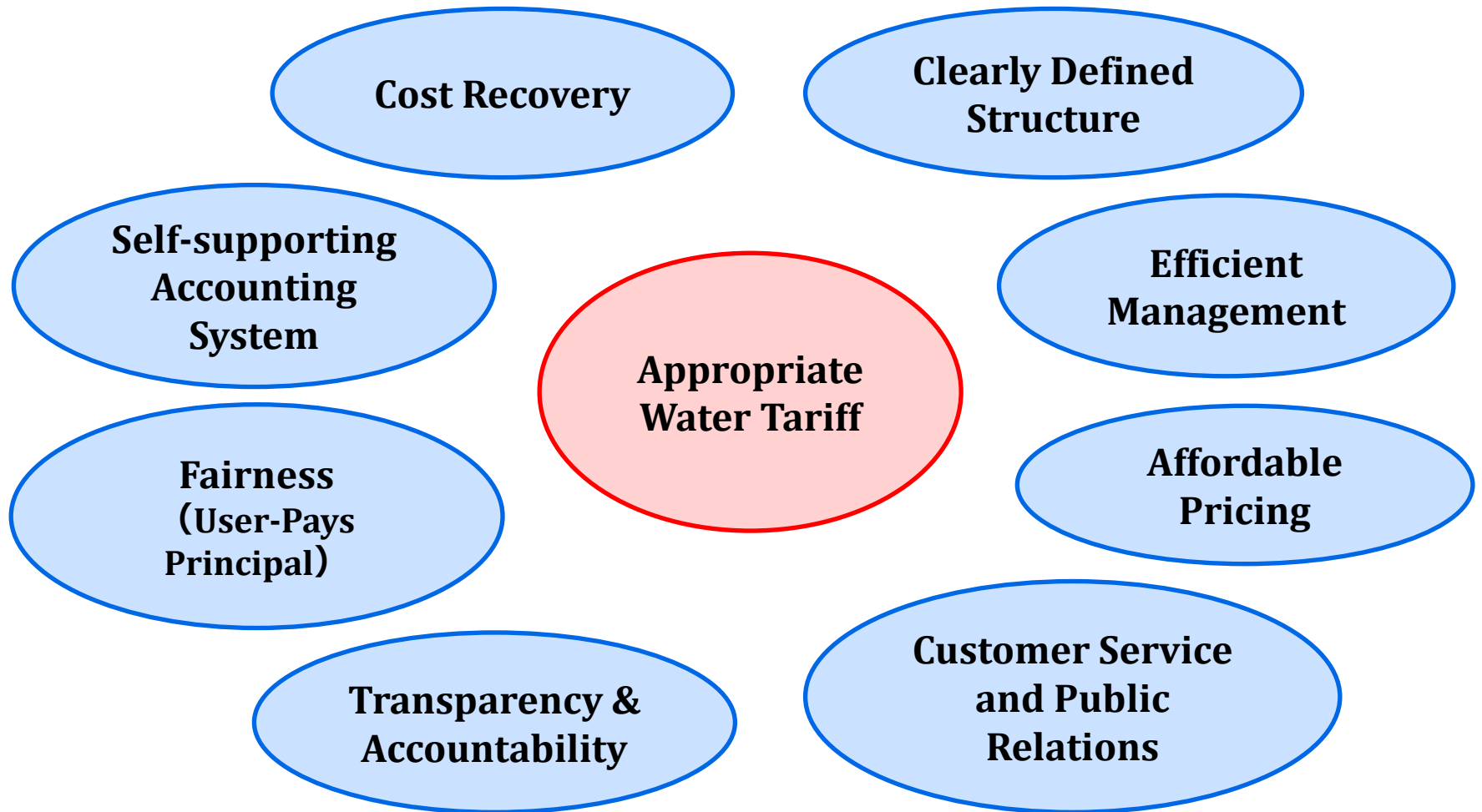
Development of public facilities through the **utilization of private finance, management abilities and technical capabilities** by the law and guidelines



Kawai Water Treatment Plant by PFI Scheme, Yokohama City

3. Water Tariff Setting

Main Components for Water Tariff Setting in Japan



3. Water Tariff Setting

(1) Self-Supporting Accounting System and Fully Distributed Cost Method

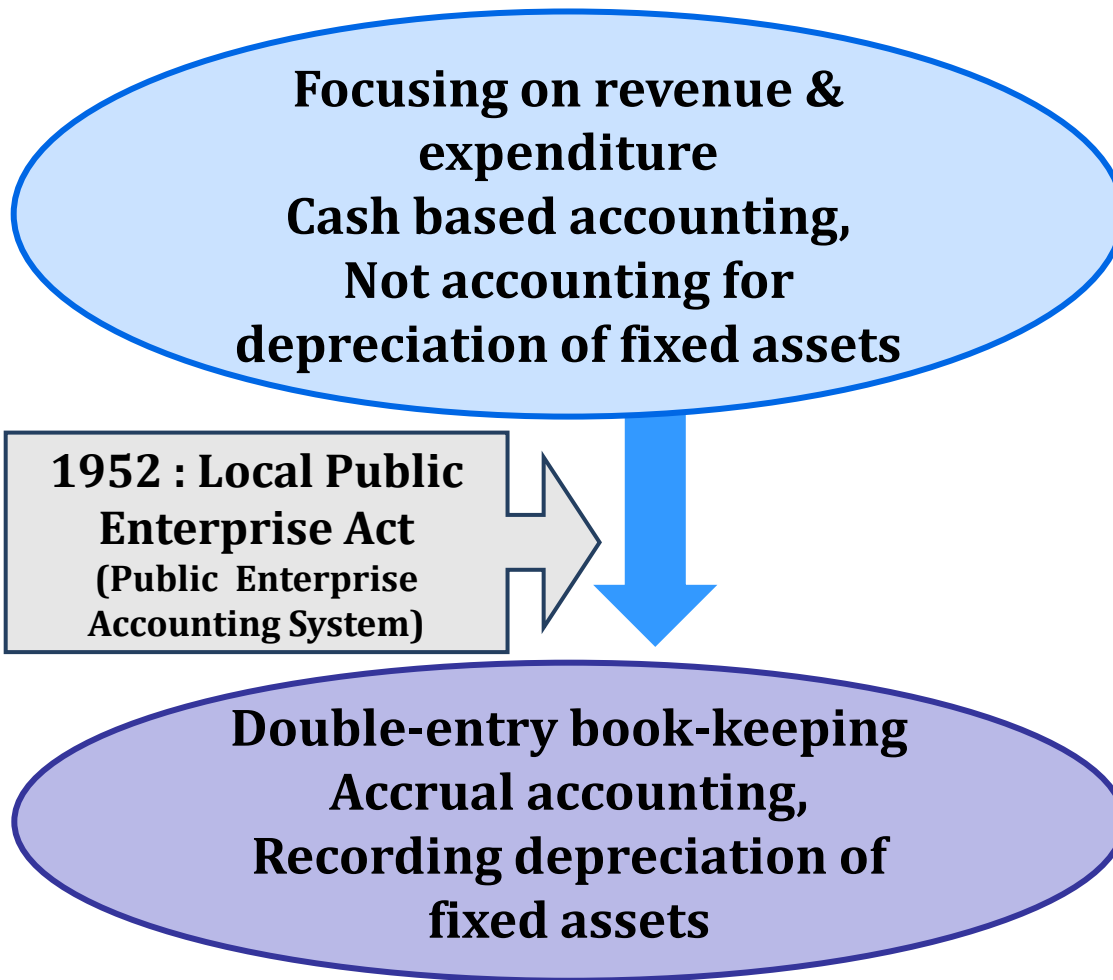


Image of double-entry book-keeping

Balance Sheet

Asset	Debt
	Capital
	Profit

Income Statement

Cost	Income
Profit	

3. Water Tariff Setting

Local Public Enterprise Act

Article 17

Special Account

- The accounting of local public enterprises shall be implemented by instituting a special account.

Article 17-2

Principle of Expenses Sharing

- The expenses must be covered with the operating income.
- Expenses not suitable to be borne by operating income shall be covered by the general account or other special accounts (e.g. Fire fighting use).

Article 17-3

Subsidy

- The local government may give support to the local public enterprise by the general account or the separate special account, when it is necessary for restoration after natural disasters or for some other special reasons.

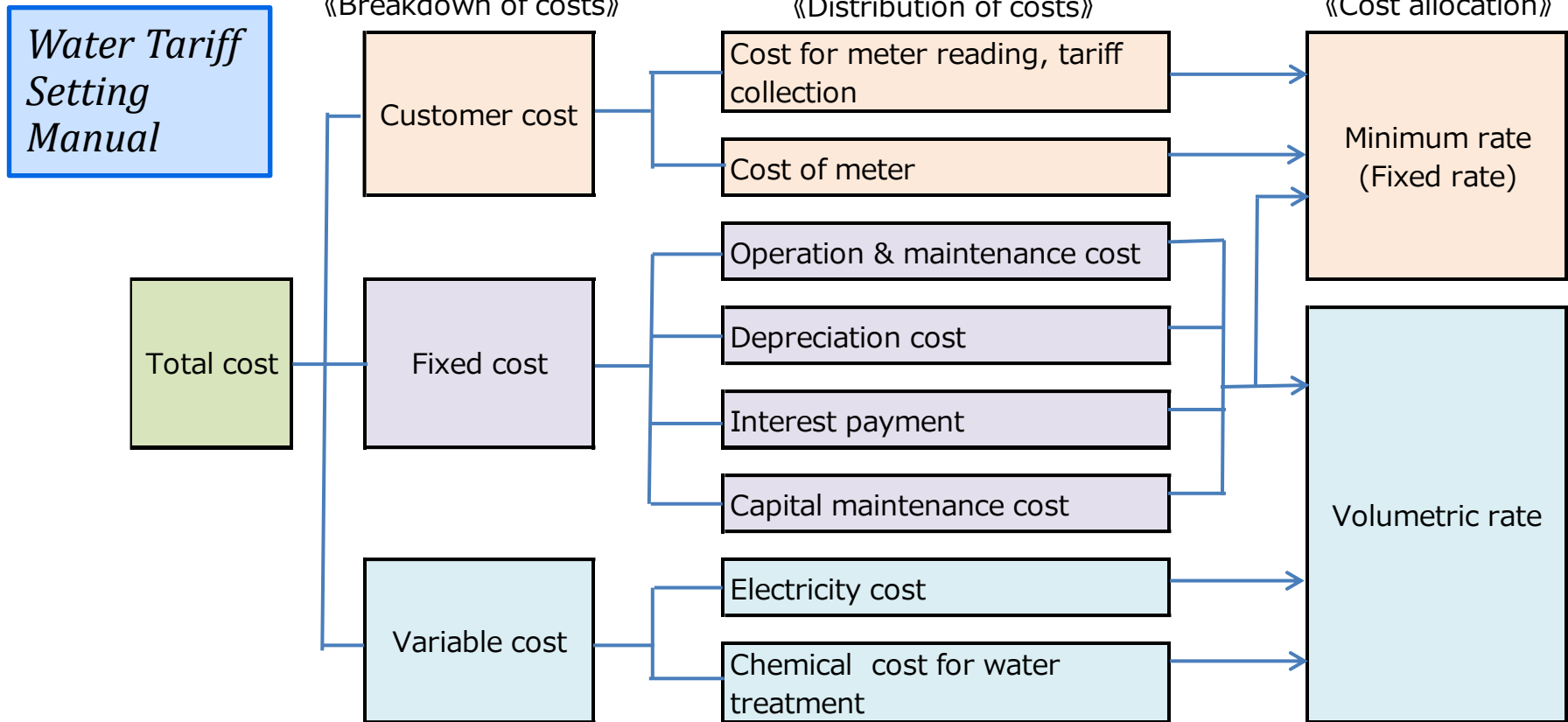
3. Water Tariff Setting

(2) Water Tariff Setting Manual

Total Expenditure

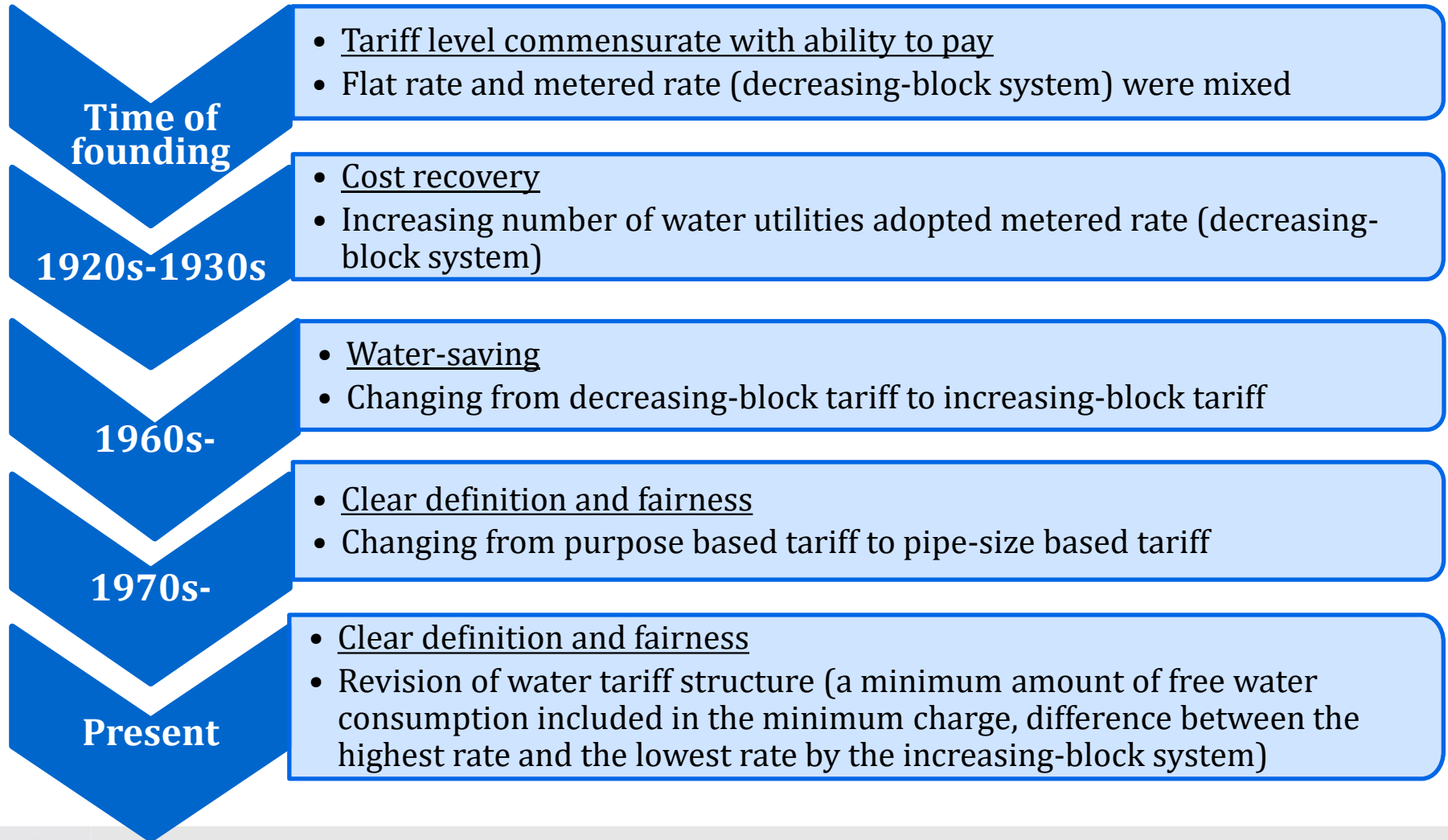


Total Revenue of Water Tariff



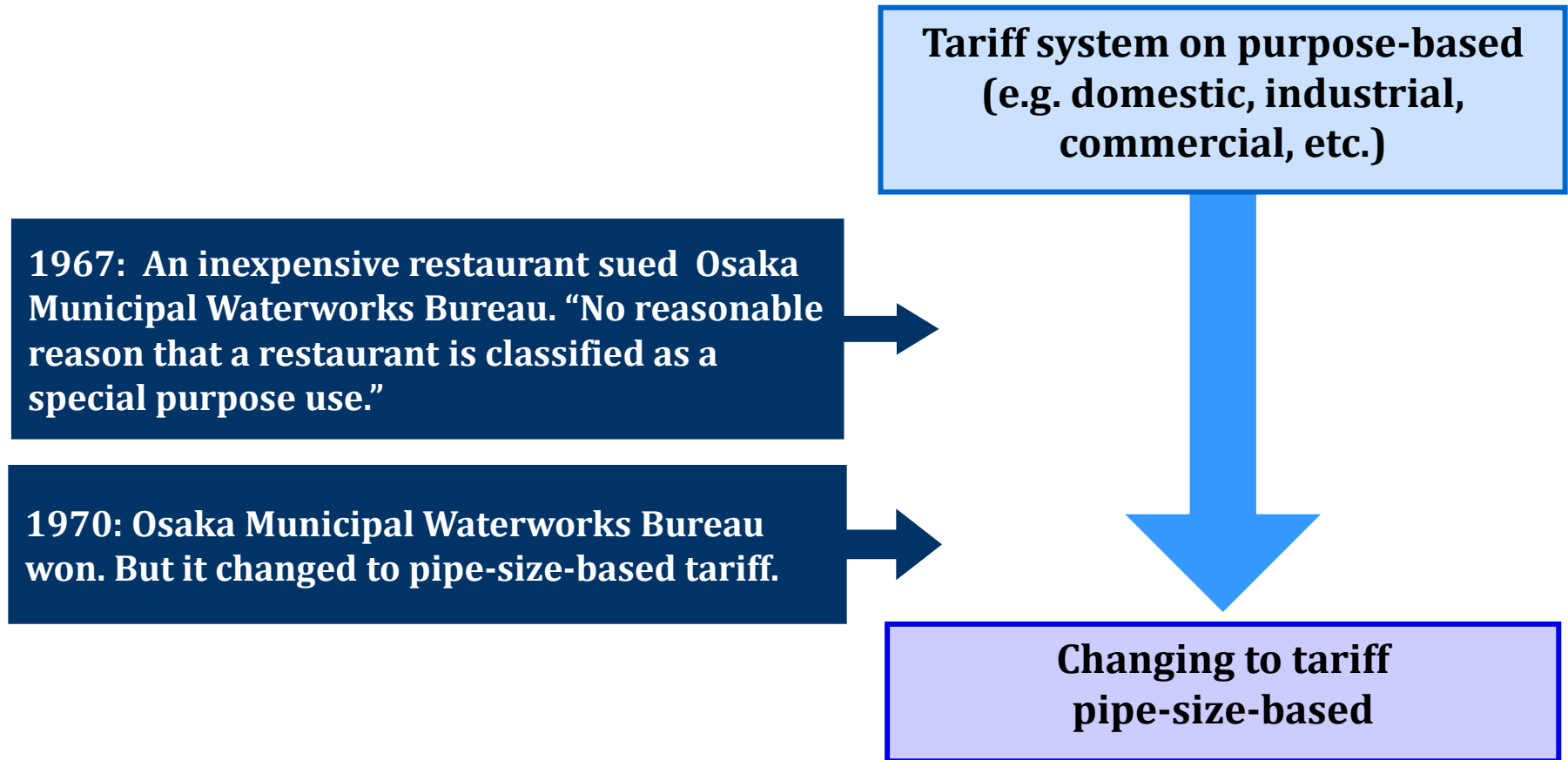
3. Water Tariff Setting

(3) Fairness and Clear Definition



3. Water Tariff Setting

Lawsuit in Osaka Challenged the Fairness of the Purpose-Based Tariff System Contributed to the Shift to the Pipe Size Based Classification



3. Water Tariff Setting

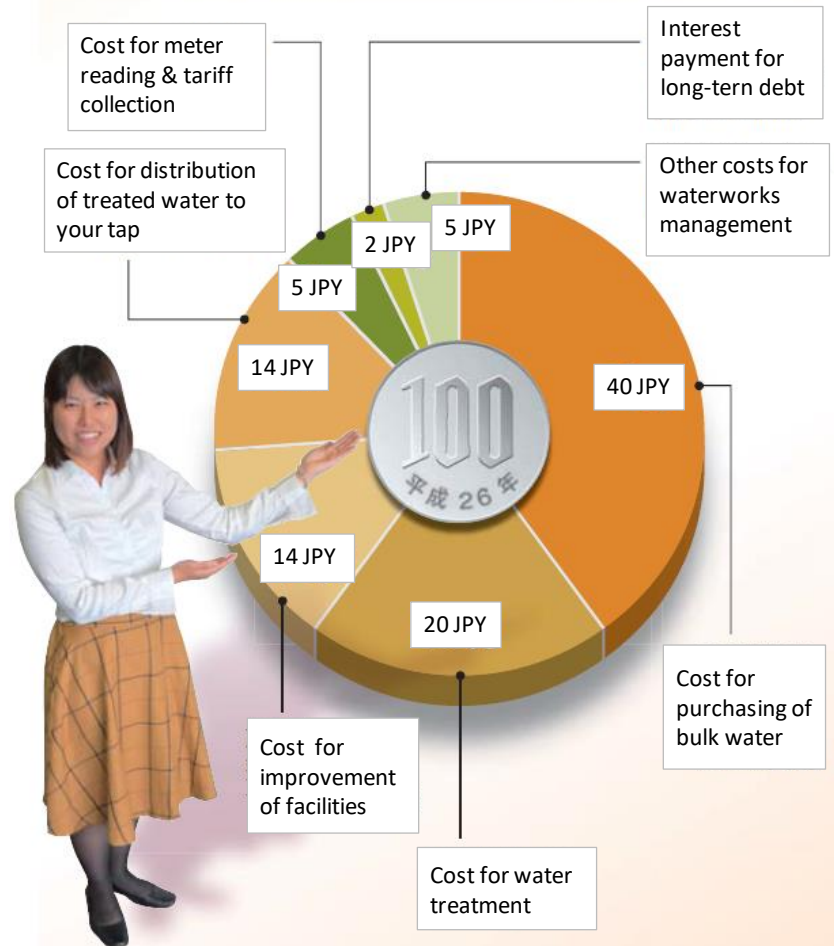
(4) Transparency & Accountability, Public Relations

Water Utility
Disclosure of financial information



Customer
Understanding of financial condition

How your 100 JPY is spent as water tariff?



Source: Kawanishi Water and Sewer Bureau, *Water Supply and Sewerage in Kawanishi: Secure for Drinking, Comfortable for Using*, 2015, <http://www.kawanishi-water.jp/ikkrwebBrowse/material/files/group/2/h27-12-1.pdf>

3. Water Tariff Setting

(5) Efficient Management

**“Water Supply Act” and
“Local Public Enterprise Act”**
Water tariffs must be fair and reasonable, commensurate with costs of an efficient operation.



Water Utility
Continuous efforts for optimize and streamline operations.

Example: Osaka City

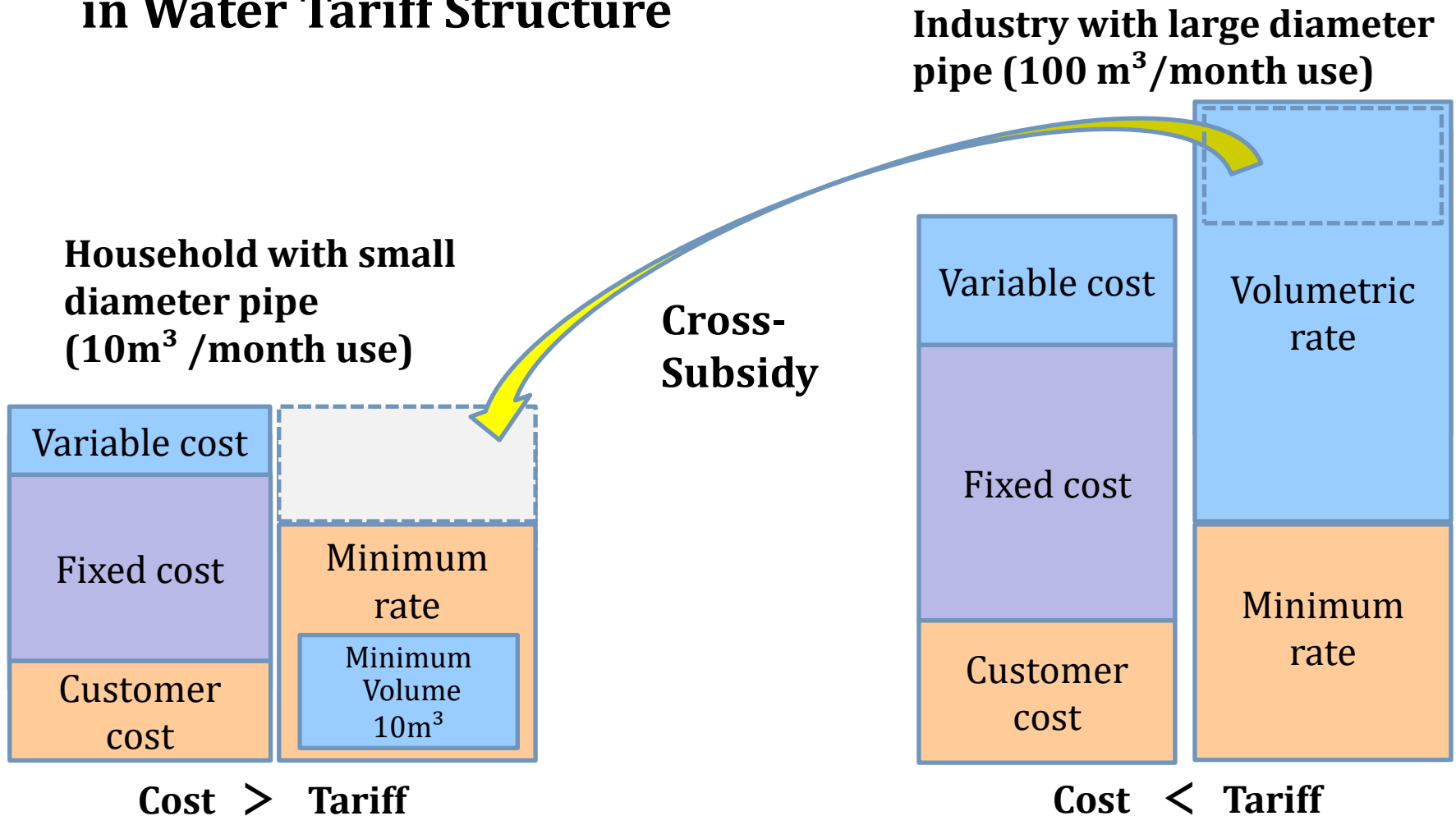
- Not replacing retired engineers and technical staff
- Reduction in staff requirements by improving equipment and control systems at water treatment plants
- Reduction in staff requirements by introducing on-line systems in service stations and data processing of inspection book, etc.



Source: Osaka Municipal Waterworks Bureau, *“One Hundred Year History of Water Supply in Osaka City,”* Osaka Municipal Waterworks Bureau, 1996.

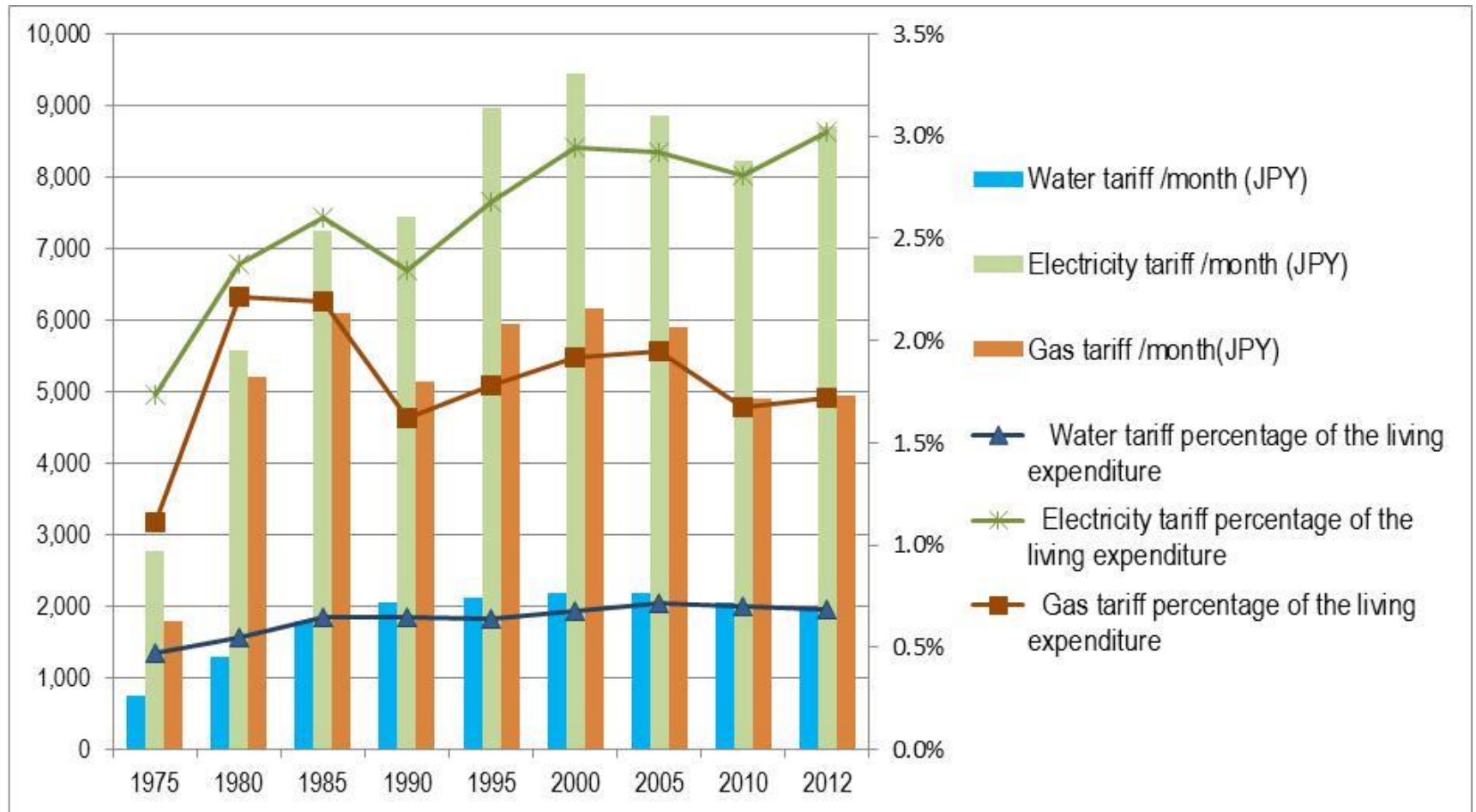
4. Consideration for the Low-Income Group

(1) Minimum Rate and Cross Subsidy in Water Tariff Structure



4. Consideration for the Low-Income Group

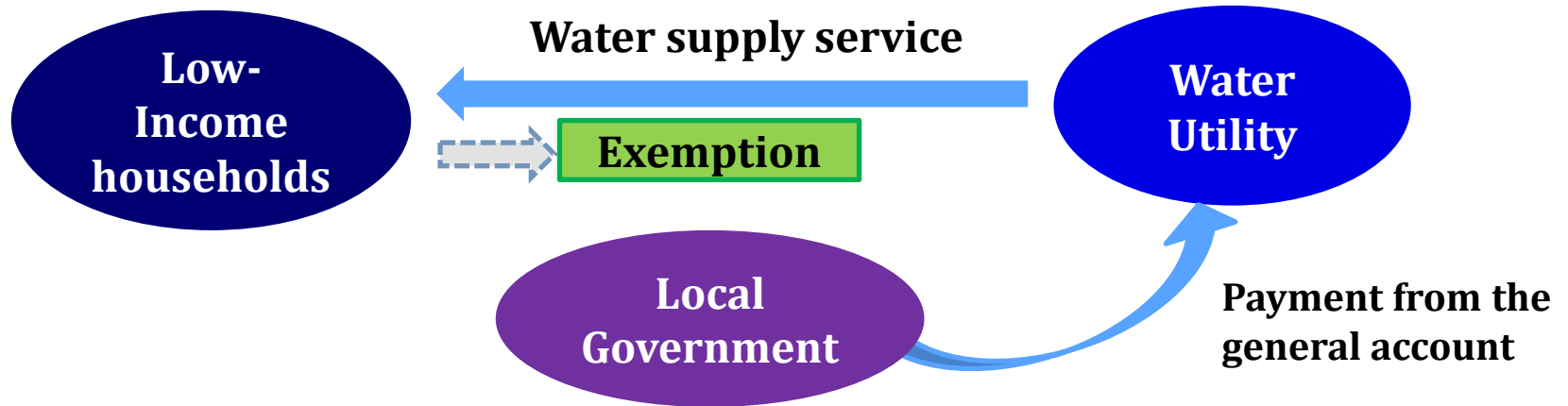
Water tariffs are affordable compared with electricity and gas



Source: Created from the data of JWVA, "The Outline of Water Supply," 6th ed. 2015.

4. Consideration for the Low-Income Group

(2) Water Tariff Exemption

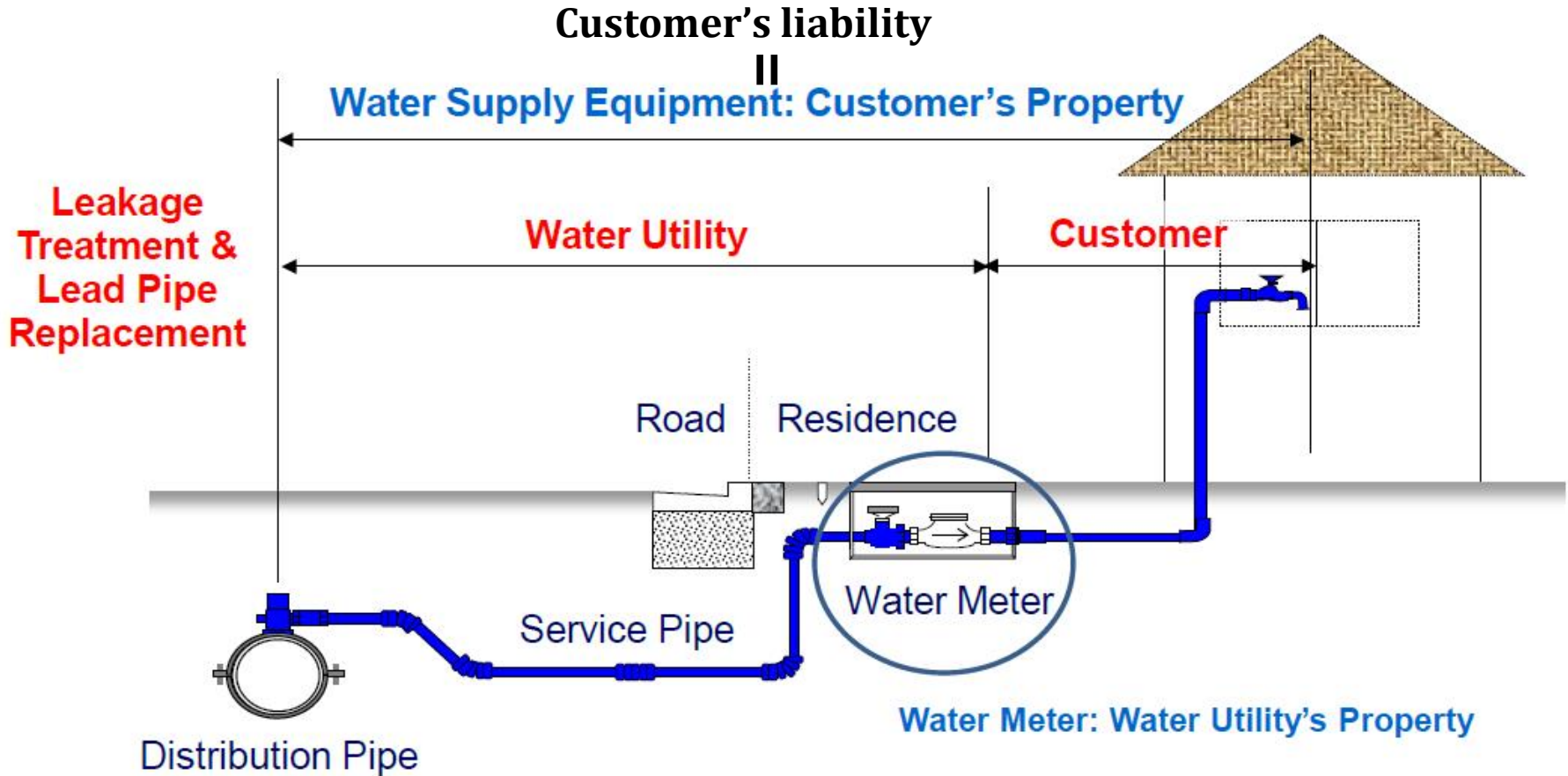


Example: Rules for Exemption from Minimum Charge in Water Tariffs in Tokyo

Recipient qualification	A household that receives public assistance, such as livelihood assistance, education allowance, home allowance, medical allowance, or nursing-care allowance.
Amount of exemption	Minimum charge and metered rate charge up to 10m ³ /month.

4. Consideration for the Low-Income Group

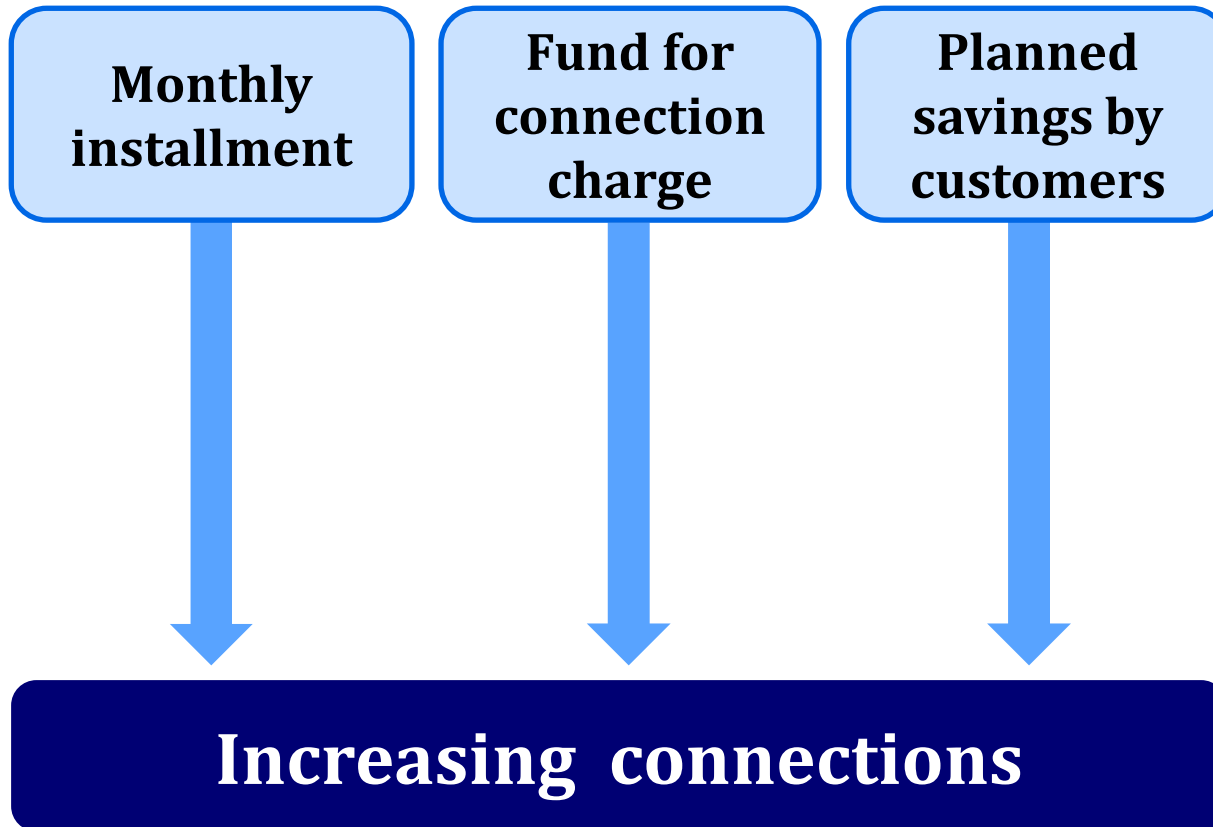
(3) Water Meter Policy & Connection Charge



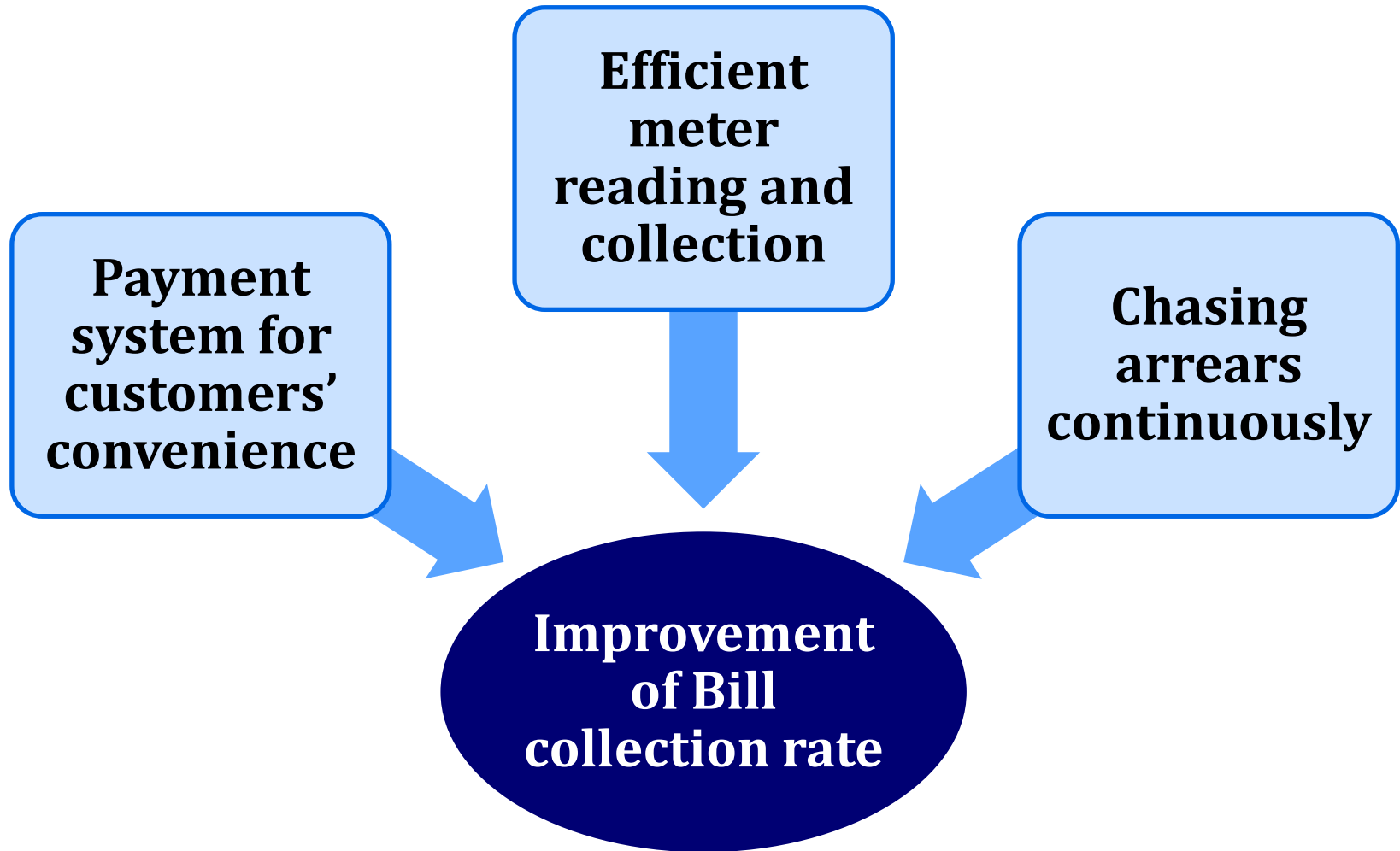
Source: JWVA

4. Consideration for the Low-Income Group

Financial Arrangement for Connection Charge



5. Billing and Collection



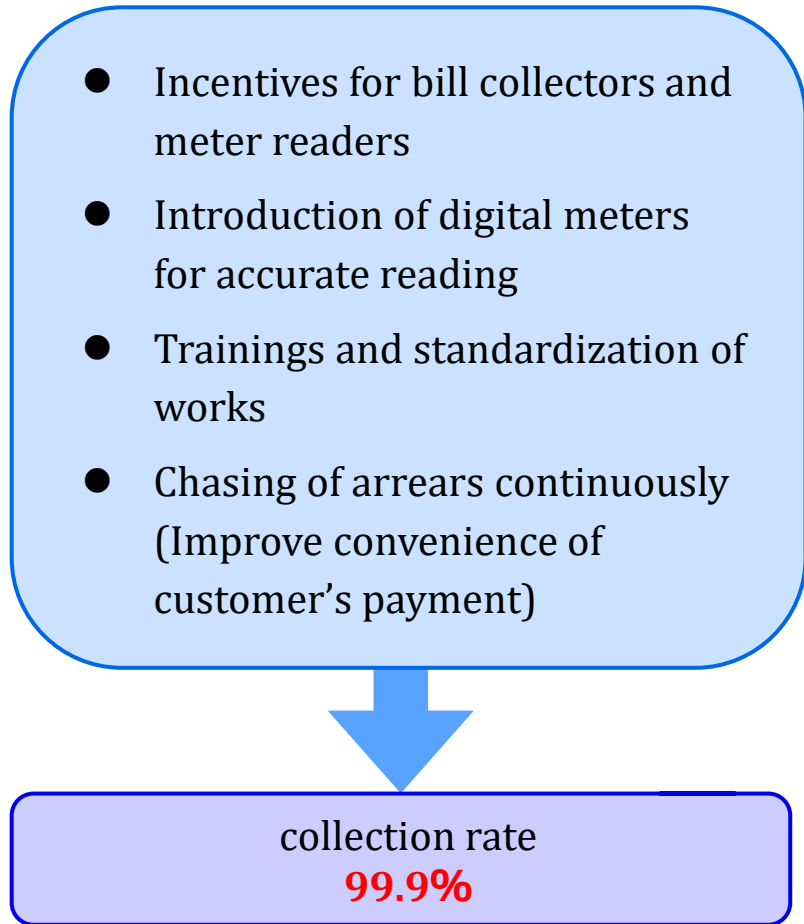
5. Billing and Collection

Example: Changes in Water Bill Collection and Handling of Unpaid Tariffs in Osaka Municipal Waterworks Bureau

Period	Collection system	Remarks
1910 - 1930	Quarterly payment by customers	(Issue) Only 30% of customers paid water bills by due date. The office could lose track of customers if change of address was not reported.
1931	Introduction of monthly door to door collection	(Result) 99.9% collection rate was achieved in four years after the introduction, and 100% in nine years.
1966	Introduction of bank account transfers	<p>(Result) More customers shifted to account transfers every year, helping improve the efficiency and reduced the need for cash handling.</p> <p>(Issue) Efficiency of door to door collection was lowered. Difficult to collect during daytime because more households had no one home during daytime, and the unpaid amount went up.</p>
1975	Door to door collection system was abolished.	Tariff collectors were replaced by dedicated personnel assigned to receive and manage payments and settle unpaid bills. A manual on settlement of bills was prepared to set standard procedures for resolving overdue accounts.
	Gradual promotion of bank account transfer and expansion of financial institutions handling them	
1993	Start of handling payment in convenience stores (open 24/7) Payments can be made during holidays and at night.	

5. Billing and Collection

Example: Challenges and Solutions Concerning Meter Reading and Door to Door Collection System in the Bureau of Waterworks, Tokyo Metropolitan Government



1 st day	Meter reading
	↓
1 st day	Transmitting metering data (& tariff calculation)
	↓
4 th day (10 days)	Issuing of Bills
	↓
14 th day	Deadline of Payment
	↓
28 th day (7 days)	Issuing of Reminder Letter
	↓
35 th day	Designated Deadline
	↓
74-97 th (7 days)	Issuing of Advance notice of disconnection
	↓
81-104 th	Deadline
	↓
-	Issuing of Disconnection Enforcement
	↓
-	Disconnection

Source: Training material of Nihon Suido Consultants., Co. Ltd..

6. Lessons Learned (1)

- **(Financial Sources for Water Supply Development)** Water supply facilities were developed by **public enterprise bonds** and. Utilities borrowed **large sums at low interest rates and long repayment periods from public financial sources. Subsidies based on well-defined policy goals** were granted. This government financial assistance contributed greatly to achieving universal access to water supply service. Public enterprise bonds are an effective and fair way to share the liability of the construction costs among existing and future customers. It is important to have **a financial plan showing that water tariffs can generate enough revenue to cover debt repayment and demonstrate financial soundness**.
- **(Subsidies for Nationwide Water Supply Coverage)** Although it is desirable to cover all expenses with the revenue from water tariffs, **subsidies were required to achieve nationwide water supply coverage and develop water resources** in Japan. Especially, in rural areas with small populations, it has been difficult to cover the construction costs of the facilities with tariffs alone.

6. Lessons Learned (2)

- **(Tariff Setting)** In Japan, water tariffs are set based on the following policies and principles: (1) Utility uses the **fully distributed cost method** and **self-supporting accounting system**, (2) financial liability for construction of facilities is shared **equitably** and there is absolute clarity in how tariffs are set, (3) **efficient management** of the utilities, (4) **affordability**, and (5) adequate information disclosure. It is important to have **legal frameworks** to provide the principles and **standardized procedures** to guide the tariff setting process. Utilities make continuous efforts towards efficient management and information disclosure so that **customers clearly understand and support the water supply business**.
- **(Affordability)** To support all households including low-income groups, water tariffs are made **affordable by including a minimum volume in the minimum charge** and implementing **cross-subsidies**. **Exemption** and **reduced tariff** systems are established as a welfare policy of the local government. Customers could pay by **installments** for costly new connections and were encouraged to **save money** systematically for the payments in the early stage of water supply development.

6. Lessons Learned (3)

- **(Increasing Bill Collection Rate)** Japanese water utilities have achieved **bill collection rate of nearly 100%** by shifting to a payment system that is convenient for customers under the financial services available. There are **clear procedures for following up on unpaid bills and applying penalties** as required. **Training for meter readers and tariff collectors together with performance based incentives** could also help raise collection rates. **Installation of meters at all customers and keeping meter accuracy,** have also contributed to high collection rates.