



# Water Quality Management and Japanese Legal Frameworks for Johkasou

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JAPAN

Ministry of the Environment

# Outline

- 1. Japanese Water Quality Management**
- 2. Japanese Legal Frameworks for Johkasou**
- 3. Conclusion**

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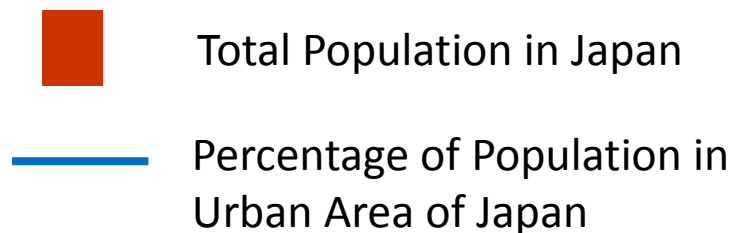
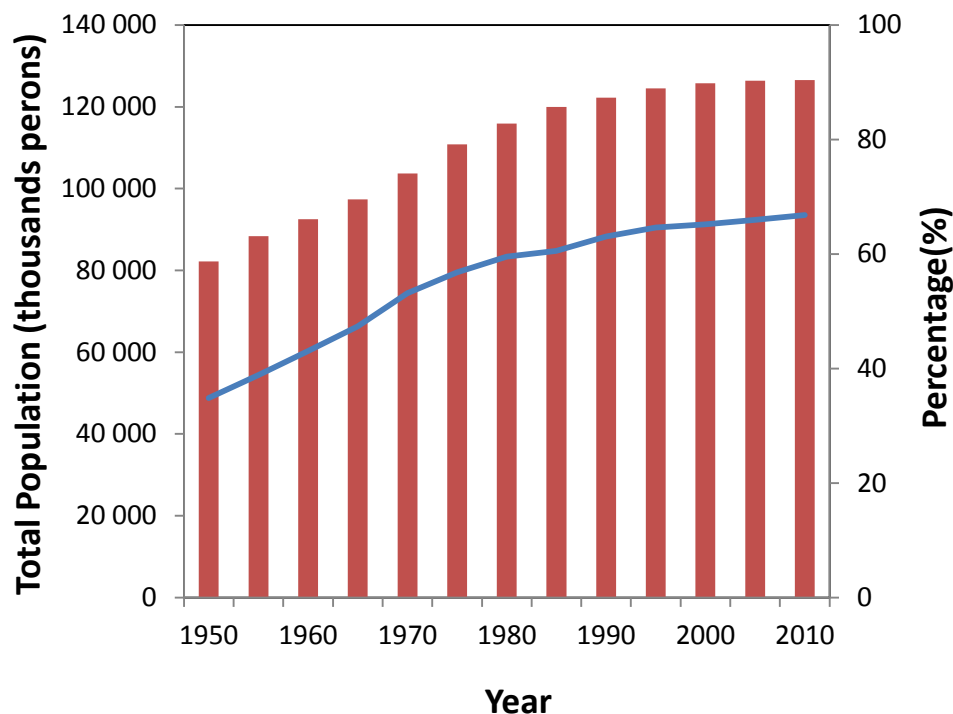
**1. Japanese Water Quality Management**

2. Japanese Legal Frameworks for Johkasou

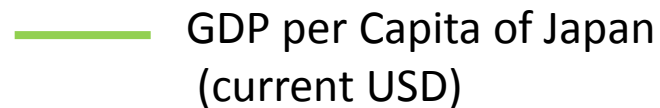
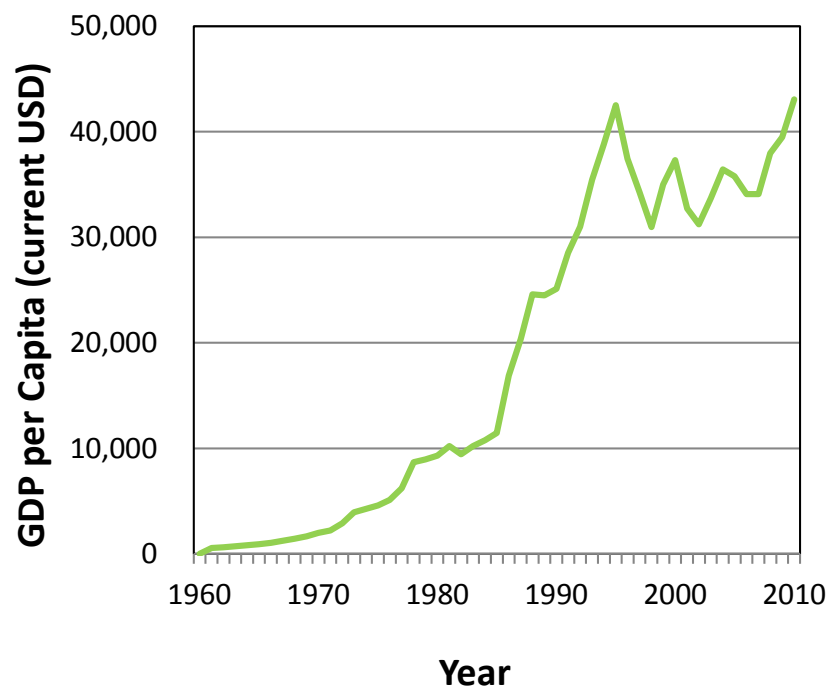
3. Conclusion

# Population Increase, Urbanization and Economic Growth

## Population Increase and Urbanization



## Economic Growth



# Water Pollution of Tokyo in 1970's



**Tokyo Bay**



**A river in Tokyo**



**The Kanda River  
(Tokyo)**

# Water Quality Standard in Japan

## Living environment items

(Public water areas)

	River	Lake	Sea Area
BOD	$\leq 1 - 10 \text{ mg/L}$	-	-
COD	-	$\leq 1 - 8 \text{ mg/L}$	$\leq 2 - 8 \text{ mg/L}$
pH	6.0 - 8.5	6.0 - 8.5	7.0 - 8.3
SS	$\leq 25 - 100 \text{ mg/L etc.}$	$\leq 1 - 15 \text{ mg/L etc.}$	-
DO	$2-7.5 \text{ mg/L} \leq$	$2-7.5 \text{ mg/L} \leq$	$2-7.5 \text{ mg/L} \leq$
Coliform bacteria count	$\leq 50 - 5,000 \text{ MPN/100 mL}$	$\leq 50 - 1,000 \text{ MPN/100 mL}$	$\leq 1,000 \text{ MPN/100 mL}$
N-hexane extracts	-	-	Undetected.
Total nitrogen	-	$\leq 0.1 - 1 \text{ mg/L}$	$\leq 0.2 - 1 \text{ mg/L}$
Total phosphorous	-	$\leq 0.005 - 0.1 \text{ mg/L}$	$\leq 0.02 - 0.09 \text{ mg/L}$
All zinc	$\leq 0.03 \text{ mg/L}$	$\leq 0.03 \text{ mg/L}$	$\leq 0.01 - 0.02 \text{ mg/L}$
Nonyl phenol	$\leq 0.0006 \sim 0.002 \text{ mg/L}$	$\leq 0.0006 \sim 0.002 \text{ mg/L}$	$\leq 0.0007 \sim 0.001 \text{ mg/L}$
LAS	$\leq 0.02 \sim 0.05 \text{ mg/L}$	$\leq 0.02 \sim 0.05 \text{ mg/L}$	$\leq 0.006 \sim 0.01 \text{ mg/L}$

# Framework for Water Quality Management in Japan

Environmental Quality Standard

【Environment Basic Law】

National government

Measures for Industrial Wastewater Treatment

▪ Effluent Water Quality Standard

【Water Pollution Control Law】

Uniform Standards for Japan

National government

▪ More Stringent Effluent Standards 【Water Pollution Control Law】

▪ Regulations for Private Industries 【Water Pollution Control Law】

Notification, Measurement and record of pollution status of effluent, On-site inspections

→ Penalty, Order for remedial action, other administrative directions

Local government (Prefecture)

▪ Investment to pollution control

▪ Development of human capacities etc.

Private company

Measures for Domestic Wastewater Treatment

▪ Sewerage treatment facilities 【Sewerage Law】

▪ *Johkasou* facilities 【*Johkasou* Law】 etc.

▪ National government  
▪ Local government  
▪ Individual

Subsidy system  
System of maintenance

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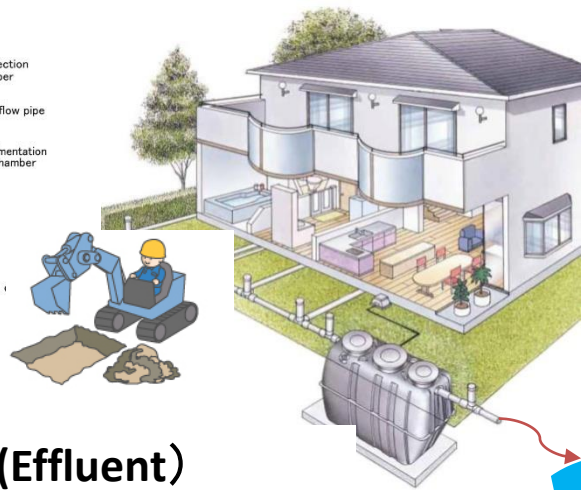
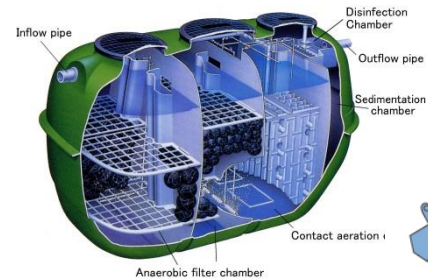
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# Domestic Wastewater Treatment System in Japanese Laws

- Black & gray water treatment, including on-site treatment, effective collection, and sludge processing

## (Structure)



(O&M)  
(Desludging)

## (Effluent)

BOD20mg/L and less

**Building Standard Law**

**Johkasou Law**

## Domestic Wastewater Treatment Plan 【Municipal】

### Vacuum car

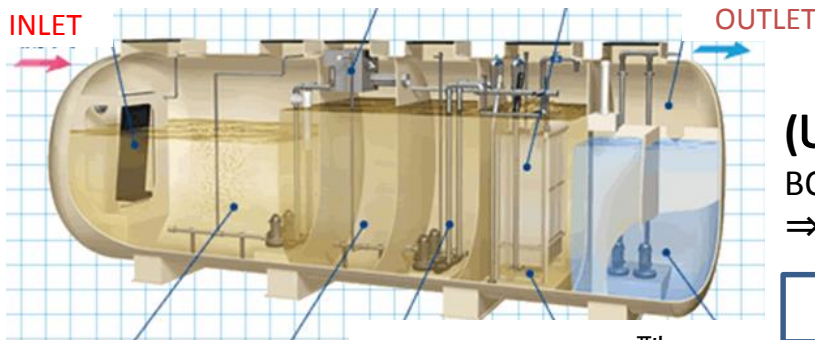
- Effective and sanitary transportation of night soil and sludge



Treatment Facility

(Transport)

**Waste Management and Public Cleansing Law**



(Uniform standards for effluent water)

BOD 120mg/L and less

⇒ more than 501 persons 【Large scale Johkasou】

**Water Pollution Control Law**

# Summary of Johkasou Law

## The Purpose of Johkasou Law

Promotion of human waste and gray water treatment by Johkasou for;

- Conservation of water quality in public water area,
- Preservation of the living environment and
- Improvement of public health

### ⇒ Articles in the Law

- ① Johkasou installation (✕ related to “Building Standard Law”)
- ② Operation/maintenance of Johkasou
- ③ Approval of Johkasou models
- ④ Johkasou business for Installation and Operation/Maintenance
- ⑤ Nationally qualified “Johkasou technicians”
- ⑥ Miscellaneous and penalties

# Installation of Johkasou

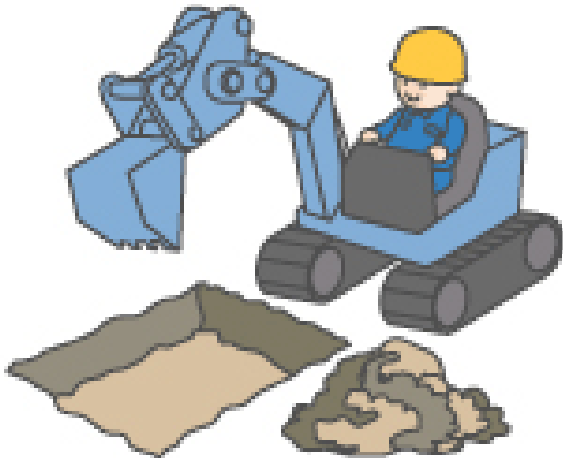
## ▶ Notification



- ▶ Notification to the prefectural governor etc.
- ▶ To understand a new installation or any change in the structure or size
- ▶ Confirmation of any problems in terms of the structure and O&M

## ▶ Installation

- ▶ Johkasou shall be constructed by a Johkasou installation vendor registered by the prefectural governor (effective for five years; Accredited by the government)
- ▶ Complying with the “Technical Standards for Johkasou construction” (17 items)
- ▶ Supervised by a certified Johkasou Installation worker



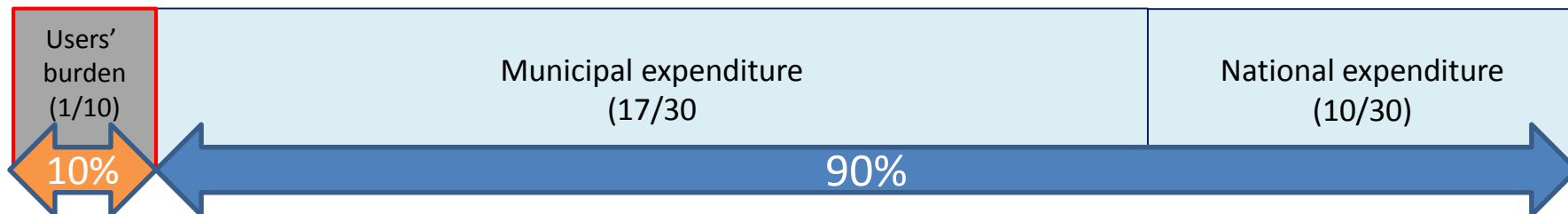
- ▶ Johkasou installation management method
  - ▶ Lecture text for a certified Johkasou Installation worker
  - ▶ Summarized according to technical standards
  - ▶ Contents
    - ▶ Construction method
    - ▶ Description of equipment and materials
    - ▶ Improvement method

# Subsidy System for Johkasou Installation

## Johkasou Installation Promotion Program (1987 to ...)



## Municipal Johkasou Installation Program (1994 to ...)



## Subsidized rate

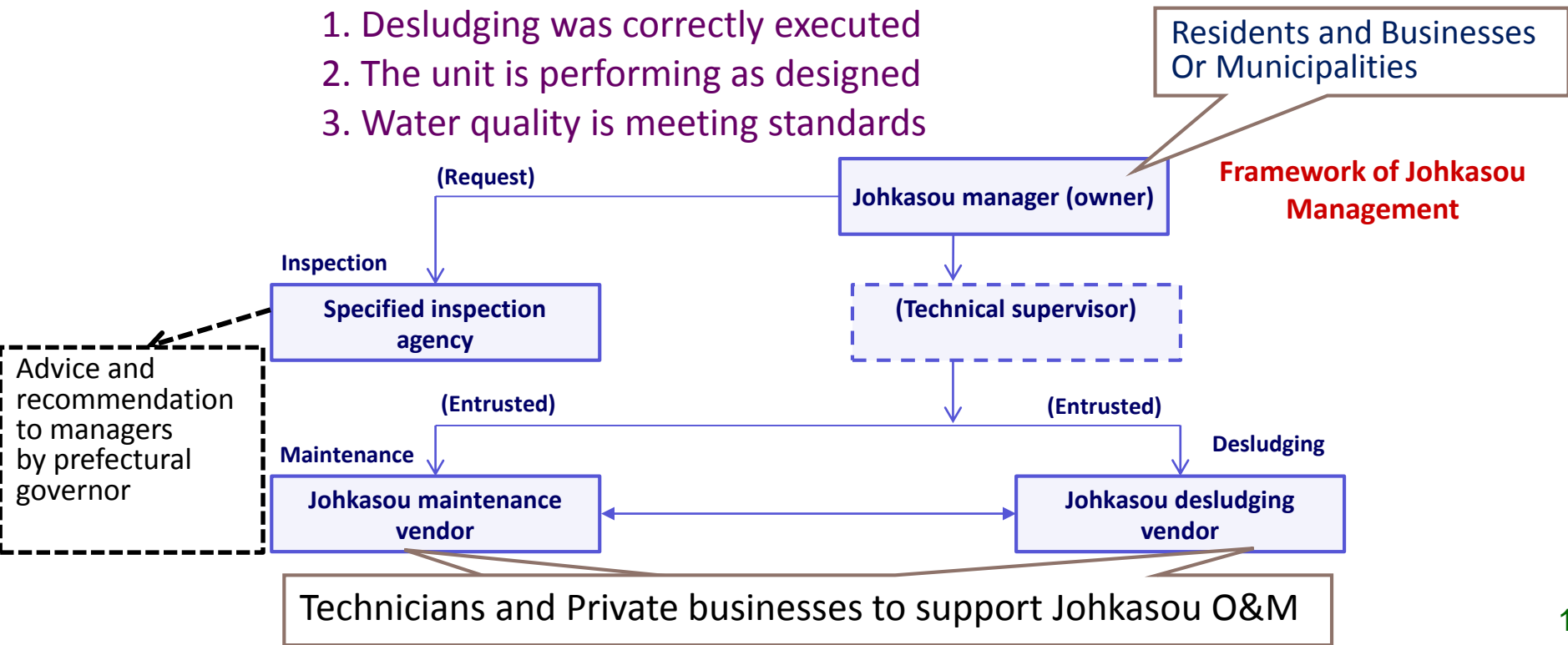
**40 %** (Private Johkasou installation)

**90 %** (Municipal Johkasou installation)

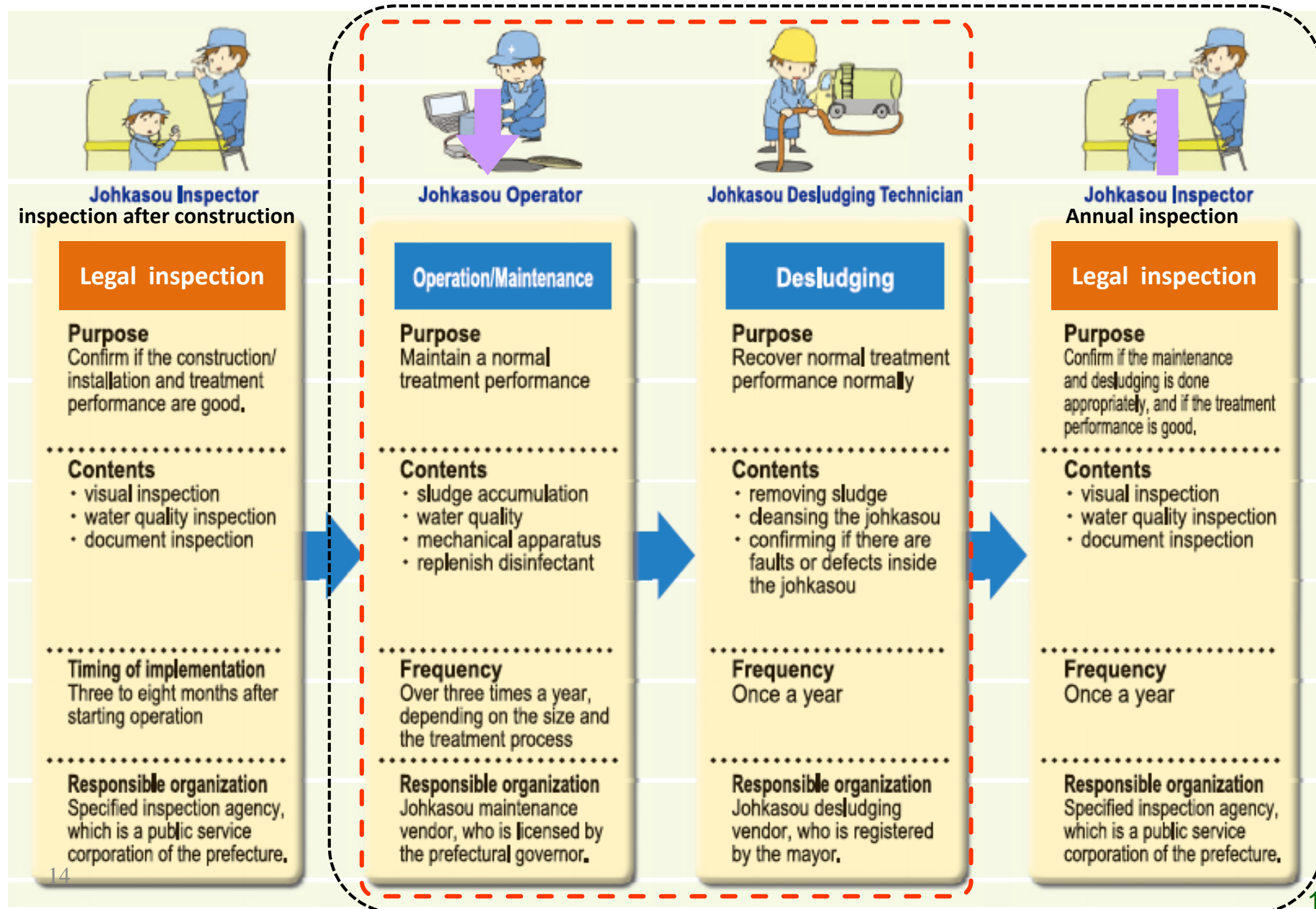
# Operation & Maintenance of Johkasou System in Japan

- To properly function and deliver its expected performance, the Johkasou owner has a statutory obligation to periodically conduct maintenance and ensure that sludge is regularly collected.
- However, Johkasou owners do not have sufficient knowledge for O&M.  
⇒ this work is mainly entrusted to Johkasou maintenance vendors and desludging vendors.
- Another statutory obligation requires that Johkasou receives annual inspection to confirm that:

1. Desludging was correctly executed
2. The unit is performing as designed
3. Water quality is meeting standards

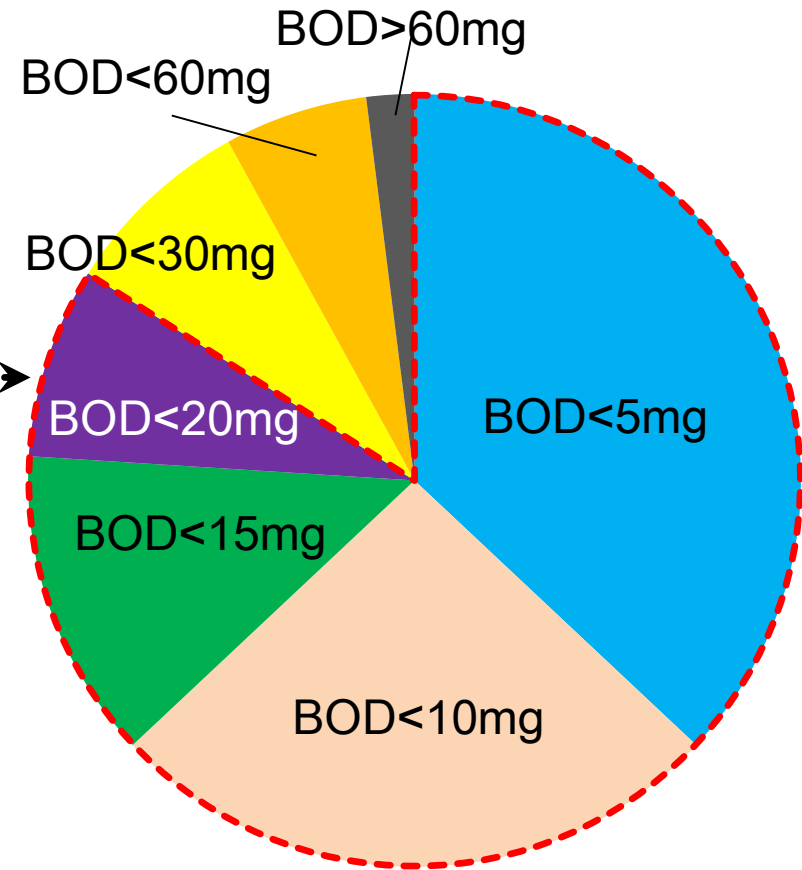


# Details of Operation and Maintenance



# Treatment Performance of Johkasou

- For applicable maintenance doing,
- 838,349unites(85.0%) of Johkasou is BOD<20mg/l
  - generality Johkasou performance is equivalent to sewerage treatment system



- ※By Johkasou administrative organization research in 2013
- Johkasou structural standard is BOD<20mg/L, 986,643 units
  - Inspection result of legal inspection in 2013



# Outsourcing System for Johkasou Installation and Management

Installation



Johkasou  
construction  
business

**29,952**  
companies

Inspection after installation



Designated  
inspection  
agency

**65**  
institutions

Operation/Maintenance



Johkasou  
maintenance  
business

**12,500**  
companies

Desludging



Johkasou  
desludging  
business

**5,193**  
companies

Annual inspection



Designated  
inspection  
agency

**65**  
institutions



# Human Resource Development for Johkasou

- Johkasou technicians should be equipped with extensive knowledge on not only wastewater treatment/Johkasou, but also water environment conservation and public health.
- Curriculums for Johkasou operator and Johkasou installation worker are as shown below

Johkasou operator		Johkasou installation worker	
➤ Fundamental of Johkasou	8 H	❑ Fundamental of Johkasou	8
➤ Laws and regulations related with Johkasou	4 H	H	
➤ Structure and function of Johkasou	22 H	❑ Laws and regulations related with Johkasou	3
➤ Introduction to installation of Johkasou	4 H	H	
➤ Operation and maintenance of Johkasou	30 H	❑ Structure and function of Johkasou	15
➤ Water quality management of Johkasou	10 H	H	
➤ Introduction to desludging of Johkasou	2 H	❑ Management of Johkasou installation	8
		H	
		❑ Introduction to O&M and desludging of Johkasou	3
Total	80 Hours		
			37 Hours



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# Conclusion

- **Johkasou system** is an effective approach for water quality management.
- The detect function of Johkasou is normally demonstrated by **proper installation and operation**.
- The important points for proper installation and operation are not only **regulations** but also **governmental support** in the respect of technological standardization, financing and outsourcing, curriculums.





Thank you for your attention

Oirase Keiryu (Aomori)