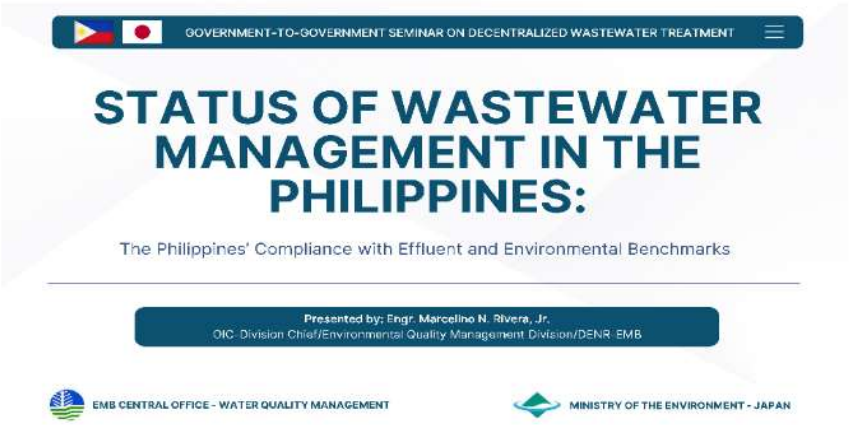
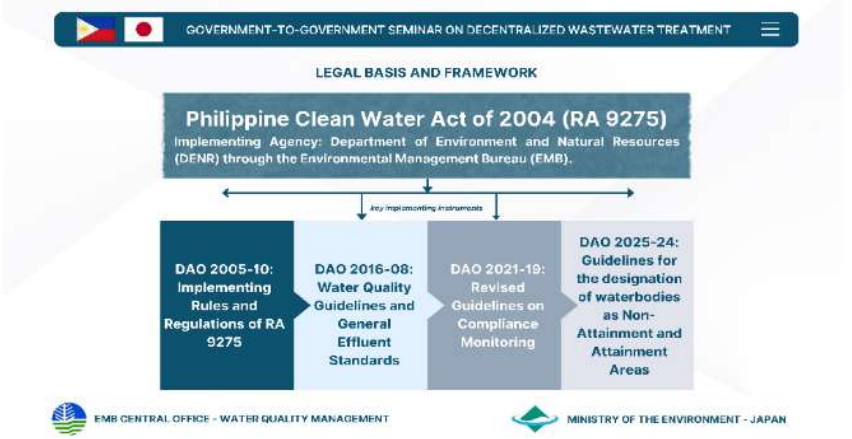
6.2. フィリピン国浄化槽セミナーにおける発表資料

6.2.1. Status of Wastewater Management in the Philippines: The Philippines' Compliance with Effluent and Environmental Benchmarks, Engr. Marcelino N. Rivera, Jr., OIC-Division Chief of EQMD, DENR-EMB





CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES

General Effluent Standards

Prescribed under DENR Administrative Order (DAO) No. 2016-08, or the ***"Water Quality Guidelines and General Effluent Standards" of 2016***

These standards establish the **maximum allowable concentrations** of specific **pollutants** in wastewater that can be discharged to water bodies or land. They apply to **all point sources** of pollution, **new or existing**, **regardless of industry category**, unless **industry-specific standards** are provided.

Parameter	Unit	Water Body Classification								
		AA	A	B	C	D	SA	SB	SC	SD
Ammonia as NH_3-N	**mg/L**	**NDA**	**2**	**3**	**4**	**9**	**NDA**	**3**	**4**	**9**
BOD	mg/L	NDA	20	30	50	120	NDA	30	100	150
Boron	**mg/L**	**NDA**	**4**	**4**	**4**	**12**	**NDA**	**4**	**25**	**100**
Chloride	mg/L	NDA	350	350	450	500	NDA	n/a	n/a	n/a
COD	mg/L	NDA	60	60	100	200	NDA	60	200	300
Color	TCU	NDA	100	100	150	300	NDA	100	150	300
Cyanide as Free Cyanide	mg/L	NDA	0.14	0.14	0.2	0.2	NDA	0.04	0.2	0.4
Fluoride	mg/L	NDA	2	2	2	4	NDA	3	3	6
Nitrate as NO_3-N	mg/L	NDA	14	14	14	30	NDA	20	20	30
pH (Range)		NDA	6.0-9.0	6.0-9.0	6.0-9.4	5.5-9.5	NDA	6.5-9.0	6.0-9.0	5.5-9.5
Phosphate	**mg/L**	**NDA**	**1**	**1.5**	**4**	**10**	**NDA**	**2**	**4**	**10**
Selenium	mg/L	NDA	0.02	0.02	0.04	0.08	NDA	0.02	0.2	0.4
Sulfate	**mg/L**	**NDA**	**500**	**500**	**550**	**1000**	-	-	-	-
Surfactants (MBAS)	mg/L	NDA	2	3	15	30	NDA	3	15	30

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MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

SUBJECT TO REGULATION	
Types of Industries	All Industries Selected Industries
Applicable Effluent Volume	No limit, but DAO 2005-10 (Rule 14.5) outlines a tiered structure for annual permit fees based on the volume of effluent discharged per day.
How are the standard values set?	Uniform Depends on sectors Others (specify:)
Possibilities of setting more stringent standards	Yes No
Transition periods, provisional standards or others (to give industries time to adapt to emission standards)	Transition period (grace period as per DAO 2016-08 Provisional Standards Others (specify:)
Relevant laws to regulate effluent qualities from industries	• Republic Act No. 9275 (The Philippine Clean Water Act of 2004) • DENR Administrative Order (DAO) No. 2005-10 • DENR Administrative Order (DAO) No. 2016-08 • DENR Administrative Order (DAO) No. 2021-19

MONITORING AND INSPECTION	
Monitoring Method	Self (automated) Gov. or 3rd Party
Monitoring Parameter(s)	DAO 2016-08 specifies that the significant effluent quality parameters that industries must monitor
Frequency	Self-Monitoring Reports (SMRs) – quarterly submission
Inspecting Agency	Department of Environment and Natural Resources - Environmental Management Bureau (EMB) or Laguna Lake Development Authority (LLDA)
Inspection	Traditional on-site inspection, then if violations are identified, EVB can issue a Notice of Violation to the establishment
Reporting Obligation	Yes, through Self-Monitoring Report (SMR) system
Reporting to (whom)	EMB or LLDA
Number of Regulated Facilities	22,000 Valid Discharge Permit
How to identify the Facility Number	Through Wastewater Discharge Permit, or DENR ID Number or Company Registration System (CRS)

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CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES

Influent BOD (mg/L)	Unit	Class C	Class D	Class SC	Class SD
3,000 to <6,500	mg/L	100	150	100	150
6,500 to <10,000	mg/L	200	300	200	300
10,000 to 30,000	mg/L	600	1,000	600	1,000
>30,000	mg/L	900	1,500	900	1,500

For Strong Wastewater

Applicable only if the establishment provides proof:

- Influent values for twelve (12) months are within Table 10 of DAO 2016-08
- Laboratory results must be from a DENR-recognized laboratory

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CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES

Basis for the Standards

GES applies to all establishments discharging wastewater to receiving bodies of water or land

CLASS AA: Public Water Supply I	CLASS SA: Protected Areas
CLASS A: Public Water Supply II	CLASS SB: Recreational Waters
CLASS B: Recreational Waters	CLASS SC: Fisheries
CLASS C: Agriculture	CLASS SD: Navigational Waters
CLASS D: Navigable Waters	

BASIS	DESCRIPTION
Water Quality Guidelines	To preserve classification of receiving water bodies
Toxicological Data	Protection of human and ecological health
Stakeholder Input	Consultations with effected sectors
Risk-Based Approach	Adjusted per use/class of receiving water
OTHER CONSIDERATION	
Technology-Based	Based on achievable treatment performance
International Benchmarks	Adapted from global practices esp ASEAN

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CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES

Measures taken to Improve the Compliance of Industries

- **Securing a valid Wastewater Discharge Permit**
- **Compliance with Wastewater Discharge Permit Conditions and Applicable Effluent Standards**

Note: Should be based on effluent analysis through EMB-recognized Laboratory

- **Submission of the Completely Filled-out Module 3 of the Self-Monitoring Report (SMR)**

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CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES

WASTEWATER DISCHARGE PERMIT
Sec 14 RA 9275 - Rule 14 of DAO 2005-10 IRR

- A **legal authorization** granted to the owners or operators of facilities by the DENR to discharge wastewater
- It shall specify, among others, the quantity and quality of effluent of the said facilities allowed to be discharged into a specific water body
- The annual fee is from Php 2,000 to Php 3,900, depending on the volumetric rate of discharge
- **Validity: Up to five (5) years**

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CLARIFICATION IN THE ISSUANCE OF DISCHARGE PERMIT FOR ESTABLISHMENTS/INDUSTRIES 19 APRIL 2021 MEMORANDUM

- Identify the SEQP
- Quantity and Quality of Effluent

ONE (1) DISCHARGE PERMIT WILL BE ISSUED PER OUTFALL/OUTLET

IN UNSEWERED AREAS:

- Install a Septic Tank (DOH AO 2019-0047) or Onsite STP
- Must be regularly desludged by DOH-accredited desludger (DILG MC 2019-62)
- Certificate of Treatment for DP Approval

- Must be treated to meet the SEQP

COMMERCIAL AND INDUSTRIAL WASTEWATER

SERVICED BY OPERATIONAL WASTEWATER TREATMENT FACILITY

- Must connect to the sewer line
- Wastewater discharge must meet the criteria set by the operator of the accepting treatment facility
- Certificate of Connection

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CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES

CERTIFICATE OF INTERCONNECTION

- Establishments/Industries located in areas serviced by an operational wastewater treatment facility shall be required to connect to the sewer line.
- Wastewater to be discharged into the sewer line must be treated in accordance with the criteria set by the operator of the accepting wastewater treatment facility.
- A Certificate of Interconnection/Connection shall be conditional requirement in the issuance of a Discharge Permit

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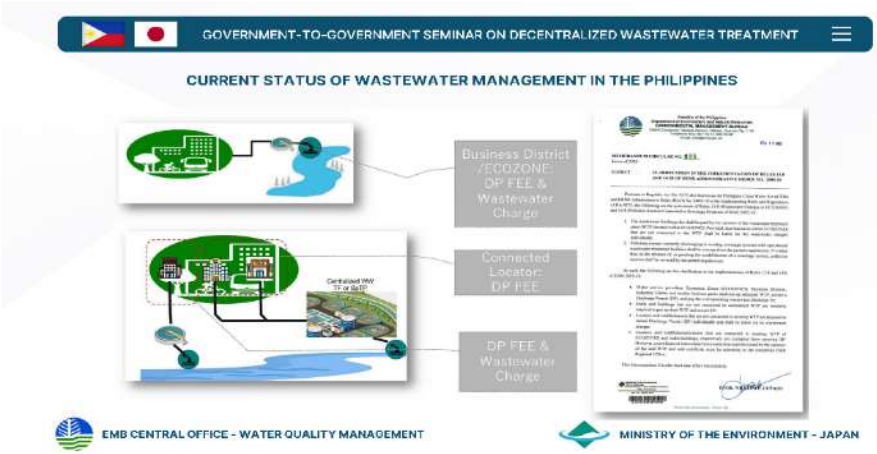
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CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES
Business District /ECOZONE: DP FEE & Wastewater Charge
Connected Locator: DP FEE
DP FEE & Wastewater Charge
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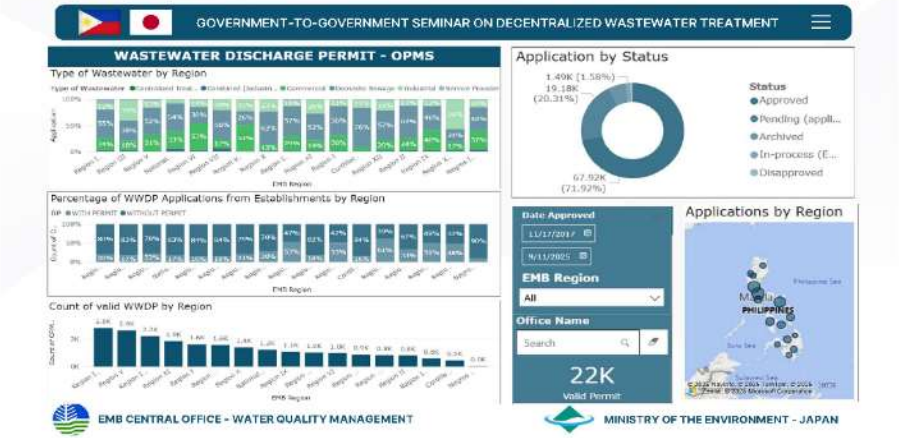
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WASTEWATER DISCHARGE PERMIT - OPMS
Type of Wastewater by Region
Percentage of WWDP Applications from Establishments by Region
Count of valid WWDP by Region
Application by Status
Applications by Region
Date Approved
EMB Region
Office Name
22K
Valid Permit
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CURRENT STATUS OF WASTEWATER MANAGEMENT IN THE PHILIPPINES
Sources of Wastewater
Common Wastewater Treatment Technologies
Monitoring and Compliance
Domestic Sources
Commercial Sources
Industrial Sources
Agricultural/ Recreational
Septic Tanks, STPs, DEWATS, and Constructed Wetlands
Grease Traps and Oil-Water Separator, SBR, MBR
Wastewater Treatment Facility
Lagoons, Biogas Digesters, Ponds, Wetlands
Discharge Permit Issuance and Submission of Self-Monitoring Report (SMR)
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GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT
INITIATIVES AND BEST PRACTICES
DENR-EMB PROGRAMS
Implementation of the Philippine Clean Water Act (RA 9275)
Establishment of Water Quality Management Areas (WQMAs)
Adopt-an-Estero/Waterbody Program (partnerships with LGUs, industries, and NGOs)
Monitoring and compliance programs for industrial and commercial establishments
PUBLIC-PRIVATE PARTNERSHIP PROJECTS IN WASTEWATER MANAGEMENT
Collaboration with private water concessionaires (e.g., Maynilad, Manila Water) for sewerage and septage management systems
BOT (Build-Operate-Transfer) schemes for wastewater treatment facilities
Partnerships with industries for shared treatment plants and innovative financing mechanisms
INNOVATIVE AND MULTI-FACETED APPROACHES OF SANITATION PROGRAMS
Philippine Sustainable Sanitation Roadmap (DOH-led with DENR & partners)
NSSMP – supports LGUs in wastewater and septage planning
Community campaigns and LGU-driven on septic tank maintenance and desludging
Alignment with SDG 6 and the Philippine Development Plan (PDP)
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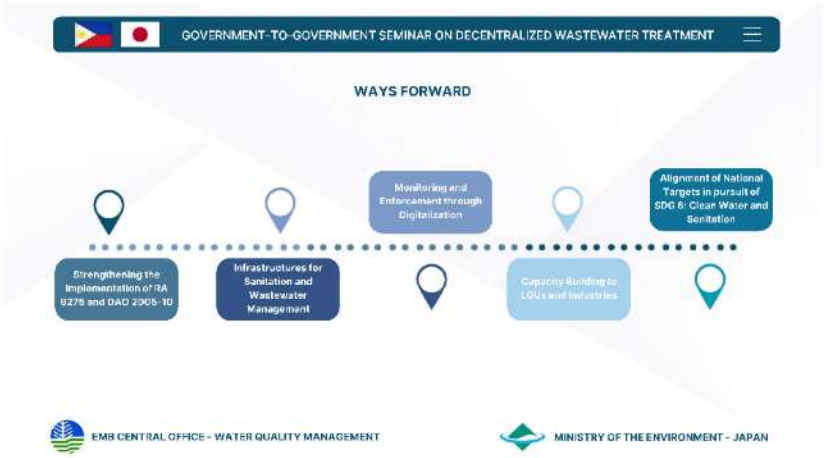
GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT
WAYS FORWARD
Strengthening the Implementation of RA 9275 and DAO 2005-10
Infrastructures for Sanitation and Wastewater Management
Monitoring and Enforcement through Digitalization
Capacity Building to LGUs and Industries
Alignment of National Targets in pursuit of SDG 6: Clean Water and Sanitation
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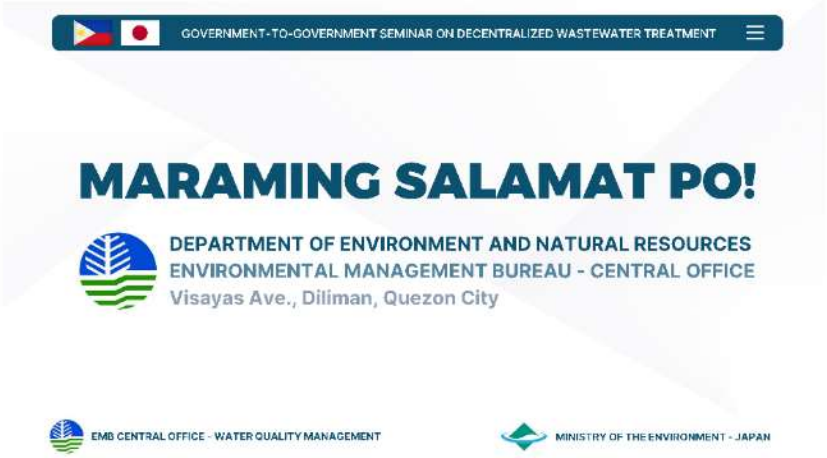
GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT
MARAMING SALAMAT PO!
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ENVIRONMENTAL MANAGEMENT BUREAU - CENTRAL OFFICE
Visayas Ave., Diliman, Quezon City
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6.2.2. Advancing Wastewater Infrastructure: Progress in Developments and Gaps in the Philippine Context, Engr. Alexander Castro, Department of Public Works and Highways (DPWH)

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

OVERVIEW

NEDA BOARD RESOLUTION No. 6 (s. 2017) - Confirming the Proposed Amendments to the National Sewerage and Septage Management Program

- List of qualified beneficiaries expanded to include non-Highly Urbanized Cities and 1st Class Municipalities
- Scope of National Gov't (NG) cost share broadened to include septage projects
- NG subsidy increased from 40% to 50% of total project cost

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WAYS FORWARD

Philippine Water Supply and Sanitation Master Plan (PWSSMP)

"The **PWSSMP** uses the Integrated Water Resource Management (IWRM) principle for a comprehensive and integrated approach in describing the sector and addressing the gaps towards ultimately achieving the national targets and commitments"

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WAYS FORWARD

NEDA BOARD RESOLUTION NO. 41 (s. 2024) - Approving the Draft NEDA Board Resolution Adopting the Unified Resource Allocation Framework (URAF) for Water Supply and Sanitation (WSS) as Approved by the Committee on Infrastructure (INFRACOM)

SECTION 12 Implementing Guidelines
Within 60 working days after the effectivity of this Resolution, the INFRACOM shall issue the implementing guidelines of the URAF-WSS, in consultation with relevant government agencies and instrumentalities as may be necessary.

The Implementing Guidelines shall include the adoption of URAF principles for the inclusion of funding and coverage of the National Septage and Sewerage Management Plan of the Department of Public Works and Highways.

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WAYS FORWARD

The Philippines is a partner country of the Asia Wastewater Management Partnership (AWaP), an endeavor initiated by Japan and other Asian nations for the purpose of achieving Goal 6.2 of the seventeen (17) Sustainable Development Goals (SDGs).

AWaP holds General Meetings in order to discuss the experiences of each partner country and to share good practices and technologies with each other

It is recommended that the Philippines keeps its involvement with AWaP, especially in any future plans to collaborate with the other partner countries.

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6.2.3. Wastewater Treatment in Japan: Historical Context and Regulatory Framework for Johkasou Systems, ホワン ティー マイ 氏　環境省 環境再生・資源循環局 廃棄物適正処理推進課 浄化槽推進室　環境専門調査員

Historical Context and Regulatory Framework for Johkasou System in Japan

25th September 2025

Ms. Mai HOANG THI
Senior Environment Expert, Office for Promotion of Johkasou

Office for Promotion of Johkasou
Waste Management Division
Environmental Regeneration and Material Cycles Bureau
Ministry of the Environment
Government of JAPAN
https://www.env.go.jp/recycle/jokaso/en/

環境省
Ministry of the Environment
Government of Japan

Table of Content

Water pollution in Japan during rapid economic growth

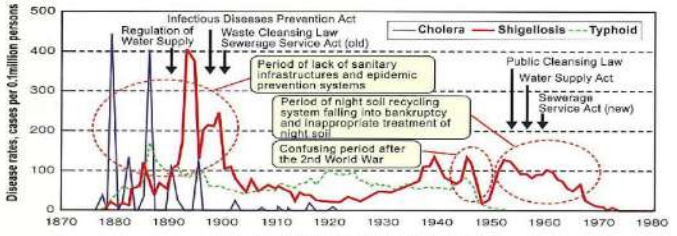
Sumida River (Tokyo)
in the 1970s

Dohkai Bay (Kitakyushu)
in the 1960s

Chofu Weir, Tama River(Tokyo)
in the 1970s

History of wastewater treatment and infectious diseases

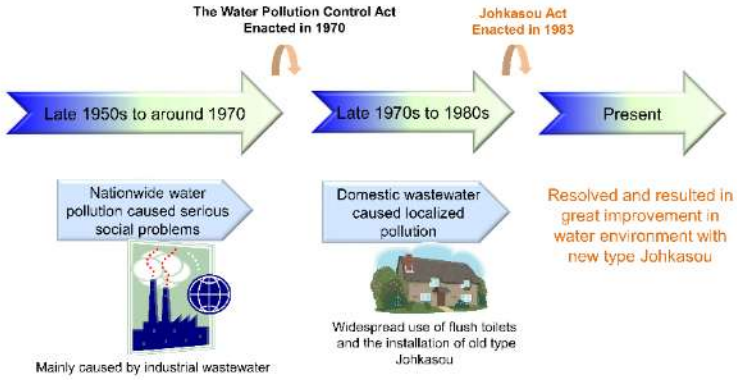
- Up to the 1950s, night soil was used as agricultural fertilizer and regarded as a valuable resource.
- From the late the 1950s, due to the spread of chemical fertilizer and rapid urbanization, night soil shifted from being seen as "fertilizer" to being treated as "waste". The lack of night soil treatment facilities and hygienic treatment led to serious social problems.
- The spread of infectious diseases continued until the Japan's period of rapid economic growth in the 1970s.



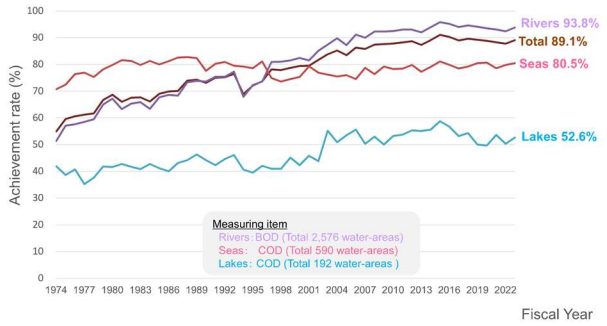
Trends of waterborne disease rates in Japan

Reference: Yuzo Inoue, History and technology of night soil treatment in Japan, J. of Monthly Johkasou

Domestic wastewater treatment issues in Japan



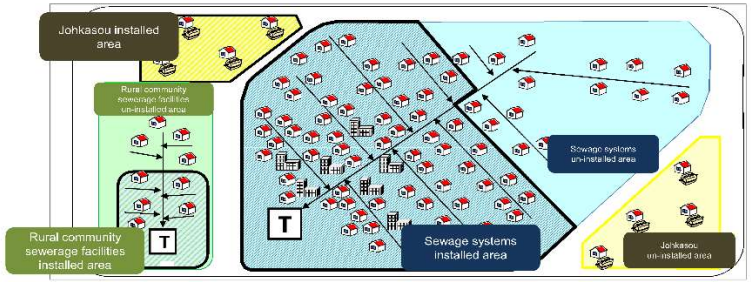
Achievement of water quality related to Effluent Standards



Public waters water quality measurement results (2023)

Ministry of the Environment, Government of Japan

Domestic Wastewater Treatment Systems in Japan



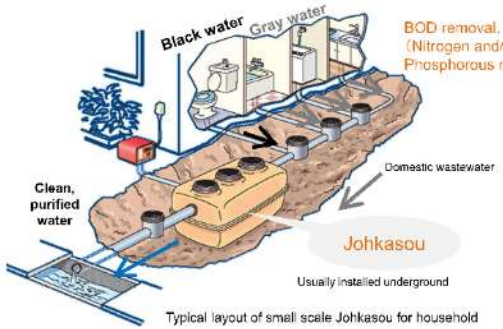
- **Sewage Systems** : managed by the Ministry of Land, Infrastructure, Transport and Tourism
- **Rural community sewerage facilities**: managed by the Ministry of Agriculture, Forestry and Fisheries
- **Johkasou**: managed by the Ministry of the Environment

Current situation of population served for treating domestic wastewater

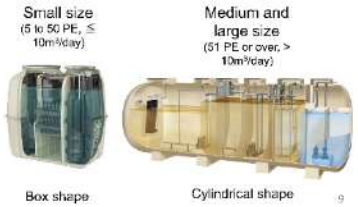
Type of treatment facility	Population served (x 1,000 people)	
	End of FY2024	End of FY2023
Sewage systems	**101,397 (81.8%)**	101,279 (81.4%)
Rural community sewerage facilities including Facilities for fishing villages, Facilities for forestry villages, Simple wastewater facilities	**2,835 (2.3%)**	2,938 (2.4%)
Johkasou	**11,746 (9.5%)**	11,772 (9.5%)
Municipal Johkasou Installation Program	**817**	824
Johkasou Installation and Maintenance Program	**6,220**	6,229
Other Johkasous	**4,708**	4,719
Community plants, etc.	**148 (0.1%)**	154 (0.1%)
Total population served	**116,126**	116,144
Percentage of population served	**93.7%**	93.3%
Total population	**123,964**	124,483
Total population not served	**7,838**	8,339
Population without domestic wastewater treatment	**6.3%**	6.7%

General Information of Johkasou

- "Johkasou" is categorized as a decentralized wastewater treatment system for domestic wastewater discharged by household, building and similar sources.
- Johkasou have a combined purification structure capable of treating both night soil (black water) and miscellaneous wastewater (gray water).
- Johkasou achieve high and stable performance comparable that of sewage treatment plants, and more than 4 million units have been installed across Japan.



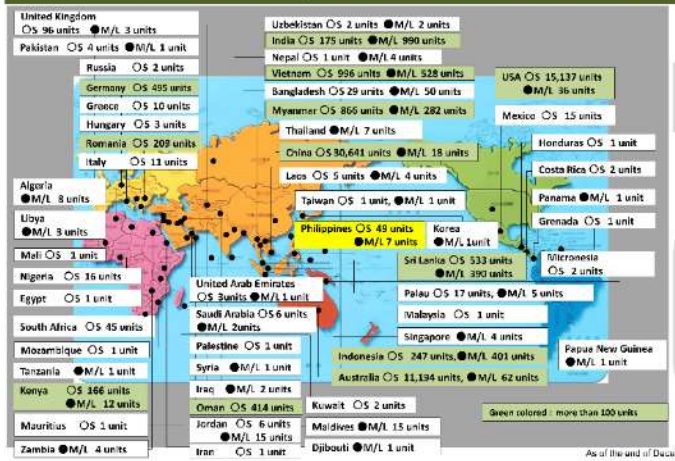
Typical layout of small scale Johkasou for household



Box shape　　Cylindrical shape

9

Installation Records of Japanese Johkasou Overseas (as of Dec.2024)



As of the end of December 2024 by Johkasou System Association

10

Overall concept of water environment improvement and related legal framework

Basic Environment Law

Basic National Environmental Policies

Industrial Wastewater Measures

■ Water Pollution Control Act

- Wastewater Standards for wastewater from factories or establishments
- Regulations on business operators
- Notification, measuring and recording of wastewater, on-site inspection
- Penalties, improvement orders and other administrative guidance

Domestic Wastewater Measures

■ Sewerage Law
Sewerage System Establishment

■ Johkasou Act
Installation of Johkasou etc.

National Government

- Vision
- Law & Regulations
- Technical Standards
- National Subsidies

Sharing responsibility

Local Government

- Master Plan and its implementation
- Ordinance
- Construction, operation and management of sewerage facilities
- Advice and guidance on Johkasou operation and maintenance

11

Johkasou Act

■ Purpose

- Strengthen regulations of manufacturing, installation, operation, maintenance and desludging of Johkasou.
- Provides qualifications for Johkasou installation workers and operators
- Provides registration systems for Johkasou installation vendors and maintenance vendors
- Provide licensing systems for desludging vendors

Promotion of domestic wastewater treatment by Johkasou for conservation of water quality in public water area, preservation of the living environment and improvement of public health

■ Definition

- Johkasou is the decentralized wastewater treatment facility that can treat both black water and gray water from household, building and so on and discharge effluent comply with effluent standards.
- Johkasou should be installed when installing a flush toilet under the Building Standard Law, unless the wastewater is discharged to sewerage systems.

■ Related Laws

Johkasou Act → **Enforcement Ordinance** → **Enforcement Regulations**

Enacted in 1983

Define the scale of Johkasou which need Johkasou Operators etc.

Define the period of inspection, desludging or the technical standard of desludging etc.

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History of Johkasou Act

1960 to around 1980	Widespread use of flush toilets and the installation of old type Johkasou (treating black water only)
1983	Johkasou Act enacted (enforced in 1985)
2000	New installation of old type (Tandoku-shori) Johkasou was prohibited
2005	Stricter water quality management systems introduced
2019	• Strengthening the authority of prefectural governors for conversion from old type to the current type (Gappei) Johkasou • Clarification for proceeding Johkasou installation as a public works • Others

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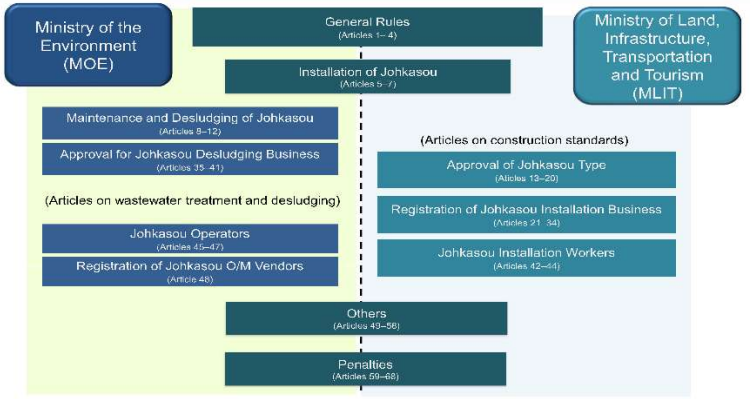
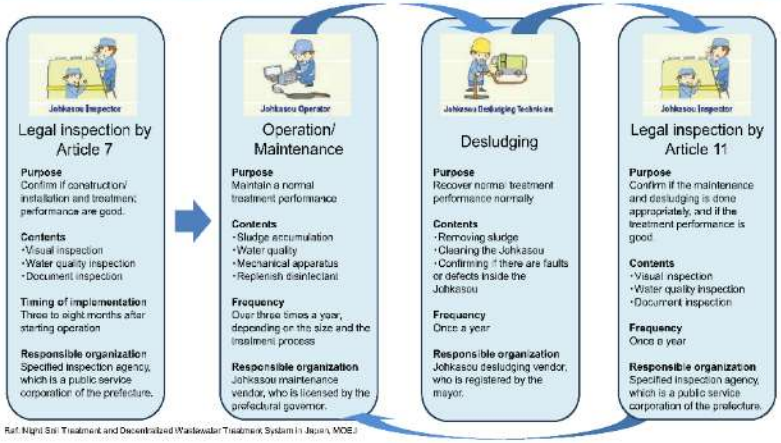
Outline of Articles and its jurisdiction in Johkasou Act



14

Inspection and Maintenance of Johkasou



Ref. Night Soil Treatment and Decentralized Wastewater Treatment System in Japan, MOE)

15

Registration process and qualifications system

16

Training courses for Johkasou Technicians

- Johkasou Technicians should possess extensive knowledge not only in wastewater treatment and Johkasou, but also in water environment conservation and public health.
- The training curricula for Johkasou Operator and Johkasou Installation Worker are outlined as below.

Johkasou Operator by Article 45		Johkasou Installation Worker by Article 42	
Basic of Johkasou	8 hrs	Basic of Johkasou	8 hrs
Laws and regulations related with Johkasou	4 hrs	Laws and regulations related with Johkasou	3 hrs
Structure and function of Johkasou	22 hrs	Structure and function of Johkasou	15 hrs
Introduction of installation of Johkasou	4 hrs	Management of Johkasou installation	8 hrs
Operation and maintenance of Johkasou	30 hrs	Introduction of O&M and desludging of Johkasou	3 hrs
Water quality management of Johkasou	10 hrs		
Introduction of desludging of Johkasou	2 hrs		

Total 80 hours (13 days)
Test 2 hours

Total 37 hours (5 days)
Test 2 hours

17

Thank you for your kind attention

Check Japan's Johkasou System on Youtube

https://www.youtube.com/watch?v=r4xOKGbYWes

6.2.4. An Overview of Johkasou Systems: Challenges of Decentralized Wastewater Management and the Johkasou, 橋本 和司 氏　ADBI　コンサルタント, 日本サニテーションコンソーシアム　顧問

Challenges of Decentralized Wastewater Management and the Johkasou

September 25, 2025
Kazushi HASHIMOTO
ADBI Consultant and Advisor to
Japan Sanitation Consortium (JSC)

1. Challenge of Decentralized Wastewater Management in Developing Countries

Challenges of the on-site sanitation systems (Households)

[**Case of India**]

1. Septic tanks are often dramatically undersized, faultily designed and poorly constructed. Septic tanks are frequently installed underneath homes, driveways or sidewalks due to small lot sizes, thus making access for inspecting or de-sludging difficult.
2. Limited capacities and resources with Local Governments and absence of regulations on maintenance and cleaning of septic tanks and pits are a major challenge.
3. Fecal sludge is dumped on drains and open areas posing considerable health and environmental risks.
4. Sanitary workers work in hazardous conditions manually cleaning on-site pits and tanks without adequate protective gear and equipment.
5. There is a general lack of awareness on septic tanks among the system owners and local governments which results in pollution of the ground and surface water bodies.

(Source) Gov. of Telangana State, India 'Policy on Faecal Sludge & Septage Management' (2018) 1.4 Key Sanitation Issues and Challenges - Telangana

Challenges of the decentralized wastewater treatment systems (Commercial/Institutional buildings)

[**Case of Jakarta, Indonesia**]

In Jakarta, 4,000 commercial/institutional buildings, not connected to the sewerage system, rely on individual treatment plants (ITPs). 58% of them are not managed properly, resulting in non-compliance with the effluent standards. Particularly, sludge management is very poor.

- The reported desludging frequency and de-sludged sludge volume are extremely small compared to assumed sludge generation volume.
- A number of hearing repliers clearly stated that there is such a fact that de-sludged sludge is discharged to rivers and rainwater drainage channels.

(Source) JICA 'The Project for Capacity Development of Wastewater Sector Through Reviewing the Wastewater Management Master Plan in DKI Jakarta' Main Report 'B4.2.3 ITP Built by Others' https://openjicareport.jica.go.jp/pdf/12078630_02.pdf

Challenges of the decentralized wastewater treatment systems (Commercial/Institutional buildings)

[Case of Hyderabad, Telangana State, India]

In Hyderabad, there are 1,200 large commercial and institutional buildings such as IT parks, gated communities, etc.) in the peripheral areas of the city where there is no sewerage system. They are mandated to install high performance Onsite Wastewater Treatment Systems (OWTSs) and to reuse their effluents.

- The results of the Audit (August 2023) indicate that out of the 494 OWTSs surveyed, 253 are functional, 95 are nonfunctional, 46 are under construction, 64 are not installed, and entry is denied for the remaining 36 STPs.

(Source) ADBI Working Paper 'Operation and Maintenance and Performance Monitoring of On-Site Wastewater Treatment Systems in Japan: A Proposal for India' (April 2025) 3.5

https://doi.org/10.56506/BWTF7138

Challenges of the decentralized wastewater treatment systems (Community)

[Case of SANIMAS in Indonesia]

In Indonesia, under the SANIMAS, or 'Community-Based Sanitation' (Sanitasi Berbasis Masyarakat) Program, 21,832 small-scale sanitation sytem (SSS) were built, serving an estimated 6 million people.

In 2019, Bill & Melinda Gates Foundation (BMGF) and Islamic Development Bank (IsDB) conducted an independent evaluation of SANIMAS Program. The results of this evaluation are as follows;

- the overall system performance is poor at 51%, and of concern at 43%, of the investigated sites. At 48% of the investigated sites, one or more signs of serious management challenges were observed.

(Source) Independent Evaluation of SANIMAS Model as an Approach for Providing Decentralised Sanitation (2019)P.11
https://www.isdb.org/sites/default/files/media/documents/2021-03/SANIMAS%20Model_as%20an%20Approach%20for%20Prodiving%20Decentralised%20Sanitation_March%202021.pdf

(Reference) Preparatory Survey for Improvement of Decentralized Wastewater Management in India

Asian Development Bank Institute (ADBI), Japan Sanitation Consortium (JSC) and Administrative Staff College of India (ASCI) jointly conducted the survey (January 2024) and 4 Working Papers are published, which deal with the challenge and solution in the decentralized sanitation/wastewater management both in India and in Japan.

- Wastewater Management and Reuse in Hyderabad, India: Comparison of the Related Regulations Between Japan and India https://doi.org/10.56506/TJRY1633
- Progress of Fecal Sludge Management for On-Site Sanitation and Wastewater Treatment Systems in Warangal City and Hyderabad Metropolitan Region, Telangana State, India https://doi.org/10.56506/AVPO8023
- Operation and Maintenance and Performance Monitoring of On-Site Wastewater Treatment Systems in Japan: A Proposal for India https://doi.org/10.56506/BWTF7138
- Regulation and Monitoring of the Design and Installation of On-Site Wastewater Treatment Systems in India https://doi.org/10.56506/GNRJ3042

Challenges of Decentralized Wastewater Management (not limited to developing countries)

Improper design of the on-site facilities
Lack of monitoring of compliance with the building standards of the on- site facilities
Poor installation of the on-site facilities
Improper management of the sludge generated by the on-site facilities by their owners or users
Unregulated De-sludging Operators working in the difficult conditions
Improper treatment/disposal of the on-site sludge
Improper operation and maintenance of the decentralized wastewater treatment systems
Lack of human resources for the maintenance work
Lack of awareness on the on-site sanitation management system
Lack of accountability

2. Japan's response to these challenges of Decentralized Wastewater Management

Japan's response to the challenge of Decentralized Wastewater Management (1)

Challenges	Japan's Response
Improper design of the on-site systems	• Structural Standards for the on-site systems. • Government approval of the design of the manufactured on-site systems. • Performance testing of the manufactured non-standard on-site system.
Lack of monitoring of compliance with the building standards of the on-site systems	Building confirmation system by the qualified building officials.
Poor installation of the on-site systems	• Registration system of the construction business. • Certification system of the installation workers (national examination/completion certificate of the training course by the designated training institution).

Japan's response to the challenge of Decentralized Wastewater Management (2)

Challenges	Japan's Response
Improper management of on-site system sludge by owners or users	Legal responsibility of the owner/user of the on-site system to de-sludge it regularly, at least once a year.
Unregulated de-sludging workers working in the difficult conditions	Mayor's permission of the de-sludging business, with periodic renewal of the approval.
Improper treatment/disposal of the on-site systems generated sludge	Municipalities' legal responsibility to ensure the safe treatment and disposal of sludge from on-site systems.

Japan's response to the challenge of Decentralized Wastewater Management (3)

Challenges	Japan's Response
Improper operation and maintenance of the decentralized wastewater treatment systems	• The owners/users' legal responsibility to conduct operation and maintenance (O/M) works at the interval specified in the Ordinance. • Registration system of the O/M vendors. • Adopting operator certification system (national examination or completion of a training course conducted by a designated training institution) • Legal responsibility of the owners/users of large systems (≥501 Population Equivalent) to deploy a qualified Technical Supervisor.

Japan's response to the challenge of Decentralized Wastewater Management (4)

Challenges	Japan's Response
Lack of human resources for managing the on-site sanitation system	Training and examination system for installation workers, de-sludging workers, operators and inspectors of the on-site systems.
Lack of accountability	• Annual inspections of the on-site systems by third-party inspection agencies (for all the on-site systems). • Monitoring of compliance with effluent standards by the Prefectural Governor under the Water Pollution Control Law (for large on-site systems (≥60 m^3/day).

For more details;

https://www.adb.org/sites/default/files/publication/711441/adbi-cs2021-01.pdf

14

Enforcement mechanisms for Decentralized Wastewater Management in Japan

[Table of Contents of the Johkasou Act (1983)]

More than half of the articles are dedicated to the qualification requirements for the business and the professionals involved in the installation, operation and maintenance, and desludging.

Chapter 1 General Provisions (Article 1~4)
Chapter 2 Johkasou Installation(Article 5~7)
Chapter 3 Operation/Maintenance of Johkasou and Johkasou Desludging (Article 8~12)
Chapter 4 Approval of the Johkasou Type (Article 13~20)
Chapter 5 Registration Pertaining to Johkasou Construction Business (Article 21~34)
Chapter 6 Permission for Johkasou Desludging Business (Article35~41)
Chapter 7 Johkasou Installation Worker (Article 42~44)
Chapter 8 Johkasou Operator (Article 45~47)
Chapter 9 Registration System of Johkasou Operation and Maintenance Vendors by Regulations (Article 48)
Chapter 10 Miscellaneous Provisions (Article 49~50)
Chapter 11 Penal Provisions (Article 59~68)
(Source) Johkasou Act (Tentative Translation) www.env.go.jp/recycle/jokaso/en/pdf/johkasou_act.pdf

3. How much does the Johkasou cost?

How much does the Johkasou cost? (OPEX)

Breakdown of Annual O&M Cost of **Johkasou** in Japan

	5 PE Type	Note
Maintenance fee	JPY 15,000 (USD 100)	Three times/year
Spare parts and consumables	JPY 6,000 (USD 40)	
Desludging fee	JPY 26,000 (USD 173)	Once a year
Electricity fee	JPY 13,000 (USD 86)	
Inspection fee	JPY 5,000 (USD 33)	Once a year
Total (Annual O&M Cost)	JPY 65,000 (USD 433)	
Monthly O&M Cost	JPY 5,416 (USD 36)	

Annual O&M Cost of Johkasou in Developing Countries

	5 PE Type	60 PE Type
Maintenance fee	USD 14	USD 19
Spare parts and consumables	USD 14	USD 165
Desludging fee	USD 35	USD 417
Electricity fee	USD 18	USD 209
Inspection fee	USD 5	USD 5
Total (Annual O&M Cost)	USD 86	USD 815
Monthly O&M Cost	USD 7	USD 68

Remark: The above figure are hypothetical figures based on the assumption that the service frequency is provided as in Japan, while the labour cost in developing countries is one-tenth of that of Japan. The price of spare parts and consumables in developing countries are assumed to be 1/4 of that of Japan. The desludging and electricity fees are those paid in India.

17

How much do the MWCI Customers pay for the sewerage service?

			Wastewater Charge (WWC) Total			Payment for wastewater service /household (equivalent) /month
	Water consumption (cu.m. per month)	Water Charge (WC)	Environmental Charge (25% of WC)	Sewerage Charge (32.85% of WC)		
Residential customer (HH)	20	P 433	P 108	-	P 108	P 108 (USD 1.9)
Business Group 1 customer	300 (equivalent to 15 HHs)	P 26,805	P 6,701	P 8,805	P 15,506	P 1,033.7 (USD 18.1)

(Source: NOTICE TO MANILA WATER CUSTOMERS AND THE PUBLIC NEW WATER RATES FOR THE EAST ZONE [illegible])

4. Conclusion

- Decentralized Wastewater Management in developing countries faces serious challenges. Its improvement is essential not only for households but also for commercial/institutional users.
- These challenges are not limited to the developing countries. Japan had also encountered the similar challenges in 1960s-1970s and overcame them by the establishment of the Johkasou Act (1983).
- For the effective decentralized wastewater management, regulations, penalties or standards are not enough. The most important is to establish the enforcement mechanisms of these regulations and standards. The Johkasou Act in Japan contains a lot of enforcement measures.
- Johkasou would be an affordable option for the commercial and institutional users in the Philippines, as far as the appropriate enforcement mechanisms are established in the Philippines.

Thank you for your attention!

khashimoto1@adbi.org

6.2.5. JOHKASOU SYSTEM-How Important Maintenance Services, Mr. Kenn Jerone Omar, KUBOTA Water and Environment Philippines, Corp.

JOHKASOU SYSTEM-How Important Maintenance Services-

Presenter: Mr. Kenn Omar, Sales Engineer

KUBOTA WATER AND ENVIRONMENT PHILIPPINES CORPORATION

SEPTEMBER 25, 2025

For Earth, For Life
Kubota

HIGLIGHTS OF KUBOTA JOHKASOU

- KUBOTA HAS BEEN MANUFACTURING AND SUPPLYING JOHKASOU FOR OVER 50 YEARS
- EFFLUENT WATER QUALITY IS COMPLIANT WITH DENR ADMINISTRATIVE ORDER 2016-08 AND 2021-19 FOR WATER CLASS A, B, C, D.
- REMOVES AMMONIUM NITROGEN (NH4-N), NITRATE NITROGEN (N03-N) AND PHOSPHATES (PO_4^{3-}-P).
- TREATMENT PROCESSES: MOVING BED BIOFILM REACTOR (MBBR) AND MEMBRANE BIOREACTOR (MBR). KUBOTA JOHKASOU MBR IS INSTALLED WITH KUBOTA MANUFACTURED MEMBRANES.
- INTEGRATION WITH KUBOTA SMART INFRASTURCTURE SYSTEM (KSIS)
- CONTRIBUTUION OF REDUCING GHGs from SEPTIC TANK System

2

For Earth, For Life
Kubota

INSTALLATION RECORDS

Asia
- China
- Vietnam
- Myanmar
- **Philippines**
- Thailand
- Indonesia
- Bhutan
- Bangladesh
- Sri Lanka
- Laos
- Oman
- Saudi Arabia

OVER 30,000 UNITS INSTALLED IN 25 COUNTRIES OUTSIDE OF JAPAN SINCE 2009

Japan

Africa
- Kenya
- Djibouti

Oceania
- Australia
- Papua New Guinea
- Palau
- Fiji
- Tonga

America
- America
- Nicaragua
- Panama
- Algeria

3

For Earth, For Life
Kubota

APPLICATIONS OF JOHKASOU

KUBOTA JOHKASOU can treat various source of wastewater such as from kitchen, toilet, bath, laundry , etc.

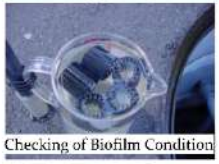
ENSURING THE PERFORMANCE OF THE JOHKASOU

It is important that the Johkasou System is properly monitored and maintained through the following measures:

Routine Inspection – conducted monthly to quarterly, **Periodic Maintenance** – every 6 to 12 months, **Annual Servicing**, **Emergency Maintenance** as needed.

With our local presence here in the Philippines, we ensure reliable after-sales service and support.


Water Quality Monitoring


Checking of Biofilm Condition


Tank Cleaning


Check operation status of blower


Check control panel


Desludging Work


Checking of Membrane Condition

For Earth, For Life
Kubota

WE ARE IN THE PHILIPPINES

KUBOTA (KBT) → KUBOTA JOHKASOU SYSTEMS (KJS)

Johkasou Manufacturer

Johkasou Supplier

KUBOTA ENVIRONMENTAL ENGINEERING (KKE)

KUBOTA WATER AND ENVIRONMENT PHILIPPINES CORP. (KWP)

- We are an EPC (Engineering, Procurement, and Construction) company.
- We offer services on operation and maintenance of WWTP/STP.
- We supply chemicals and consumables.

KWP provides all necessary engineering services, including operation and maintenance, water and wastewater analysis, and chemical supply, to ensure the performance of Johkasou.

For Earth, For Life
Kubota

6.2.6. FujiClean Johkasou Seminar in Philippines-, 前田 幹太郎 氏　フジクリーン株式会社 海外事業部 係長

FujiClean

Johkasou Seminar in Republic of the Philippines

1

Introduction・会社紹介

FujiClean

FujiClean has over 60 years of experience developing Johkasou technologies.

60年以上にわたる浄化槽技術の開発

FujiClean Johkasou sales exceeding 50,000 units a year.

年間5万基以上の販売実績

Developing an original diaphragm air pump

2

Project Histories・販売実績

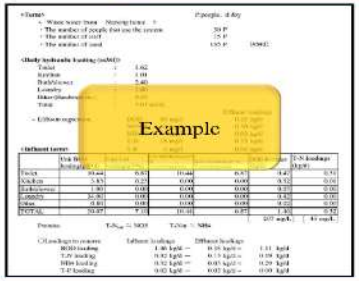
FujiClean

3

Selection of Johkasou・浄化槽の選定

FujiClean

Based on design information such as the building's purpose and expected number of users, we select the Johkasou.

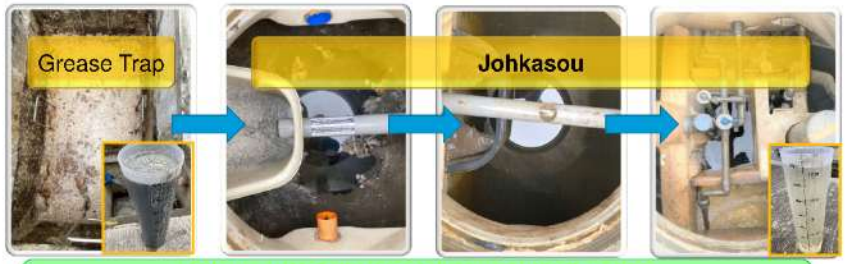


Which should be selected?

4

The Importance of Maintenance・維持管理の重要性

FujiClean

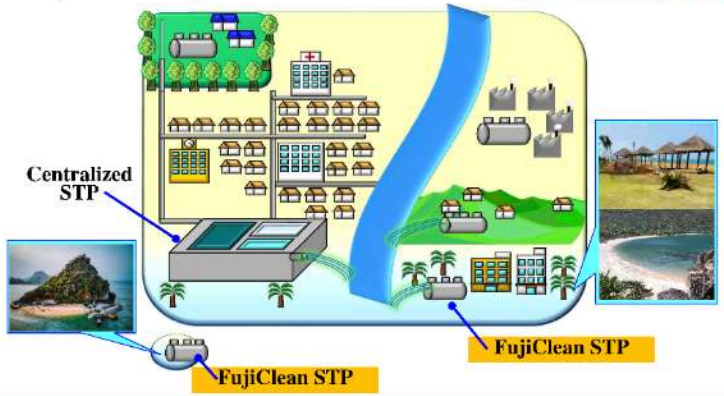


Johkasou are systems that require maintenance.
Adjusting them every few months ensures they continue to function properly.

浄化槽は維持管理が必要なシステムです。
数か月に一度調整することで、機能が保たれます。

5

JICA Project in Baguio



6

FujiClean

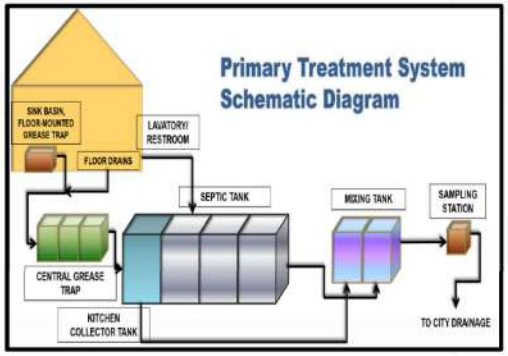
Let's restore natural waterways and make them clean enough for children to play in.

7

6.2.7. Behind the Counter: Environmental Challenges of Fast-Food Chains on Philippine Water Systems-, Mr. Darlito C. Guamos, Assistant Vice President and Environmental Management Unit Head – Jollibee Group

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

QSR WASTEWATER TREATMENT SYSTEM BEFORE DAO 2016-08



EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

CHALLENGES:

Our stores are currently enhancing our wastewater management to be able to adhere with the

- Limited Interconnection Facility
- Limited STP Providers
- Business Viability
- Operation and Maintenance
- LGU Requirements

EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

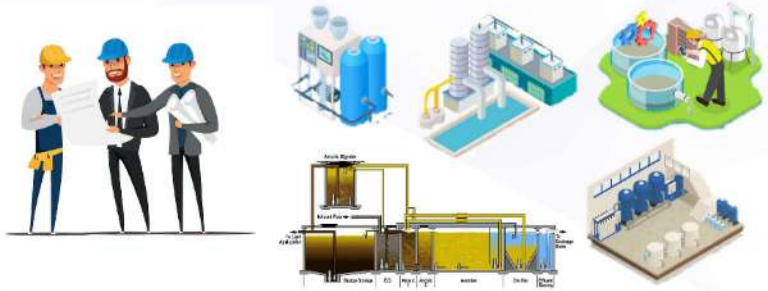
LIMITED INTERCONNECTION FACILITY

EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

LIMITED STP PROVIDERS FOR QSR



EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

BUSINESS VIABILITY

CAPEX (STP Cost): **2M to 4M**

OPEX (Annual): **500K to 700K**

EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

OPERATION AND MAINTENANCE

EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN

GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT

LGU REQUIREMENTS

EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT

MINISTRY OF THE ENVIRONMENT - JAPAN


GOVERNMENT-TO-GOVERNMENT SEMINAR ON DECENTRALIZED WASTEWATER TREATMENT
Together, Let's Continue to Spread Joy and Protect the Environment
Jollibee Group
EMB CENTRAL OFFICE - WATER QUALITY MANAGEMENT
MINISTRY OF THE ENVIRONMENT - JAPAN