

Summary of Workshop

Tetsuo Kuyama, IGES

Output 1

Networking among Excellent
Experts on Decentralized Domestic
Wastewater Treatment in Asia



Output 2

Knowledge about technology and management framework of decentralized domestic wastewater in Asia.



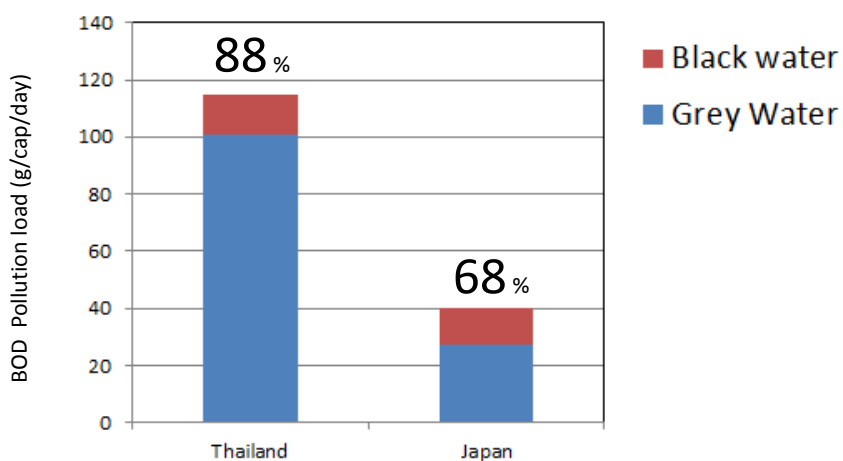
3 On-site Treatment System

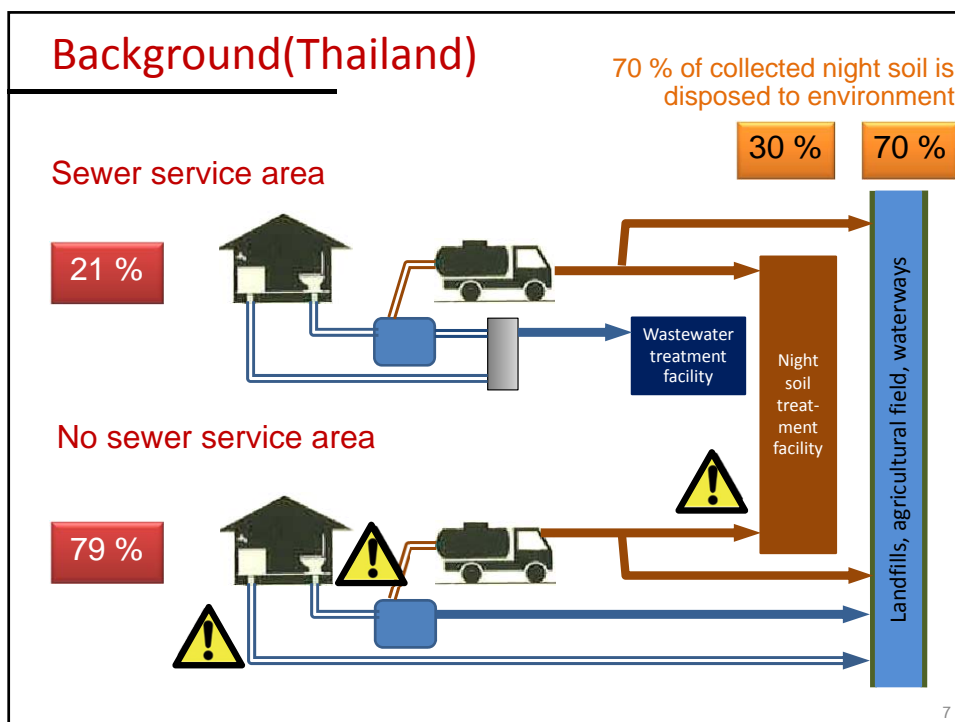


8 clusuter Treatment System



Impact of Grey Water to Water Environment



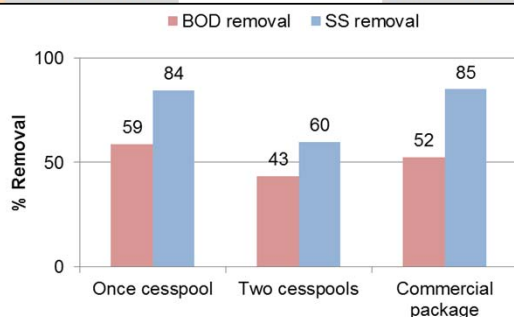


Septic Tank (common method as on-site)

Malaysia (2010)	20%
Vietnam (2008)	41%
Indonesia (2012)	53%
Cambodia (2008)	43%
Manila/Philippine (2010)	71%

Water Quality : Influent and Effluent

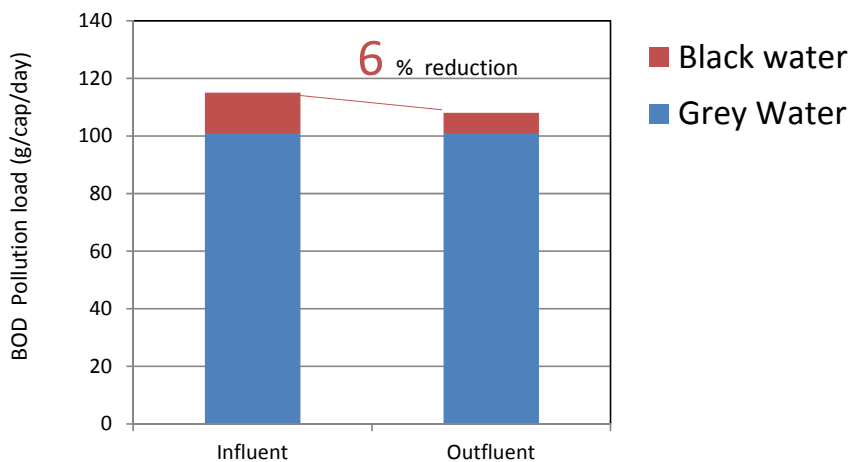
	BOD (mg/L)				SS (mg/L)			
	Influent		Effluent		Influent		Effluent	
	Range	Avg.	Range	Avg.	Range	Avg.	Range	Avg.
Once cesspool	705-4,520	2,289	123-3,000	946	68-11,685	2,998	8-2,115	470
Two cesspools	66-6,450	2,537	25-9,517	1,436	102-1,556	608	4-1,068	245
Commercial package	519-3,075	1,783	658-1,157	849	204-4,030	1,461	64-356	220



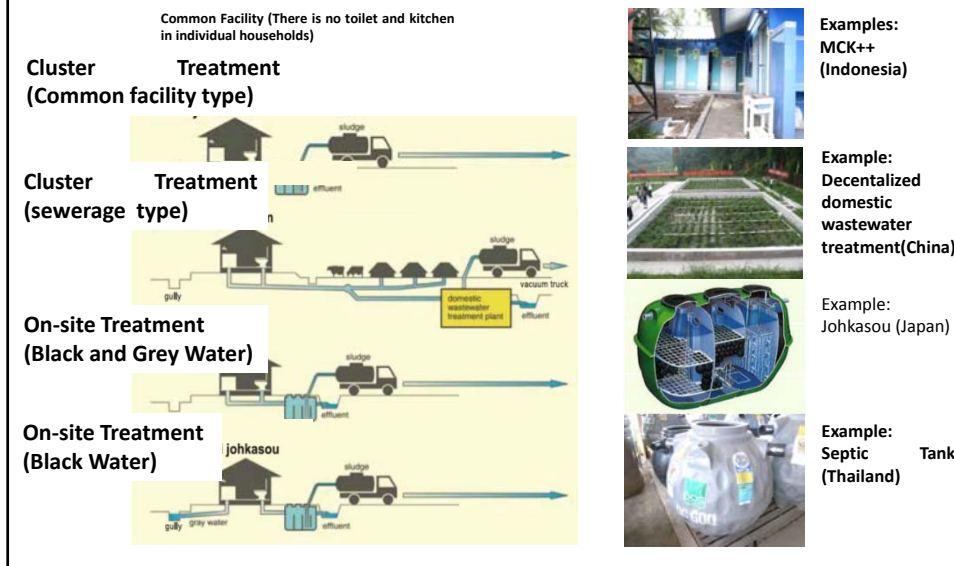
Source: Dulyakasem, S., et. al., 2013. Determinations of Blackwater characteristics and sludge accumulation rates in Decentralized Wastewater Treatment Systems (DEWATs) in Thailand

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Removal Rate (BOD) of Septic Tank for Domestic Wastewater including Black water and Grey water



Diversity in Methodology of Decentralized Domestic Wastewater Treatment in Asia



In addition to Cost and Water Quality/Removal Rate following factors should be considered

- Required Land Area
- Detention time
- Lifetime of facility
- Optimum Temperature
- Required Skills for O&M
- others

WEPA's message (tentative) (1)

Appropriate technology should be decided considering **natural and socio-economical condition** at the site

Responsible Entity for Construction and Operation

Local Government

[Example]

- Construction and operation of decentralized domestic wastewater treatment in China
- Construction and operation of cluster domestic wastewater treatment in Thailand

Private company/ developer

[Examples]

- Construction and operation of small scale domestic wastewater treatment facility in Malaysia (Developer/IWK)
- Construction and operation of small scale domestic wastewater treatment facility in Manila (Manila Water and Manilad)

Community

[Examples]

- Construction and operation community based domestic wastewater treatment plant in Indonesia (SANIMAS)

Individual person (house owner)

[Examples]

- Installation and operation of on-site domestic wastewater treatment (Johkasou) in Japan
- Installation and operation of septic tank in Thailand and Manila

Law or regulation for decentralized domestic wastewater treatment

Thailand's septic tank

- Construction: "Building Control Act(1979)"
- Effluent Quality Standard: "National Environmental Quality Act(1992)"
- Septage Management : "Public Health Act(1992)"

Japan's Johkasou

- People lived in non-sewerage coverage area must install Johkasou based on "Johkasou Law(1982)"
- New installation of Johkasou treating only black water has been prohibited by 2001

China

- Standard for urban domestic wastewater discharge (GB18918-2002)
- Rural domestic wastewater discharge standard(D64/T700-2011)
- Technical guideline for rural domestic wastewater treatment (DB64/T699-2011)

Indonesia

- Domestic water must be discharged based on effluent standard (NO.112 2003 established by MOE)
- Water Pollution Control Law (No 82 2001) regulate the responsibility of government and local government for domestic waste water management

Thailand's cluster treatment

- "Enhancement and Conservation of National Environmental Quality Act(1992)"
- The Plan and Decentralization Process to Local Government Organization Act(1999)
- State government has concession agreement with IWK on domestic wastewater management

Philippine

- MWSS has concession agreement with Manila Water and Manilad on domestic wastewater management
- Based on the concession, 100% domestic wastewater must be treated by 2037

Cambodia

- National Effluent Quality Standards: Sub-decree on water pollution control-No27 ANRK BK 1999

Subsidy System

Japan (Johkasou)

40% from Central and Local government (Individual type)

90 % from from Central and Local government (Municipal type)

Thailand

90 % from Central government

10 % from Local government

Indonesia (SANIMAS)

100 % from Central government

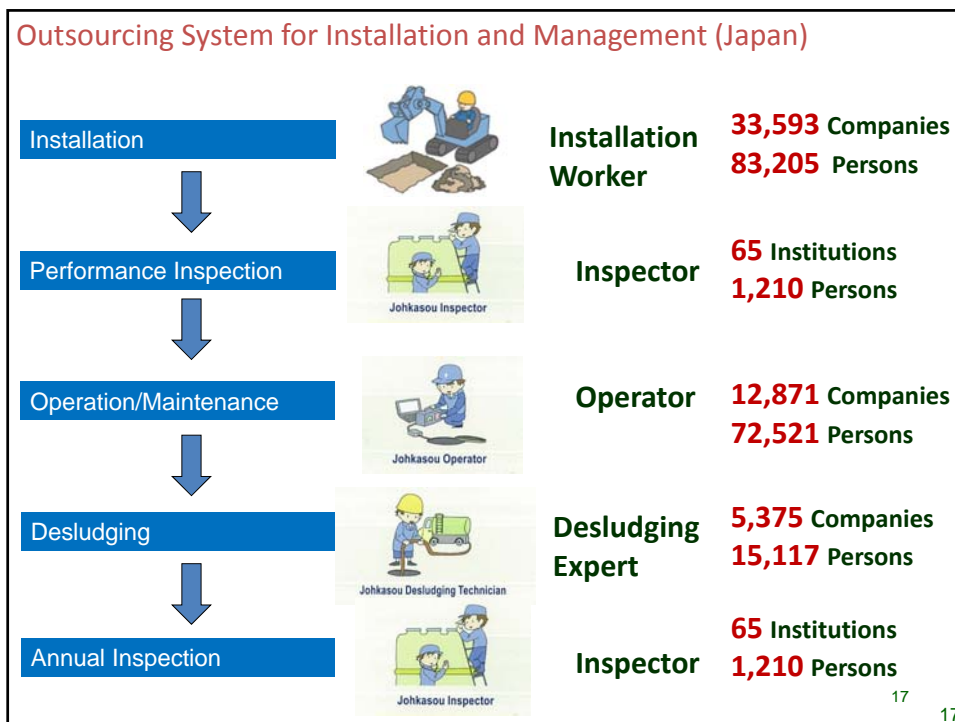
Guideline for Technological Standardization




Japan
(for Johkasou)




Indonesia
(for SANIMAS)




Education
SANIMAS FACILITATOR 

- SANIMAS Implementation assist by 2 facilitator (Technical & Social)
- Criteria of Facilitator:
 - ❖ Minimum Education : Diploma
 - ❖ Healthy
 - ❖ Having good ability of communicating and speak local language fluently
 - ❖ Familiar with the condition of SANIMAS area (geographic & culture)
- Facilitator Trained for 7 days on the beginning of fiscal year (February –March)
- Training material given by various stakeholders (MoPW, Ministry of Health, Ministry of National Affairs, National Planning & Development Agency) incooperated with BORDA.



SOCIALIZATION OF SANIMAS
SANIMAS SEPATAN, TANGGERANG



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WEPA's message(2) (tentative)

- In order to encourage proper installation and operation, regulations alone are not sufficient. **Governmental support** in the respect of **technological standardization, financing, outsourcing and education** is needed.

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Charging System



Environmental Tariff (Manila Water)

Sewerage users **50 % to 20%**

Non sewerage User **0% to 20%**



Sewerage service fee

RM 3/month (for low-cost house)

RM8 /month (for conventional houses)



Fee for SANIMAS

0.5 – 1 USD/month

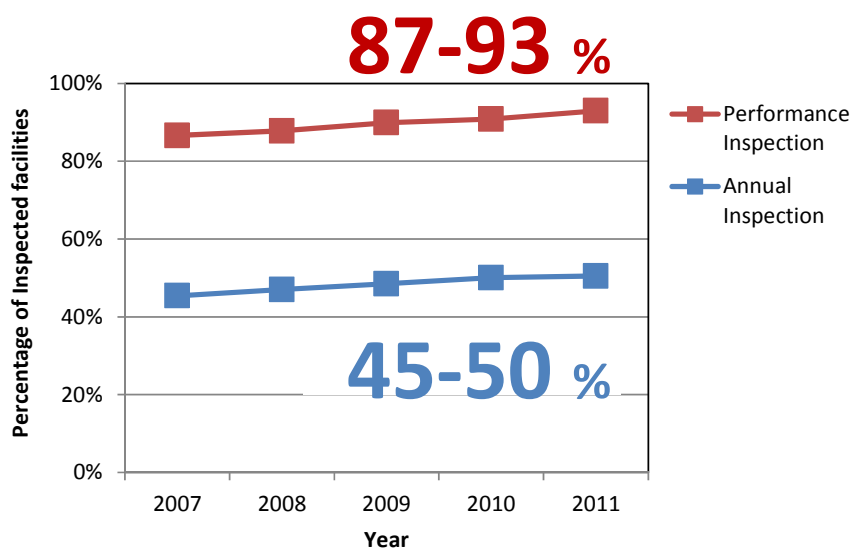
0.1 USD/ day



Wastewater Fee Collection

Collected : **Only 8** plants among **100** plants

Monitoring



Historical Change of Inspected Johkasou in Japan

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WEPA's message(3) (tentative)

- **Proper Operation and Maintenance** including **Charging** and **Periodical Monitoring** is required for sustainable management of decentralized domestic Wastewater treatment system.

WEPA's Future Plan

- **Summarizing** technology and management framework of decentralized domestic wastewater treatment in Asia (Documentation)
- **Strengthening WEPA data** to share different technologies decentralized domestic wastewater treatment in Asia
- **Organizing Small WS/Twinning program** to share more specific topics on management of decentralized domestic wastewater treatment in Asia

Discussion

- **What's factors** should be considered in order to promote decentralized domestic wastewater treatment approach to Asian region.
- **What's topic** do you like to obtain or share more detail in the next step .
- **What's activities** are needed to enhance decentralized domestic wastewater treatment system in Asia
- **Others**

Thank you

Tetsuo Kuyama
kuyama@iges.or.jp

