

August 6, 2024

Current status of domestic wastewater treatment in Asian countries and examples of initiatives aimed at solving the issues

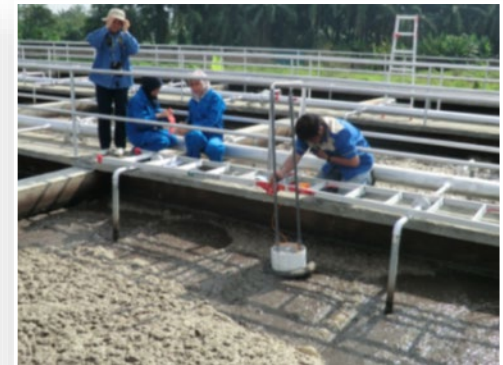
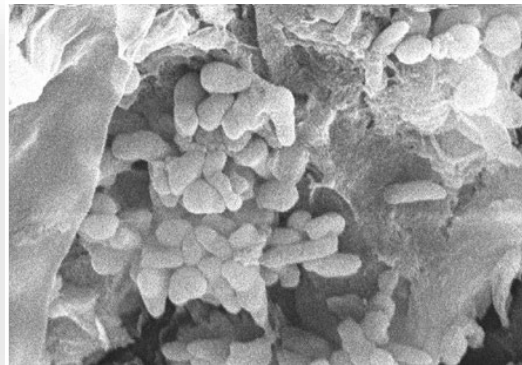
Dr. Yoshitaka Ebie

National Institute for Environmental Studies, Japan

Self-introduction



- Name: Dr Yoshitaka Ebie (yoshi)
- Research fields: Wastewater treatment engineering, molecular microbiology, greenhouse gas inventory, and disaster management.



International activities



- ISO TC224/WG8: Guidelines for the management of basic onsite domestic wastewater services



- 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands
- 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories



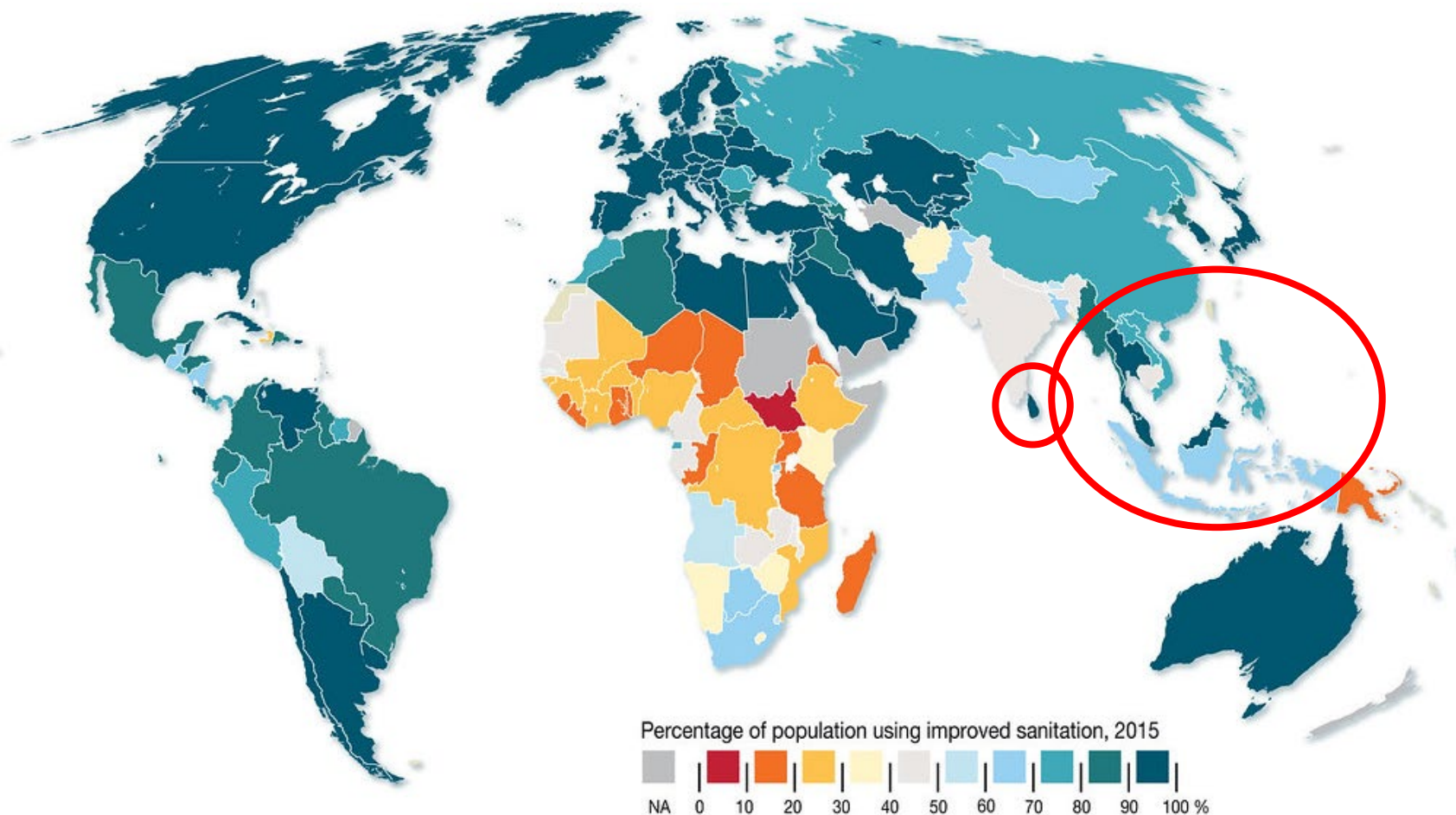
Millennium Development Goals



- Sanitary issues
 - Open defecation
 - Bucket/container
 - Pit latrine without slab
 - Shared
 - No tank/sewer pipe



Percentage of global population with access to improved sanitation (2015)



Pour flush toilet



Septic tanks



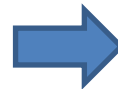
- Primary treatment
- No maintenance
- Overflow (full of sludge) or infiltration (bottomless)

Sustainable Development Goals



Goal 6.3
Halving the proportion of untreated wastewater by 2030

MDGs
Sanitary issues



SDGs
Environmental issues

Open defecation
Bucket/container
Pit latrine without slab
Shared
No tank/sewer pipe



Primary treatment
Secondary treatment
Tertiary treatment



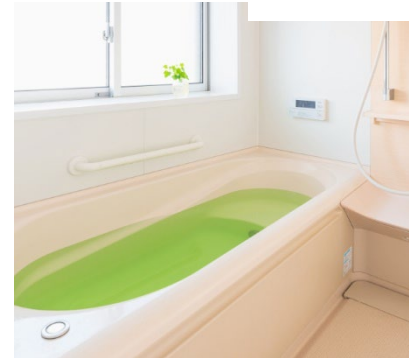
SDGs



MDGs



MDGs

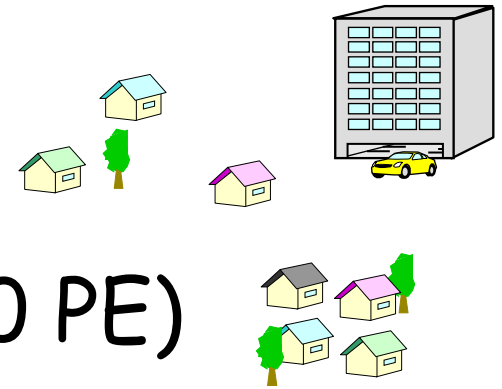


WATER

On-site and off-site

On-site/decentralized

- Individual (ex. 1 HH; 5 PE)
- Communal (ex. 2-10HH; 10-50 PE)

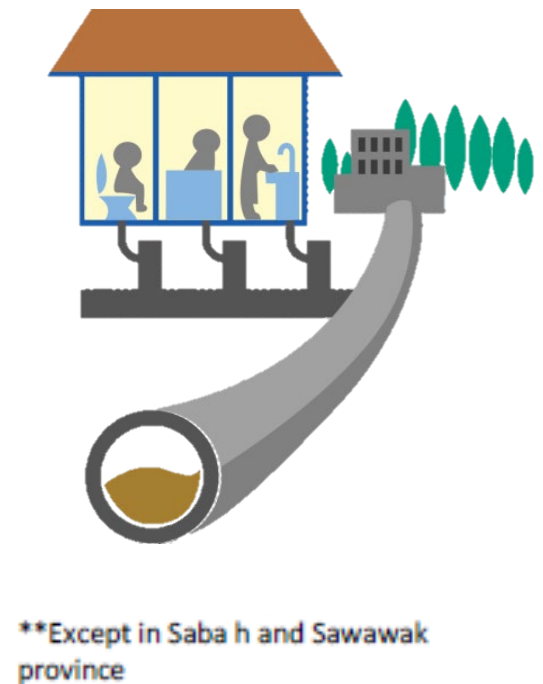
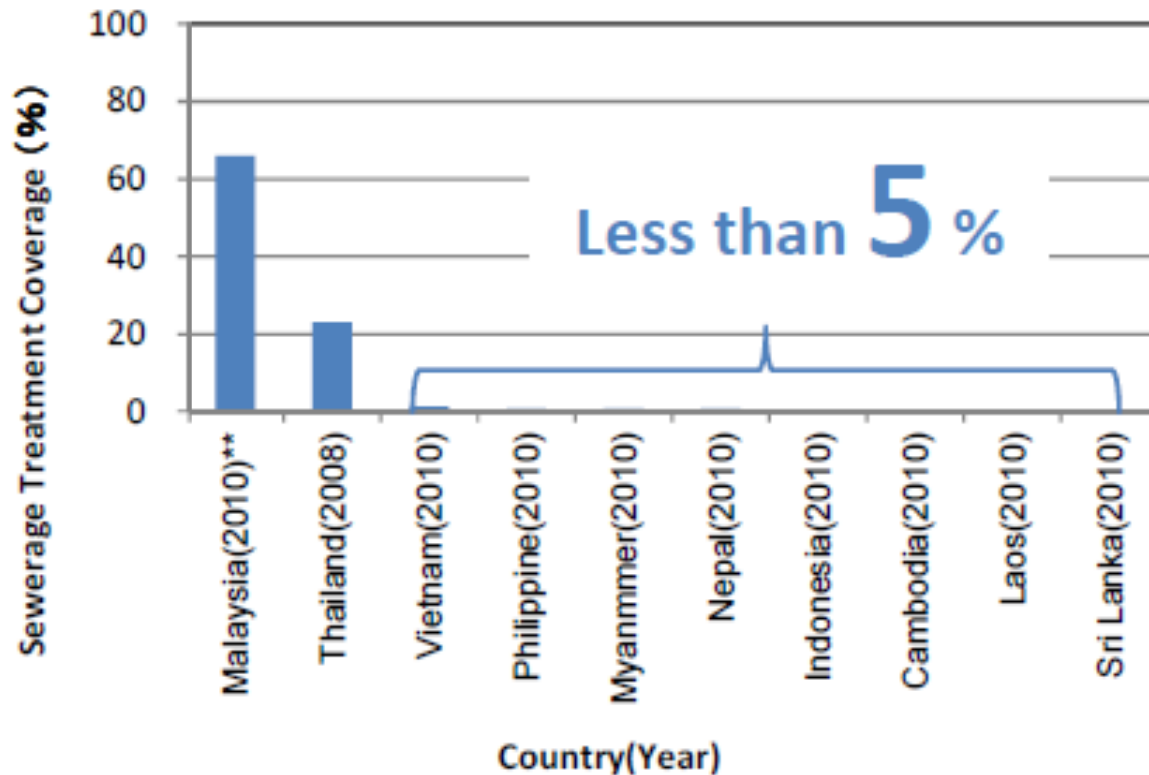


Off-site

- Settlement scale: ex. 50~20,000 PE
- City scale: ex. >20,000 PE

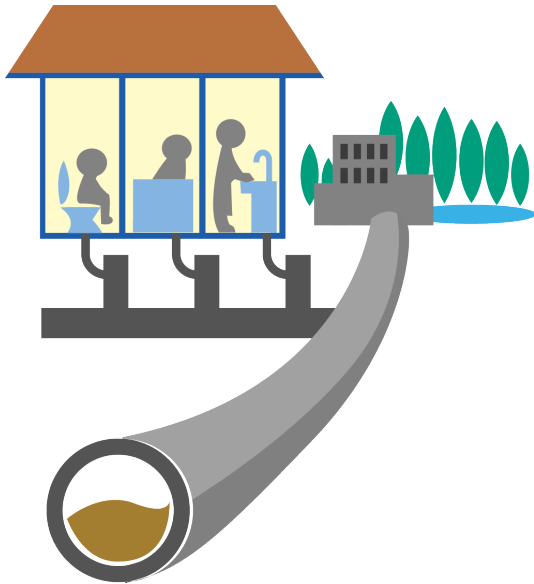


Centralized treatment facilities in Asia



Length of sewer pipe

490,000 km
in Japan

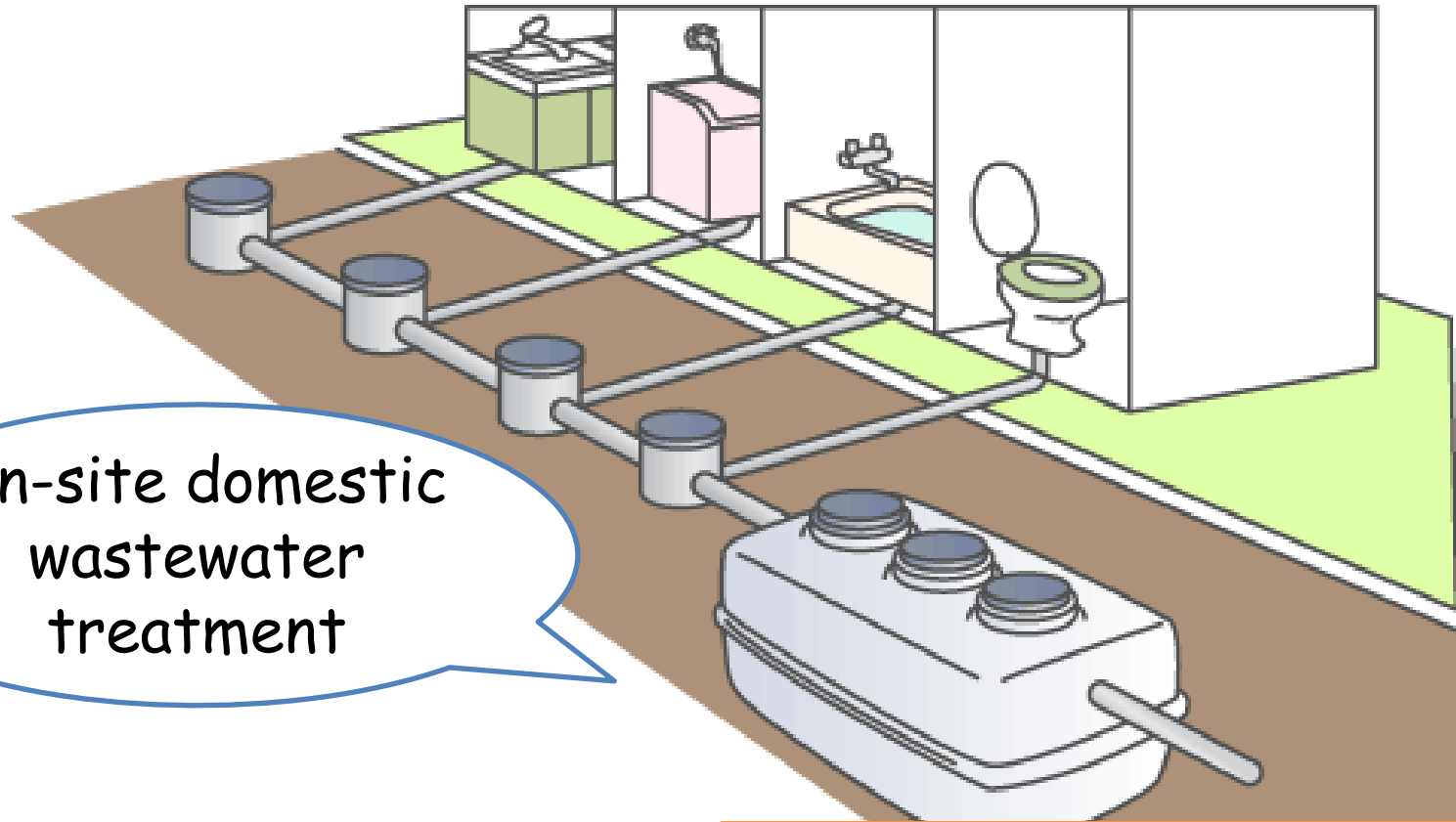


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380,000 km
to the moon



Case in Japan



On-site domestic
wastewater
treatment

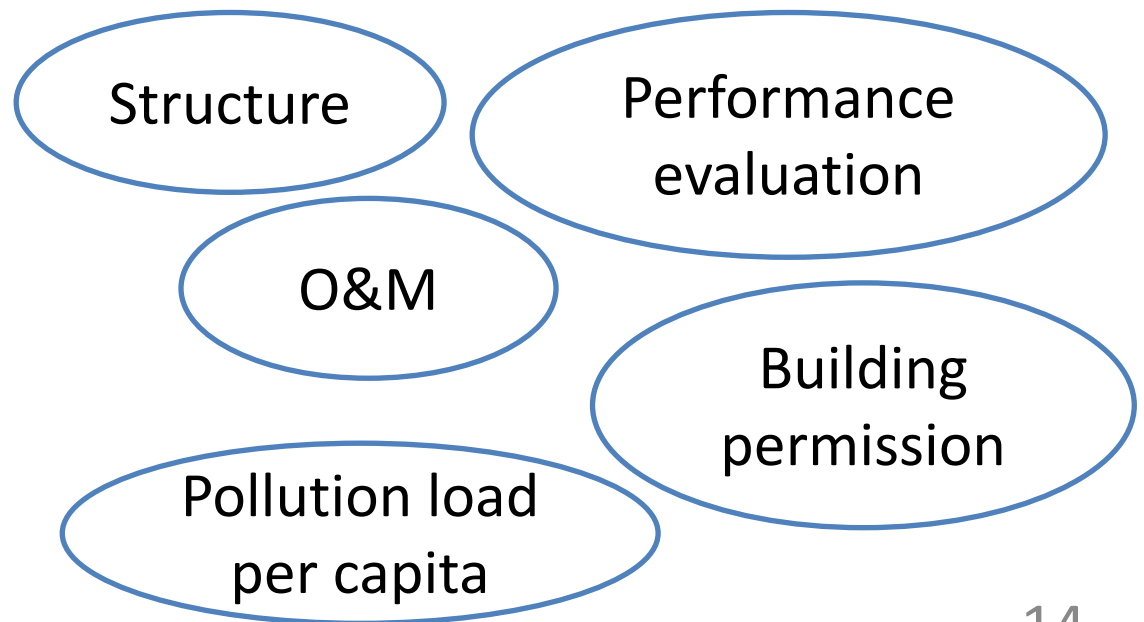
*You don't need to wait sewer
pipe network comes to you.*

A Key Message for reliable and sustainable wastewater management

SDG global indicator: Proportion of domestic and industrial wastewater flows safely treated

- **Standardization** of wastewater treatment systems in National, Regional or International level

- Necessity
- Difficulty



5 things we need to consider for dissemination of appropriate wastewater treatment technologies

1. Effluent **standards**
2. Structure standards and/or standardized performance evaluation
3. Standardized O&M and monitoring
4. Standardized Sludge collection, treatment and disposal
5. Standardized license for technicians and/or service providers

Regulation has been updated

- Ministry of Environment and Forestry has issued new effluent standard for domestic wastewater (2016).
- This new and **stringent regulation for domestic wastewater is a major step forward** to improve water environment.

Parameters	Unit	Old Regulation	New Regulation
pH	-	6-9	6-9
BOD	mg/L	100	30
COD	mg/L	-	100
TSS	mg/L	100	30
Oil and Grease	mg/L	10	5
Ammonia	mg/L	-	10
Total Coliform	N/100 mL	-	3,000
Discharge	L/person/day	-	100

On-site/decentralized domestic wastewater treatment facilities



Septic tank



Biofil



IPAL



septic tank?

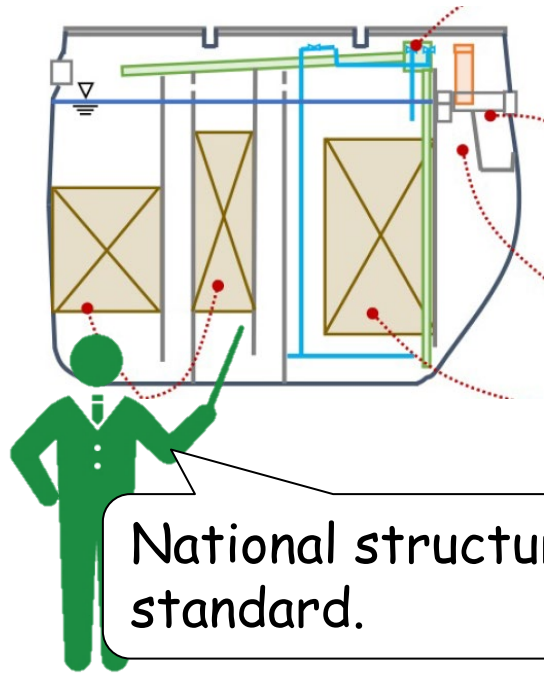


Are they all reliable?

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Compliance to the regulation may not be ensured



National structure standard.



You don't need to worry about new effluent standard with our new product.



Nobody knows!



We need a standardized performance testing method and reliable certification system

European Standard (EN)

EN12566-3: Small wastewater treatment systems for up to 50 PE



The United States

NSF/ANSI Standard 40: Residential Wastewater Treatment Systems

Australia

AS/NZS 1546 Part 3: Aerated wastewater treatment systems

Japan

Performance testing method for Johkasou

Platform for the standardization



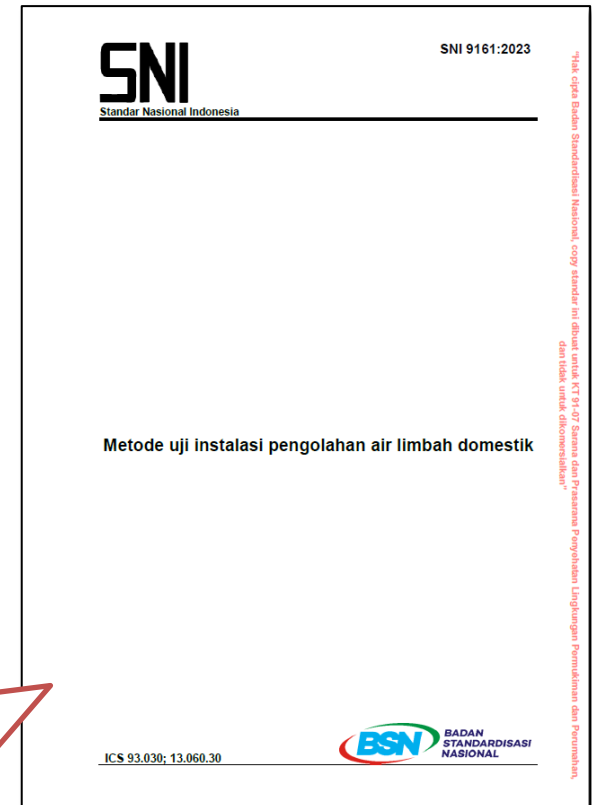
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Stakeholders Meetings

Industry-academia-government
collaboration

SNI 9161:2023
Standardized testing method of
domestic wastewater treatment plant
in Indonesia



Advantages

- If you have no standard, it would be chaos.
- If you have different local standards in different area of your country, manufacturers need to have different kind of products for each area.
 - This must exert upward pressure on price.
- If we standardize these local standards, we can make a big market within the area sharing the same standard.

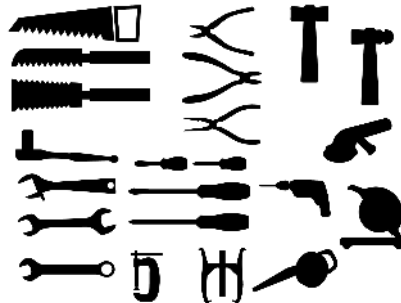
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- If you have standardized structure or performance evaluation, O&M procedures and frequency could also be standardized.



Otherwise, you must learn many O&M procedures for every single site and prepare many kinds of tools.



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- Regular desludging is closely related with the standardization of treatment facilities.
 - Japanese law requires annual desludging, then manufacturers design the capacity of the sludge storage tank with this condition.
- Desludging procedures also rely on the standard of the treatment facility.
 - Manhole size, desludging port size, depth, etc.

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Construction

National vocational qualification
(Registration to the prefecture)



Operation



Desludging

Private qualification
(Approval from the municipality)

- Civil engineering, microbiology, mechanical engineering, etc.
- Quality control of services



Thank you for your kind attention.

Your valuable comments and suggestions would be highly appreciated.



Question?