Seminar on Improving Water Environment in Indonesia

November 14, 2023

How to secure the performance of the decentralized wastewater treatment facilities?

Dr. Yoshitaka Ebie

National Institute for Environmental Studies, Japan

Sustainable Development Goals

Goal 6.3
Halving the proportion of untreated wastewater by 2030

MDGs
Sanitary issues

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

Unimproved toilet

SDGs
Environmental issues

Primary treatment
Secondary treatment
Tertiary treatment

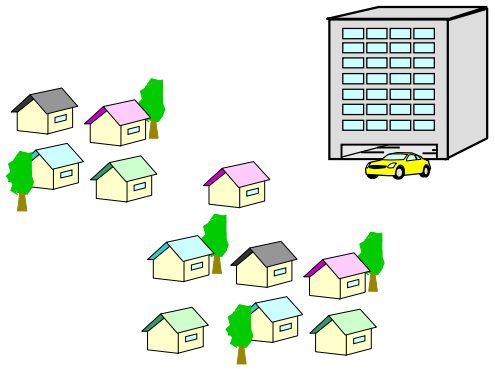
Untreated wastewater

NIES, Japan

On-site and off-site in Indonesia

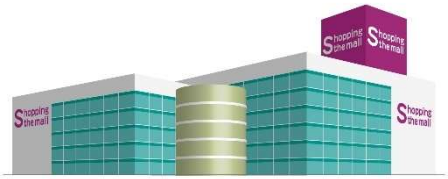
SPALD-S: On-site

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



SPALD-T: Off-site

- Settlement scale: 50～20,000 PE
- City scale: >20,000 PE
- Specific area: subsidized apartments and commercial buildings



Decentralized domestic wastewater treatment facilities

Septic tanks

Biofil

IPAL

septic tank?

Are they all reliable?

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

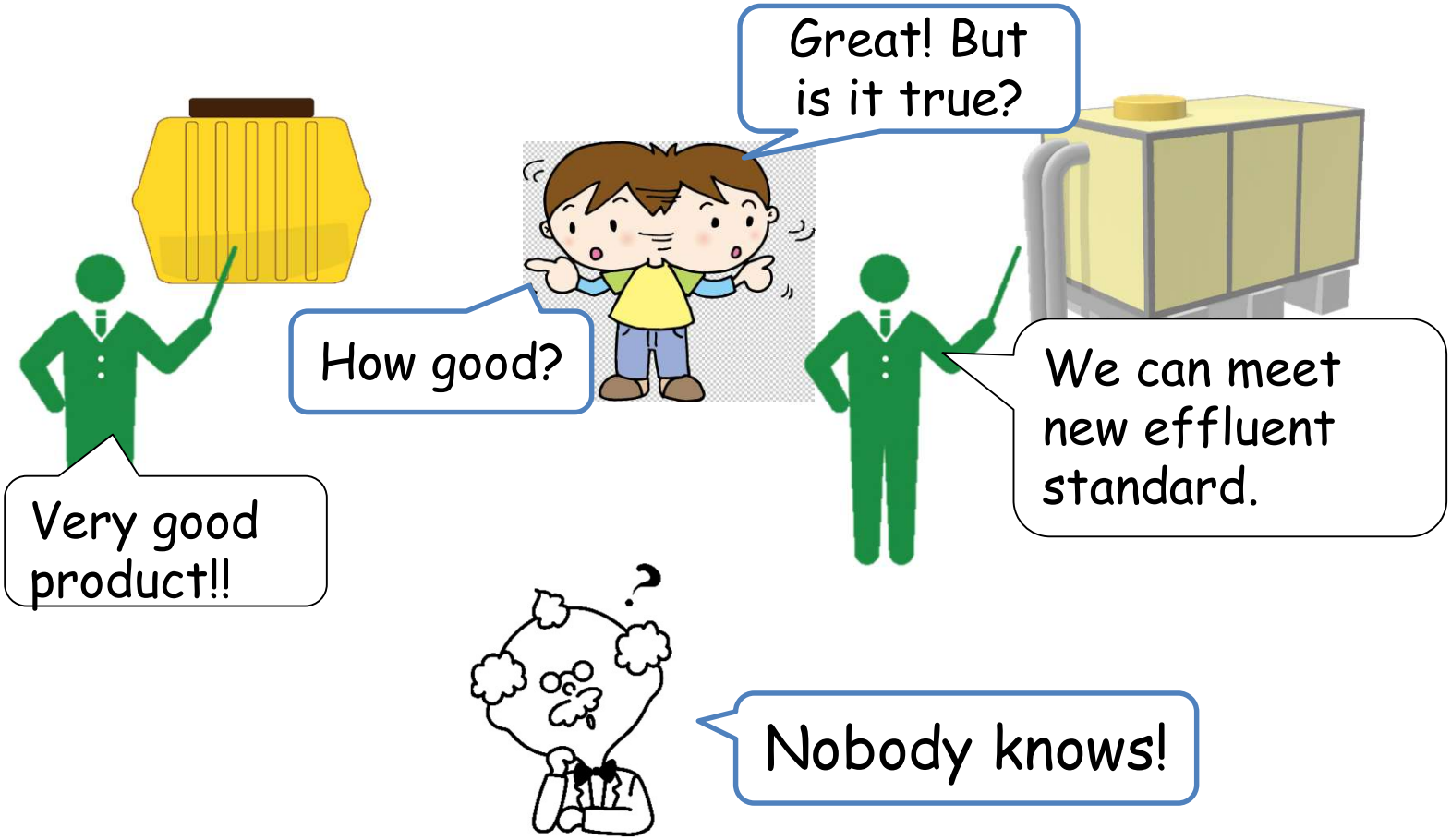
1. Effluent standards
2. Structure standards and/or **Performance certification**
3. O&M and monitoring systems
4. Sludge collection, treatment and disposal systems
5. License for technicians and/or service providers

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

Compliance to the regulation may not be ensured



We need standardized performance testing method and reliable certification system

The Stakeholders Meeting in Indonesia

To tackle this urgent problem, we have launched "the Stakeholders Meeting on domestic wastewater treatment" in 2015.

Central gov.

Local gov.

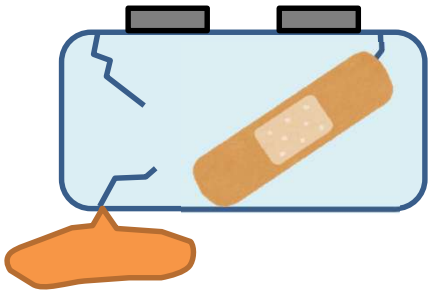
Univ.

Manufacturers

Industry-Academia-Government Collaboration

Summary of discussion

- We need more manufacturers to distribute domestic wastewater facilities in all Indonesia.
- However, it's easy to make a profit if they produce poor performance and/or weak tanks.



To eliminate low quality treatment facilities from the market

Performance testing method and Reliable certification system are required!!

Major standards in the world

NIES, Japan

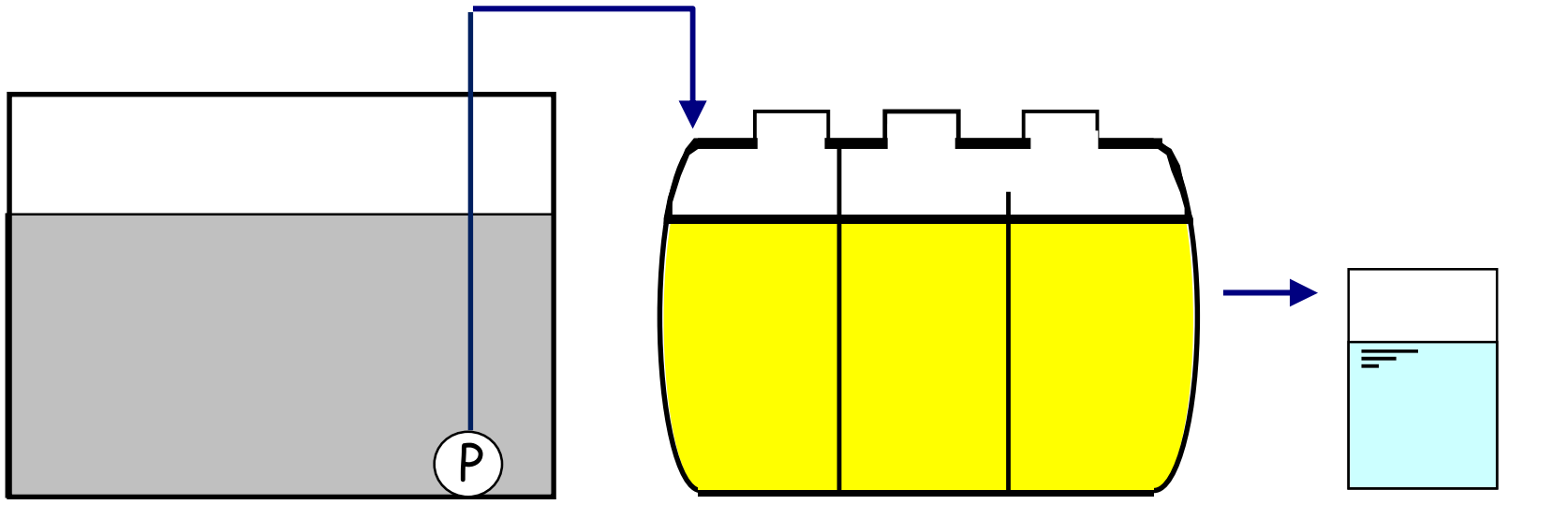
European Standard (EN)
EN12566-3: Small wastewater treatment systems for up to 50 PE

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

Testing methods



1. Feed wastewater

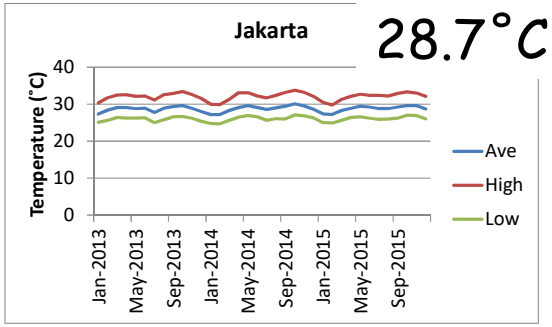
2. Take a sample

Simple! But...

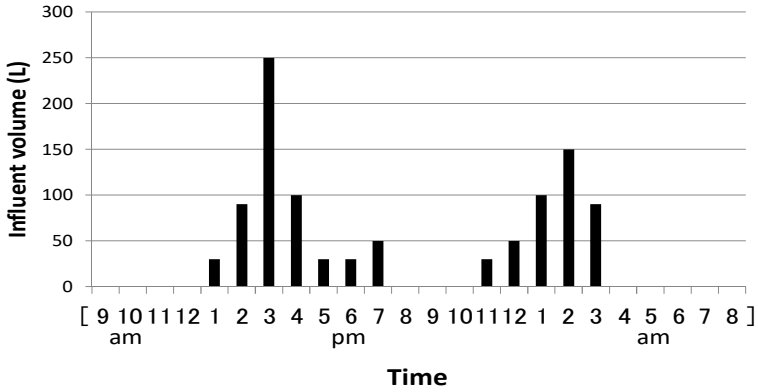
Major standardized testing method is not necessarily suitable for Indonesia.

Climate

Wastewater generation



Monthly temperature fluctuation in Jakarta



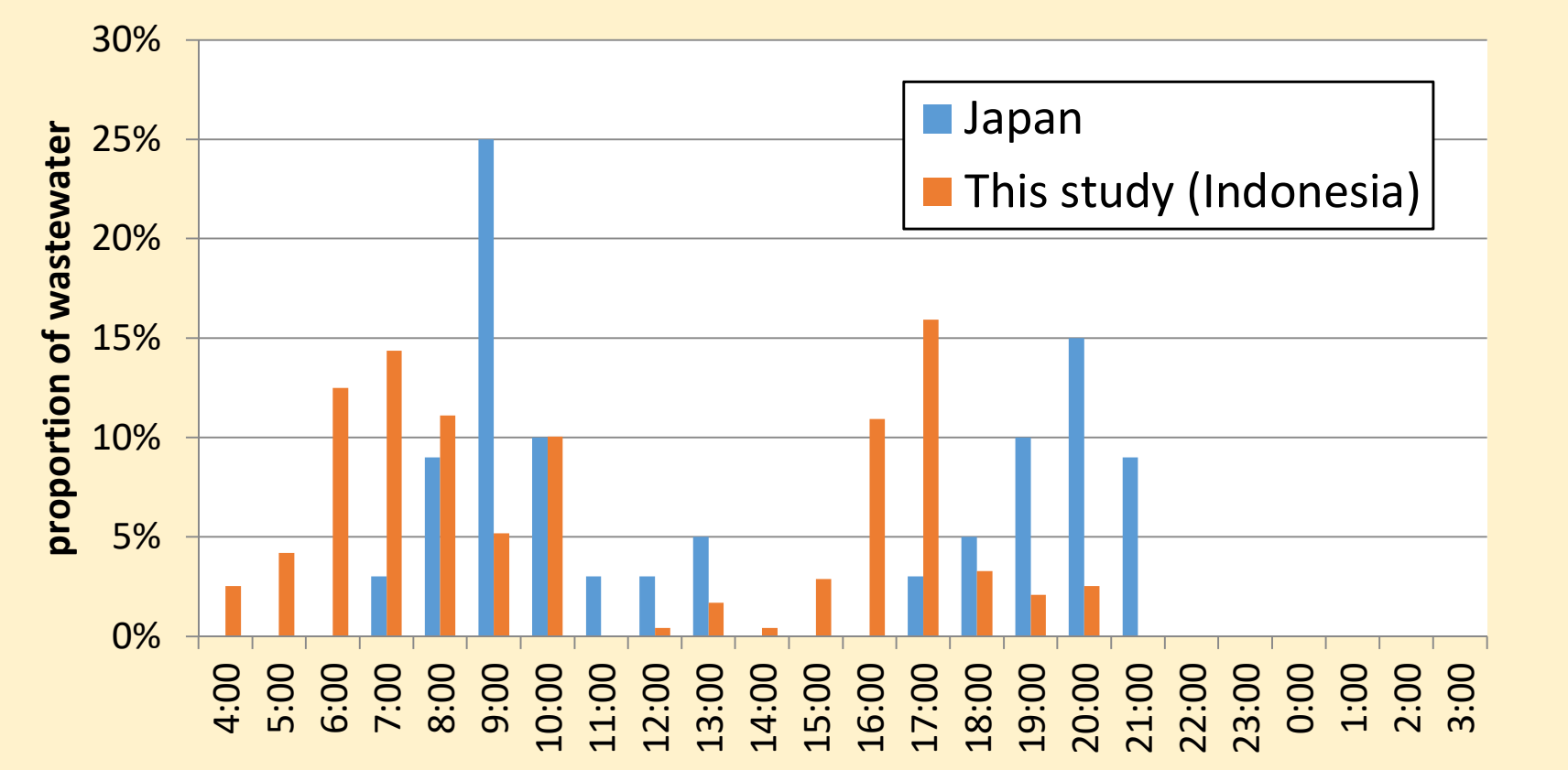
Inflow pattern in Japan

Field investigation

Wastewater volume was measured every hour.

NIES, Japan

Inflow pattern in Indonesia



- Two peaks in the morning and evening
- Starts 2-3 hours earlier than Japanese case
- No high peak which is due to bath tub

Development of the Performance Testing Method in Indonesia

1st SHM

2nd SHM

3rd SHM

4th SHM

5th SHM

Precursor of SNI (National Standard of Indonesia)

Drafted based on the industry-academia-government collaboration

NIES, Japan

When

Timing to take a test and to get certificate

Same design and manufacturing process from the time of test.

Development of new product

Take a treatment performance test

Get certification of products by type test

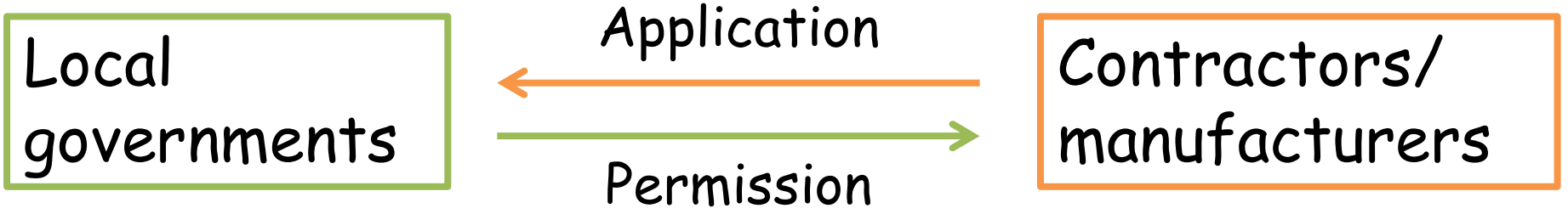
Manufacture the product

Sell products in the market

Before start manufacturing product series

How to use the certificate?

Building permission processes



*Require the certificate of the product

to confirm appropriateness

*Submit application with the certificate of the product

to prove appropriateness

➡ Compliance to the regulation would be sure!!

NIES, Japan

Final goals

- All the products in the market must have a certificate to improve water environment in Indonesia.

The certificate is based on the result of performance test

- Treatment efficiency (Water quality)
- Robustness of the tank
- Material, design, Standard Operating Procedure, workshop, etc.

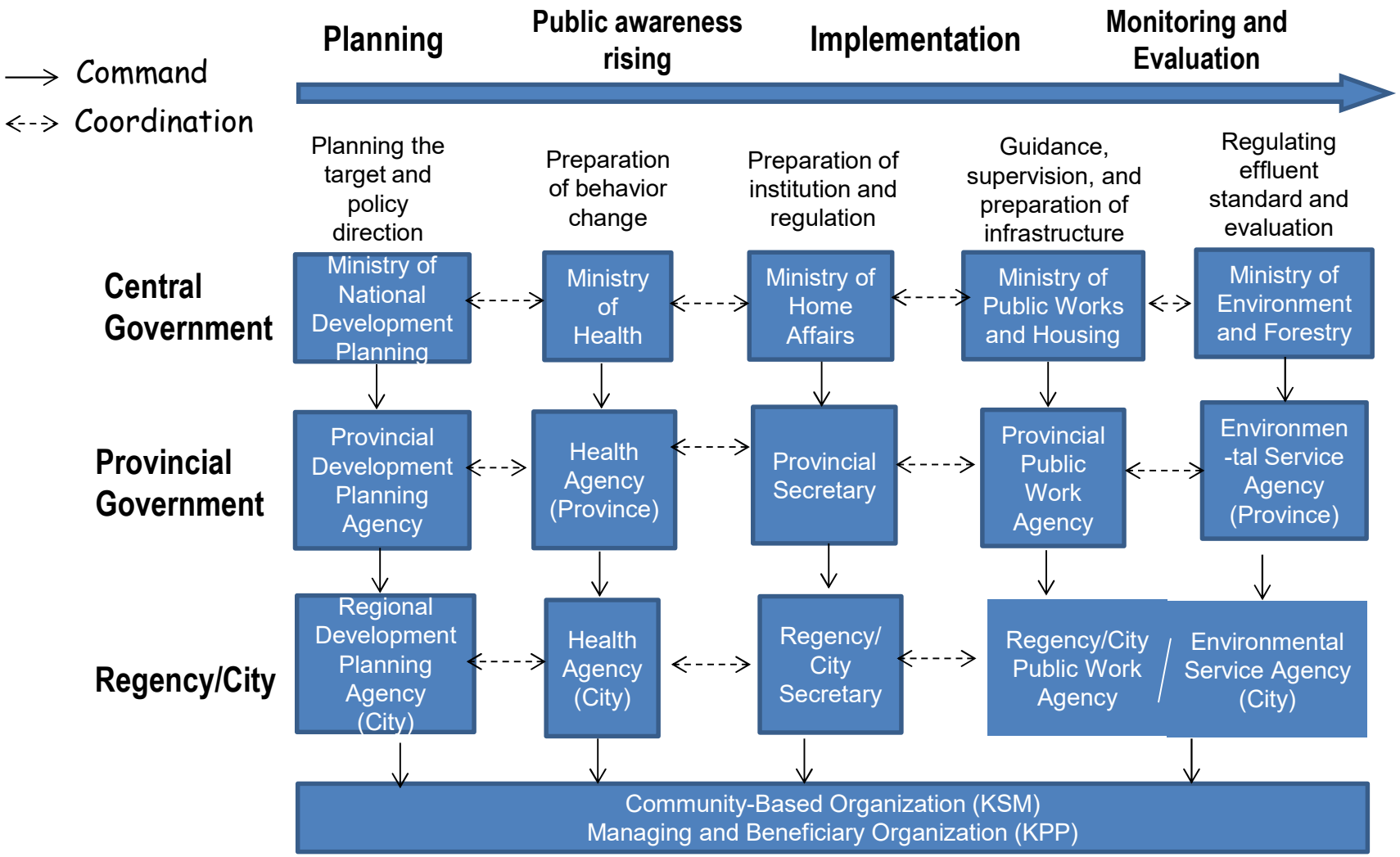
Step-wise implementation

NIES, Japan

- At the beginning, enact the certification system only for some area/buildings.
  - Central government
    - shows first targets of this certification system like "Sensitive area/tourist site, large building"
  - Local government
    - defines where is "Sensitive area/tourist site "
    - defines size of the "large building".

NIES, Japan

Institutional structure



Need to be considered

- Testing body and evaluation body
  - Requirements
- Reliable certification system
  - Enforcement by laws
  - Capacity development of both government and private sector
  - Inspection of workshops
- PE calculation method for various buildings
- Installation
  - Standardization of installation procedure


Thank you for your kind attention

Advantages of the certification system

- Private company
  - Under the low, only the authorized product can be sold and installed.
  - Can demonstrate the superior performance of your product by showing the official certificate.
  - Everyone can distinguish your product from the other cheap/unauthorized product because it is officially authorized.

Advantages of the certification system

- Government
  - Can give the permission quickly based on the official certificate of the performance.
  - Not necessarily need to inspect the performance carefully after installation.
  - Can ensure the effect of the national and local projects for domestic wastewater treatment, because we know how much amount of the pollutants will be removed by the product before the implementation.

Advantages of the certification system

- Customer
  - Can select appropriate product with the certificate.
  - Can continue their business such as shopping center, hotel and restaurant without worry about business suspension order from local government.

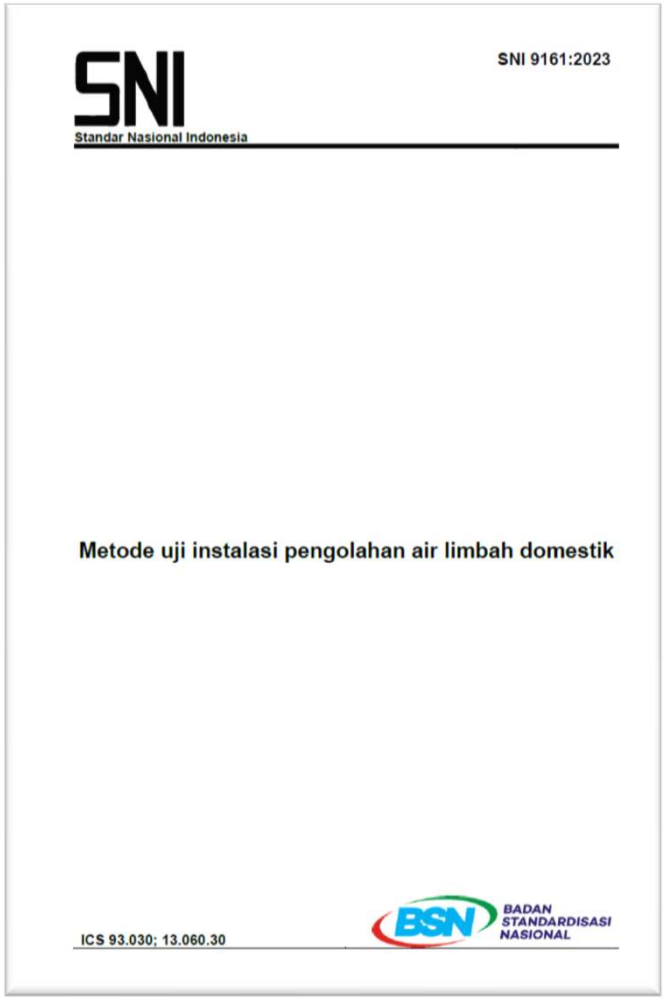
Our ideas

- Appropriate product evaluation leads new and good technology development.
- Product certification leads appropriate technology selection.

- Installation and maintenance by government might be a good way.
- Co-benefit opens new financial scheme opportunities.

- Qualification of technicians leads appropriate operation and maintenance.
- Registration system helps good management by the government.

Standardized performance testing method in Indonesia


SNI

Standar Nasional Indonesia

SNI 9161:2023

Metode uji instalasi pengolahan air limbah domestik

ICS 93.030; 13.060.30

BSN BADAN STANDARDISASI NASIONAL

SNI 9161:2023

Standards/legislation in Japan

- Standard for Johkasou accessories (Johkasou System Association: JSA)
- Standard of PVC pipes and couplers (JIS K 6741, K 6739, and so on.)
- Maintenance of Johkasou (Johkasou Law)
- Initial and annual inspection of Johkasou (Johkasou Law)
- Qualification systems (license)for Johkasou operator, inspector, and desludging technician.

Technical Specification for Johkasou (Draft)

Technical Specification for Johkasou (Draft)

March, 2013

Office for Promotion of Johkasou, Ministry of the Environment, Japan
Japan Education Center of Environmental Sanitation (JECES)

Technical Specification for Johkasou (Draft)

Annex

Annex A Testing Method for Johkasou Treatment Performance

Annex B Standard for access cover

Annex C Standard for blower

Annex D Standard for filter media

Annex E Strength Test Method

Annex F Production and production equipment overview

Annex G Instructions to construction and maintenance

Annex H Procedures of installation

Annex I Examples of contents and procedures of maintenance

Annex J Examples of contents and procedures of desludging