

First International Conference organized within the framework of
PolyUrbanWaters Research and Project Network (BMBF 2019-2025)

POLYURBAN WATERS

**Polycentric management of urban
waters in fast-growing cities and
peri-urban areas in Southeast Asia**

Professor Thammarat Koottatep / Asian Institute of Technology

Water for the Future in Southeast Asian Cities

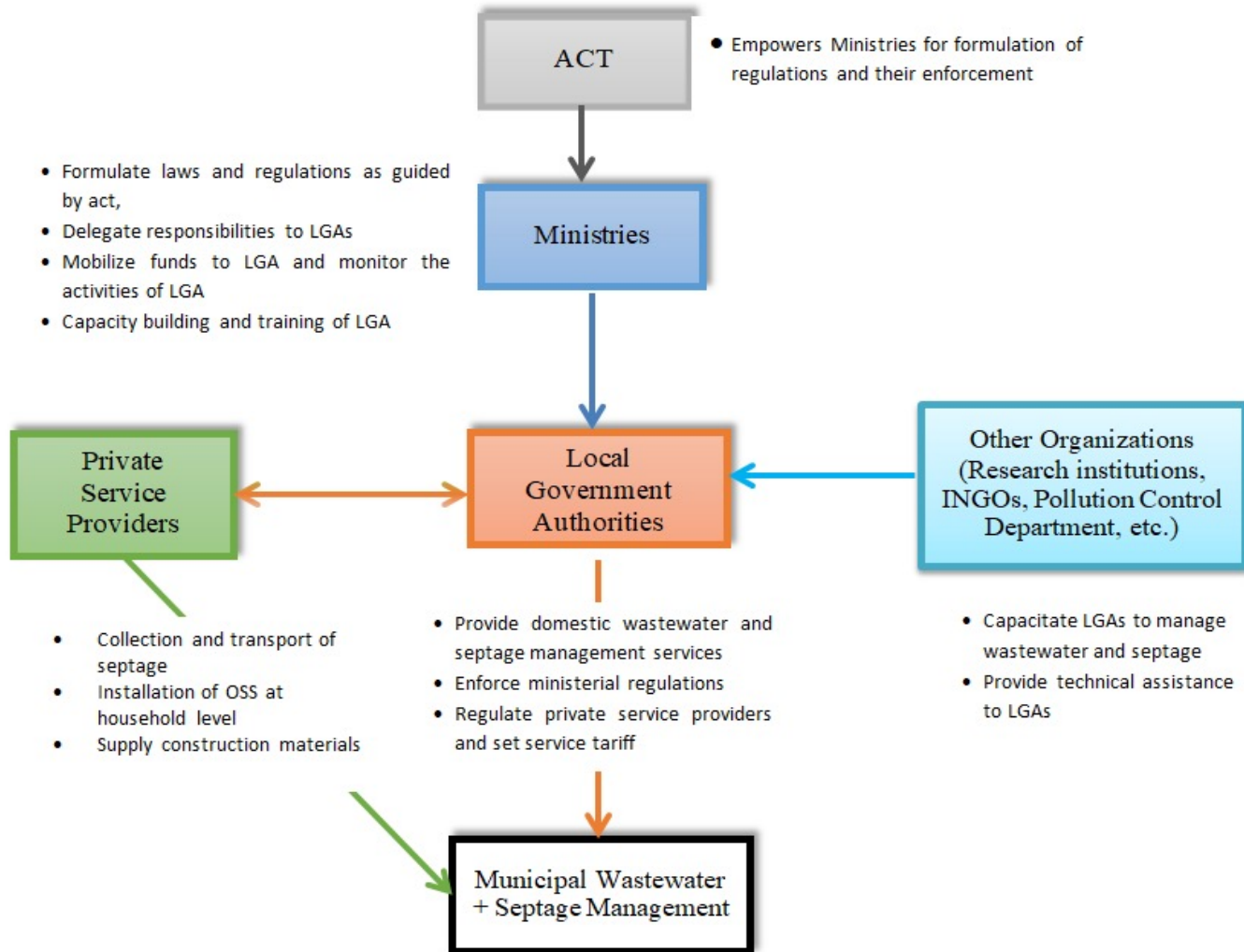
**Regulatory Frameworks For (Polycentric) Water Resources Management:
The Case Study of Wastewater Management in Thailand**

**24-25th
March 2021**

**Online /
Berlin / Kratie /
Sleman / Vientiane**

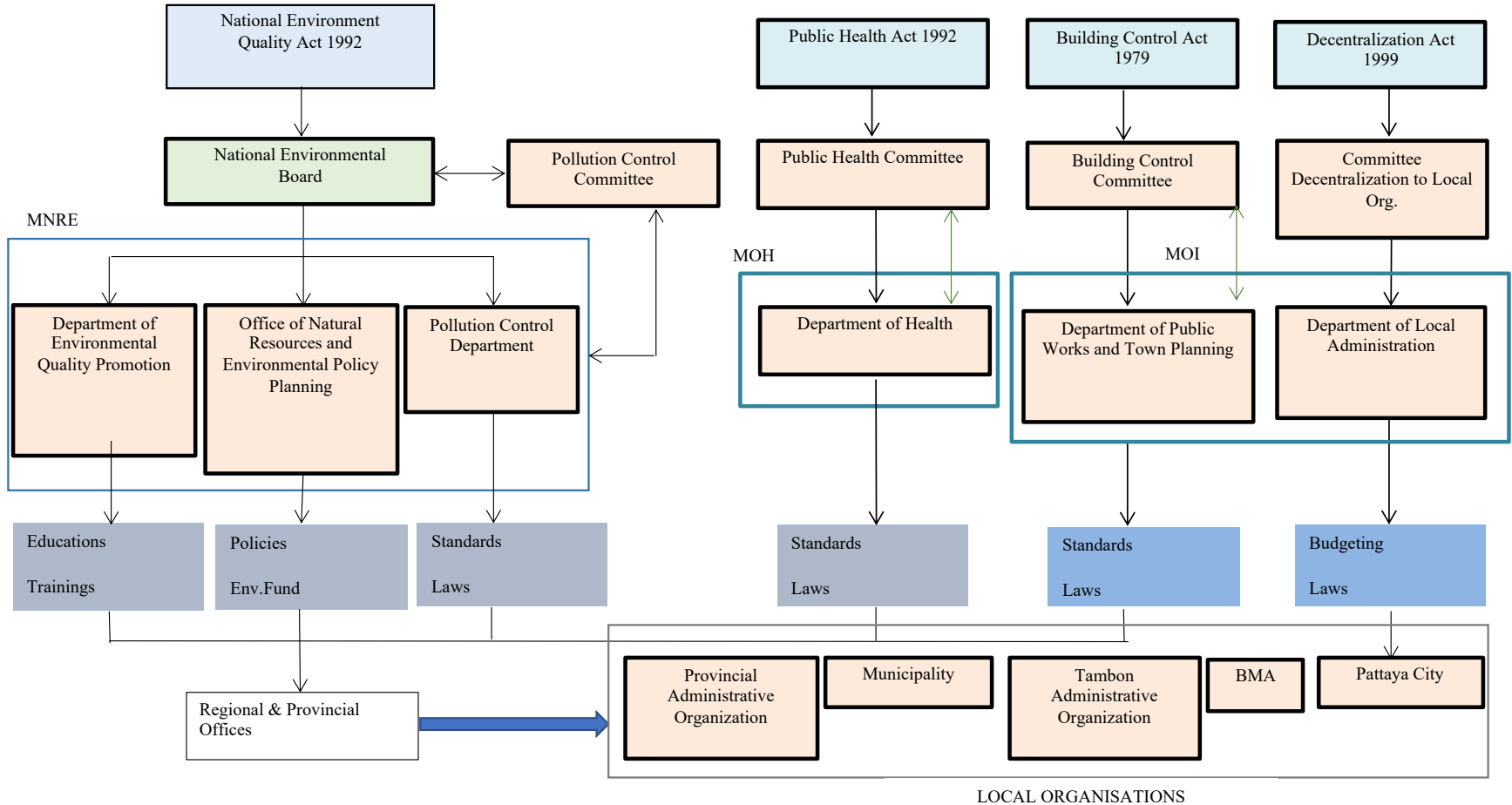
LEGAL AND INSTITUTIONAL FRAMEWORK

Wastewater and fecal sludge management



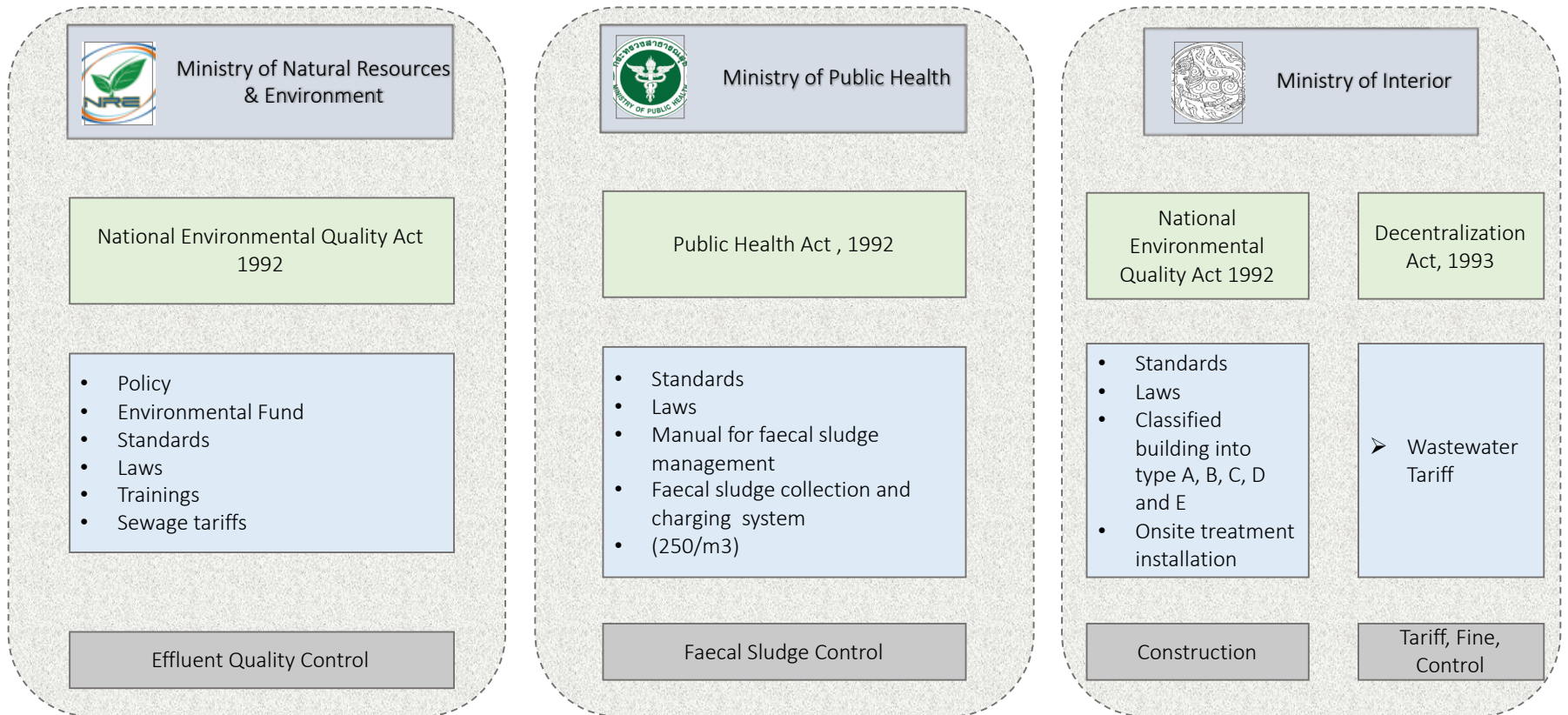
LEGAL AND INSTITUTIONAL FRAMEWORK

Wastewater and fecal sludge management



GOVERNING LAWS AND INSTITUTIONS

Wastewater and fecal sludge management



CURRENT NATIONAL POLICIES

Wastewater and fecal sludge management

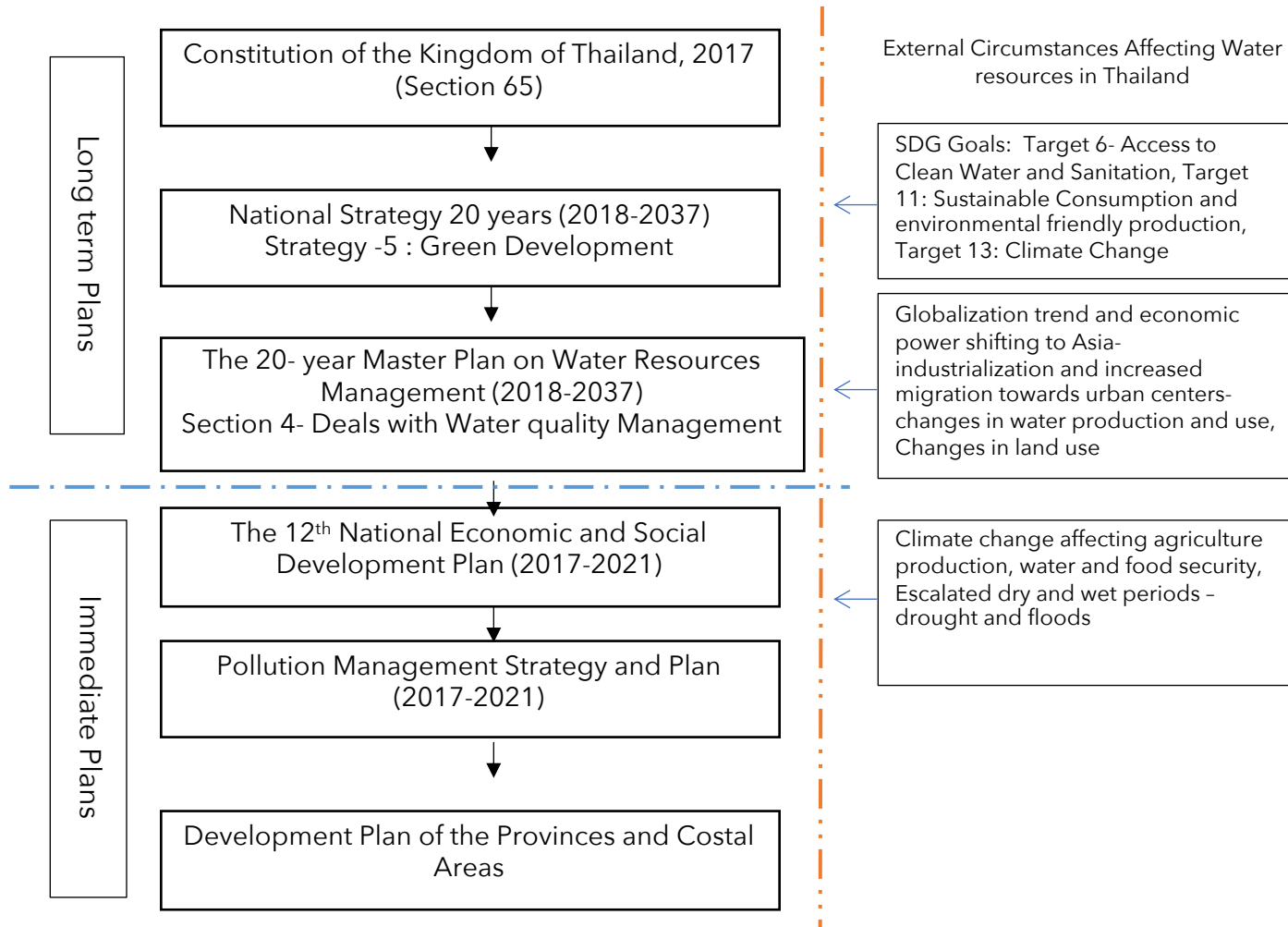


Figure : Wastewater policy and development plans. Adapted from (UNESCAP, n.d.) (Office of Natural Water Resources)

FINANCIAL ASPECT

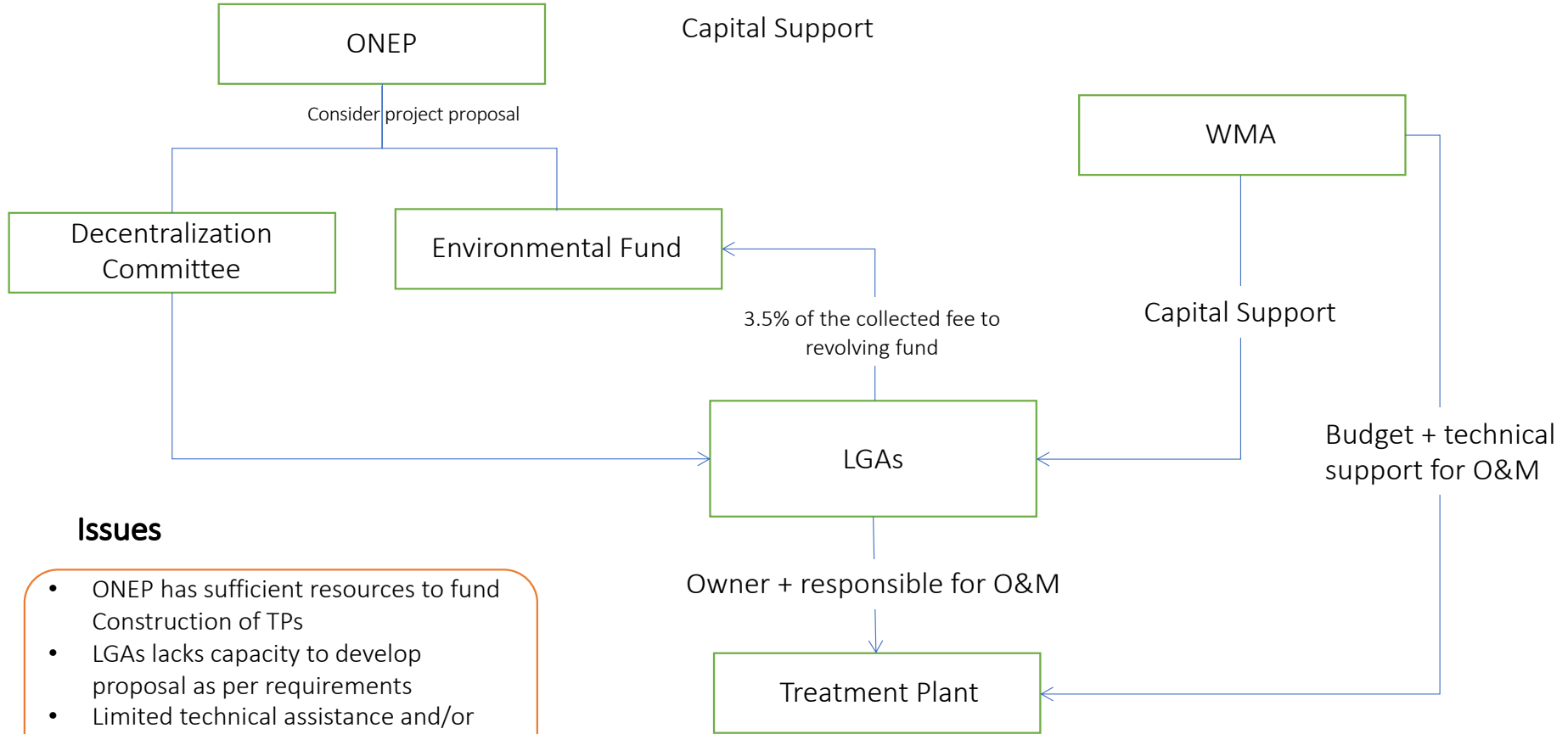
Wastewater Treatment Plant



- Investment: 83 billion Baht for 105 centralized WWTP – subsidized by central government most of which operate at half their design capacity
 - ❖ Likely, another 83 billion Baht required to cover 100% wastewater treatment
- Constraints with Centralize WWTP:
 - ❖ Capital Intensive
 - ❖ Overly sized treatment plants considering the current demand
 - ❖ No resource recovery mechanism
 - ❖ Heavily reliant on central and local fund for O&M

FINANCIAL ASPECT

Capital Investment



Issues

- ONEP has sufficient resources to fund Construction of TPs
- LGAs lacks capacity to develop proposal as per requirements
- Limited technical assistance and/or consultation to LGA

FINANCIAL ASPECT

Fecal Sludge Treatment Plant



- Only 20% of LGAs had FSM treatment plants
- Only 4% Municipalities subsidized investment cost
- Only 3% subsidized O&M cost
- FS collection fee limited to emptying and transportation – 5-9 USD /m³
 - ❖ Since 2019, max collection fee = 10 – 16 USD/m³ and treatment fee = 12 – 18 USD/m³
- Permission License fees – 143 USD/ year

FINANCIAL ASPECT

Cost Recovery



- NEQA ACT, 1992 authorizes local government to collect wastewater fee for O&M of wastewater treatment plants
 - ❖ Dragged down by political issue
- Only 18 (out of 105) LGAs, who have WWTP, adopted the fee
 - ❖ Mostly charge to large buildings: hotel, apartment, condominium, etc.
 - ❖ Rate depends on LGA's consideration
- People's willingness to pay – 0.11 USD/m³ in Bangkok
 - ❖ BUT No charge to date

RESULTS OF PERFORMANCE ASSESSMENT by AIT

Wastewater Management (score: 1 = Poor, 5 = Excellent)

Contents	Score	Justification of the score
Legislation on domestic wastewater treatment	3	Building Control Act, 1979 mandates the installation of OSS at household level and National Environmental Quality Act, 1992 requires LGs to treat wastewater prior to releasing it into open environment – enforcement is quite low as 88 % holds leaching nature septic tank and only about 27% of the wastewater produced is being treatment
Legislation on sludge treatment	2	Guided by Public Health Act, 1992 – MOPH developed guidelines for FSM however, enforcement is still lacking – Only 20 % LGAs are able to operate FS treatment plant
Policy and program for domestic wastewater management	3	National Strategy 20 years (2017-2037) – holistic approach for water management; 12 th National Economic and Social Development Plan (2017-2021). However, no major investment in wastewater treatment plants in last decade but plans to establish 464 TPs in next 2 decades, development of monitoring facilities and 60 million Baht already invested for SDG implementation
Effluent standards	5	Strict effluent standards developed by PCD – categorized into 5 different classes for domestic wastewater
Standard on treatment performance testing methods	3	TISI standard for packaged treatment units and AIT has recently developed testing center for packaged OSS (in the process of certification from TISI). However, still to develop for fecal sludge treatment units.
Financial mechanism and cost recovery	1	Though law authorizes LGAs to collect fee to cover O&M expenses of treatment plants – dragged down by political issues
Performance on domestic wastewater treatment technologies	2	Performance of OSS is poor, but the community wastewater treatment plants meet the effluent standard, however O&M is reliant on state budget Operating capacity ranges between 38- 75 % of design capacity
Performance of sludge treatment technologies	1	Only 20 % of LGA are operating FS treatment plants of with less than 50% can maintain them. No effluent and solid standards for FSM and no monitoring mechanism

KEY OPPORTUNITIES AND RECOMMENDATION

Shifting Sanitation Paradigm of Thailand

- **Consider full range of sanitation options**

- ❖ Define zones for “Centralized”, “Decentralized” and “OSS” and their combination while introducing environmentally sustainable technologies
- ❖ Redefine sanitation to encompass the whole sanitation chain to ensure the public and environment safety of both the community and downstream settlements
- ❖ Increase sewer connections, regular maintenance of the aging sewers, gravity flow mechanism or alternative pumping system (solar pumping) wherever possible.
- ❖ Similarly, for FSM, regular maintenance and frequent emptying of the OSS, safe handling during emptying and transportation.

- **Upgrading the existing on-site sanitation system**

- ❖ Employ innovative technologies like solar septic tanks where applicable and affordable as they are easy to install and readily available
- ❖ Mandate TISI standard for DEWATs for quality product and healthy market.
- ❖ Encourage households for the proper operation and maintenance (O&M) of OSS
- ❖ Check the sludge accumulation every 2 years and implement regular desludging service every 3-5 years.

- **Mixed Sanitation Approach**

- ❖ Develop a citywide sanitation planning covering “Centralized, DEWATs and OSS” and FSM or blend of these technologies – mix sanitation approach as one-size-fits-all solution is non-existent.

- **Bridge sector gaps while adopting the utility approach for effective wastewater management**

- **Reuse based technology choice and effluent standard**

- **Promote public awareness and encourage participation**

- **Encourage private investment beyond contract-based services**

Final Remark!

Sanitation should be city-wide and inclusive –
different demand and affordability

No one size fits all solution

Meet interim and intermediate needs