Financial Feasibility Analysis for FSM Business in Thailand

Case Study

Atitaya Panuvatvanich
Thammarat Koottatep, Huayna Paola Villarraga, Kristina Thapa, Yuttachai Sarathai

Asian Institute of Technology
NATS
Unveiled Sanitation Issues in Thailand

Daily production

Domestic wastewater management

- 90% Grey water: 8.83 million cu.m.
- 8% Toilet: 0.08 million cu.m.
- 10% Cesspool: 0.88 million cu.m.

Faecal sludge management

- 90% Cesspool: 0.035 million cu.m.
- 87% Toilet (unlicensed): 0.04 million cu.m.
- 13% Commercial septic tank: 0.005 million cu.m.

- 73% 6.43 million cu.m.
- 27% 2.4 million cu.m.

- 63% 80 mg/L: 514.4 tons
- 48 tons 20 mg/L: 48 tons
- 2.25 tons 450 mg/L: 2.25 tons
- 73.5 tons 2,100 mg/L: 73.5 tons

Drainage system

Wastewater treatment plant

Groundwater

Receiving water
Background: FSM in Thailand

- 63% Collection *
- Treatment

- Service fee: **8.3 USD/m³**
- Budget support from Central Government
- No sanitation tax

FS TREATMENT PLANT

- 29%; 29%
- 46%; 46%
- 25%; 25%

Non existent | Out of use | In use
FSM Cost and revenue

Unit cost (Median) 25.30 USD/m³

Operated at loss
WHAT SHOULD BE A SUSTAINABLE SOLUTION??
Introduction

- New innovation DEWAT technologies are being developed
- Current FS production still need proper management
- Creation of profit making business model is an opportunity to address untreated effluent and unsafe disposal
Objectives

• Provide an overview of financial transactions and solutions of faecal sludge service providers in Thailand
  • Collection and Treatment
  • Cost and revenue
  • Financial feasibility
Correlation of Cost and Collection

Scenario 1

How to cover operational cost?

Current service tariff: 8.3 USD/m³

• Collection minimum of 88 m³/day

Over treatment plant capacity

or

• Increase tariff by 140 % (~25USD/m³) for minimum collection of ~25m³/day*

*Thailand case

Operation cost  
Collected FS
Net Present Value (NPV) present value of an investment to consider business possibility.

Internal Rate of Return (IRR) If the IRR is higher than required rate of return, that project is considered.

All projects are lower and much lower than the required rate of return
NPV all negative

Possible project needs more revenues, example: fee at 63 USD/m³
At require rate of return 10%
Scenario 2

Output form the FSM logistic tool:

New treatment plan capacity and location
actual number of treatment required
faecal sludge collection
transportation cost,
number of truck required

13% reduction on unit cost
Scenario 3

Cost reduced:

- **Treatment plant** Investment, maintenance, operation, personal, material and monitoring
- **Transportation** distance, collection and fuel

46% reduction on unit cost
Proposed solution for FSM business

Figure: Decision tree of possible solutions for faecal sludge management in Thailand
Conclusion

- Current income is not sufficient to cover cost, only from collection fee
- FSM service operated at loss which may resulted from low service fee, inefficient logistic operation, less product utilization and inappropriate management.
- Solutions may need to be identified
  - Increase service fee
  - Improve FS collection performance with the current revenues
  - Cost reduction by using innovation technology and/or planning tool
  - Utilization of faecal sludge
For further information on the FSM Toolbox and the Innovative Sanitation Technologies

Visit us:
NATS Exhibition Booth

Side Event:
23rd February, 2017
Sembian Annex
Thank you for your attention