



# Cooperation AIT – BORDA on the application of FSM Toolbox in Project Cities (Baseline Assessment)

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**BORDA, AIT**



# AIT-BORDA Cooperation: “Regenerative Sanitation Knowledge Hub”

- Testing site for Decentralized Wastewater Treatment Systems
- Demo / training site for Decentralized Wastewater Treatment Systems
- Quality Management for on site / decentralized systems in Southeast Asia
- Setup liaison of Good Practices and standards to donor community
- Joint application and dissemination of Best Practices on tools, modules and service packages (e. g. FSM Toolbox)



# FSM Toolbox:

Demand-driven “One-stop database”

Necessity to  
**enhance the  
capacity of  
FSM  
Practitioners**



Donors



City Planners



Consultants

A **common  
platform** for  
easy  
accessibility to  
FSM Resources



[www.fsmttoolbox.com](http://www.fsmttoolbox.com)

**Fill in the  
existing gaps**

INTERACTIVE TOOLS  
AND OVER 200 DOCUMENTS



# Introduction FSM Toolbox:

## Program Workflow & Tools

### FSM Program Workflow



Tools and document resources laid out along the workflow



8 Interactive Tools and over 200  
Resource Documents



# Introduction FSM Toolbox:

## Situational Assessment Tool

### FSM Program Workflow



### Tools and document resources laid out along the workflow



**8 Interactive Tools and over 200 Resource Documents**



# Introduction FSM Toolbox:

## Situational Assessment Tool

- Diagnostic tool to assess various aspects along the service chain (containment, emptying, transport, treatment, reuse), e.g.:
  - Demographic and geographical
  - Legal Framework and enforcement
  - Finance
  - Socio-cultural aspects

**FSM Situational Assessment Tool**

Note: This sheet includes general questions on Demography/Geography, Legal framework and Enforcement/Finance, Advocacy, Socio-cultural and Monitoring. The general questions serves as a baseline for assessing the FSM situation, so this section needs to be filled up at the beginning of the assessment.

**DEMOGRAPHY / GEOGRAPHICAL** [PRINT] [RESET]

- Total population in the coverage area  persons
- Recognized slum population ..... persons
- Total number of households ..... households
  - Number of slum households ..... households
  - Number of non-slum households ..... households
- Average number of persons per household ..... persons per household
- Number of municipal wards/districts ..... Number
- Number of commercial establishments in the coverage area (\*Note: Commercial establishments include recognized number of shops, cinemas, theaters, hotels and restaurants) ..... establishments

- FSM Service Chain Scorecard + Service Chain Report

**FSM Service Chain Scorecard** [PRINT]

City: .....

Ward/Sector/Suburb: .....

Telephone Number: .....

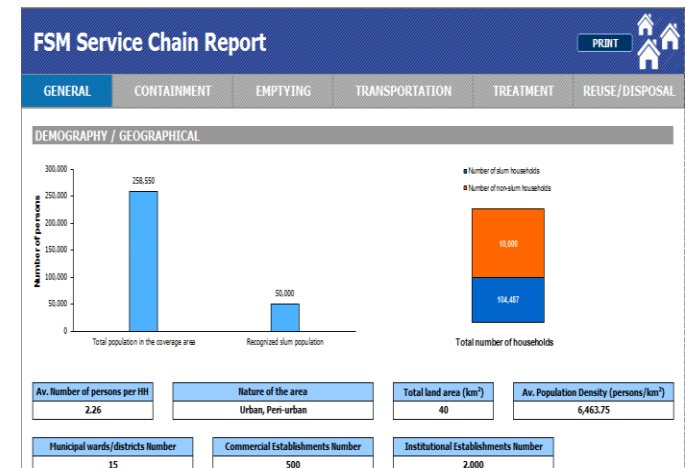
Email ID: .....

GENERAL CONTAINMENT EMPTYING TRANSPORTATION TREATMENT REUSE

Inadequate  Excellent

FSM Situation

[Click here for more information](#)



# Introduction FSM Toolbox:

## Financial and Technical Assessment Tool

### FSM Program Workflow



### Tools and Document resources laid out along the Workflow



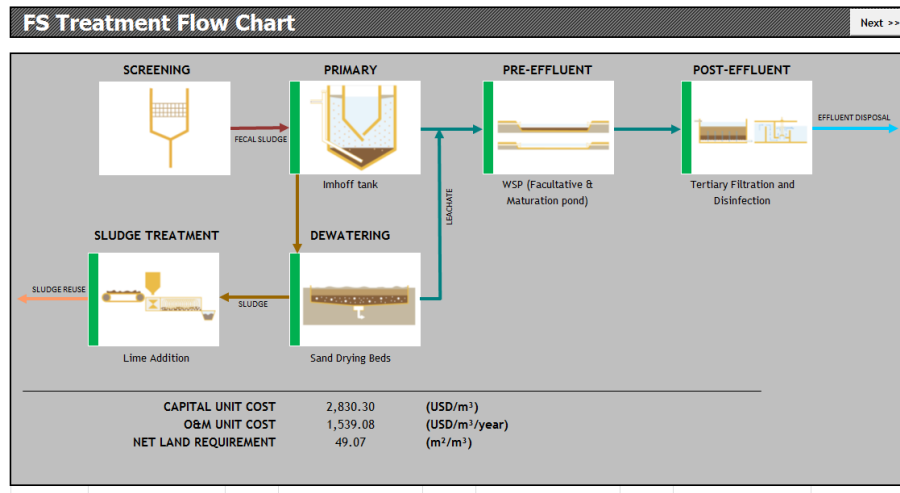
**8 Interactive Tools and over 200 Resource Documents**

# Introduction FSM Toolbox: Financial and Technical Assessment Tool

- Diagnostic tool to identify technical and financial viability, regarding e. g.:
  - FS Volume
  - Number of trucks
  - Treatment technology
  - Cost & financing, debt, revenue

* Estimate by FS Generation Rate		
Estimated annual FS generation rate per capita	0.25	m <sup>3</sup> /capita/year
Estimated annual FS generation rate per household	1.00	m <sup>3</sup> /household/year
Percentage of septic tanks that are desludgable	83%	
Estimated annual FS generation rate in coverage area	25,000	m <sup>3</sup> /year
Estimated annual FS volume to be desludged	20,750	m <sup>3</sup> /year
Number of working days per year for FS trucks	365	working days/year
Estimated FS volume per day from households	57	cubic meters per day

- Dashboard display of selected technologies and financial projections



**Primary Treatment Options** Next >>

Option1	Settler	Imhoff tank	Anaerobic Tank	WSP (Anaerobic Pond)	Thickening Pond
Capital Cost (USD/m <sup>3</sup> /day)	262.00	435.00	2,043.00	282.20	645.00
O&M Cost (USD/m <sup>3</sup> /year)	114.78	131.35	199.86	99.24	127.15
Land Requirement (m <sup>2</sup> /m <sup>3</sup> )	0.4	0.4	10.8	11.46	45.08
Removal Efficiency (%)	BOD 20-40% COD 25-50% TSS 50-70% Pathogen Removal < 50%	BOD 25-40% COD 25-50% TSS 50-70% Pathogen Removal < 50%	BOD 60-70% COD 60-70% TSS 50-70% Pathogen Removal < 50-60%	BOD 60-70% COD 60-70% TSS 40-60% Pathogen Removal < 50-60%	BOD 60-70% COD 60-70% TSS 40-60% Pathogen Removal < 50-60%
Reuse	Needs secondary and tertiary treatment	Needs secondary and tertiary treatment	Generates renewable energy	Needs tertiary treatment	Needs secondary and tertiary treatment
Advantages	(-) Simple and robust technology (+) Efficient removal of suspended solids	(+) Solid-liquid separation and sludge stabilization are combined in one single unit (+) Resistant against organic shock loads (+) Small space requirements (+) Suitable for small	(+) The small land area required (most of the structure can be built underground) (+) Can be built and repaired with locally available materials (+) No electrical energy required	(-) Simple to build. The technology is appropriate for tropical climates, and achieves relatively high pathogen removal in the effluent. (+) Resistant to organic and hydraulic shock loads (+) High reduction of	(+) Thickened sludge is easier to handle and less prone to splashing and sparging (+) Can be built and repaired with locally available materials (+) No electrical energy is required

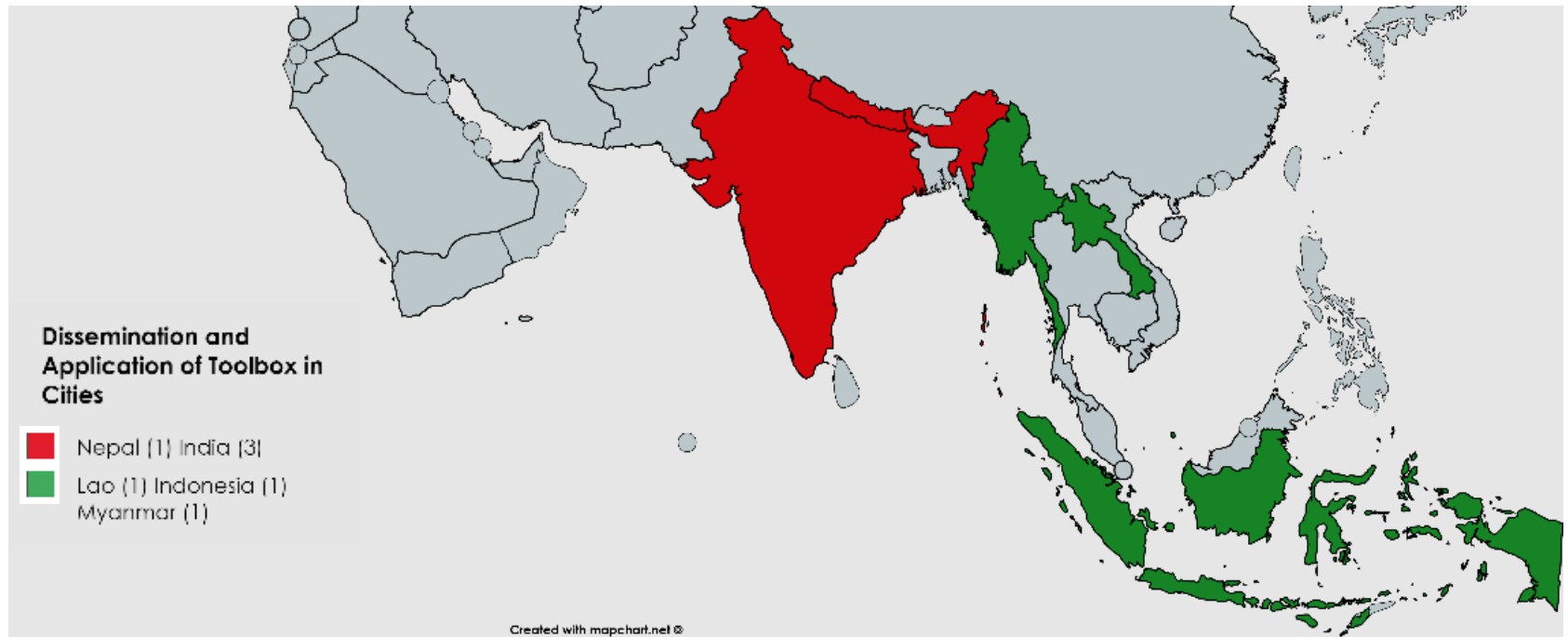




# FSM Toolbox:

## Dissemination and application

- 1 city each in Laos, Indonesia, Myanmar in collaboration with BORDA
- 33 Indian and 1 Nepalese cities in collaboration with CDD Society (Bangalore)



# Application of baseline assessment tools

## Sanitation situation in cooperation cities

- **Luang Prabang (Laos)**
  - Ca. 60.000 inhabitants
  - Most households equipped with septic tank
  - Desludging services provided under Local governmental setup
  - Sludge disposal into facultative aerobic lagoons
  - Master Plan for Drainage and Sewerage Systems
- **Sleman (Indonesia)**
  - Ca. 1.135.000 inhabitants
  - Septic tank coverage: 78%
  - Desludging services provided on on-call basis
  - Sludge partially treated in regional treatment plant (30km distant)
  - City Sanitation Strategy (1 FSM plant to be constructed in 2017; more to follow)



# Application of baseline assessment tools

## General Findings

- **FSM Toolbox**
  - Compiles Local Governments' needs for comprehensive FSM planning tools
  - Demonstrates of the complexity of FSM
  - Provides comprehensive orientation for FSM baseline assessment as basis for planning
  - Supports completion and verification of existing data
  - Triggers Local Governments' needs for interventions or improvements as it indicates gaps and deficiencies



# Application of baseline assessment tools

## General Findings

- **FSM Toolbox**
  - Requires and fosters participatory application
  - Enhances Local Governments' capacities
  - Allows for flexibility in terms of progressive implementation (technical / budget-wise)
  - Provides academia with experiences from practitioners for further development of the tool



# Application of baseline assessment tools

## Challenges

- Perception on the purpose of the FSM Toolbox
- Availability, completeness, accuracy and validity of data
- Existing targets (scope of interventions, priorities), set of actions, planning, design and/or implementation
- Language barriers



# Application of baseline assessment tools

## Lessons Learnt

- Early application of baseline component
- Participation of all relevant stakeholders
- Application of advocacy and awareness raising media
- Coaching by 3<sup>rd</sup> parties is a supporting factor
  - Support with development of data collection and validation approaches
  - Guidance for further interventions



# Outlook

- Further development of FSM Toolbox
  - AIT to further cooperate with BORDA and other organizations to improve the FSM Toolbox
  - Guidelines for data collection methodology and validation
  - Set up regional expert pool to facilitate FSM toolbox application
- Further application in several cooperation cities in Southeast Asia as essential module to manage urban waters in an integrated manner





## Conclusion

Food for thoughts:

“A tool is a tool, it is not the solution!

—

Empower those in charge of FSM to apply a comprehensive tool in a smart way.”







# Thank You!

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