FSM TOOLBOX

Faecal Sludge Management Toolbox

Understanding the need for FSM intervention

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FSM TOOLBOX

Urban sanitation remains a **significant challenge** for most low & middle income countries

FSM TOOLBOX

The urban population of the group of Least Developed Countries (LDCs)

tripled between 1990 and 2015.

FSM TOOLBOX

While **access to sanitation** in LDCs has increased in relative terms, in absolute terms the number of people using **unimproved sanitation** has **increased**.

The sanitation needs of **2.7 billion people** worldwide are served by onsite sanitation technologies

40%

total population

FSM TOOLBOX

that number is expected to grow to

5 billion by 2030

in need of faecal sludge management

FSM has not really been the **priority**

Only recently several nations, local governments, investors and communities have ***increased investments*** to not only to achieve universal access to toilets - but also ***manage excreta along the whole service chain***

Containment **Emptying** **Transport** **Treatment** **Reuse**

FSM TOOLBOX

Although investments have increased, **challenges** still remain in effective planning and implementation of FSM project goals ….

Household level users not being able to **afford** professional emptying services

Containment | Emptying | Transport | Treatment | Reuse

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no **practice or abidance** to regular desludging

operators not able to afford the transport of FS over **large distances** to treatment facilities

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the lack of **legitimate FS discharge locations** or treatment facilities

lack of **market** opportunities

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FSM TOOLBOX

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FSM TOOLBOX

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FSM TOOLBOX

Unskilled professionals

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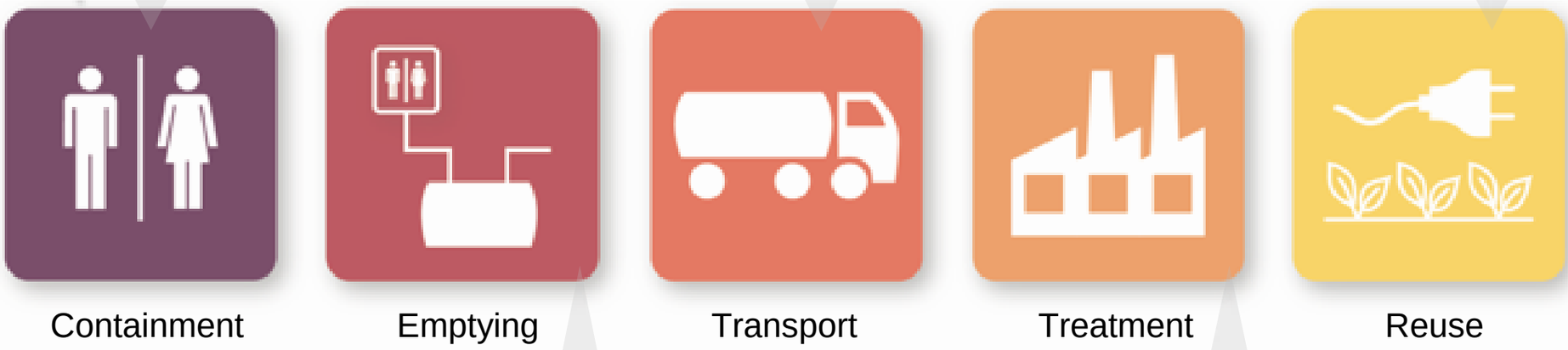

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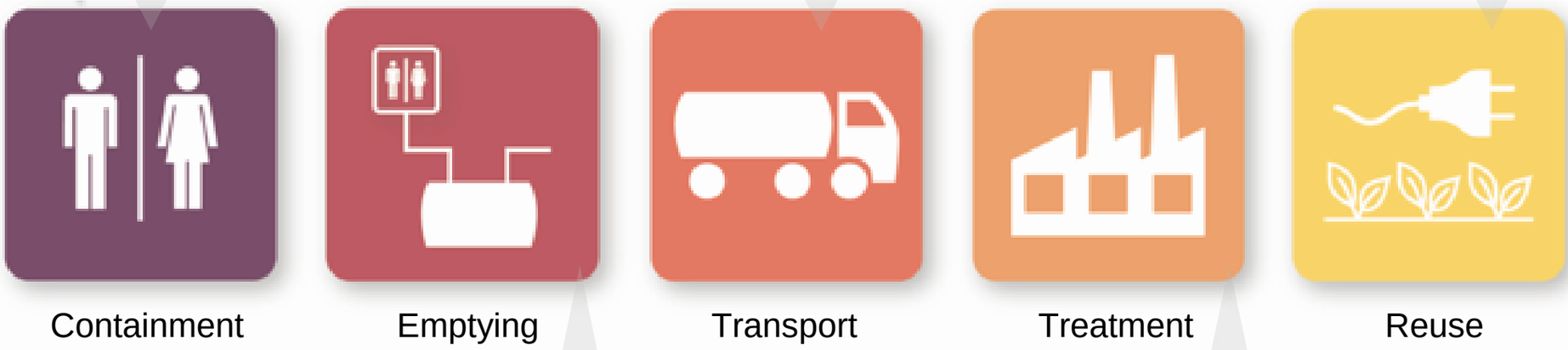

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Lack of stakeholder **awareness**

FSM TOOLBOX

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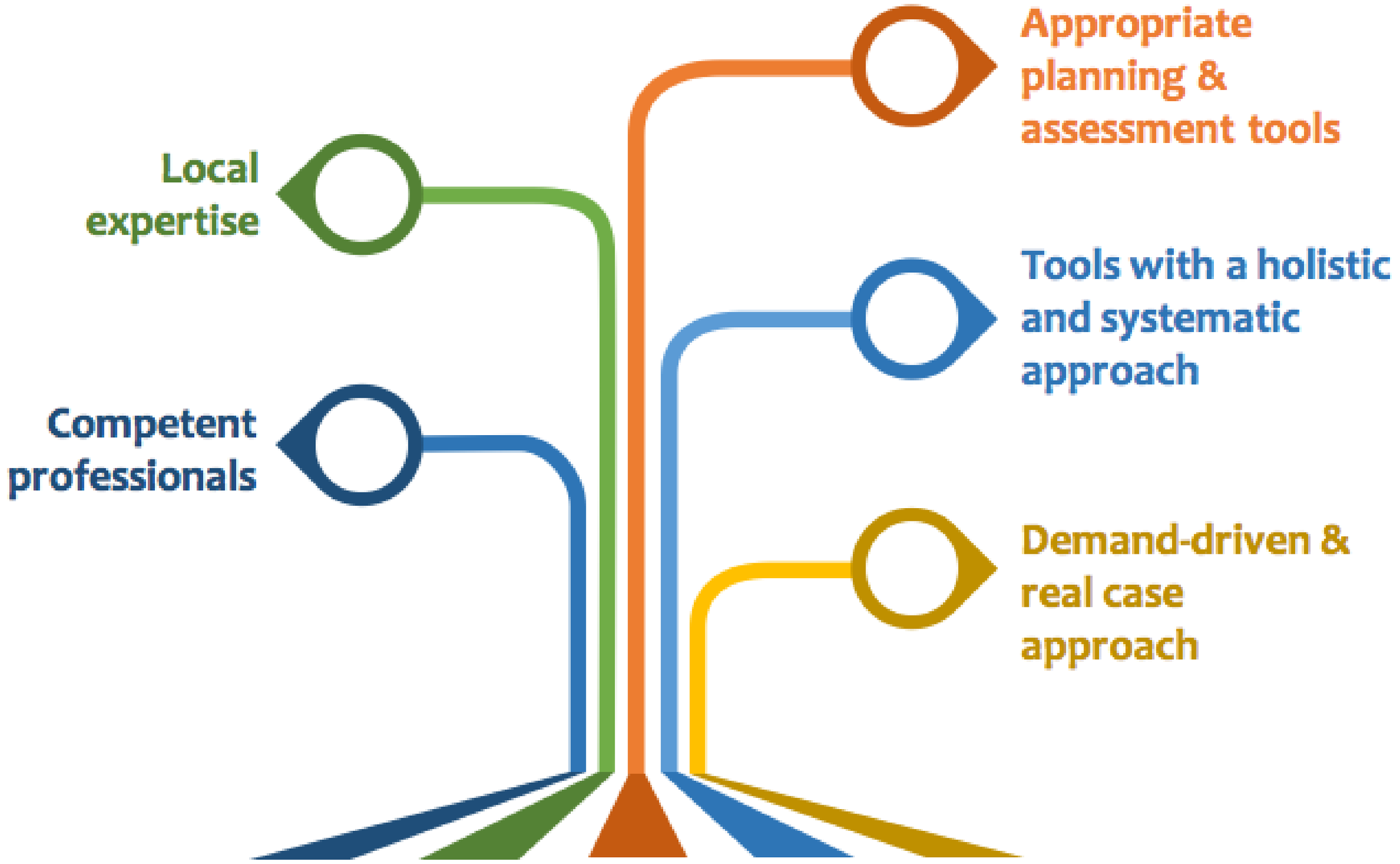
Lack of clear policies & enforcement mechanisms **awareness**

Inefficient assessment procedures

Lack of stakeholder **awareness**

How do we overcome all these problems?

Experts realized that there is an urgent need to develop



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we needed a solution that addressed

every step in the service chain

FSM TOOLBOX

FSM TOOLBOX

Comprehensive collection + Development and Dissemination of tools on FSM to **enhance the capability of the key players** to work towards effective & sustainable implementation (planning) of FSM

FSM TOOLBOX

FSM TOOLBOX

Accelerating Effective Implementation of FSM Practices

Donors

City Planners

Consultants

Tailor made solutions for each key FSM practitioners

FSM TOOLBOX

Toolbox is **not yet** a completely ‘go-to’ box of solutions

FSM TOOLBOX

You can **HELP** us get there!!!

Donors | City Planners | Consultants

FSM TOOLBOX

Faecal Sludge Management Program Workflow

Isha Basyal

FSM Program Workflow

3. Exploratory Study

7. Defining the Need & Scope of Strategies

5. Appraisal & Approval

6. Operation & Maintenance

3. Strategy Design Options

1. Monitoring

8. Review & Correct

4. Implementing the Strategy

2. Country Strategy Programming

FSM Program Workflow

1. Exploratory Study
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8. Monitoring
9. Review & Correct

Advocacy

Capacity Building

FSM Media

FSM TOOLBOX

Why do we need this?

FSM TOOLBOX

we needed a solution that addressed

every step in the service chain

Containment Emptying Transport Treatment Reuse

FSM TOOLBOX

8 tools

tools developed by AIT

FSM TOOLBOX

8 tools

tools developed by AIT

5 tools

tools developed with collaboration with partners

FSM TOOLBOX

8 tools

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5 tools

tools developed with collaboration with partners

Over

200

documents laid out under specific objectives

FSM TOOLBOX

…and to put it all together

8 tools

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200

documents laid out under specific objectives

FSM TOOLBOX

Built a **standardized framework** for FSM practitioners- that is both **practical** & **non-academic**

8 tools

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Over

200

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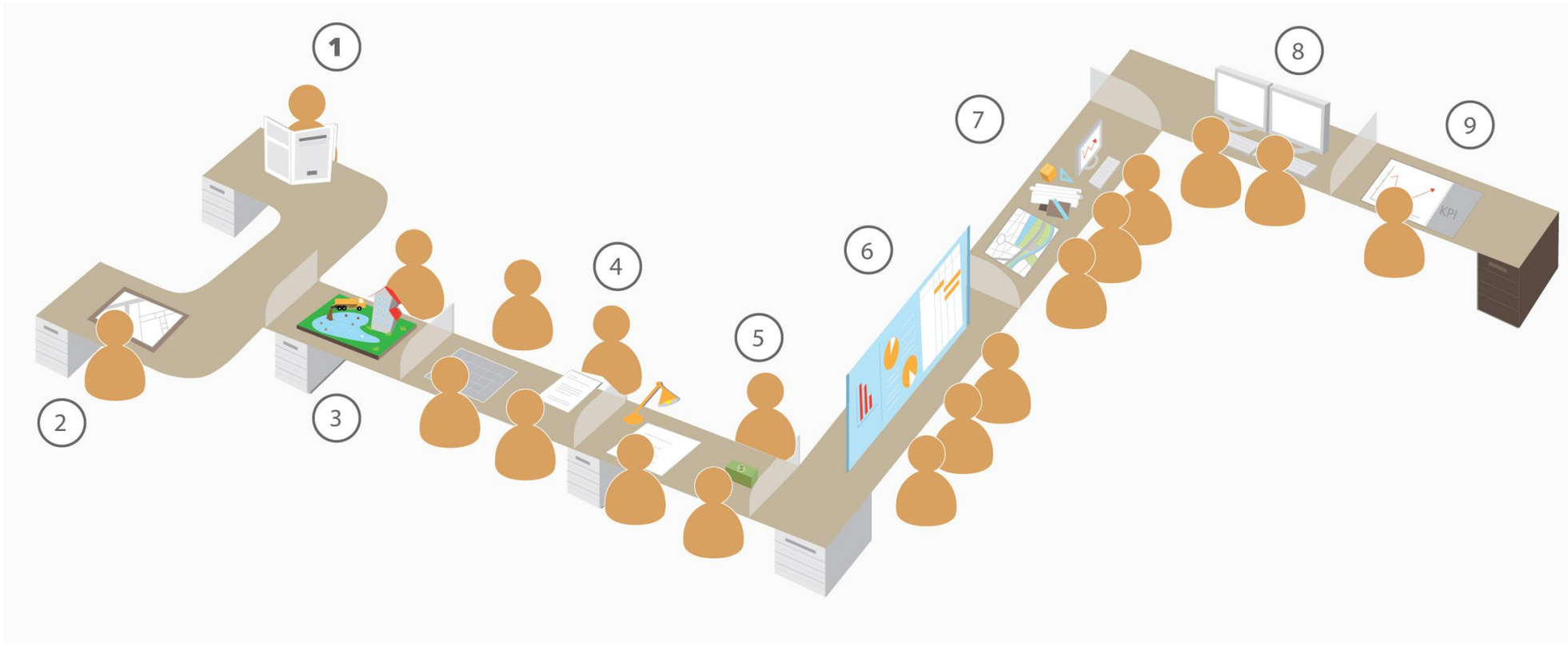
FSM Program Workflow

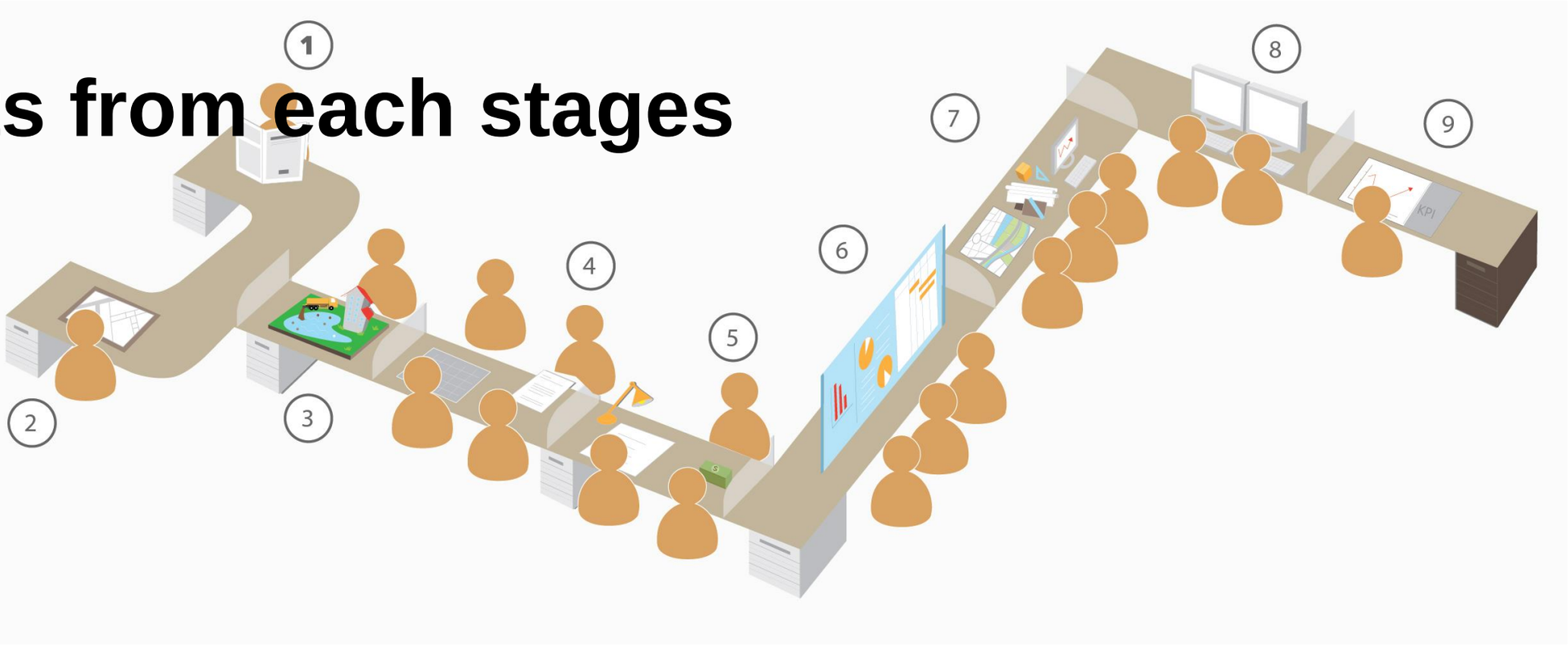


step-by-step guide with “tailor-made solutions”

FSM TOOLBOX

Properties of the Workflow

1. **Step-by-step guide**
2. **Highlight on roles of each Key Players**
3. **List of activities**
4. **Outputs from each stages**



FSM Program Workflow

1. Exploratory Study
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FSM Media

FSM Program Workflow

City Planners

1 Exploratory Study

Our first direction is based on **identifying the problems** and **initiating the FSM program** to be explored by a City Planner.

This approach prioritizes examination of national/state sanitation policies, strategies, plans, initiatives drawn out of:

- the City Planner's own initiative to improve his/her city (top-down approach)
- through needs and demands of locals and communities (bottom-up approach)

Activities

- Reviewing policies, strategies, plans and initiatives,
- Local issues
- Advocacy strategies

FSM Program Workflow

Donors

1 **Exploratory Study**

2 **Country Strategy Programming**

Donors can take a direction to make the program seamless by taking this step, where they can work with member countries to **define a medium-term development strategy** and **operational program**, also known as a Country Partnership Strategy (CPS).

Activities

- Reviewing country policies & strategies

FSM Program Workflow

City Planners

1. **Exploratory Study**
2. **Country Strategy Programming**
3. **Defining Need & Scope of Strategies**

This stage involves ratcheting up the projects by **determining needs** of the desired location, **identifying and prioritizing appropriate strategies** to address specific FSM needs considering local conditions on a holistic level.

We will also **identify stakeholders**, their engagement so that their needs and inputs are taken into consideration and incorporated into this early stage of the program.

Activities

- Situational Assessment
- Preliminary Stakeholder Identification & Engagement

FSM Program Workflow

Consultants

City Planners

1. **Exploratory Study**
2. **Country Strategy Programming**
3. **Defining Need & Scope of Strategies**
4. **Strategy Design Options**

For a task so important as designing project plans and strategy options, Consultants are used to carry out **Pre-Feasibility, Sustainability and Feasibility Studies for examining the scope of interventions**, cross-cutting issues and overarching policies.

City Planners and Donors may procure consultants if necessary to further interventions in terms of FSM program, beginning from selection of onsite sanitation, emptying and transportation, treatment to disposal and reuse. In the lead up to this intervention, feasibility checks are necessary for regulatory, institutional and capacity building strategies & overall management needs.

Activities

- Procurement of Consultants
- Feasibility Study
- Project Planning
- Project Implementation Plan

FSM Program Workflow


City Planners


Donors

1. **Exploratory Study**
2. **Country Strategy Programming**
3. **Defining Need & Scope of Strategies**
4. **Strategy Design Options**
5. **Appraisal & Approval**

Once all the strategy scope of interventions is geared up with the much needed technical and financial feasibility - donors and consultants shall go on a **fact-finding mission**, in consultation with government and other stakeholders to examine the project's technical, financial, economic, environmental, marketing and management aspects along with social impacts. The outcomes of this examination will be outlined in the **Project Appraisal Document (PAD),** which shall follow detailed risk and sensitivity analysis to assess project viability, along with discussions on loan terms, conditions and its effectiveness to improve sector performance and address policy issues.

Activities

- Project appraisal based on Donor policies
- Donor funding approval
- Procurement Plan

FSM Program Workflow

1. **Exploratory Study**
2. **Country Strategy Programming**
3. **Defining Need & Scope of Strategies**
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5. **Appraisal & Approval**
6. **Strategy Implementation**

The core of all stages, the implementation stage is filled with project execution details and agreements. Key tasks shall be carried out by relevant consultants **to detail engineering design, prepare bidding documents, procure machineries, equipment, civil works and supervision of construction work.**

Donors shall review implementation progress and monitor achievement in close coordination with city planners and executing agencies. They will also assess the project by visiting the project location at least twice a year.

Activities

- Procurement of Goods / Services
- Project Implementation Process

FSM Program Workflow


Consultants


City Planners

1. **Exploratory Study**
2. **Country Strategy Programming**
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6. **Strategy Implementation**
7. **Operation & Maintenance**

As the name says it all, this stage shall internally manage public stakeholders providing FSM solutions while procuring service-contracts and outsourcing private companies.

This stage is carried out for **proper management of the completed project elements** such that anticipated outcomes of the projects are delivered. Operational monitoring of key performance parameters need to be carried out on continual basis, which will indicate the performance and effectiveness of the Program elements.

Activities

- Project Operation, Management & Maintenance
- Operation Monitoring

FSM Program Workflow

City Planners

Donors

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8. **Monitoring**

A project's seamless operation would require meticulous monitoring such that projects are able to deliver outputs based on their logical frameworks. On so doing, we will also be able to **follow up on the project quality and its implementation progress.** Perhaps, verticals such as reports or a program website can do best to update and aggregate the project's monitoring aspects. Since communication is the key, such interactions lead to transparency and enhance accountability to all key players- beneficiaries, public and donors!

Activities

- Monitoring of project implementation progress
- Monitoring of project quality
- Reporting & updating project status

FSM Program Workflow

City Planners

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8. **Monitoring**
9. **Review & Correct**

The master of all stages, Reviewing and Correcting would require data collected throughout the program cycle to be analyzed and monitored to evaluate achievements of set targets.

Donors shall prepare a project completion report to document the implementation experience with entire results, chain of inputs, outputs, outcomes studied and outlined. City Planners can use the aggregated information from performance monitoring to evaluate the performance. As an outcome, identifying gaps and lessons learned can act as corrective measures to be corrected in the next project cycle.

Activities

- Program monitoring, review & analysis
- Corrective / follow up adaptation

FSM TOOLBOX

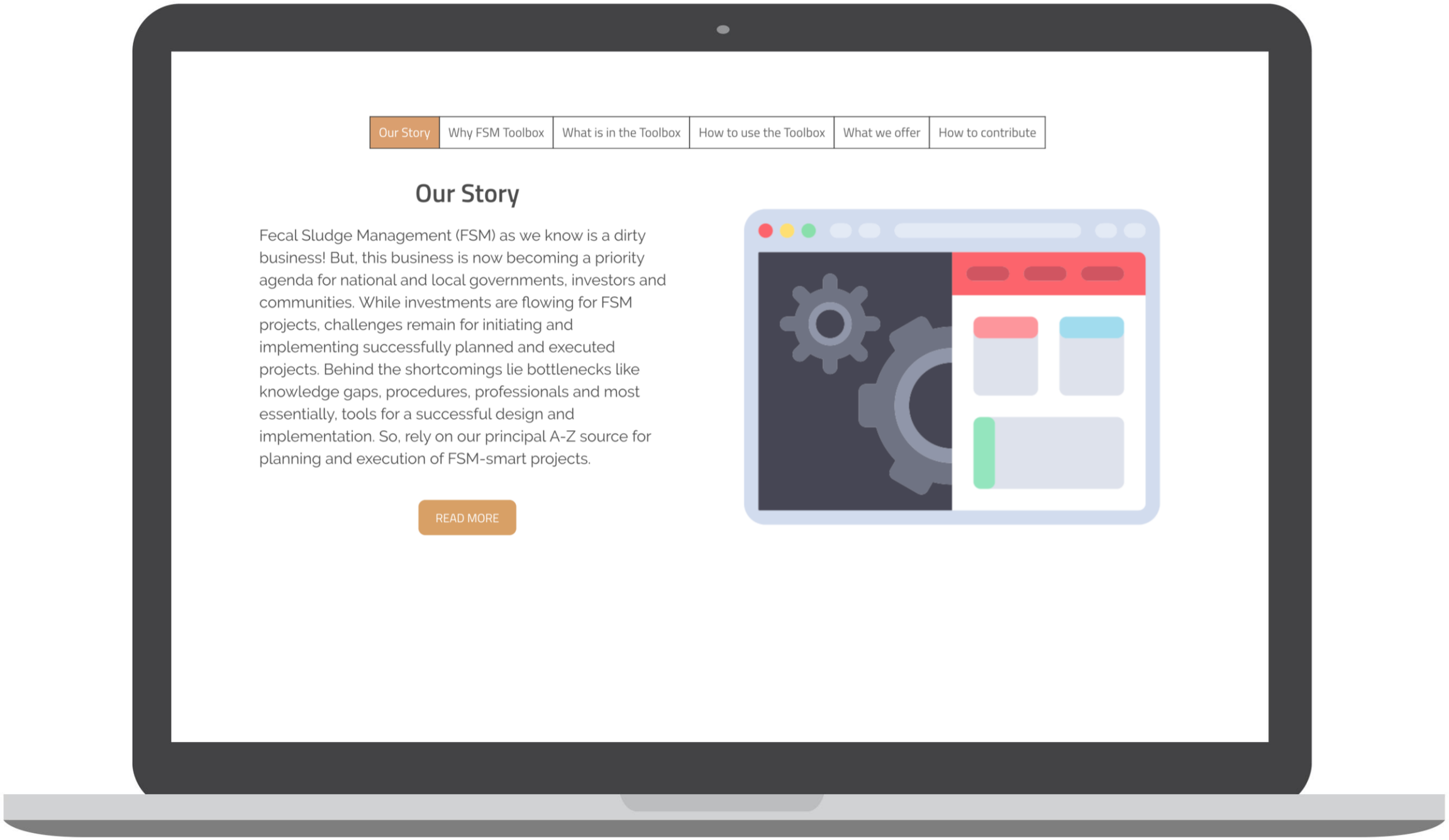
www.fsmtoolbox.com

FSM TOOLBOX


FSM
Faecal Sludge Management
TOOLBOX
ACCELERATING EFFECTIVE
IMPLEMENTATION OF FSM PRACTICES

FSM TOOLBOX

About our project



FSM TOOLBOX

How did the project come about

FSM
TOOLBOX

Our Story

The idea of FSM toolbox came into being as a need was identified to better organize the existing FSM knowledge into user-friendly toolbox for current information is fragmented and mismanaged. This happened at the FSM Consultative Workshop organized by Bill and Melinda Gates Foundation (BMGF), Asian Institute of Technology (AIT) and Asian Development Bank (ADB) in Manila in 2014.

Motivated by how effective management of tools can accelerate FSM practices, stakeholders and professionals in the meeting decided to move forward and designate three key players to undertake this task: Donors.investors, City Planners, and Consultants. The toolbox has been meant to be developed based on core aspects of project cycle and management, and hence it collates tools and documents to enable city planners, donors and consultants in pursuing their FSM programs.

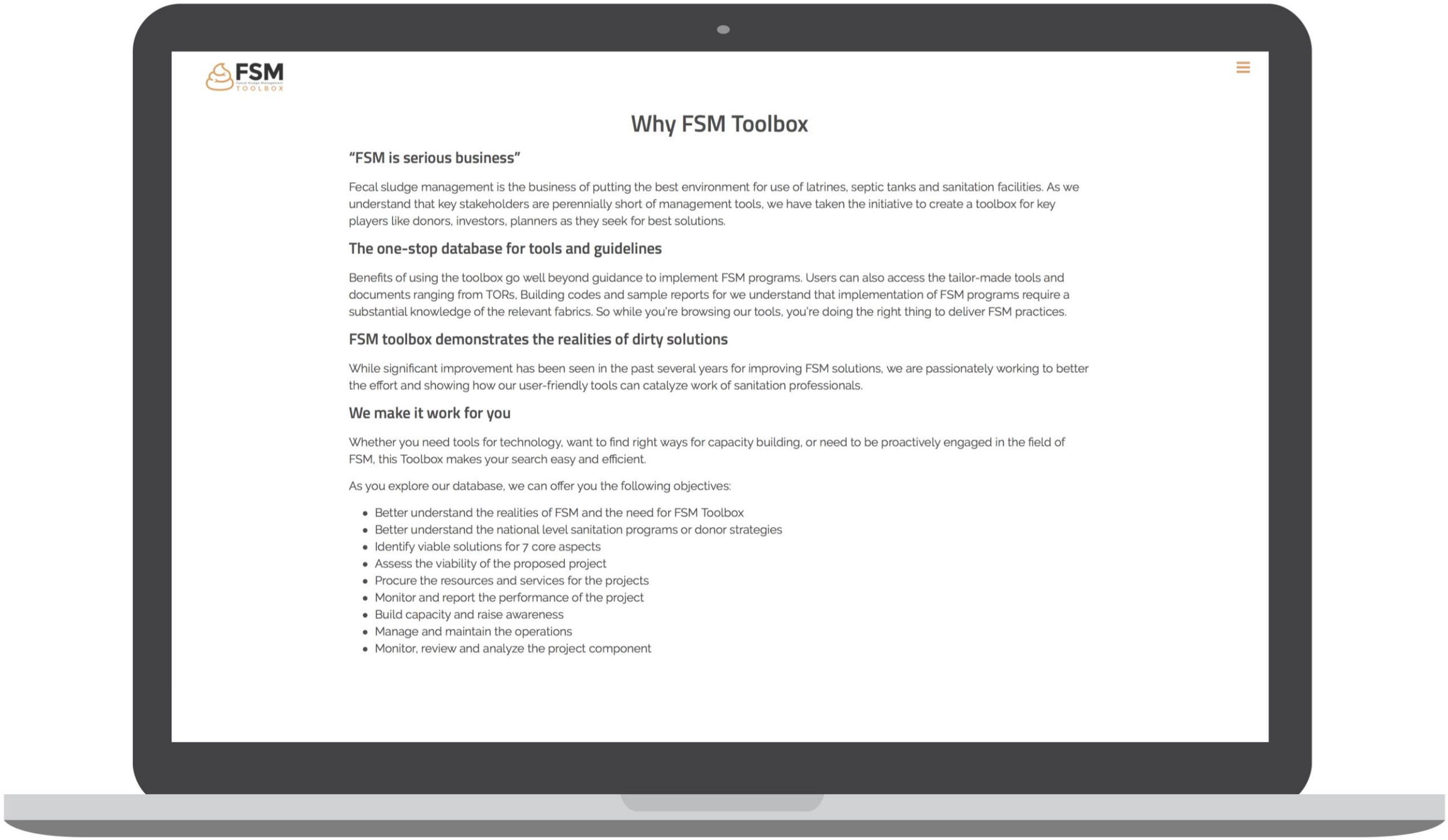
With the objective of synthesizing fragmented information and modifying them to best suit the needs of key FSM players, in 2013, developing a one-stop database for FSM practices was underway. Hence, AIT Research team initiated the toolbox by bringing the best mix information needed to address the formidable challenge of fecal sludge management.

We, the team have since been actively carrying out intensive desk research to collect the scatteredly available tools, and documents regarding water, sanitation, and faecal sludge management. As we presented the collected materials and got verified from international experts at first advisory panel meeting in Hanoi, their constructive feedbacks led us to designing applicable survey questionnaires and interviewing relevant practitioners. We have interviewed 60 practitioners from countries like Thailand, India, Bangladesh, Philippine, Vietnam, Senegal, South Africa, Uganda and Nepal). After identifying gaps in stakeholders' needs and available resources from the interviews, AIT research team, in collaboration with CSTEP and CEPT University developed 15 tools. The project since then has been seeking constant guidances from experts through focus group discussions, consultations and dialogues to validate the applicability of tools and toolbox approaches.

We have successfully disseminated information about the toolbox via platforms like workshops, trainings and discussions to verify practitioners' needs and collect feedbacks.The project has taken every opportunity to improve and enhance its applicability, when conducting workshops in places like Bangalore and Bangkok for testing the tools and collecting constructive comments alike.

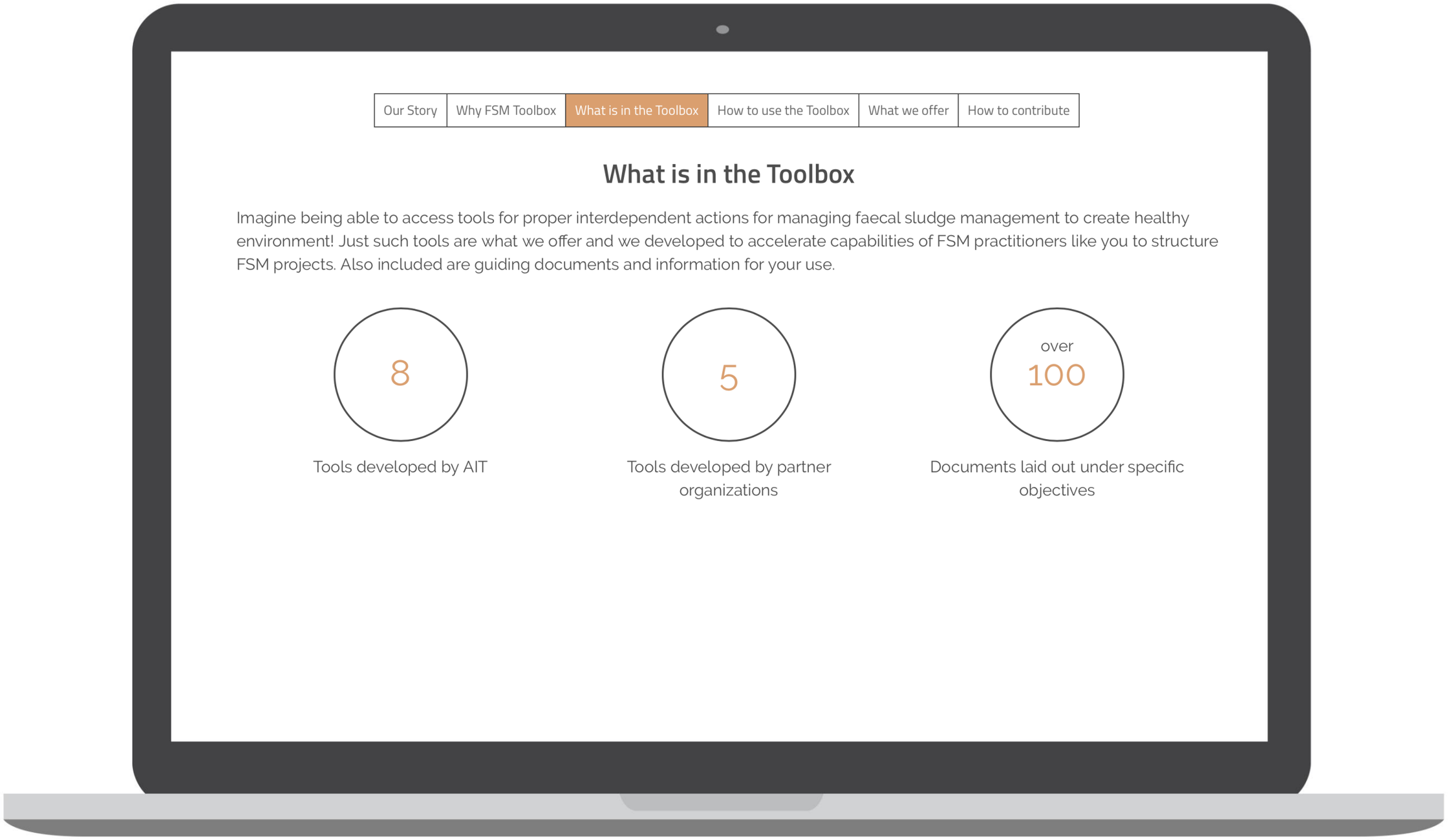
FSM TOOLBOX

How we make it work for you



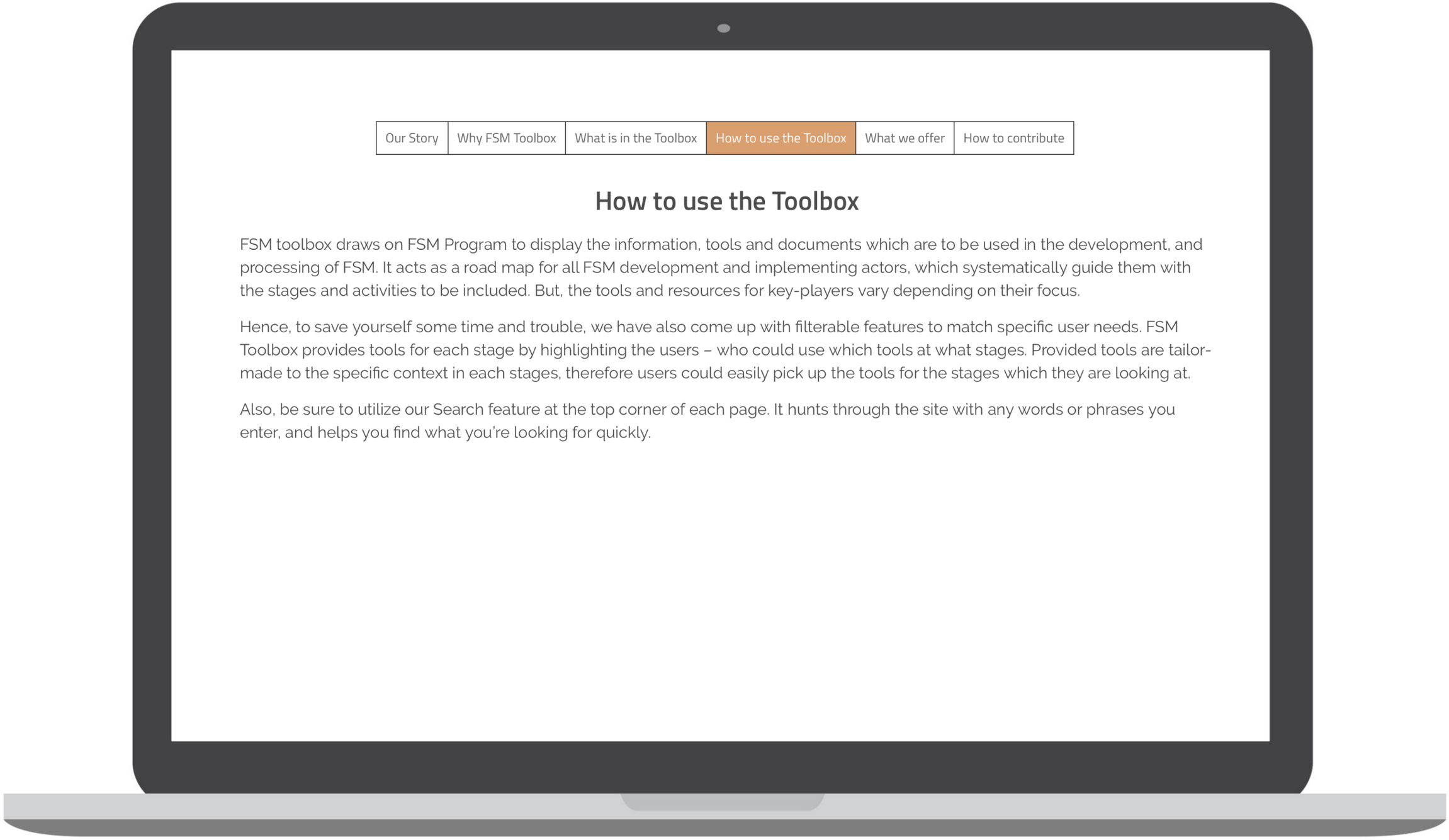
FSM TOOLBOX

Outlook on what is inside the box



FSM TOOLBOX

Guidelines



FSM TOOLBOX

Service
s

What we offer

Our dynamic work is growing! We are ready to expand and extend our contributions beyond the Toolbox! As our experience and knowledge broaden, along with providing you with a spectrum of tools, we are also developing:

Rapid Deployment Consultancy Team

to actively engage ourselves and our expertise in order to carry out assessments

On-Site Training

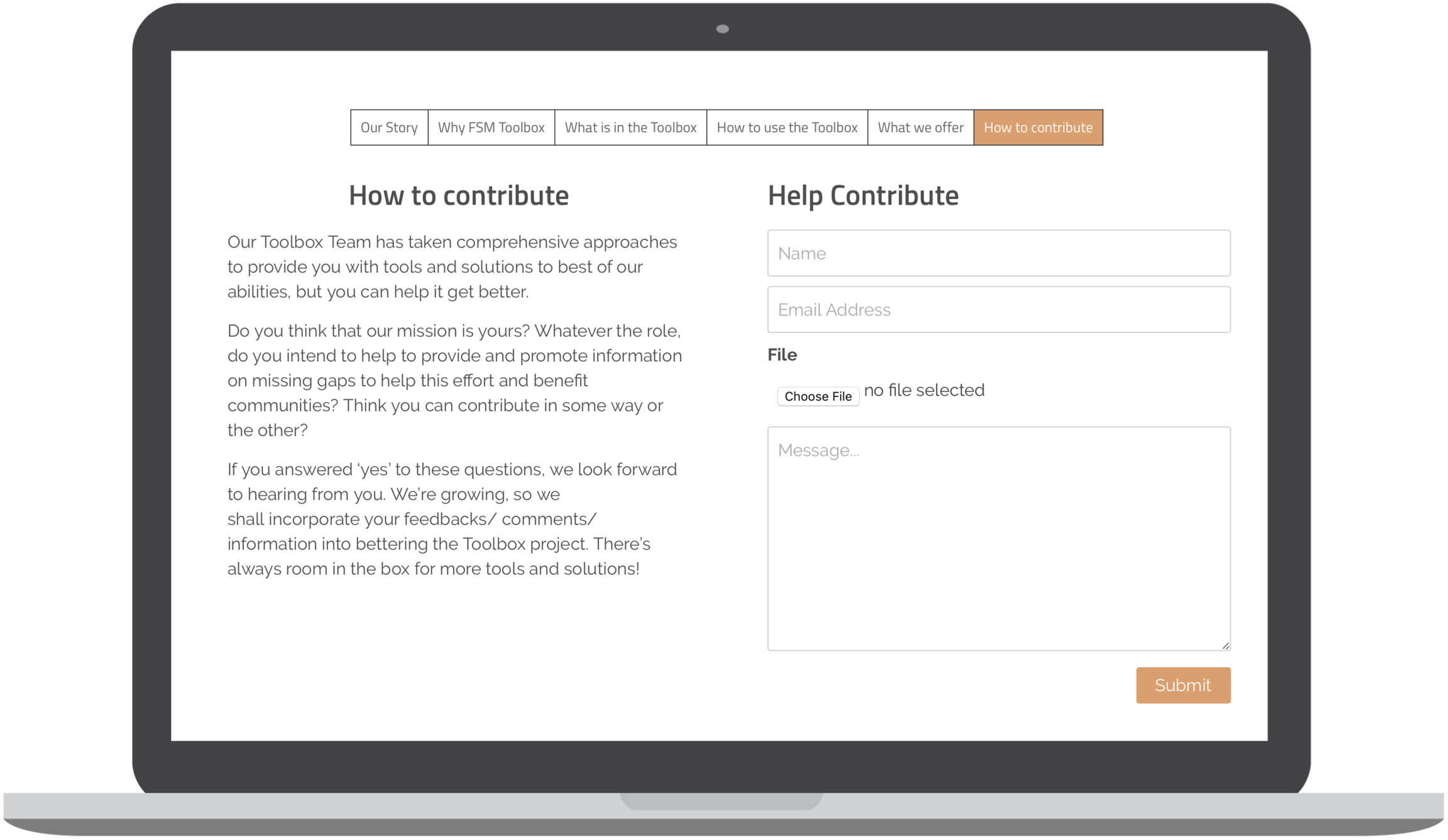
to train practitioners on how to effectively use the toolbox while matching with specific contexts

FSM Toolbox Online Course

to create a platform for knowledge assimilation and exchange

FSM TOOLBOX

Help contribute

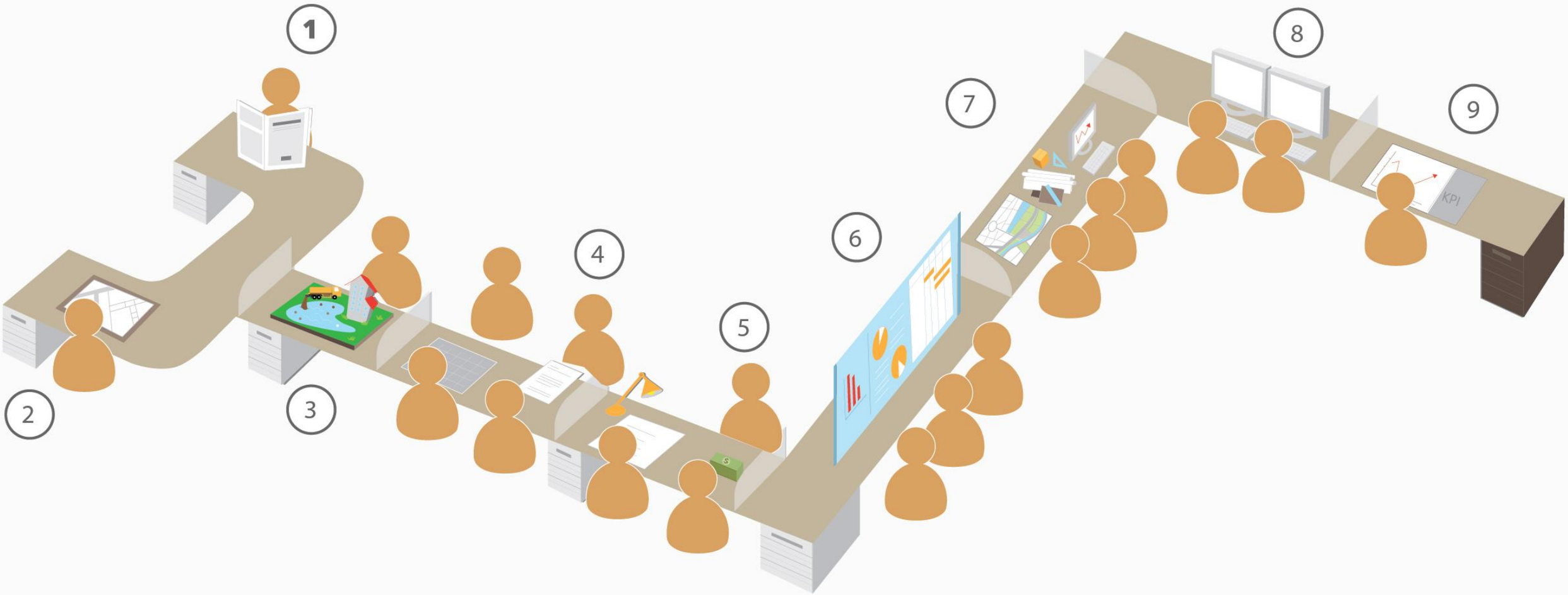


FSM TOOLBOX

There’s never been **faster and easier method** of accessing tools to optimize the performance of your FSM projects!

FSM TOOLBOX

FSM Program Workflow



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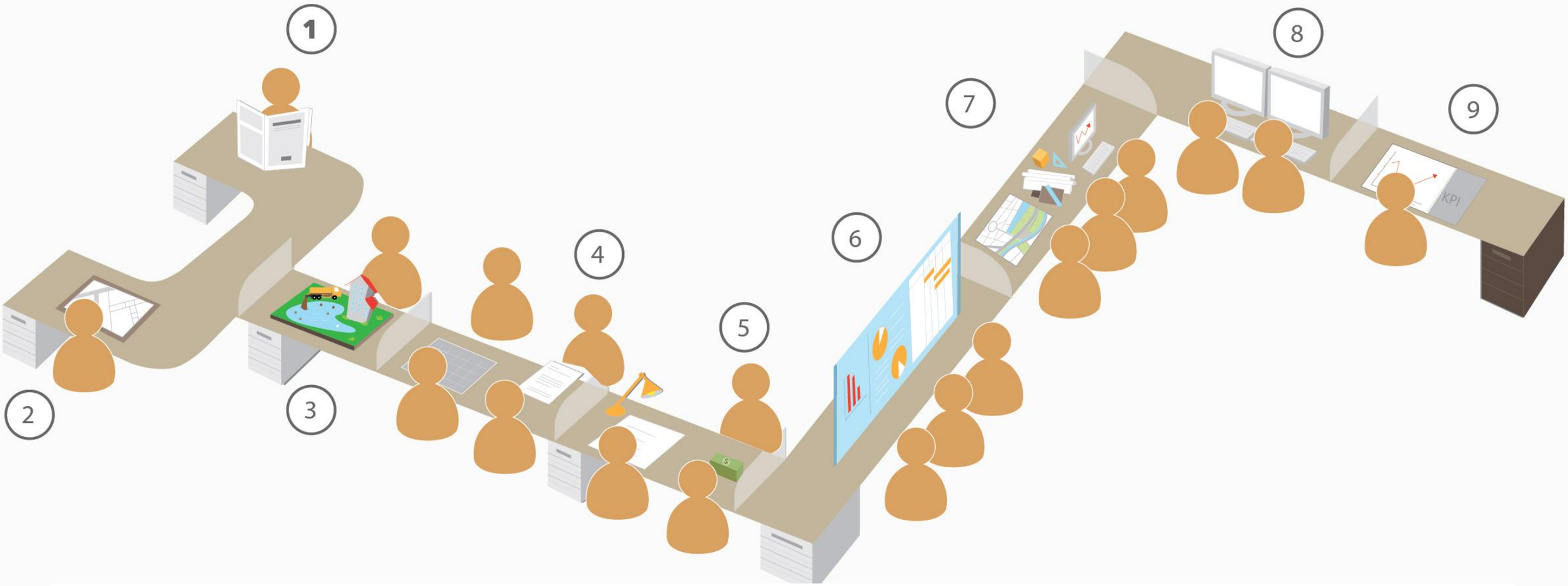

provides a **roadmap** for all FSM development and implementing actors

FSM TOOLBOX

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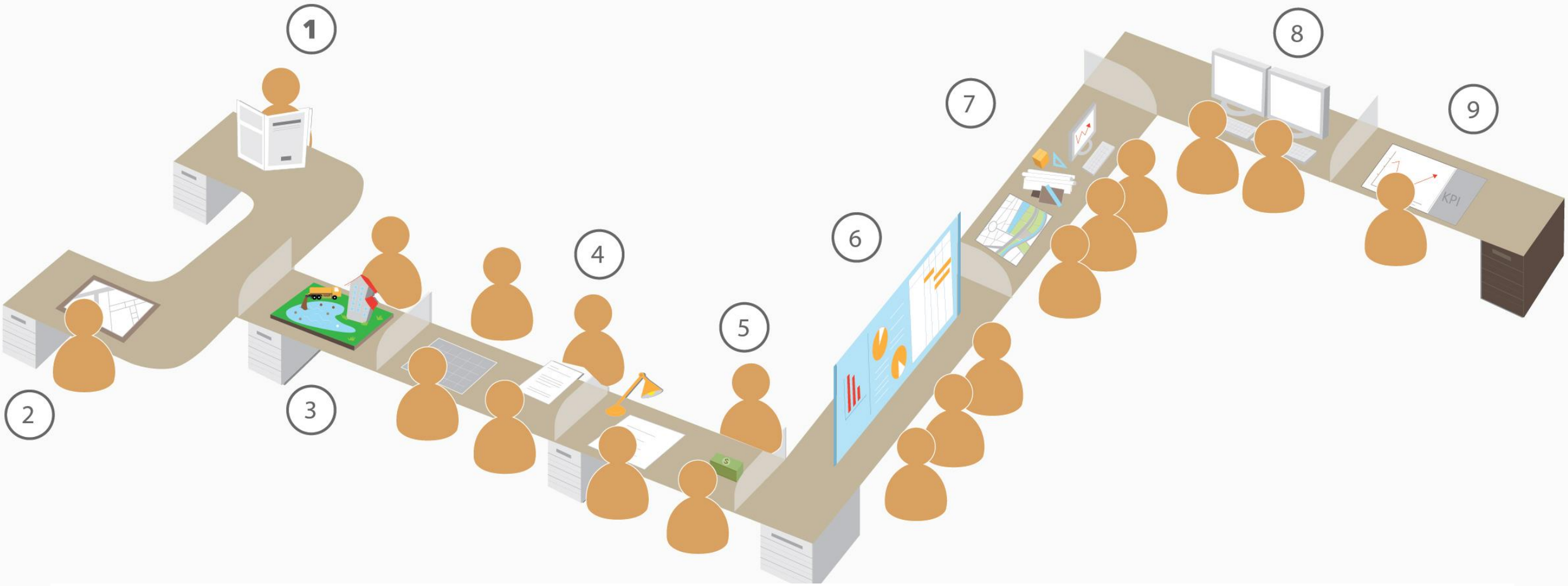
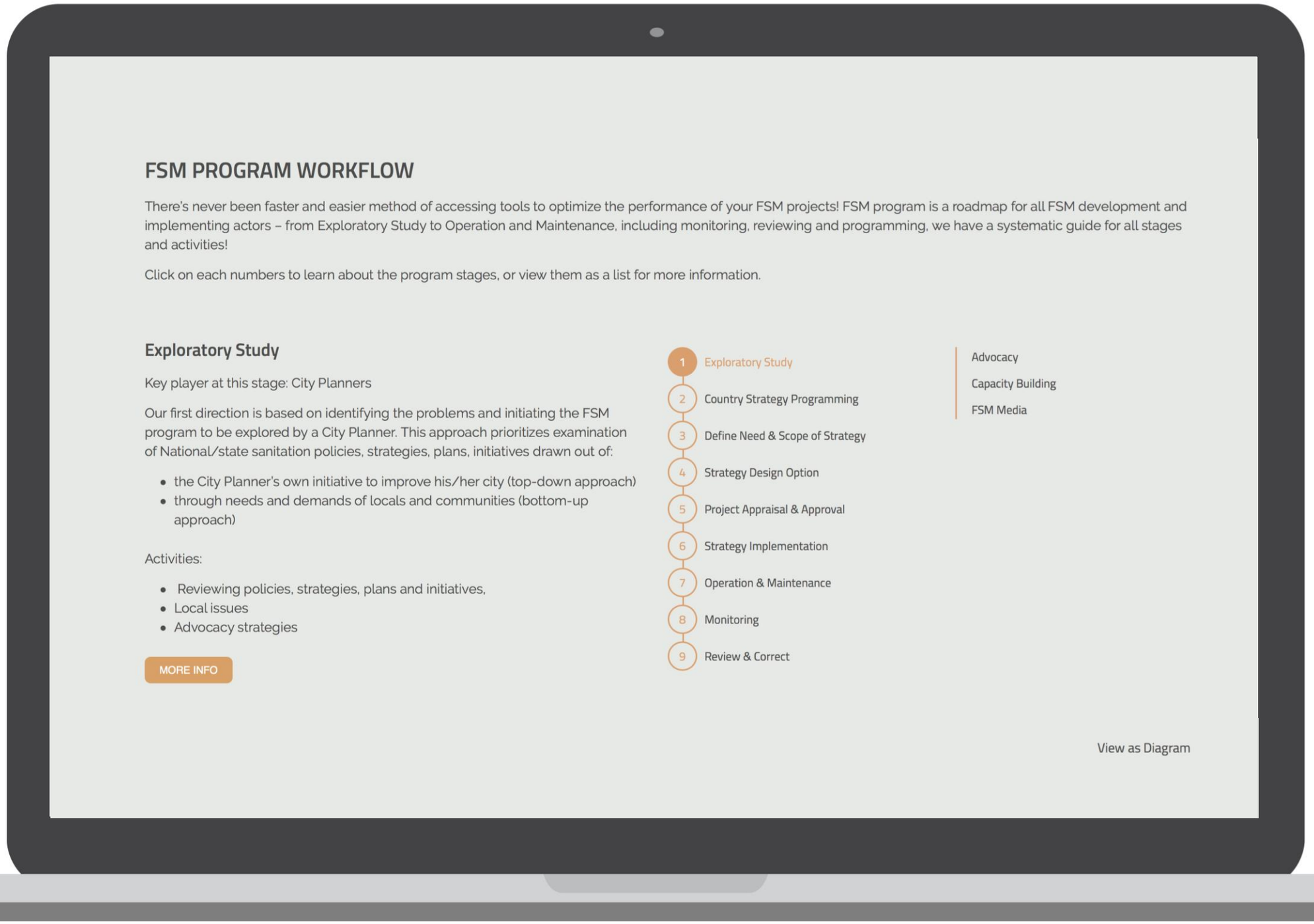


provides a **roadmap** for all FSM development and implementing actors with a **systematic guide** for all stages and activities!

FSM TOOLBOX

FSM Program Workflow

standardized framework for FSM Practitioners



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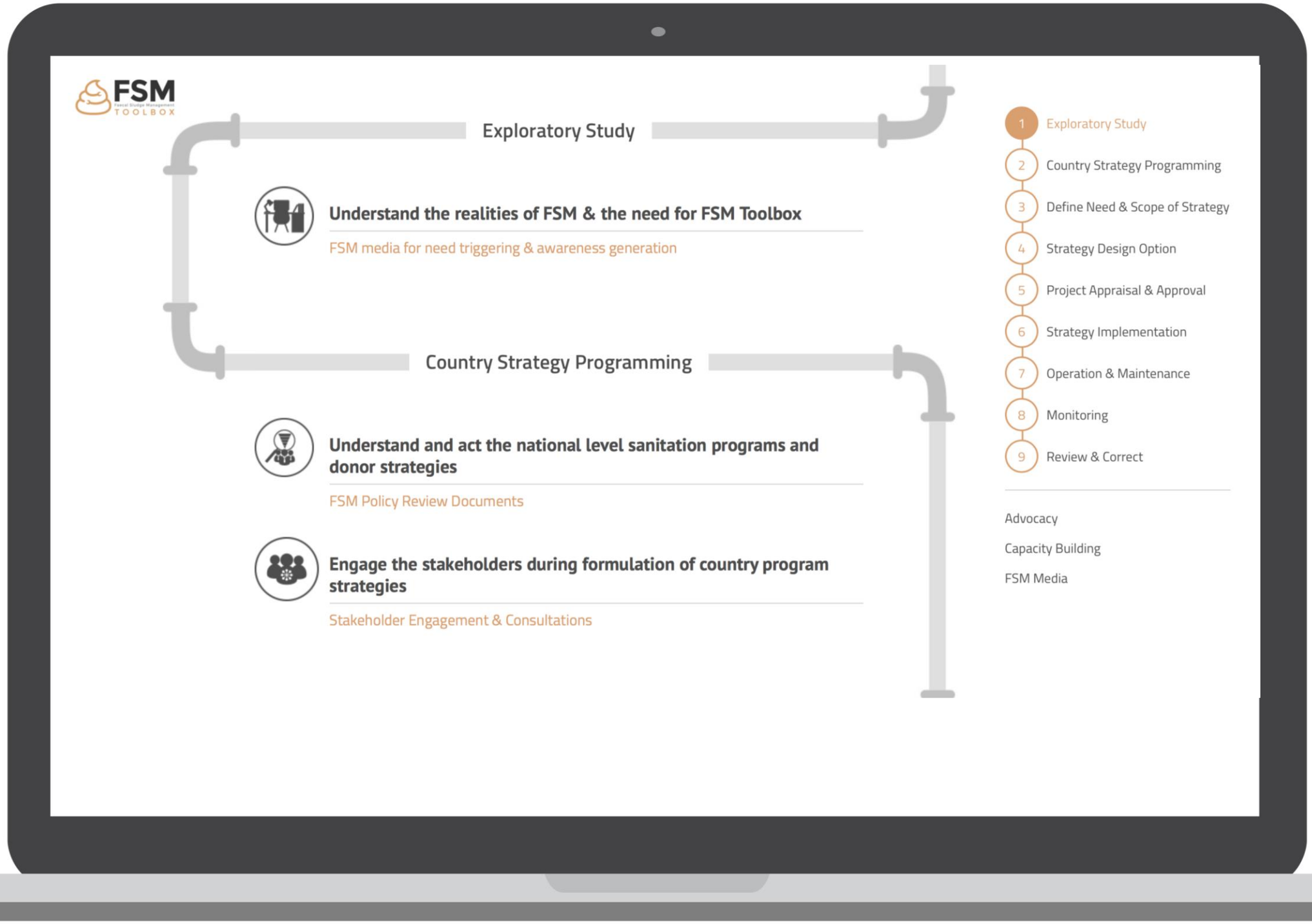

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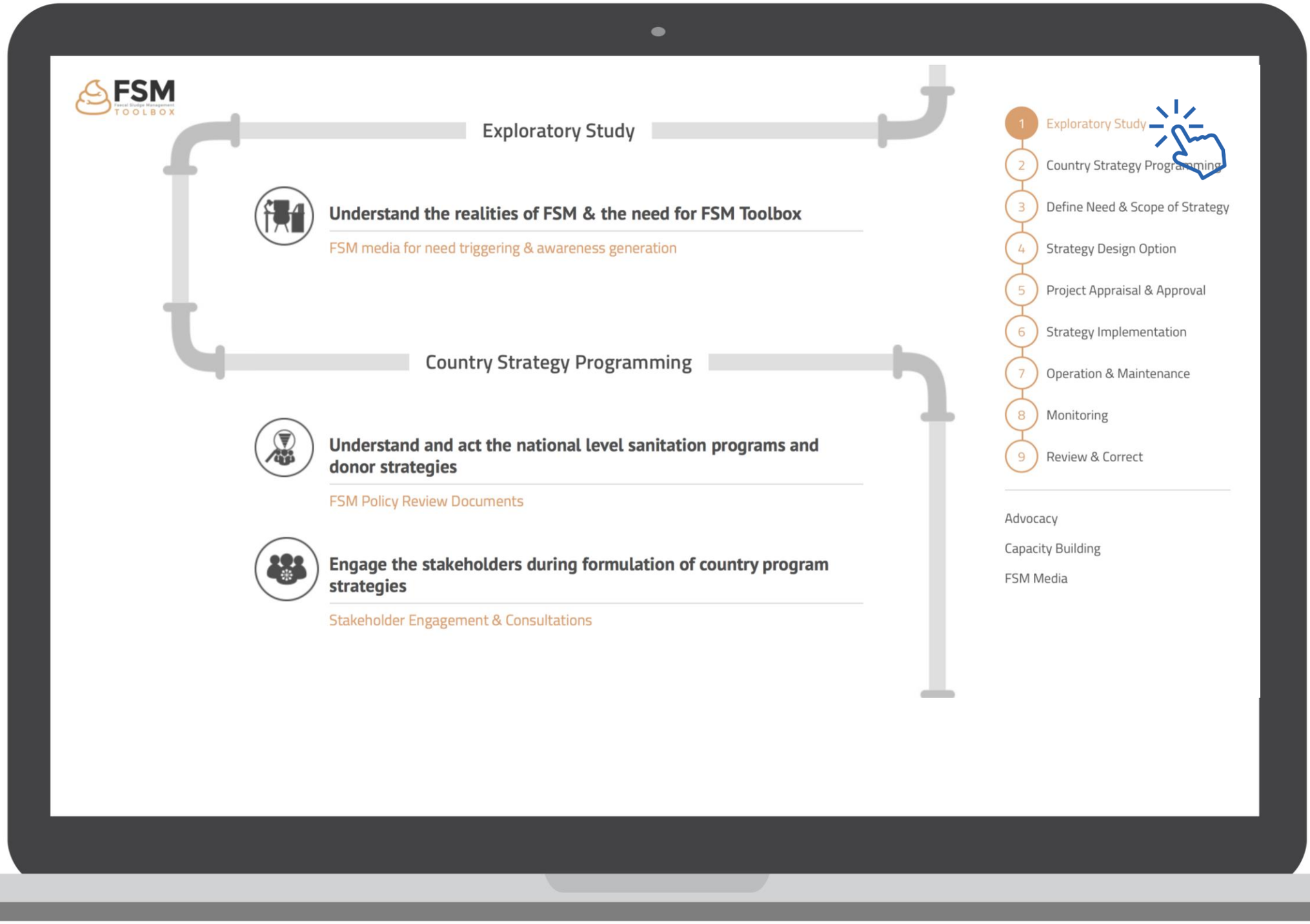

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FSM TOOLBOX

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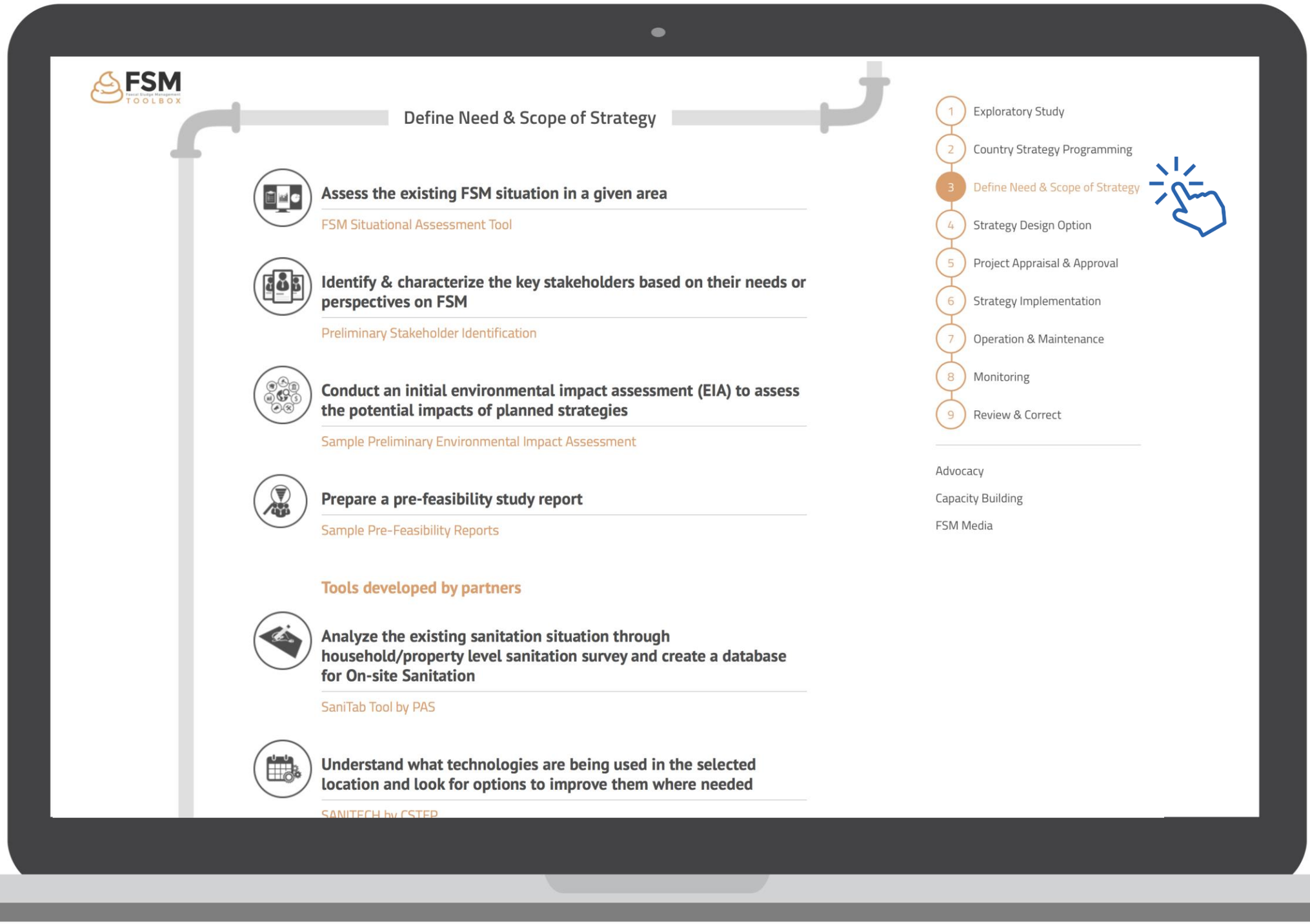

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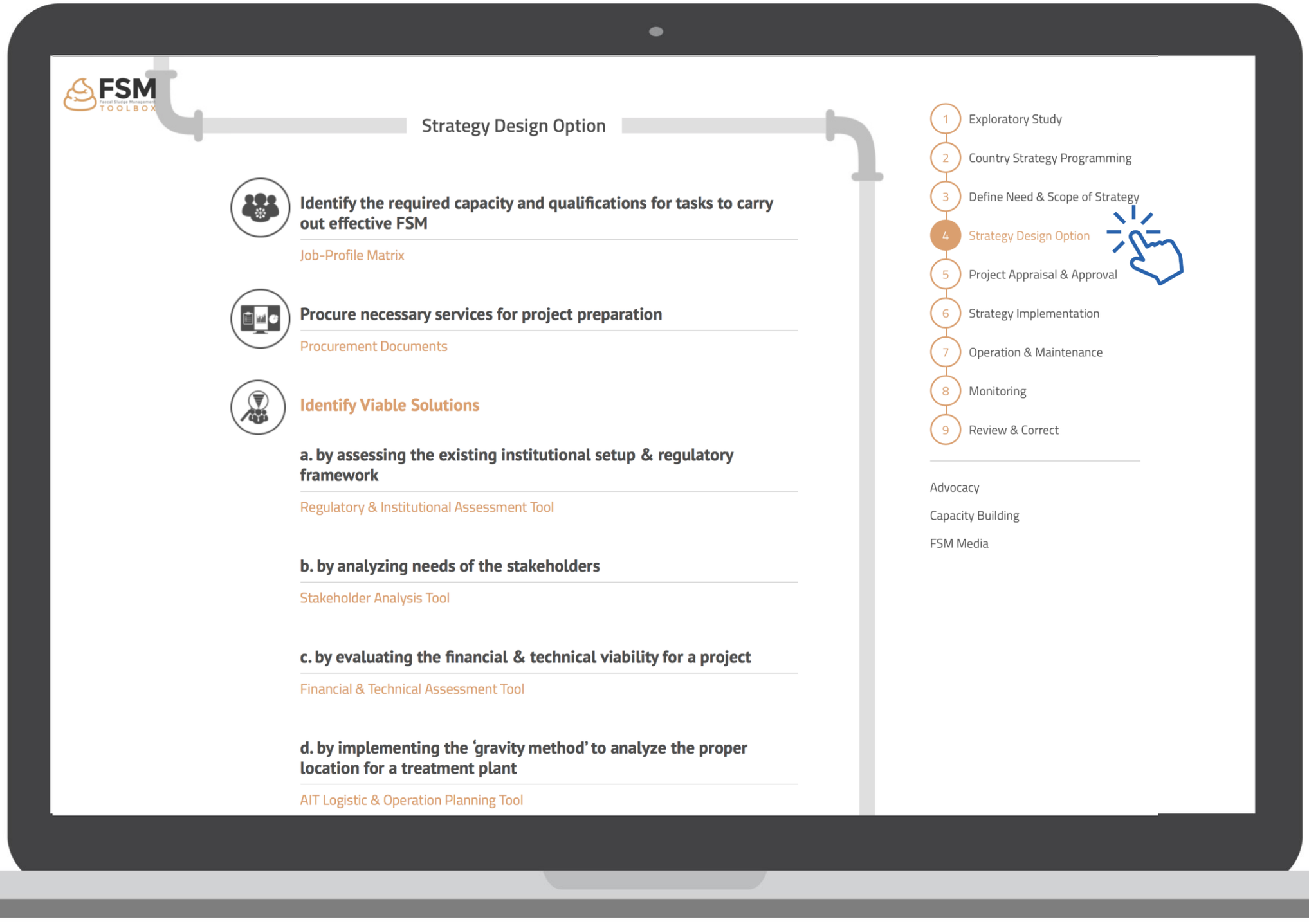

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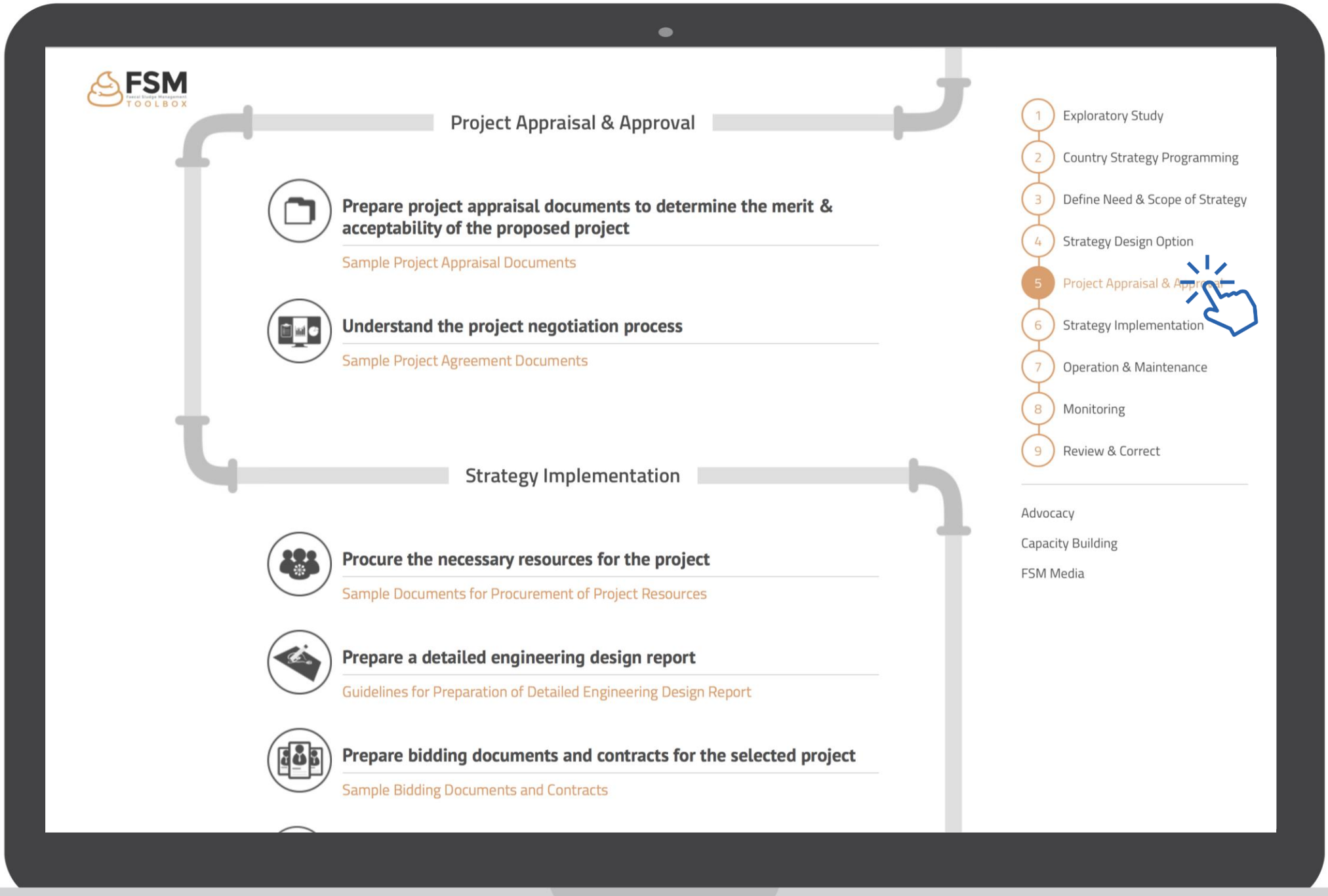

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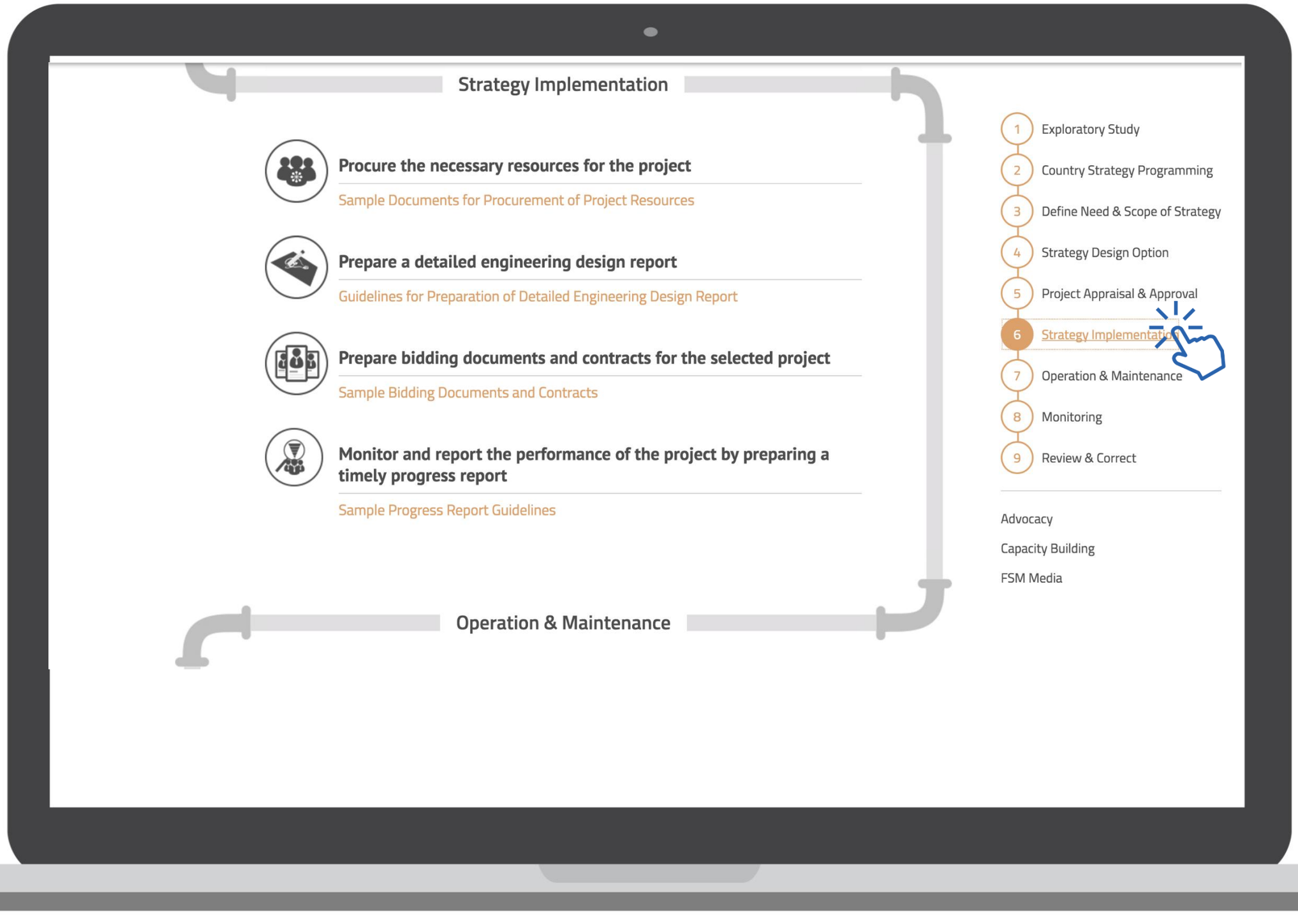

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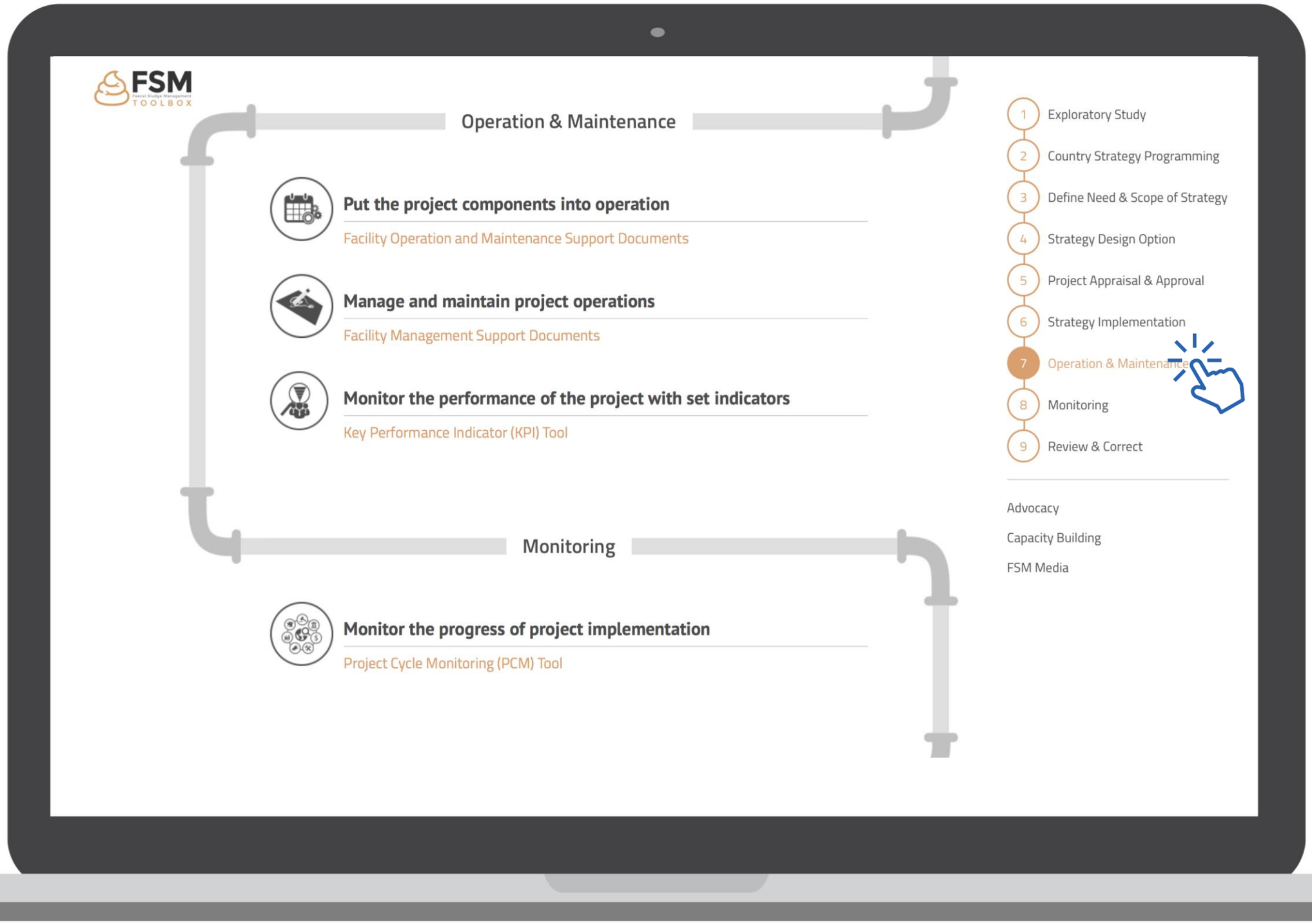

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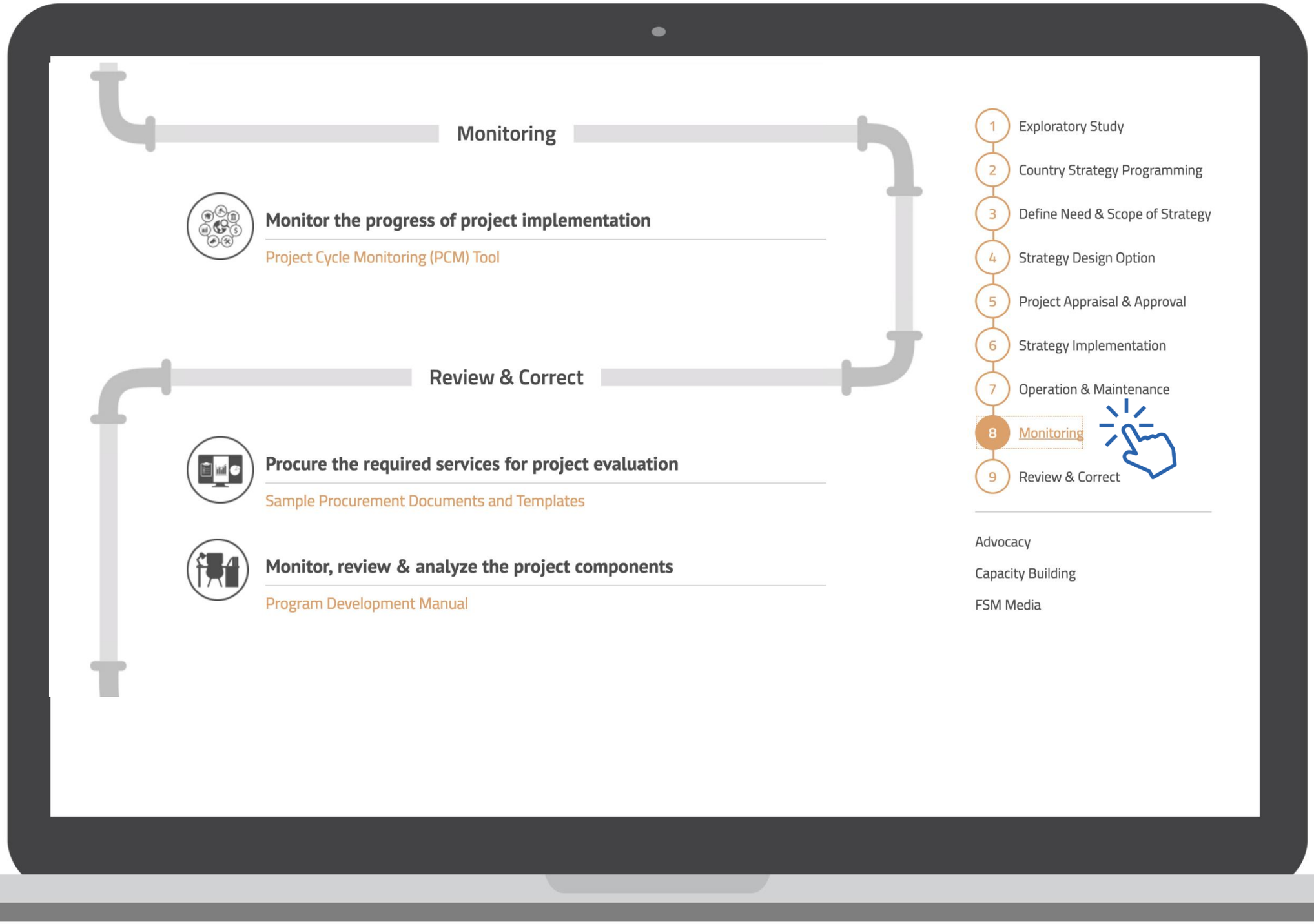
standardized framework for FSM Practitioners



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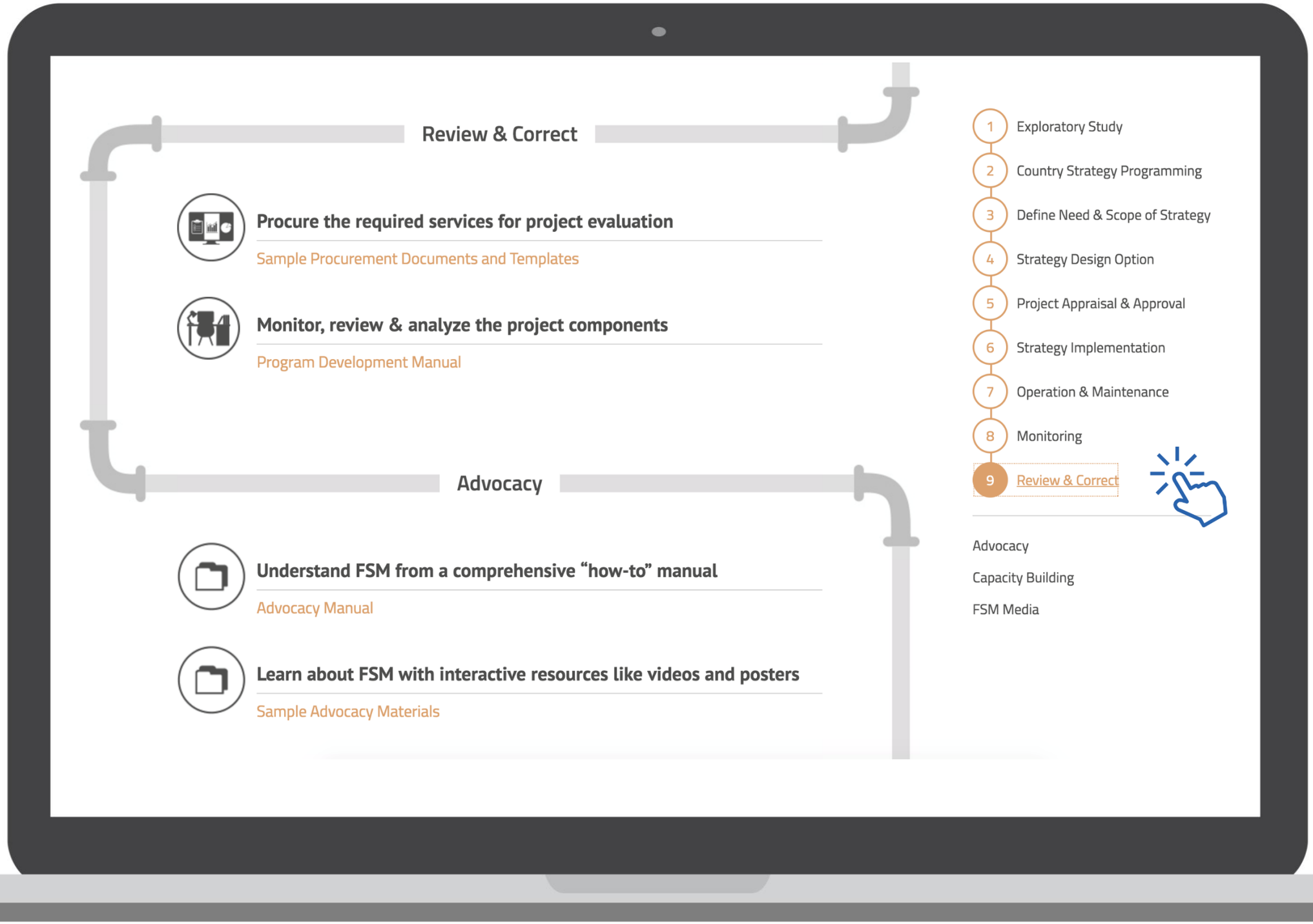

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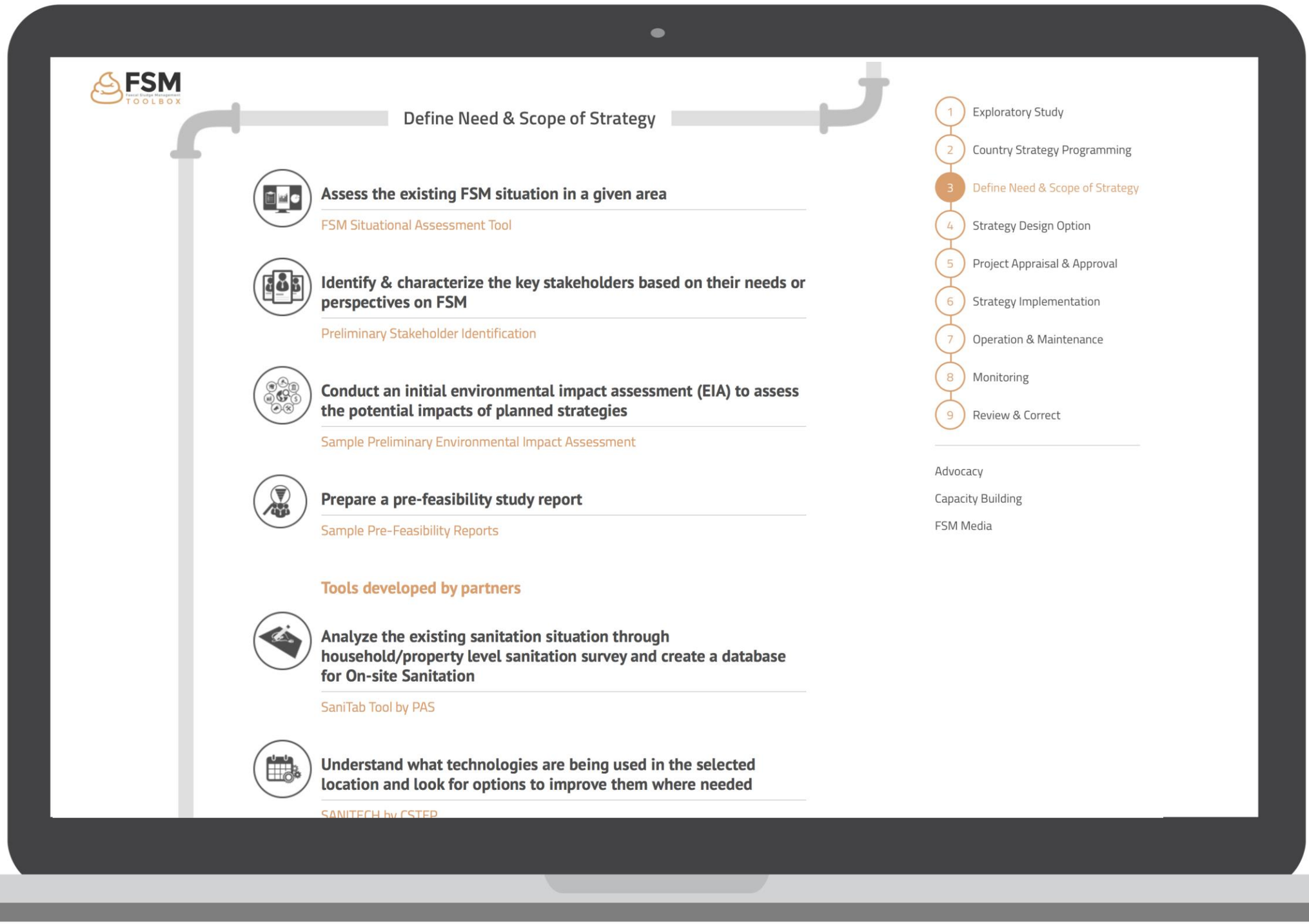
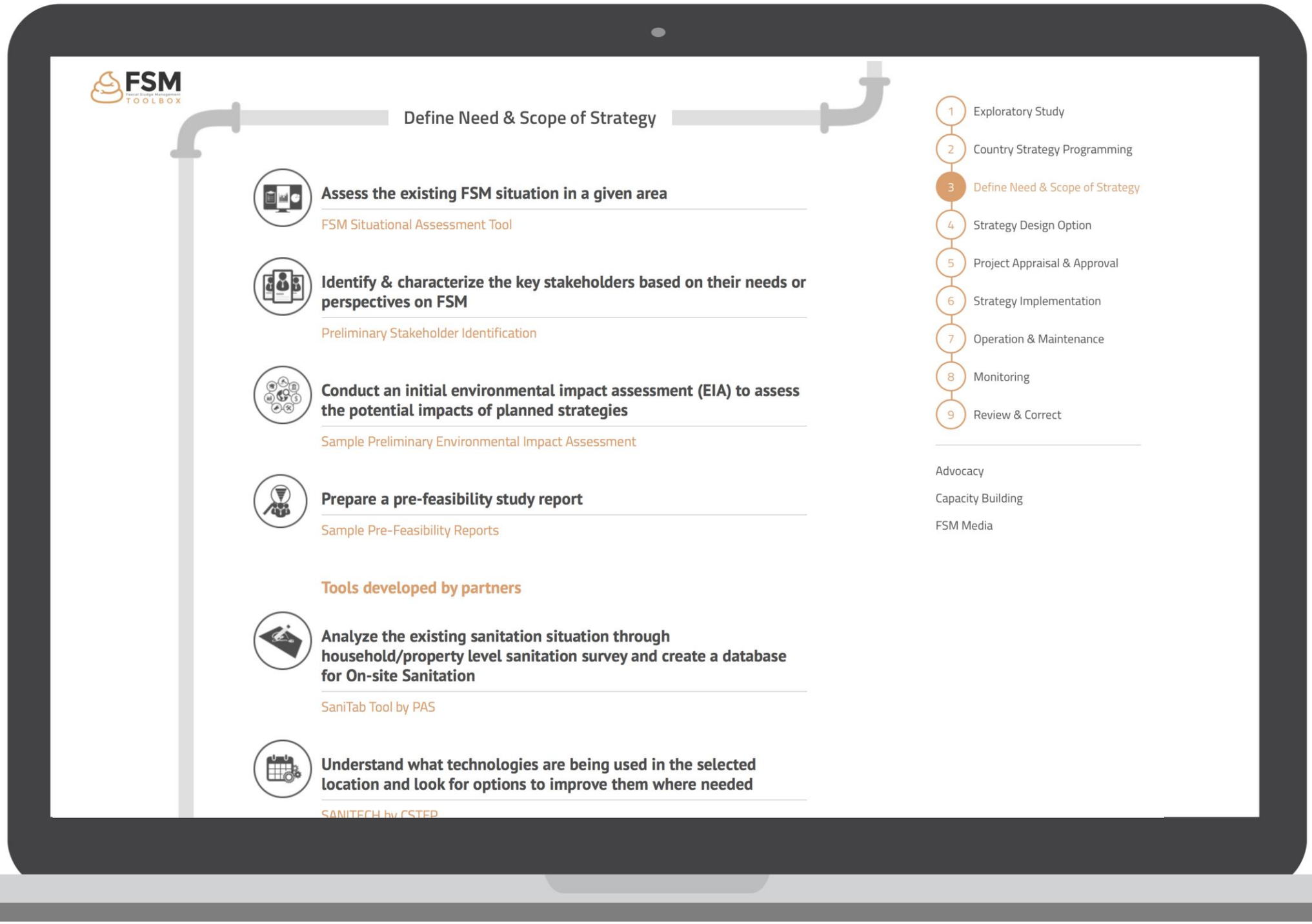
FSM TOOLBOX

We make it easy for you to choose your **objectives** along the framework



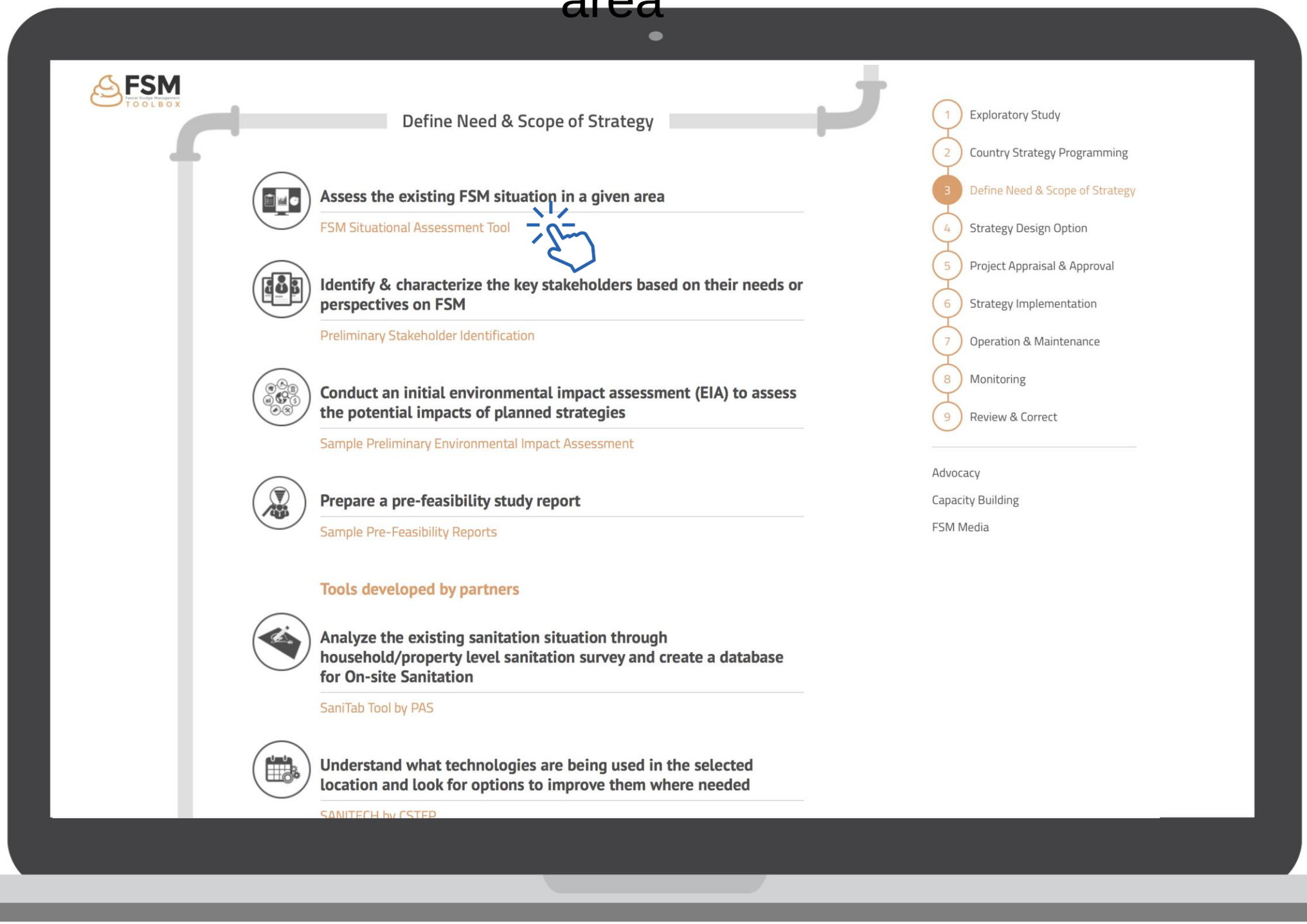
FSM TOOLBOX

Assess the existing FSM situation in a given



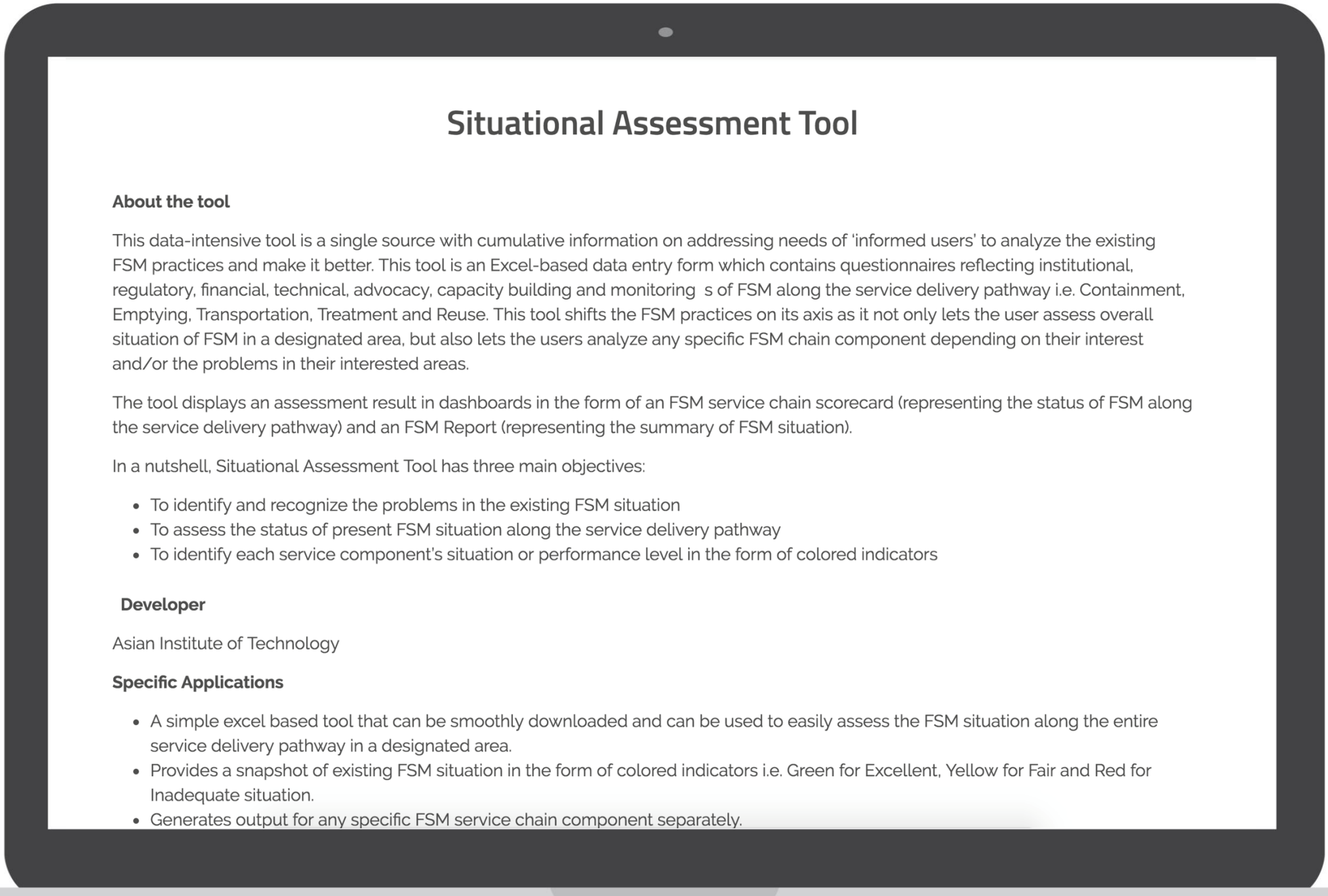
FSM TOOLBOX

Assess the existing FSM situation in a given area



FSM TOOLBOX

Introduction to the tool



FSM TOOLBOX

Just drop us a quick message ..

Developer

Asian Institute of Technology

Specific Applications

- A simple excel based tool that can be smoothly downloaded and can be used to easily assess the FSM situation along the entire service delivery pathway in a designated area.
- Provides a snapshot of existing FSM situation in the form of colored indicators i.e. Green for Excellent, Yellow for Fair and Red for Inadequate situation.
- Generates output for any specific FSM service chain component separately.
- Displays data in tabular and graphical format.

REQUEST FOR ACCESS

Looks like you're interested in our tool!
So, let's indulge in some knowledge exchange and information sharing. Please tell us about the context and situation in which you will utilize this tool. And, your wish is our command! We will provide you with the tools FREE of charge!

Contact Us

FSM TOOLBOX

Just drop us a quick message ..

Request for Resources

Our resources and simple to use, excel and web-based tools can help users like you to understand and implement projects better in any FSM businesses. Simply write to us and your resources are only a click away!

Message...

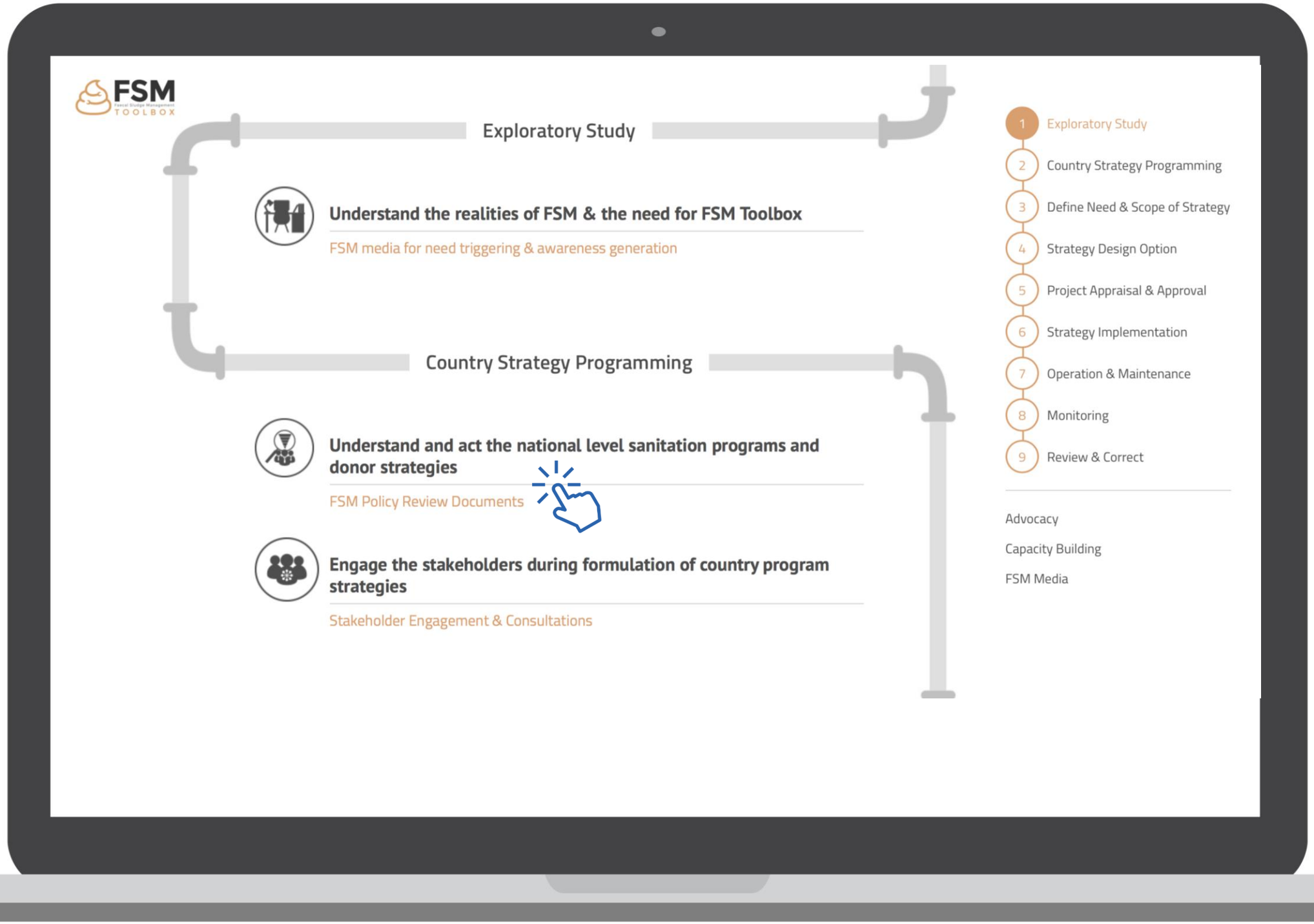
Name

Email Address

Submit

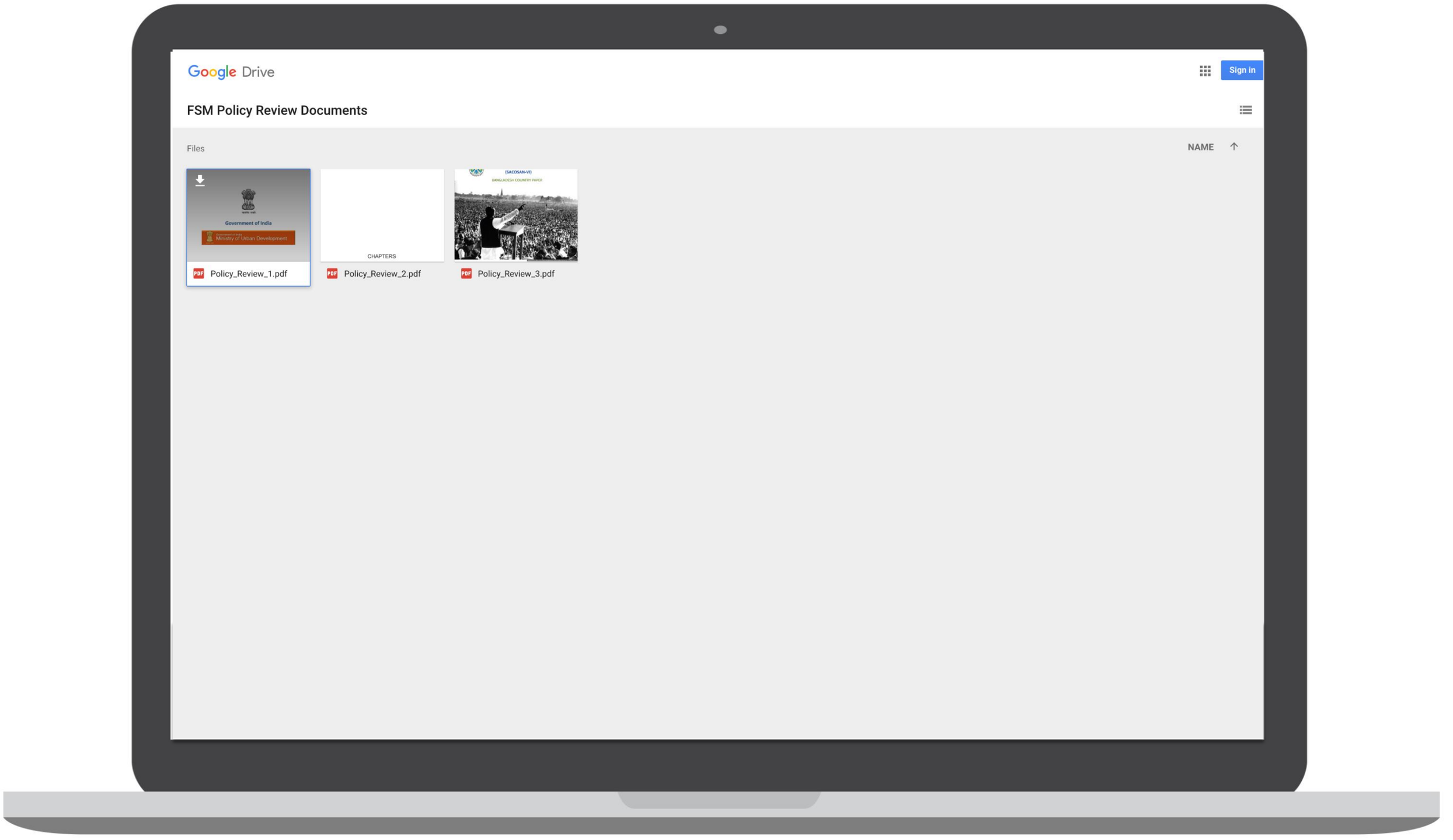
FSM TOOLBOX

Review policy documents related to FSM



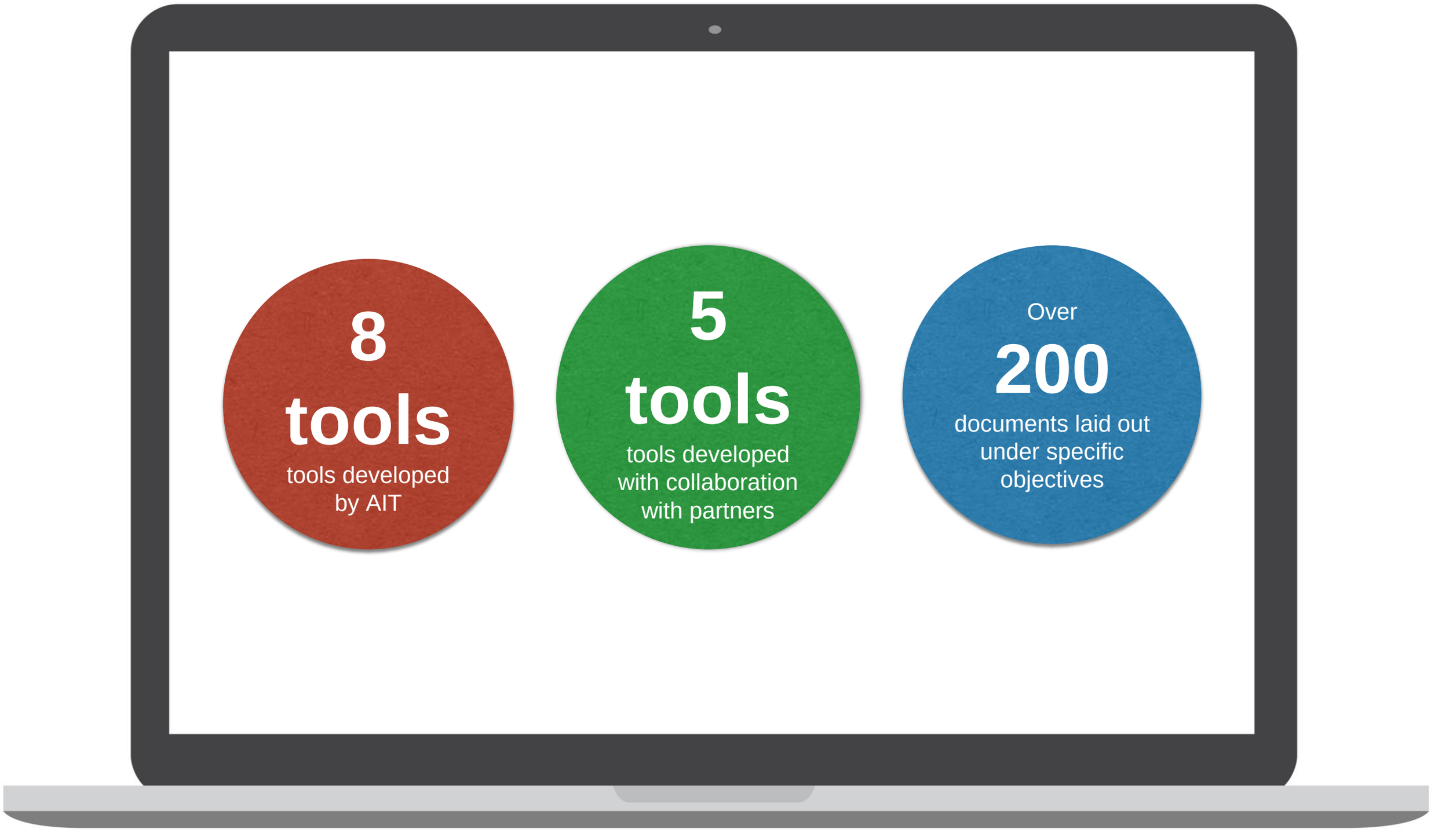
FSM TOOLBOX

Easy to download



FSM TOOLBOX

We now have ..



FSM TOOLBOX

FSM TOOLBOX

Accelerating Effective Implementation of FSM Practices

Donors

Consultants

City Planners

Tailor made solutions for FSM practitioners

FSM TOOLBOX

FSM Situational Assessment Tool

Isha Basyal

Agenda

- Tool Presentation – 30 minutes
- Discussion – 15 minutes
- Small exercise – 45 minutes
- Feedback and wrap up – 15 minutes

Finding the Tool

FSM TOOLBOX

www.fsmtoolbox.com

- FSM Program workflow
  - Define Need and Scope of Strategy
    - More Info

Learning outcome

- ✓ Describe the purpose and limitations of the SAT tool
- ✓ Use SAT tool with a given data set
- ✓ Interpret the results from the SAT tool

FSM TOOLBOX

Training Content

- ✓ What is the tool about?
- ✓ How to use the tool?
- ✓ What it helps accomplish?
- ✓ Result Interpretation
- ✓ A small practice session

Why situational assessment?

1

- To assess present status of FSM along the service delivery pathway

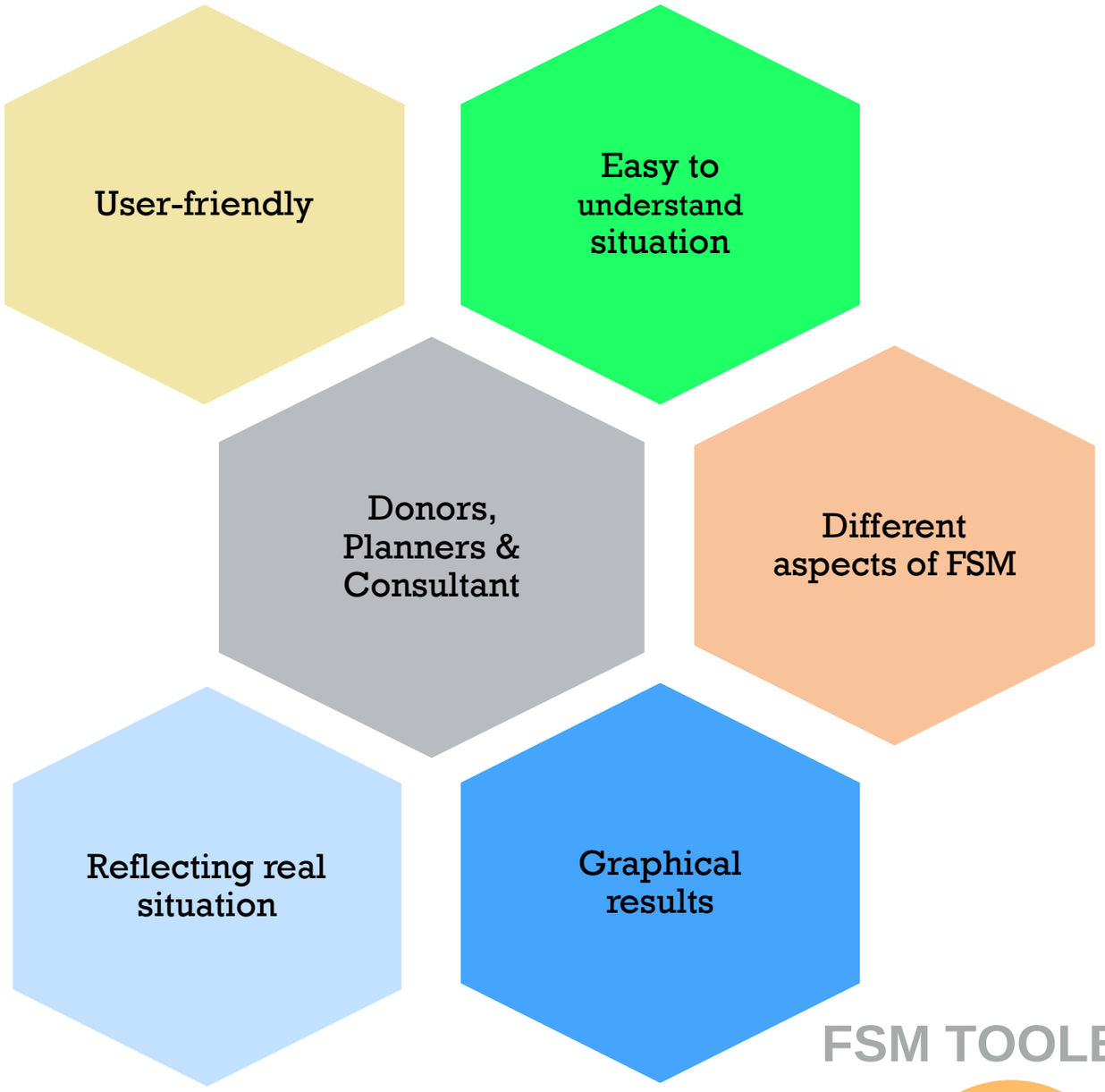
2

- To identify each service component's situation or performance level

3

- To identify the problems in present FSM situation

What is the tool about?



- Simple excel based tool
- Questions on different aspects of FSM for entire FSM chain
- Report on current FSM status for entire service delivery pathway

Possible data sources

- Municipality
- Community representatives
- Sanitation authorities
- Service providers: Emptying and transportation (formal/informal)
- Licensing authorities: Emptying/transportation/treatment
- Reports and records on FSM
- Treatment plant operators
- Reuse operators

FSM TOOLBOX

FSM TOOLBOX

Question format

Yes/In-process/No questions

- Assigned with scores and weights.
- Sub-questions appear if users select Yes/In-process option

Multiple choice question

- Only multiple-choice questions with single answer can be weighted

Open ended question

- Reflects the exploratory aspects of the situation

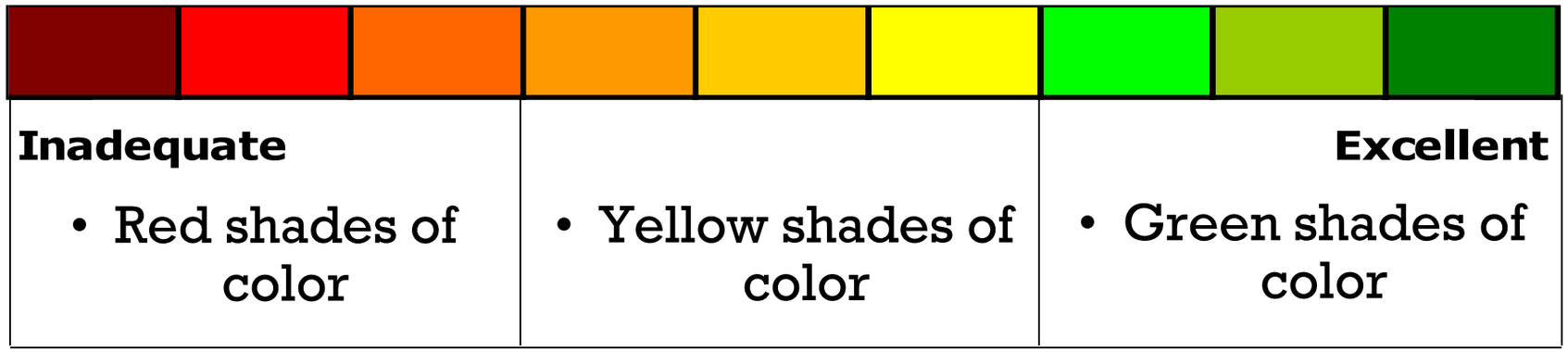
Based on Weighted Average Index Method

Final results generated on: **Dashboard**

CONTD

$$\text{Weighted Average} = \frac{\sum(\boldsymbol{Score} \times \boldsymbol{Weight})}{\boldsymbol{Total\ weight}}$$

- Further shown as colored indicators



Inadequate		**Excellent**
• Red shades of color	• Yellow shades of color	• Green shades of color

The score ranges from 0 (inadequate case) to 1 (excellent case)

- With three color coding i.e. red, yellow and green indicating Inadequate, Fair and Excellent FSM situation, respectively

Each indicator is represented in the form of different shades of same color

- To have a deep understanding on FSM situation

FSM TOOLBOX

Basic instruction before using the tool

Compatibility

- Tool is compatible on Windows PC with Microsoft Office 97 and above
- Can be downloaded from the website upon request

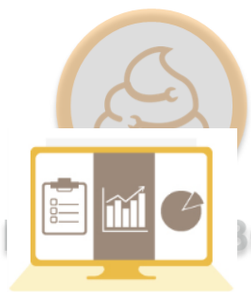
www.fsmtoolbox.com

Appearing Message

- The tool contains macros.
- Ensure macro is enabled and Select ‘Enable Content’.
- A message “Do you want to clear existing answers?” pops up every time

Applicability

- Familiar with the area and understands sanitation issues.
- Applicable to areas where households are installed with On-site Sanitation Systems (OSS).



Introduction

Tab 1 Contains the tool's descriptions

General

Tab 2 Divided into 6 sections i.e. Demography/Geographical information, Legal Framework and Enforcement, Finance, Socio-cultural aspects, Advocacy and Monitoring aspects - reflects the overall situation of FSM

Containment

Tab 3 Contains questions mainly on the types of toilets used, the geography of containment areas and the coverage of the On-site Sanitation System (OSS) and the average volume of OSS

Emptying

Tab 4 Contains questions mainly on the methods and means of emptying, percentages of accessibility, desludging and advocacy on desludging

Transportation

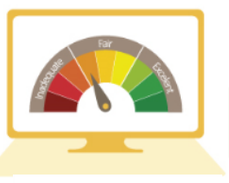
Tab 5 Contains questions mainly on the means of transportation, operation and monitoring of trucks

Treatment

Tab 6 Contains questions mainly on the geography of the treatment area, regulations and monitoring of the treatment area.

Reuse

Tab 7 Contains questions mainly on reuse of the treated septage, revenues from FS reuse and awareness on reuse of the end-products



Dashboard 1

Tab 8 Generates final results in the form of colors (representing the status of FSM along the service delivery pathway)

Dashboard 2

Tab 9 Generates FSM service chain summary report and provides information in the form of bar graph and pie-chart

FSM TOOLBOX

How to use this tool?

Step 1-A:

FSM Situational Assessment Tool PRINT

FSM Situational Assessment Tool is developed to analyze the existing Fecal Sludge Management (FSM) practices and to plan for better FSM. The tool is specifically designed to address the needs of 'informed users' and is moderately data intensive. The tool lets the user easily assess the FSM situation (for the entire FSM chain) in a designated area. This tool also lets the user analyze the situation of individual FSM chain separately.

This tool is a simple excel data entry form that includes questionnaires reflecting the aspects (regulatory, institutional, technical, financial, advocacy and capacity building) of FSM for entire FSM chain i.e. Containment, Emptying, Transportation, Treatment, Reuse. It provides a summary on the current FSM situation, in the form of Dashboard for FSM service chain scorecard and Report template. In a nutshell, it provides a snapshot of the existing FSM situation as well as lets the user identify and recognize the problems in the existing FSM situation.

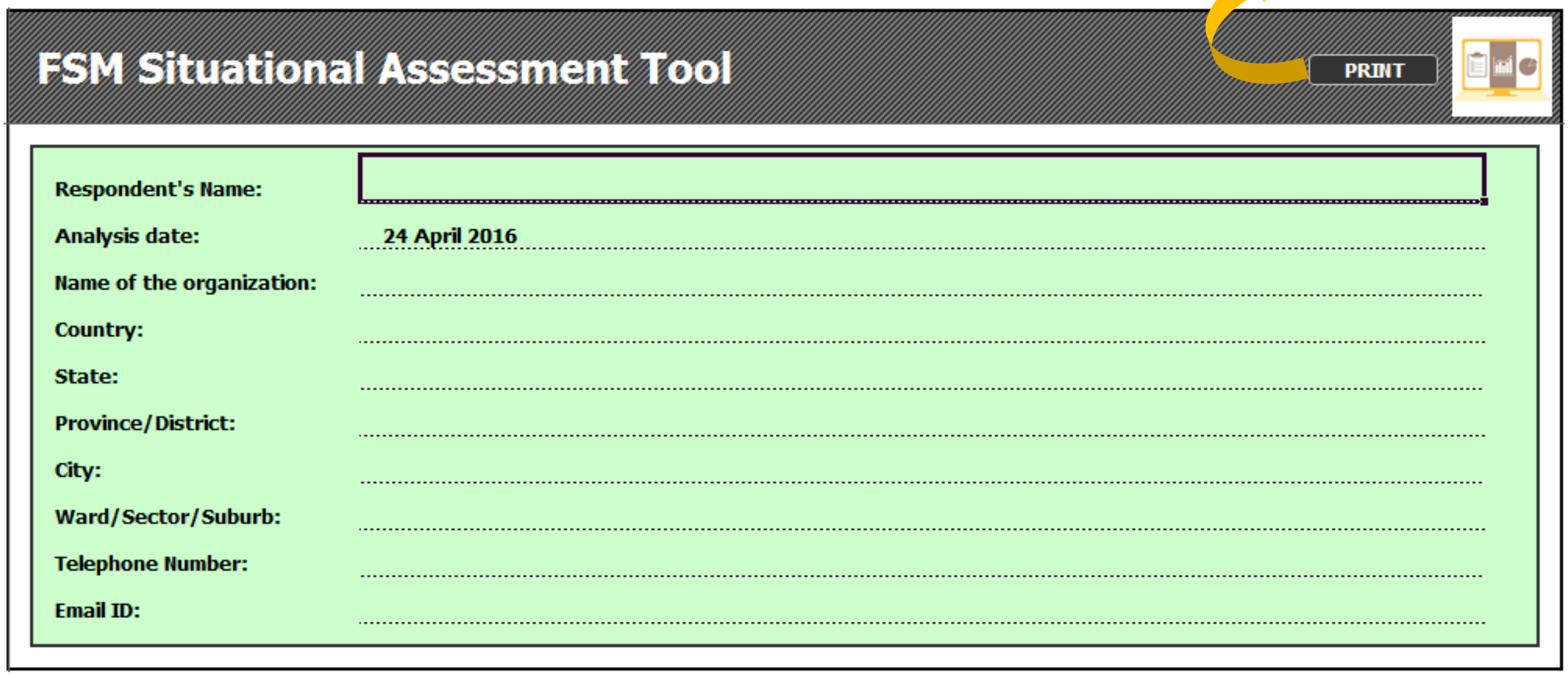
*Note: Tool contains macros, please ensure macro is enabled in excel before using the tool and select Enable Content when warning sign shows up. A message pops out every time you open a tool "Do you want to clear existing answers?" Select 'No' if you want to save your previous answers (which you had entered formerly while running the tool).Tool is applicable to areas where households are served by On-site Sanitation Systems (OSS) and is not applicable to areas which are totally sewered and are provided with centralized sewage treatment plant. Also requires knowledge on sanitation issues and needs baseline information on local conditions ofthe area in order to run the tool.

How does the tool work? (For detailed information please read the Manual)

The tool includes questions in the form of Yes/In-process/No, Open ended, and multiple-choice questions. Firstly, the questions that can be scored were identified i.e. Yes/In-process/No and some multiple-choice questions. And the weights were assigned to only those

Step 1-B:

Users can use print function throughout the tool



FSM TOOLBOX

Step 2-A:

Open ended questions

Users can press the Reset function button in each tab to reassess the situation

There is a section called Notes on the right hand side of each tab. Users can put remarks for each question while running the tool.

FSM Situational Assessment Tool

Note: This sheet includes general questions on Demography/Geography, Legal framework and Enforcement, ance, 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 the beginning of the assessment.

DEMOGRAPHY / GEOGRAPHICAL

PRINT RESET

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

Notes

FSM TOOLBOX

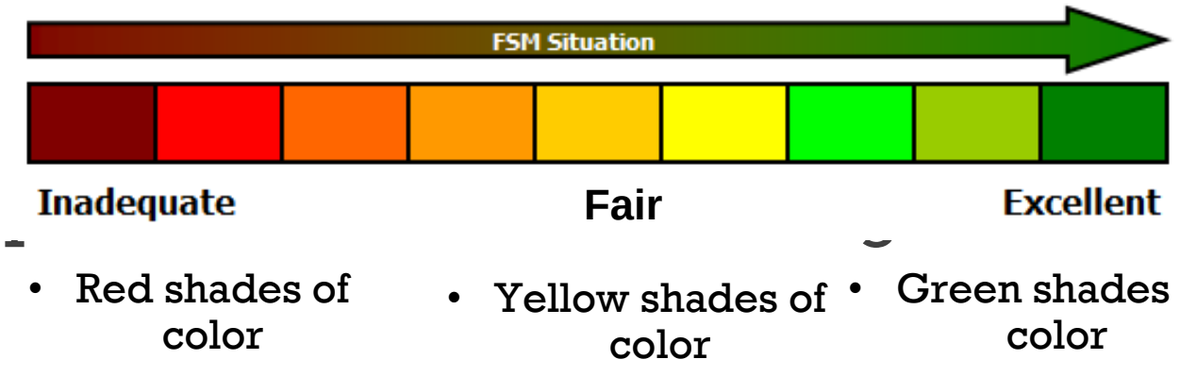
Step 2-B:

Either Yes/ In-process/No

LEGAL FRAMEWORK and ENFORCEMENT			
1. Is FSM part of the legislation or legal framework, policies, strategies or development plans at the national level?	○ Yes	○ In-process	○ No
2. Is FSM part of the legislation or legal framework, policies, strategies or development plans at the state level?	○ Yes	○ In-process	○ No
3. Is FSM part of the legislation or legal framework, policies, strategies or development plans at the city/municipality level?	○ Yes	○ In-process	○ No

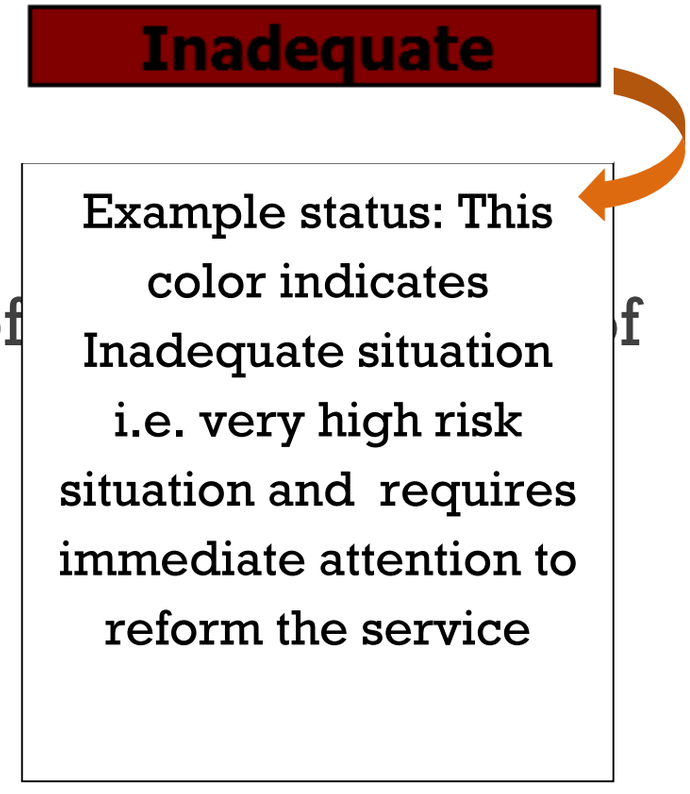
FINANCE			
1. Does the city/municipality have an existing FSM system?	○ Yes	○ In-process	○ No
2. Does the current sanitation fees include charges for FSM?	○ Yes	○ In-process	○ No
3. Is there willingness to pay for the improvement of FSM services ?	○ Yes	○ In-process	○ No
4. Does the city/municipality have financial statements for its FSM operations?	○ Yes	○ In-process	○ No
5. Does the city/municipality plan to undertake FSM projects?	○ Yes	○ In-process	○ No
6. Is there funding allocation for proposed FSM projects?	○ Yes	○ In-process	○ No

Step 2-C:



- Red shades of color
- Yellow shades of color
- Green shades of color

- FSM situation indication: Based on intensity of … f color



FSM TOOLBOX

Step 3:

FSM Situational Assessment Tool

CONTAINMENT

PRINT RESET

1. Are the permits required for the construction of on-site sanitation systems (OSS) in existing or new buildings? ○ Yes ○ In-process ○ No

2. Are the specifications for construction of OSS clearly identified in the national building code or other similar documents? ○ Yes ○ In-process ○ No

3. What are the types of toilet in the area?
   Write percentage of selected toilet types.

☐ Dry Toilet	..... %
☐ Urine Diversion Dry Toilet (UDDT)	..... %
☐ Urinal	..... %
☐ Pour Flush Toilet	..... %
☐ Cistern Flush Toilet	..... %
☐ Urine Diverting Flush Toilet (UDFT)	..... %
☐ Others, please specify	..... %

4. What percentage of containment area is: flood prone and non flood prone

Flood prone area	..... %
Non flood prone area	..... %

FSM TOOLBOX

Steps 4:

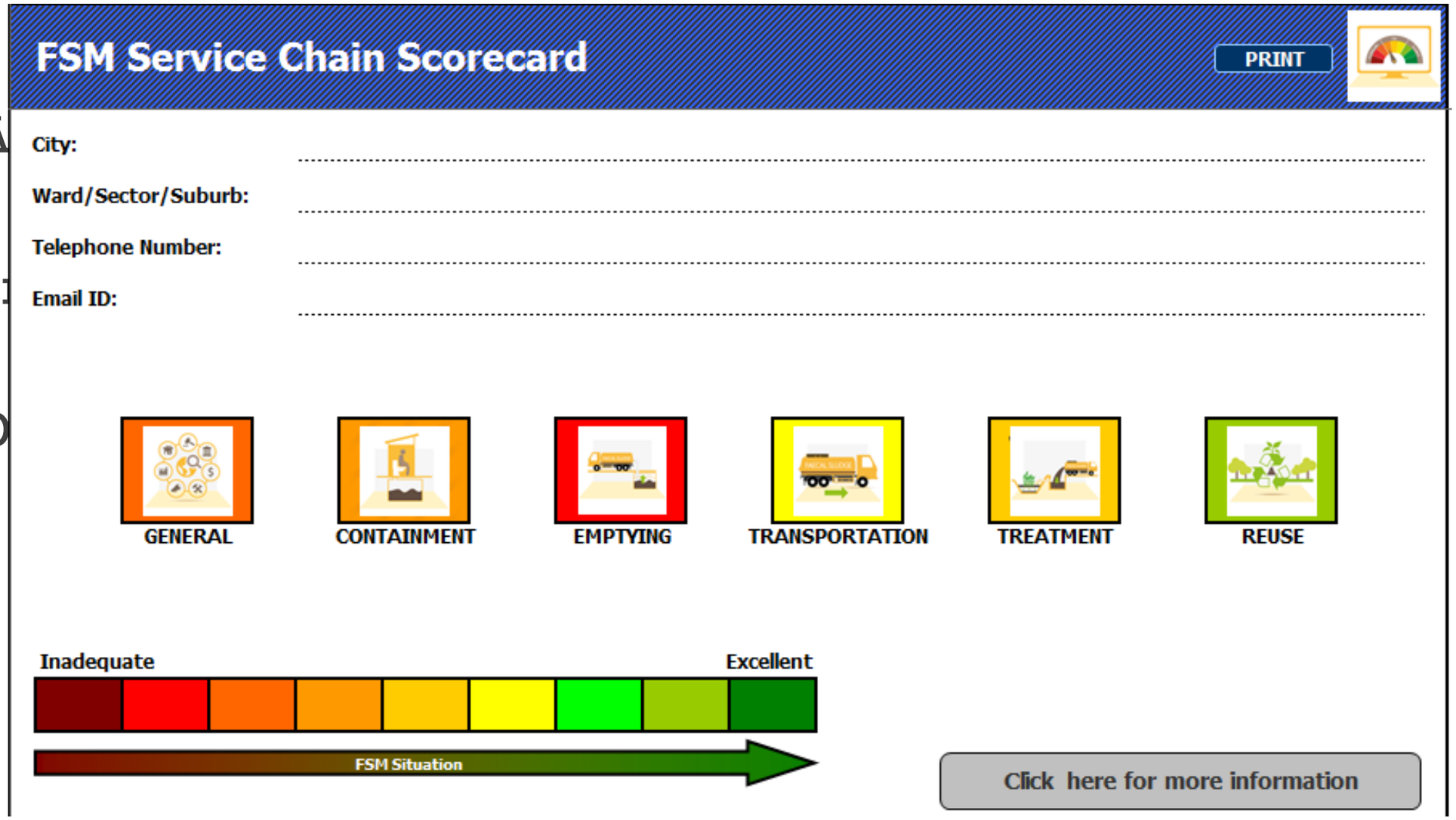
- For remaining tabs "*Emptying*", *Transportation*", "*Treatment*" and "*Reuse*" –repeat step 3

Points to be noted	
	General sheet serves as a baseline for assessing the situation so it needs to be answered in the beginning
	However, users can assess any specific FSM chain component (or any Excel tab) depending upon their interest and/or the problems in their interested area, and can observe the result/situation of that specific tab

FSM TOOLBOX

What it helps accomplish?

- A
- S
- D



Screenshot of Dashboard 1

Contd..

- Go
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- Use
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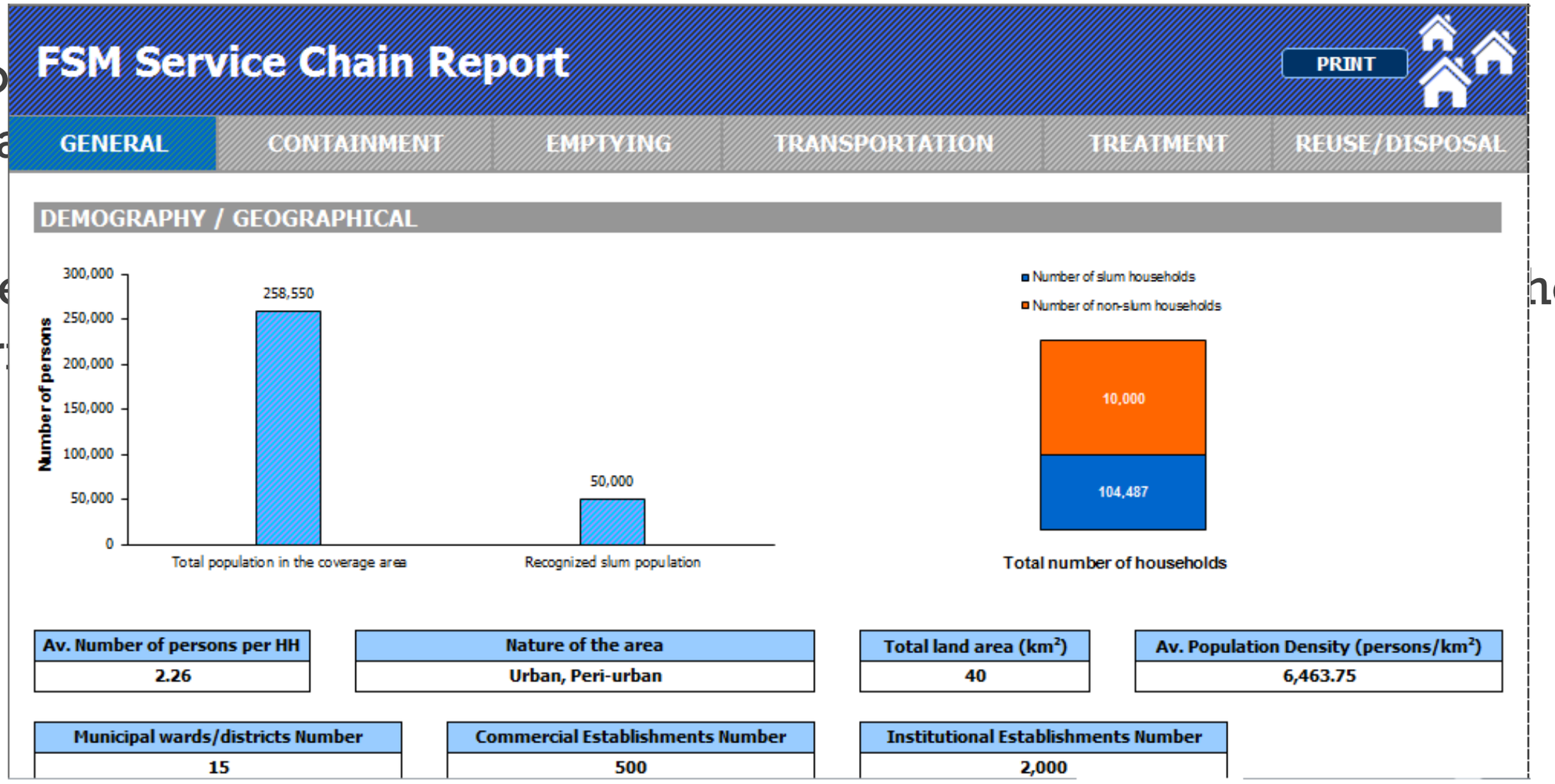


Screenshot of Dashboard 2

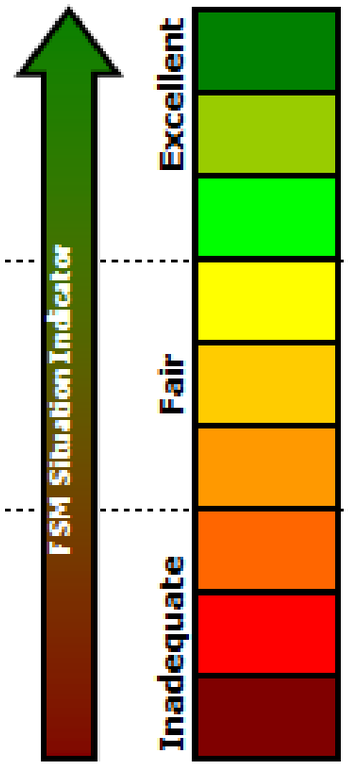
FSM TOOLBOX

Result Interpretation

SCORECARD

PRINT

The score ranges from 0 (inadequate case) to 1 (excellent case) in response to a set of questions with three color coding i.e. red, yellow and green indicating Inadequate, Fair and Excellent FSM situation, respectively. And each indicator is represented in the form of different shades of same color to have a deeper understanding on FSM situation.



COLOR	RANGE	Indicators of FSM Situation
Excellent	0.90 - 1.00 0.79 - 0.89 0.68 - 0.78	The score for Excellent Indicator ranges from (0.68 - 1.00). It indicates very low risk situation of FSM and further suggests that the service delivery is largely on place.
Fair	0.56 - 0.67 0.45 - 0.55 0.34 - 0.44	The score for Fair Indicator ranges from (0.34 - 0.67). It indicates moderate risk situation of FSM and further suggests that there is a need of awareness to increase the service delivery performance level.
Inadequate	0.22 - 0.33 0.11 - 0.21 0.00 - 0.10	The score for Inadequate Indicator ranges from (0.00 - 0.33). It indicates very high risk situation of FSM and further suggests that there is a need of an immediate attention to reform the service delivery performance level.

FSM TOOLBOX

What after the assessment RESULTS?

FSM Financial & Technical Tool

- Excel-based tool for city planners, consultants & donors for proposed FSM projects

- Focuses on the collection, transport & treatment phases of FSM

- Allows users to assess the technical and financial viability of various options and help for the decision making

FSM TOOLBOX

Regulatory and Institutional Assessment tool

- A web-based tool
- Helps identify the existing and missing regulations along the FSM service chain
- Identifies the Institutions involved in FSM and delineate their roles and responsibility
- Does the gap analysis for the roles and responsibilities
- And provides suggestive documents for identified GAPS

FSM TOOLBOX

Job Profile Matrix

- An Excel sheet (information sheet)

- Provide compiled info of FSM positions

- Present FSM job positions in six categories

- Describe required skills, qualification and experience for each position

- Easy to browse the information & **edit the information** according to the users' situations & needs

Stakeholder Analysis Tool

- Important and powerful step for the success of every project

- An excel-based tool

- List of possible FSM stakeholders to document their information

- Interest-Influence based analysis

- Decision support for selecting **stakeholder engagements level** and **tools to communicate** with the stakeholders

AIT Advocacy Manual

- Comprehensive “how-to” manual

- This manual presents –
  - What is FSM Advocacy
  - Advocacy Steps
  - Guidelines on Advocacy activities
  - Calendar of Global Sanitation Events
  - Stakeholder Engagement and Consensus Building

AIT Advocacy Manual

- Comprehensive “how-to” manual

- This manual presents –
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  - Advocacy Steps
  - Guidelines on Advocacy activities
  - Calendar of Global Sanitation Events
  - Stakeholder Engagement and Consensus Building

FSM TOOLBOX

Key Performance Indicator

- Simple excel based tool
- provide a profound overview for entirely or partly assessing the FSM service chain
- monitor performance over time.

Program Guiding Manual

- Guiding manual for city planners and donors

- Guide to develop a national programme for establishing appropriate faecal sludge management

- Instructions on formulation of a strategy

- Allows to set-up a framework for learning from monitoring results on a long-term basis

FSM TOOLBOX

Integrated Faecal sludge Management Tool –SaniPlan

Technology Decision Support Tool - CSTEP

AIT Logistic tools

AIT Planning tools

THANK YOU

FSM TOOLBOX

A small practice session

- Assess FSM situation

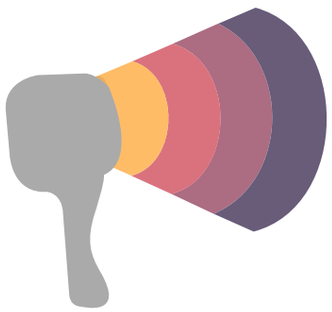
- acquire knowledge about data requirement
- filling in the information on tool
- assessing the real situation
- learning to generate the results and interpret it

FSM TOOLBOX

Regulatory and Institutional Assessment Tool

Isha Basyal
basyal-isha@ait.asia

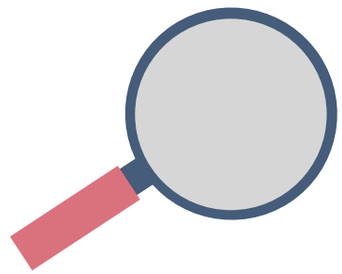
FSM TOOLBOX



Lesson 1

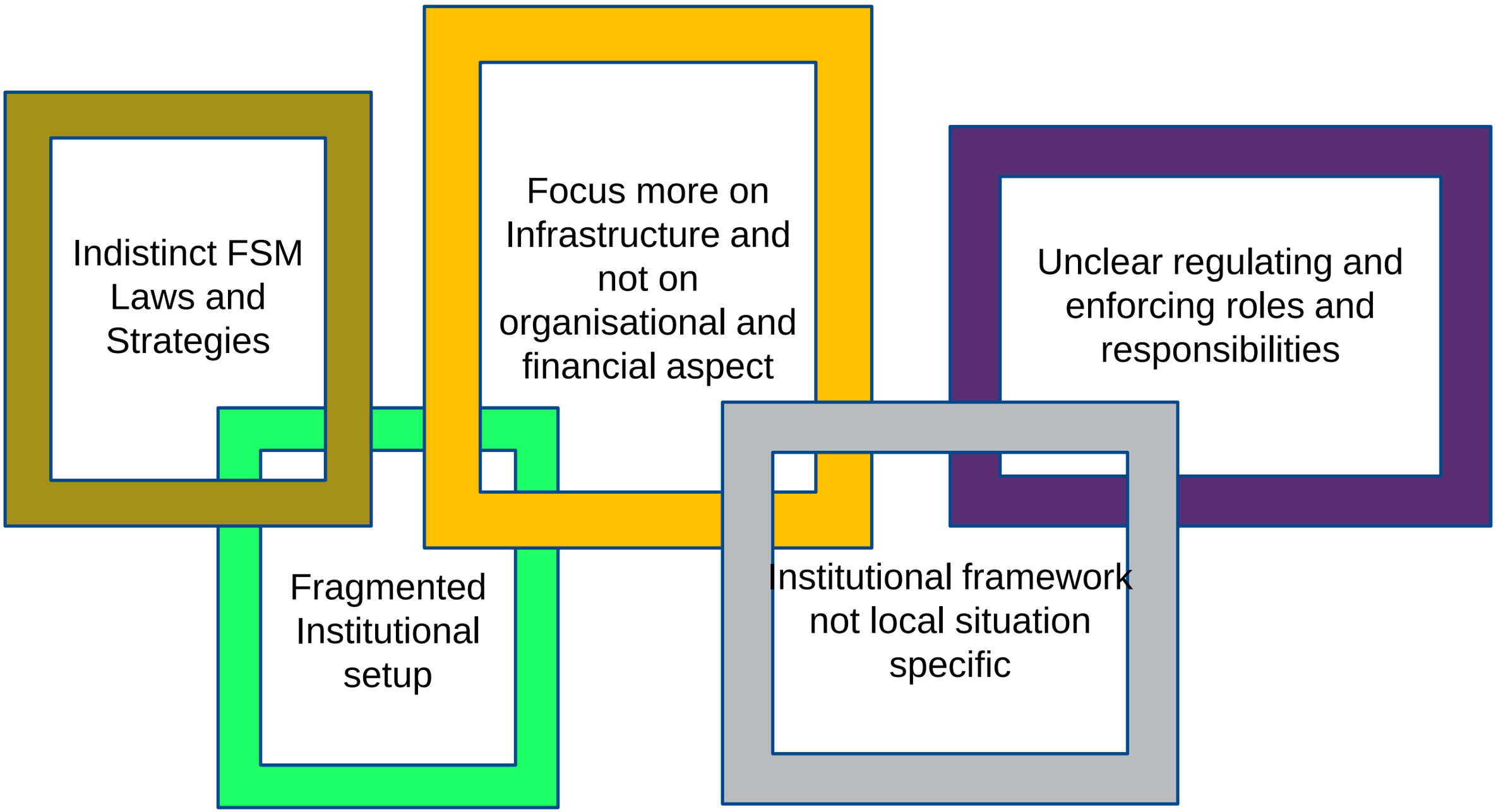
Regulatory and Institutional Assessment

Presentation
Exercise and Q&A



Evaluation

Current situation



FSM TOOLBOX

Challenges faced

- **Outdated Regulation**
- **Stringent Regulations/Standards**
- **Room for innovative technologies**
- **Poor enforcement**
- **Gaps in Regulations**

How things have changed for Countries?

FSM TOOLBOX

“Malaysia”

Good Sanitation Model

Local Government → **1993** → **Single Private concessionaire-Indah Water Konsortium**

FSM TOOLBOX

How they did it?

FSM TOOLBOX

Legislative Reforms	Financial Reforms	Implementation Reforms
❖ Sewerage Services Act ✓ Guidelines for Developers ✓ Technical specification for proper Septic tank Design	❖ Financial subsidy from the Federal government ❖ Private developers required to finance building their own facilities ❖ HHs committed to pay semi-annual bill or monthly bills ❖ Penalties for violating the maintenance and desludging requirements ❖ Tariffs contributing 20% of OPEX	❖ Demand and capacity determined over 30 years of time ❖ Rehabilitation of old sewerage treatment plants ❖ Use of available oxidation ponds for interim septage disposal ❖ Develop database of HHs with septic tanks ❖ Promotional campaigns

Project outcome

Developed desludging services

Constructed septage and wastewater treatment facilities

94 % of the population had access to improved Sanitation by 2006

80-90 % paying monthly bills and compliance with scheduled desludging

Mandatory desludging every 3 years

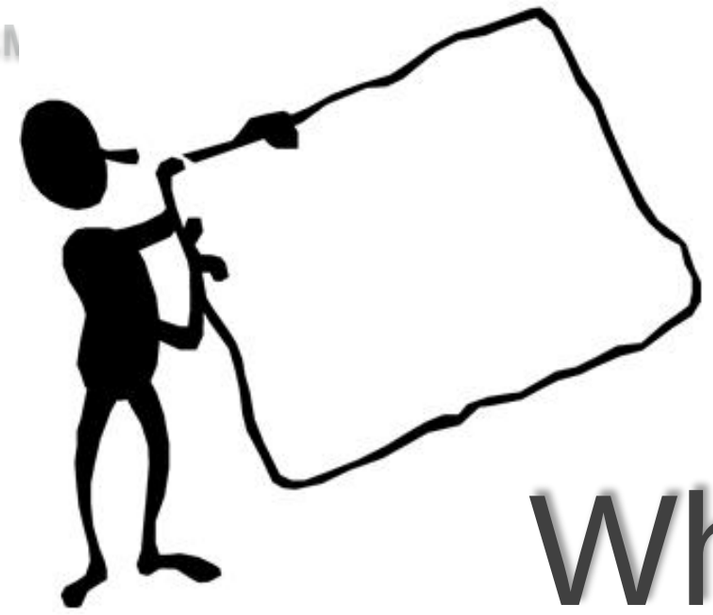
Users Prerequisite

FSM TOOLBOX

Demand driven approach

Interview with Target Users

FSM TOOLBOX



What they had to say?

Regulatory

Country Specific Guidelines

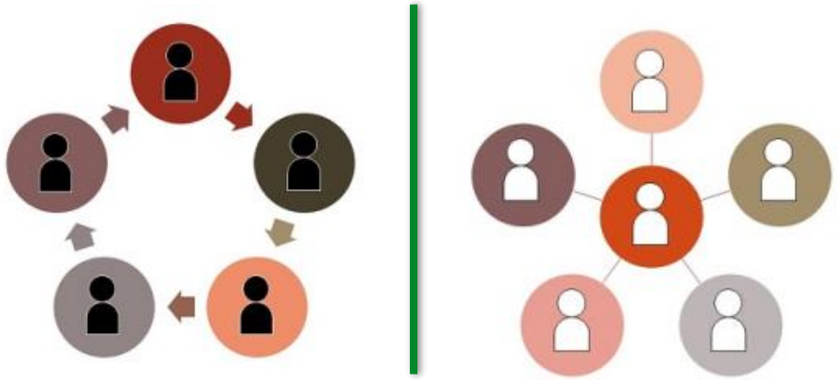
Ordinances/ Penal provisions

Service Standards/ Tariff

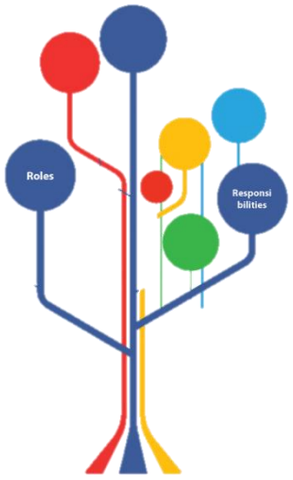
Discharge Requirements

FSM TOOLBOX

Options of different FSM Institutional Structure



Clear Roles and Responsibilities



Institutional

Successful /Unsuccessful Case studies

Idea for Tool Development

Regulatory Checklist

Generic regulations for Household and Operators along the service chain

Existing and Missing

FSM Regulations that are prevalent at present and that aren't

Suggestions of Regulations for missing

V.2

Identify involved Organisations

Based on the situation specific institutional structure, prepare an Organisational Chart

Delineate their roles and responsibilities

Single out responsibilities for the identified organisations

Gaps and Overlaps

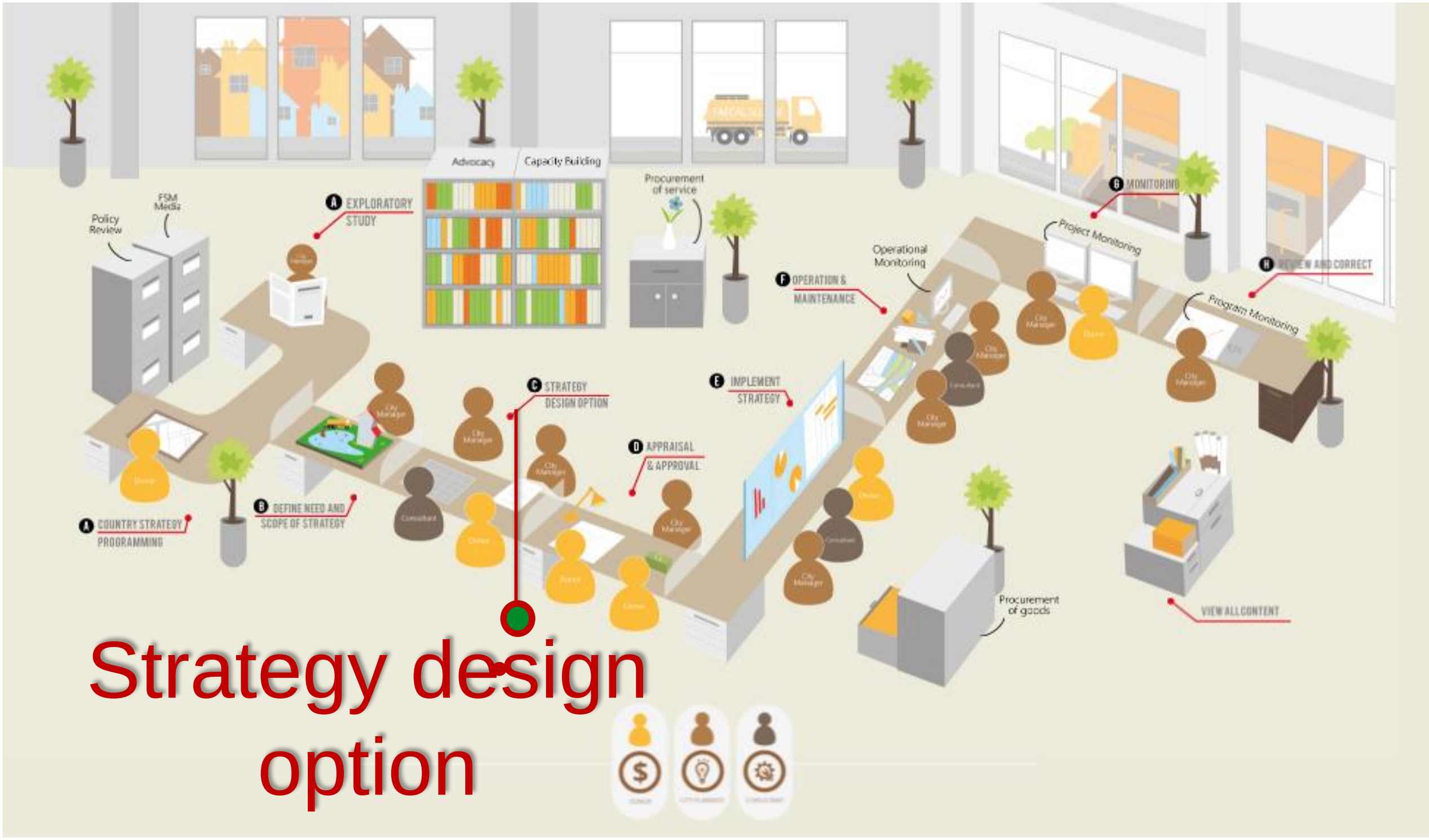
Analyze gaps and overlaps for recognized FSM organisations. Recommendations of further read for singled out gaps.

✓Fitting to Global context

✓Adaptive to Local Context

Where to find this tool?

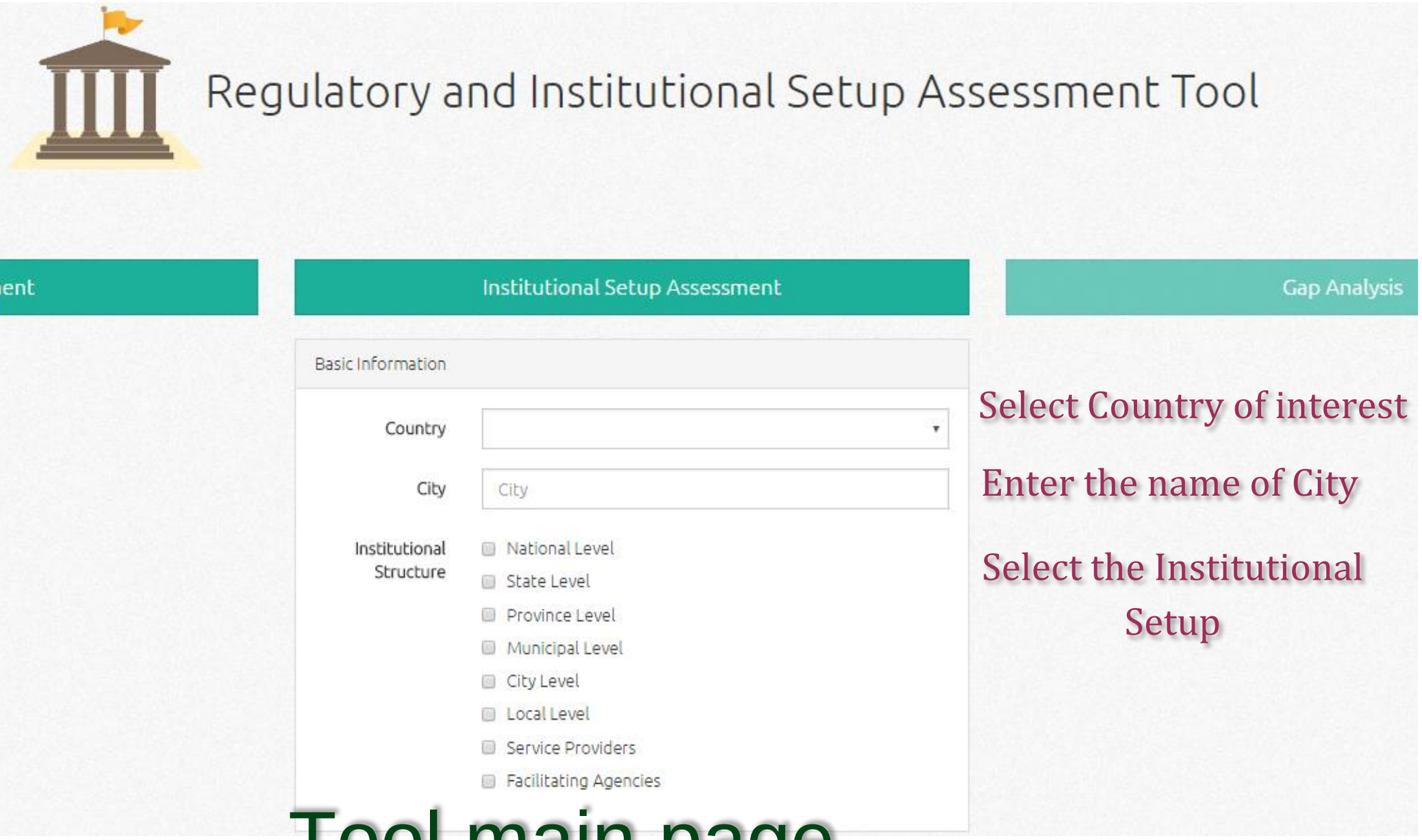
FSM TOOLBOX



Strategy design option

Getting Started

FSM TOOLBOX



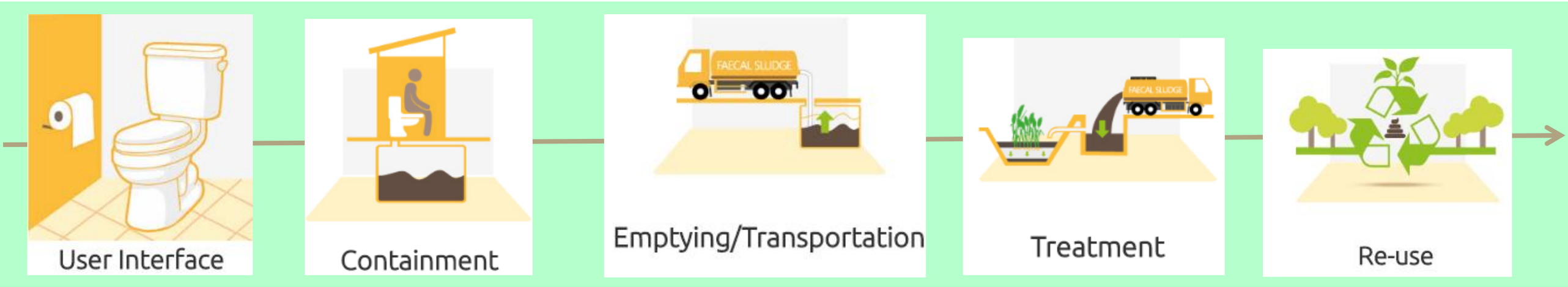
Tool main page

FSM TOOLBOX

Regulatory Assessment

FSM TOOLBOX

Steps Include



Display of ***Regulations*** along the FSM chain

Mark existing Regulations

Enter the name of associated ***Organisations***

Enter the name of ***Document*** by which these regulations exists

Preview

Save

FSM Service Chain		
 User Interface :e	☑ Mandatory construction of Toilets	National Level / Province Level / Local Level
	☐ Toilet construction specifications	
	☐ Sewer or interceptor connection	
	☐ Retrofitting existing Installation	

Regulations			
☑ Mandatory construction of Toilets	National Level	Ministry of Environment	Regulation on construction of Toilets

Result

FSM TOOLBOX

Summarised display of existing and missing Regulations

Print

 User Interface	 Containment	 Emptying/Transportation	 Treatment	 Re-use
Mandatory construction of Toilets				
Missing Toilet construction specifications Sewer or interceptor connection Retrofitting existing Installation Permits for construction of Onsite Sanitation systems License Requirements for construction of Toilets Examination and Certification Annulment of License	Missi	Missing	Missing	Missing

Further Click on this will show the Organisations and the Name of the Document

FSM TOOLBOX

Result Interpretation

Display of existing Regulations show **where we stand**

Easy identification of organisations that are associated in handling these Regulations

Name of the documents show until **which level** of Organisational setup have these **Regulations reached**

Recommendations for missing regulations will be available from Ver.2

FSM TOOLBOX

Institutional Setup Assessment

- Following Regulatory Assessment
- Direct through the main page

Steps Include

Generating a FSM organisational chart

Delineating their roles and responsibilities

Identifying Gaps and Overlaps

Guidance to references based on Gaps

Salient Features

FSM TOOLBOX

New | Edit | Sample | Responsibilities

Examples

Working Chart | Functioning Table

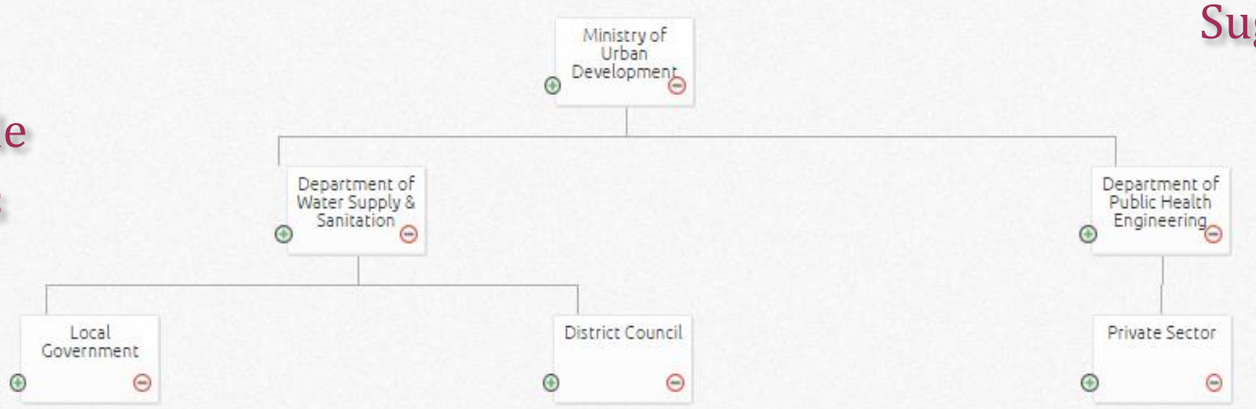
Identify their responsibility

National Level

State Level

Service Providers

Adaptable to users need



Suggestions

- National Level
- Ministry of Finance
- Ministry of Local Planning
- Ministry of Health
- Ministry of Tourism, Environment & Natural Resources
- Ministry of Environment & Forest
- Ministry of Urban Development
- Ministry of Local Government & Rural Development
- Ministry of Public Health
- Ministry of Water Supply and Sanitation
- Ministry of Federal Affairs & Local Development

Add National Level

Add Related

Remove Related

Print | Save

Possibility to add more than one

Add Parastatal bodies

Department Name

Add | Clear

Possibility to add new

FSM TOOLBOX

Preview of Functional Chart

Core activities for organisations at each level

Further breakdown of core activities

Possibility to add further information or add non-existing regulations

Working Chart | Functioning Table

Level	Department	Core activities related to FSM		
National Level	Ministry of Local Planning	☑ Legal Framework	☑ Develop Onsite Sanitation Policy	Develop Onsite Sanitation Policy on regular desludging
			☐ Clear Delineation of roles and responsibilities	
			☐ Septic Tank design	
			☐ Desludging Ordinance	
			☐ Effluent Standards	
			☐ Advocacy Strategy	
		☐ Regulatory Function		
		☐ Technical Support		
		☐ Monitoring Strategy		
		☐ Financial Policy		
		☐ Financing		
State Level				
Service Providers				

Gap Analysis

FSM TOOLBOX

Gaps identification for each level

Suggestions of relevant references for identified Gaps

National Level

Gaps

Effluent Standards	Policy enforcement and Implementation	Design, operation and maintenance guidelines for septage treatment plants
No Documents	Septic Tank Regulatory Compliance	Design and Construction of Treatment Plants
		Onsite Sanitation
		Sludge treatment facilities

Disposal	Treatment	Tariff Structure
No Documents	No Documents	Tariff structure
		Tariff Setting Guidelines
		Septage Disposal Fee

State Level

Service Providers

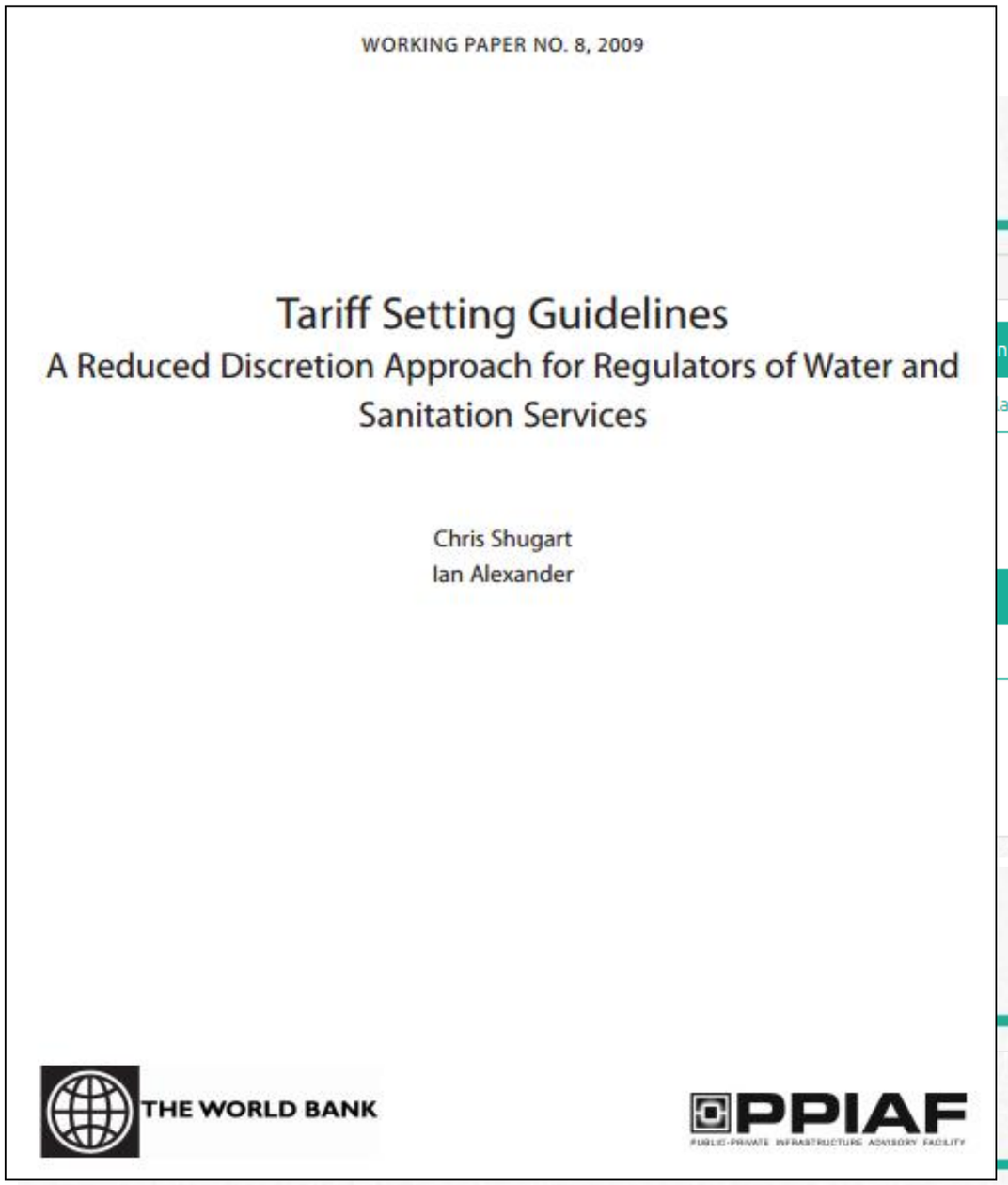
FSM TOOLBOX

Gap Analysis

FSM TOOLBOX

Gaps identification for each level

Suggestions of relevant references for identified Gaps


WORKING PAPER NO. 8, 2009

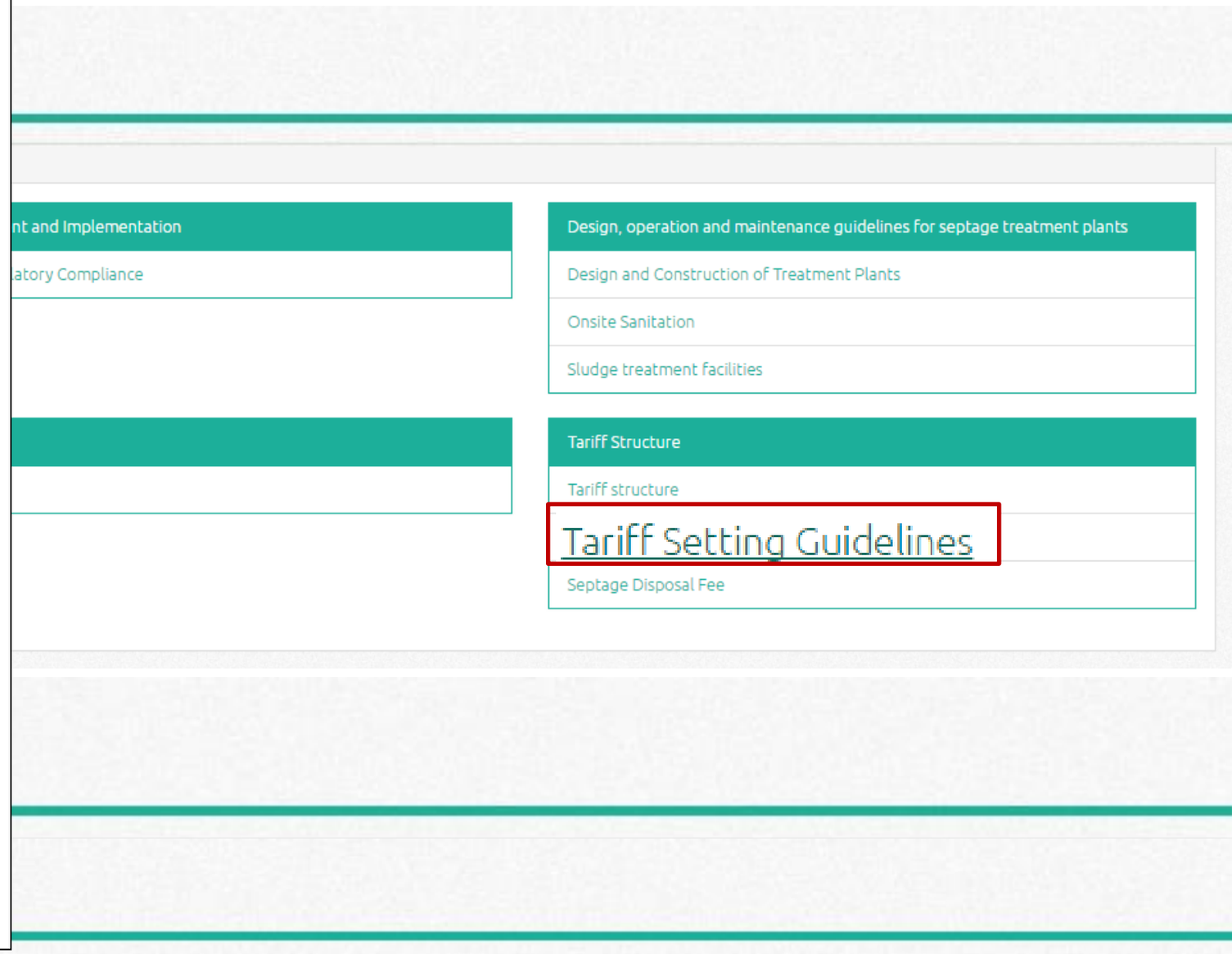
Tariff Setting Guidelines

A Reduced Discretion Approach for Regulators of Water and Sanitation Services

Chris Shugart
Ian Alexander

THE WORLD BANK

PPIAF
PUBLIC-PRIVATE INFRASTRUCTURE ADVISORY FACILITY



FSM TOOLBOX

Result Interpretation

FSM TOOLBOX

Understanding of Organisations that are involved in FSM

Distinct roles and responsibilities

Provides visual on their gaps

Knowledge on required interventions for identified Gaps from provided references/Samples

Helps develop a road map to sustainable operations

FSM TOOLBOX

Key Users

FSM TOOLBOX

City Planners

Consultants

FSM TOOLBOX

Limitations of the tool

- ✓ Provide Country specific “Regulations or Institutions”
  - However, flexible to enter country specific information
- ✓ No suggestions for Regulatory gap analysis
  - creating database of regulations – in process (Ver. 2)
- ✓ ONE solution to gaps identified in “Institutional Assessment” section
  - Iterative process, should be local specific
  - But guides users to the direction they can follow to get the solutions

FSM TOOLBOX

Today's Session

Familiarize with the Tool and it's Features

through a small practice session

Case Study

FSM TOOLBOX

FSM TOOLBOX

- http://www.fsmtoolbox.com/riat

FSM TOOLBOX

Key Performance Indicator

Key Performance Indicator

- What can you monitor in Fecal sludge Management ?
- Imagine a FSM project which is running without preparing monitoring. What are the threats you see in success of this FSM project?

What is Monitoring ?

Monitoring is the observation and collection of information to assess the overall functioning of the project system as per the desired schedule and standard.

Key Performance Indicator

Why Monitoring ?

- What gets monitored is more likely to get done.
- If you don’t monitor performance, you can’t tell success from failure.
- If you can’t see success, you can’t reward it.
- If you can’t recognize failure, you can’t correct it.
- If you can’t demonstrate results, you can’t sustain support for your actions.

FSM TOOLBOX

FSM TOOLBOX

Key Performance Indicator

Learning Outcomes

1. Identify what is monitoring and why is monitoring required.
2. Identify two tools (Key performance indicator and Program guiding manual) for monitoring develop by FSM toolbox.
3. Describe what key performance Indicator tool is.
4. List some of the parameters that should be monitored in fecal sludge management

FSM TOOLBOX

Key Performance Indicator

FSM Toolbox Monitoring tool

1. Key Performance Indicator

1. Program Guiding manual

What is Key Performance indicator ?

- Key Performance indicators are the set of indicators that managers use to gauge or compare performance in terms of meeting their **strategic and operational goals**.
- Acronym KPI is also use to indicate **Key Performance Indicators**.

FSM TOOLBOX

What is Key Performance Indicator (KPI) Tool ?

- In-depth overview of KPIs for FSM
- Monitor the development of project progress
- Tracking projects according to planning values
- Consolidates different aspects of FSM

Key Performance Indicator

Key Users

Consultants

City Planners

Donors

The tool focuses on ..

Key Performance Indicator

	Economic Framework	Private Users	Non private users	FS emptying	Maintenance	Treatment
Motivation	• Financial viability is a core aspect for sustainable Faecal Sludge Management	• *To understand characteristics of given service area for safe removal of FS.*	• *contributes a significant additional volume of faecal sludge in a given service area*	• *For safe removal from the site* • *An important cost component*	*For appropriate operation and maintenance of the infrastructure as well as hygienic behavior.*	Operations of treatment plant should be closely followed for i) Good public health ii)Environmental protection iii) Financial sustainability
Example of indicators	*Fuel cost, wages index, etc*	*Number of households in that service area, ……etc.*	*Number of Institutional systems in service area, ……...etc.*	*Number of public emptiers, ……..etc.*	*Number of household with well-maintained toilets,……etc.*	Quality of FS products,…….etc.

Exercise

FSM TOOLBOX

Program Guiding Manual

What is the tool about ?

- Guides the development of a program in six steps.
- Instructs on the formulation of a strategy.
- Allows to set-up a framework for learning from monitoring results on a long-term basis

Program Guiding Manual

FSM TOOLBOX

How it looks like?

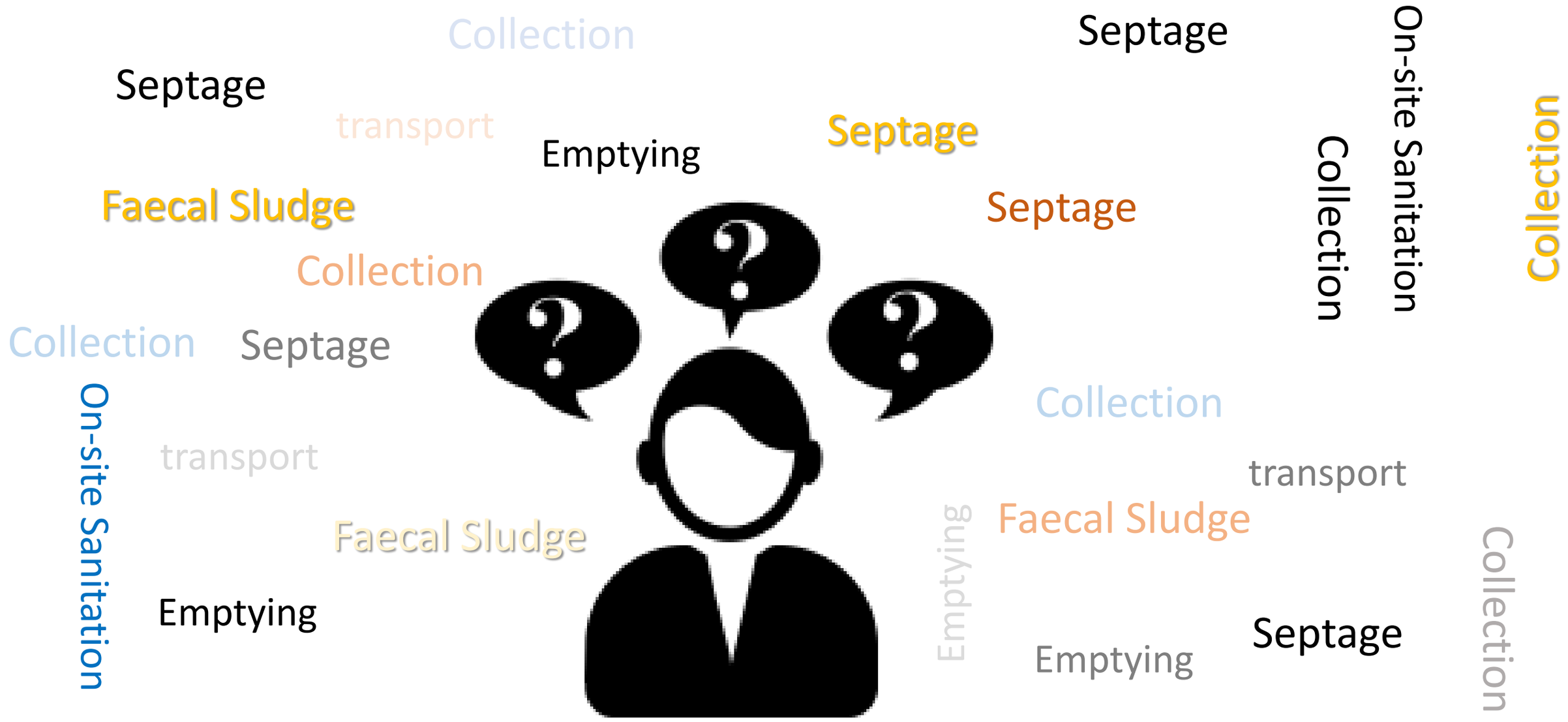
FSM TOOLBOX

Harmonizing Terminologies

Su Su Myat

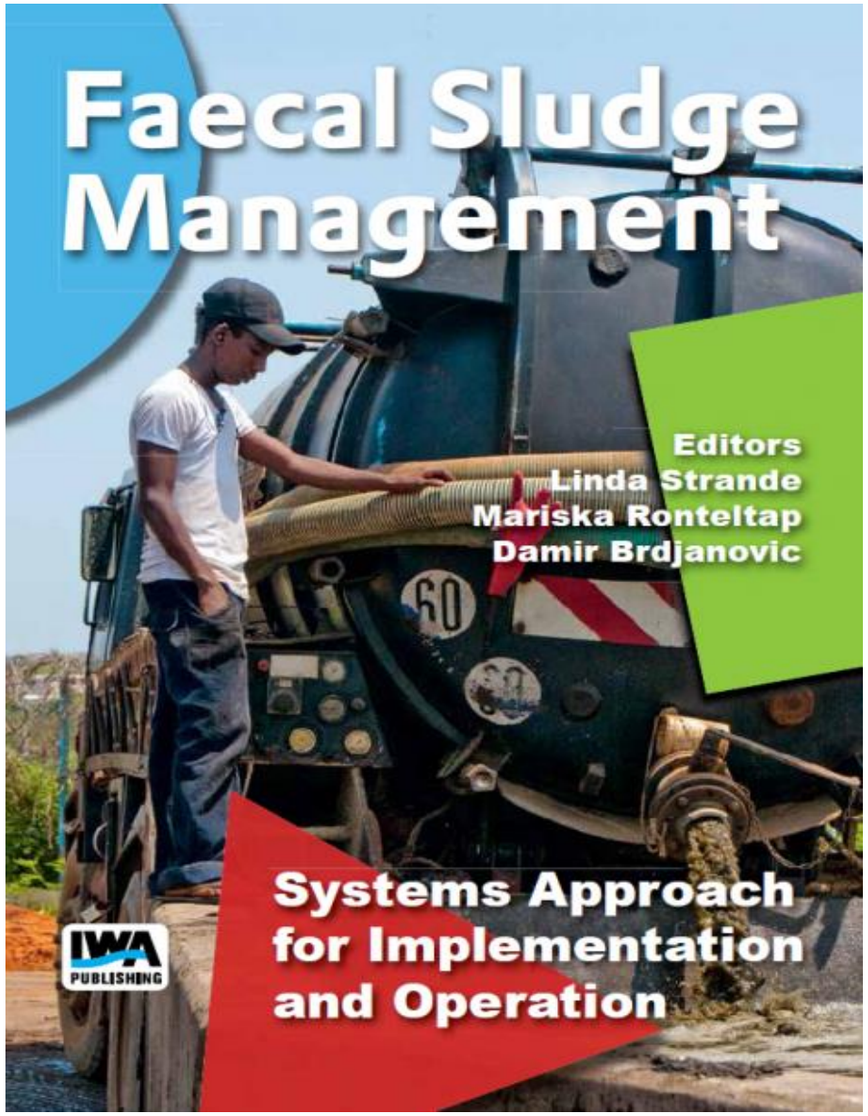
FSM TOOLBOX

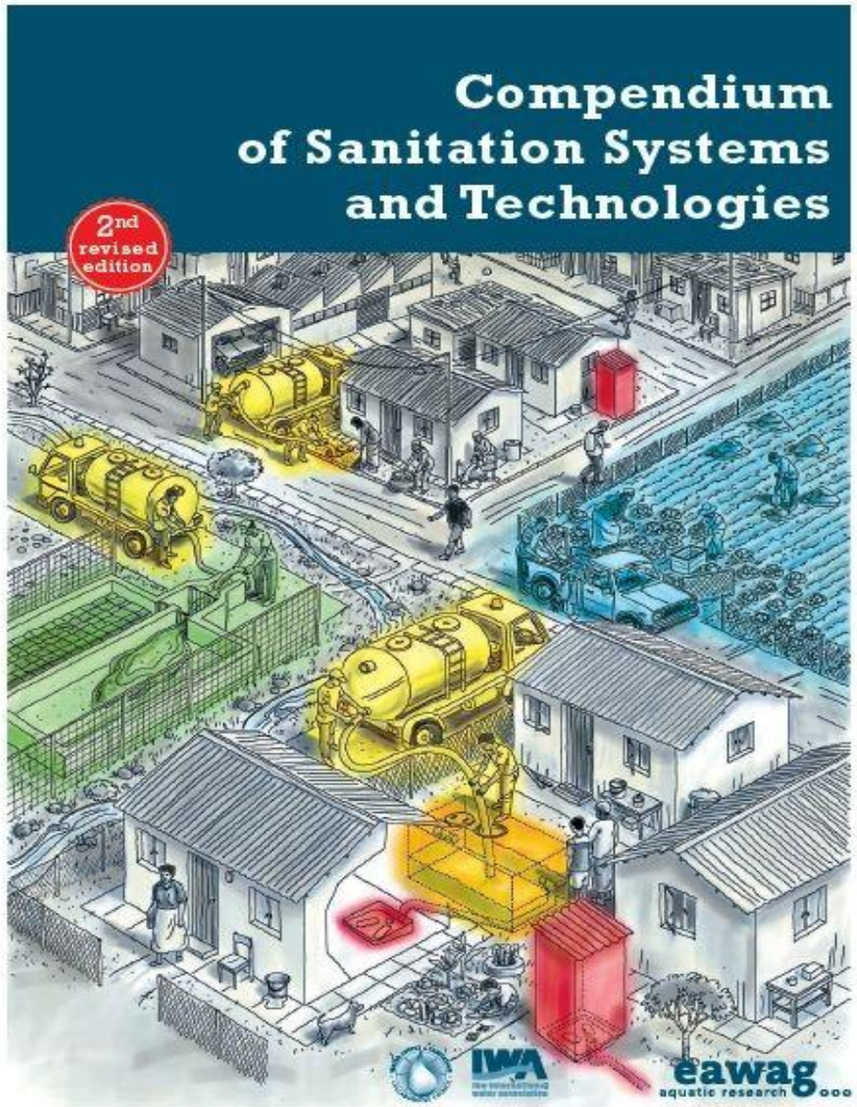
Jargon in Sanitation Sector



FSM TOOLBOX

Terminology Unifying



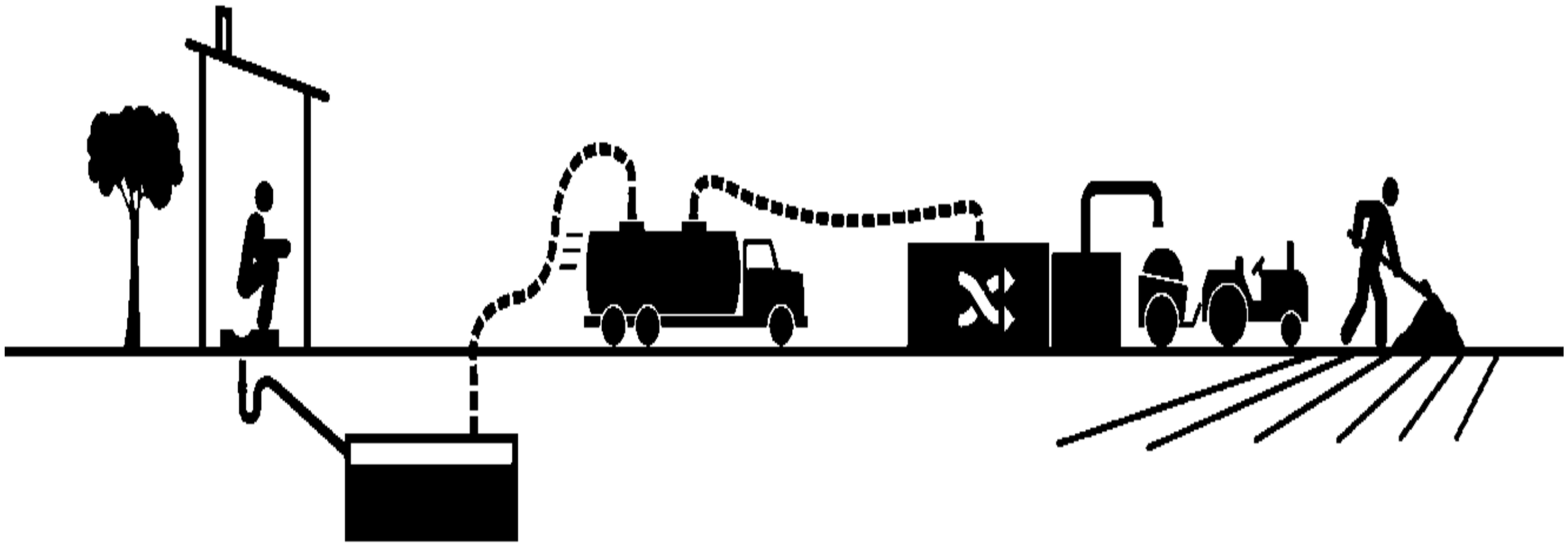


FSM TOOLBOX

In this Session …

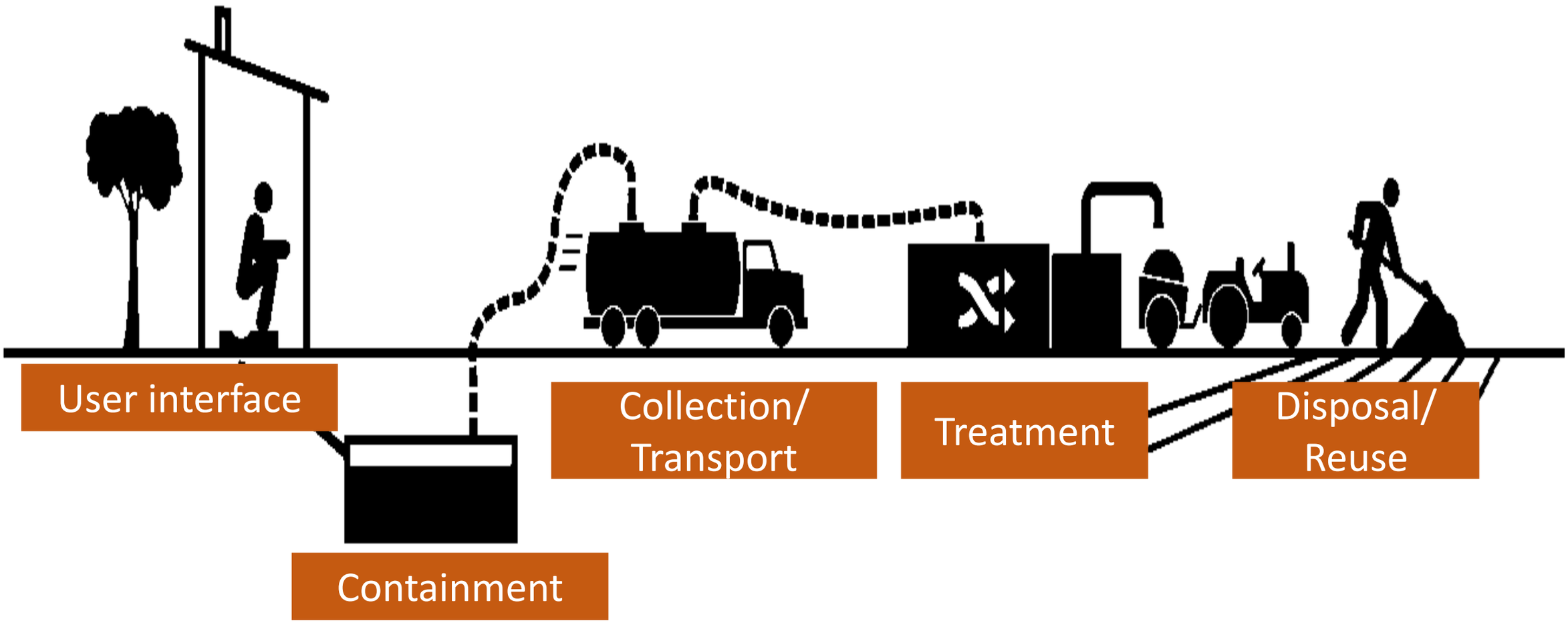
- Clarify the terminologies used for “**Sanitation Service Chain**, **Non-sewered and Sewered Sanitaiton Systems**”

- Establish word wall to collect and clarify confusing terminology throughout the workshop program.



FSM TOOLBOX

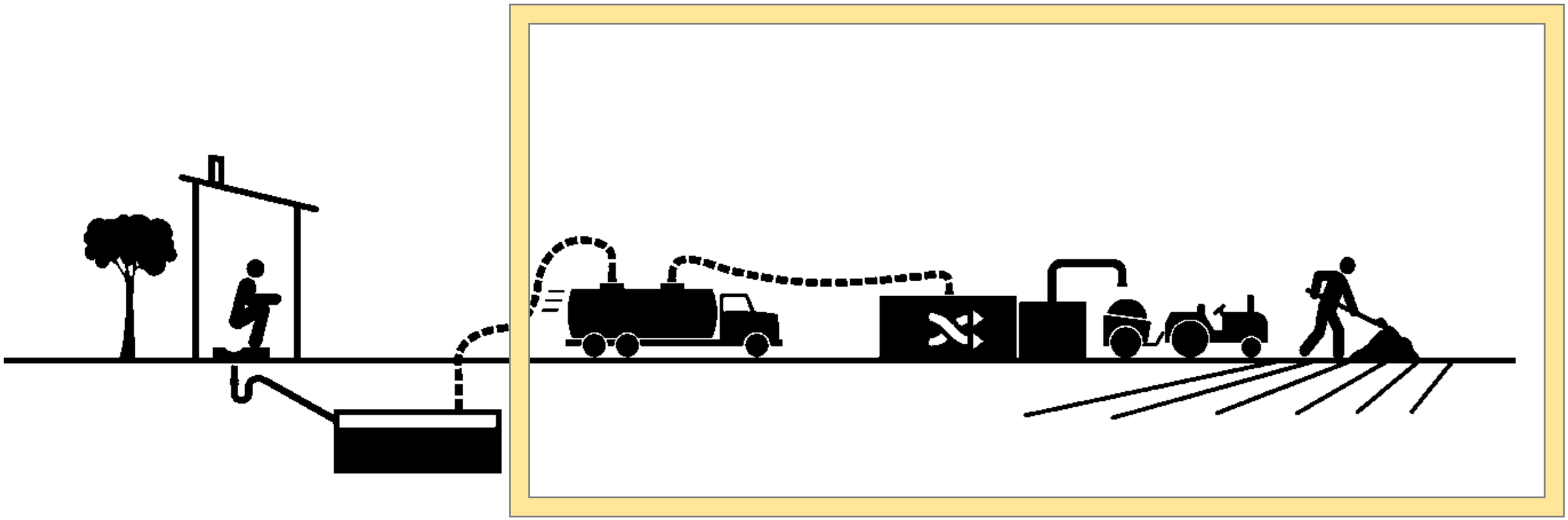
Sanitation Value Chain



Credit: Bill & Melinda Gates Foundation

FSM TOOLBOX

Faecal Sludge Management?



The FSM component is specifically the emptying, collection, transport, treatment and enduse or disposal of FS.

(Source: FSM Book)

FSM TOOLBOX

Confusing Terminology

Faecal Sludge = ?

Septage = ?

Wastewater = ?

FSM TOOLBOX

Faecal Sludge?

Excreta from an on-site sanitation technology (like a pit latrine or septic tank) that may also contain used water, anal cleansing materials, and solid waste.

Source: CAWST

FSM TOOLBOX

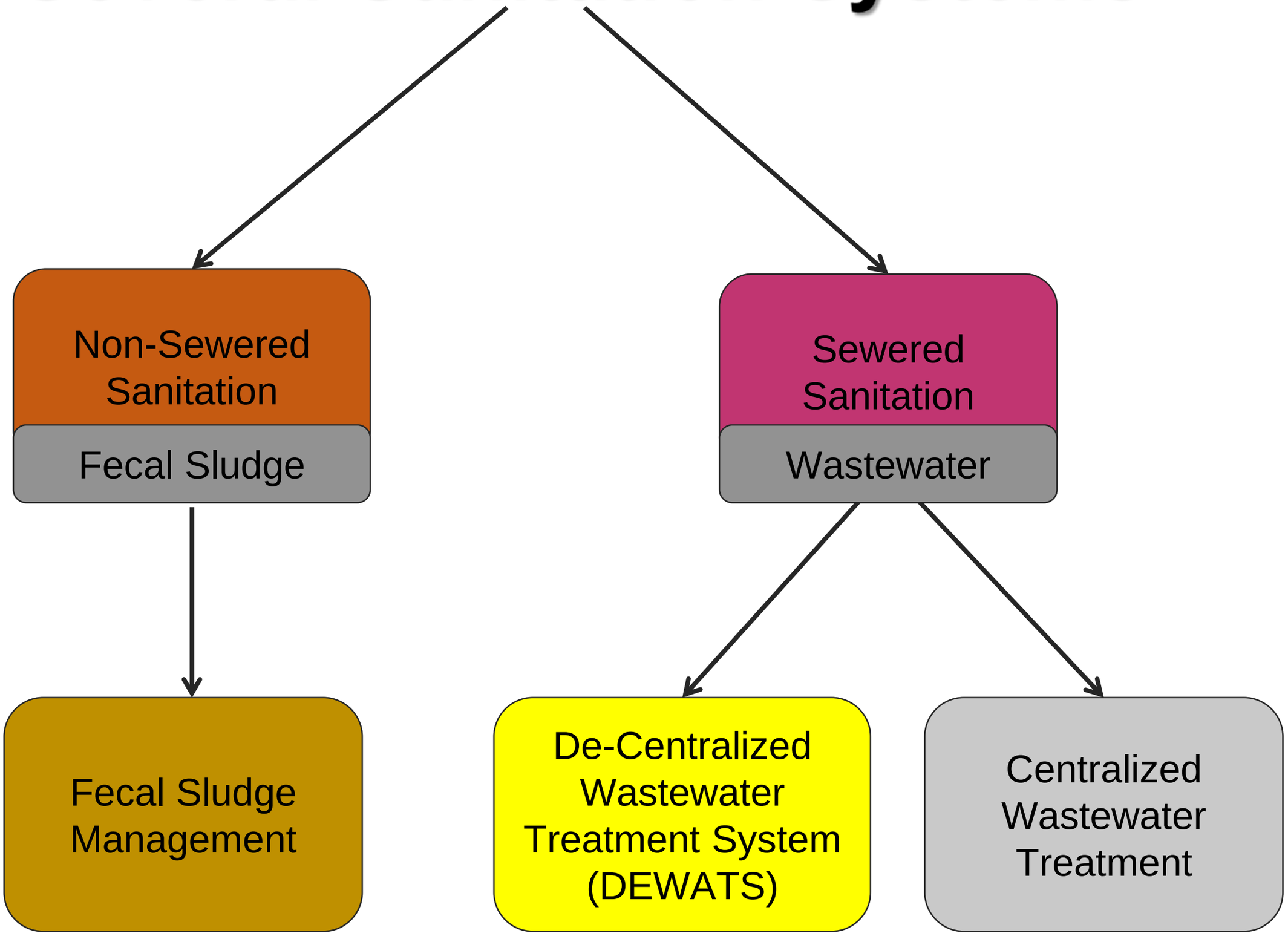
Septage

A historical term to define sludge removed from septic tanks.

Source: Compendium

FSM TOOLBOX

Several Sanitation Systems



Source: Adapted from Water and Sanitation Program

FSM TOOLBOX

Terminologies

1.Dehydrated/urine diversion

2.Sewerage system

3.Urban Sanitation

4.Non-networked sanitation

5.Wastewater treatment plant

6.Decentralized sanitation

7.Non-connected sanitation

8.Centralized sanitation

9.Low cost Sanitation

10. Fecal sludge management

11.Decentralized sewage facilities

12. Fecal sludge treatment plant

13. DEWATS

14. Networked sanitation

15. On-plot sanitation

16. Connected sanitation

FSM TOOLBOX

Terminologies

Sewered sanitation	Both	Non-sewered sanitation
Sewerage system **(2)**	Urban Sanitation **(4)**	Dehydrated/urine diversion **(2)**
Wastewater treatment (5)	Decentralized sanitation **(7)**	Non-networked sanitation **(5)**
Centralized sanitation **(9)**	Low-Cost Sanitation **(10)**	Non-connected sanitation (8)
Decentralized sewage facilities (13)		Fecal sludge management (12)
DEWATS **(15)**		On-plot sanitation (17)
Networked sanitation (16)		Fecal sludge treatment plant (14)
Connected sanitation (18)		

World wall

S STAKEHOLDER

M MONITORING

A ASSESSMENT

R REGULATORY

T TECHNICAL

Stakeholder Analysis Tool

Su Su Myat

FSM TOOLBOX

Meetings

Content

- Stakeholder Analysis and Why
- Stakeholder Analysis Process
- Stakeholder Participation Level
- Stakeholder Analysis Tool

FSM TOOLBOX

What is Stakeholder Analysis?

- Understanding stakeholders and their feelings
- Knowing potential impacts
- Building close relationships between stakeholders
- Foundation and Structure for participatory planning, implementation and monitoring
- Important and powerful tool to success of every project

FSM TOOLBOX

Why is Stakeholder Analysis in FSM?

- To identify who to involve and at what level of participation throughout the projects
- To identify conflicts of interests between stakeholders
- To identify relations between stakeholders and how to strengthen
- Structure the knowledge about project stakeholders and share it with others
- Understand how to deal with different people
- Access how best to harness the positive aspects of the informal sector, minimize the negative aspects
- Create effective links between informal and formal sectors

Source: FSM Book – Chapter 15

FSM TOOLBOX

Steps of Stakeholder Analysis

1) Identification of stakeholders
2) Characterizing stakeholders
3) Planning for their participations

- Stakeholder Analysis Tool is to provide the assistance to the users in those steps

FSM TOOLBOX

Exercise

- List the FSM stakeholders that are part of faecal sludge management

FSM TOOLBOX

Identify FSM Stakeholders

- One of the first tasks when starting new project
- An iterative process (Additional stakeholder are added later)
- Using expert opinion, focus groups, semi-structured interview, snow-ball sampling (people who know other people)

FSM TOOLBOX

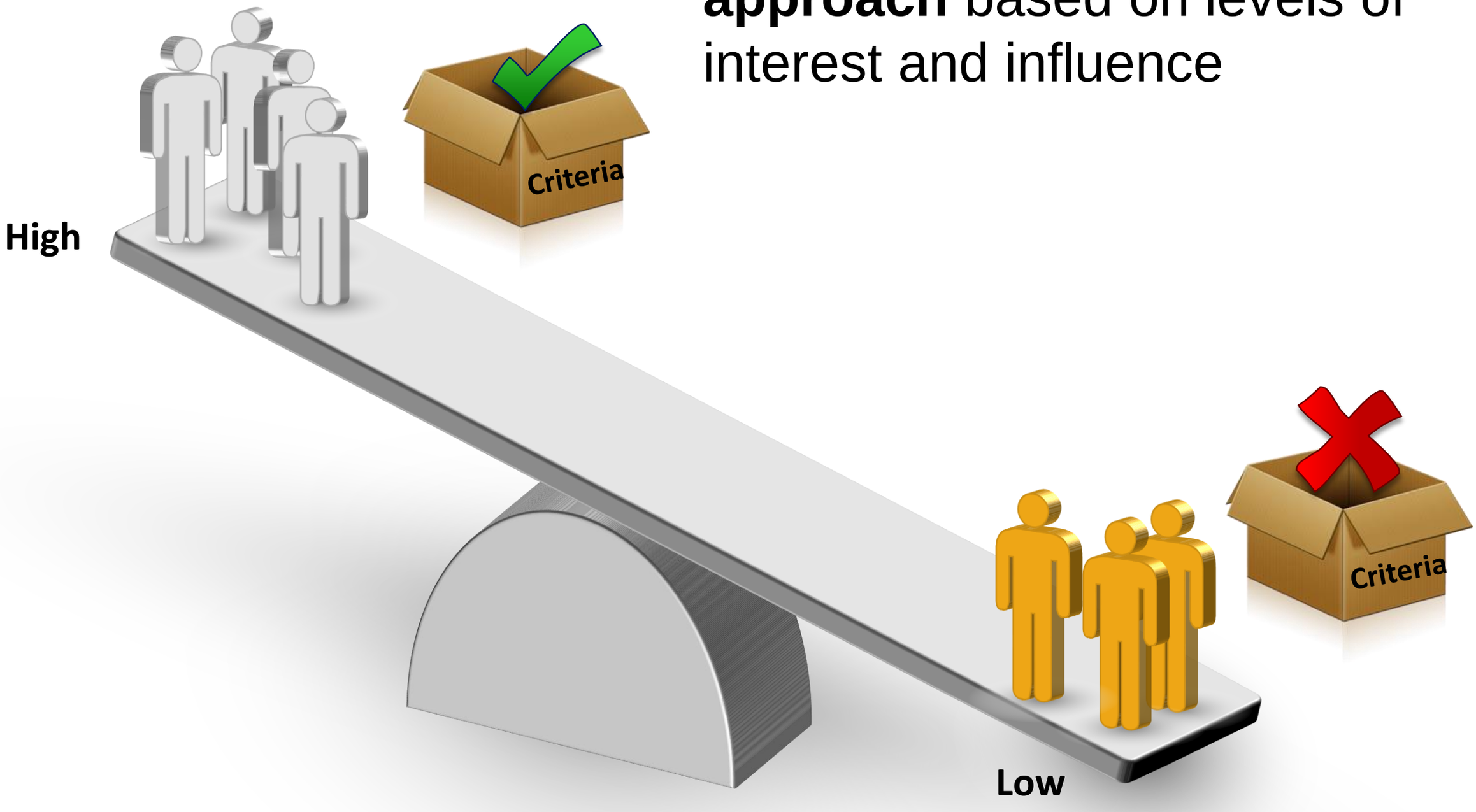
Characterize the FSM Stakeholders

What do you want to know about stakeholders?

- *to determine who to engage in the different parts of the planning process, and to what degree*

FSM TOOLBOX

Interest – Influence



“Analytical Categorization” approach based on levels of interest and influence

FSM TOOLBOX

Influence - Interest

Influence – the power that stakeholders have on the project (to control which decisions are made, facilitate their implementation, or affect the project negatively.)

Interest – Stakeholders who needs, constraints and problems are a priority in the strategy.

FSM TOOLBOX

Confusing Terminology

Influence

FSM TOOLBOX

Criteria: Interest - Influence

(6) criteria for influence

(4) criteria for interest

FSM TOOLBOX

Criteria: Influence

- **Political Power**: *Stakeholders who involve in making political decision, governmental roles.*
- **Potential support**: *Stakeholders who could support the projects in any possible ways.*
- **Potential Threat**: *Stakeholders who have deviated views on the projects' objective, but whose involvements and/or contributions are necessary in the projects.*
- **Ability to get Funding**: Stakeholders who could financially contribute to the projects to initiate or move forward.
- **Negotiating Position**: Stakeholders who have got the powers to negotiate in conflicts or to agree on the proposals, and also for necessary changes.
- **Land Provider:** *Stakeholders who are the potential land owners of the planned treatment plants or disposal sites.*

FSM TOOLBOX

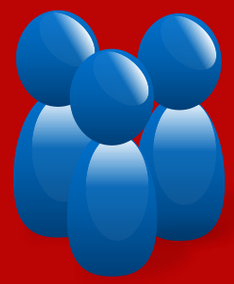
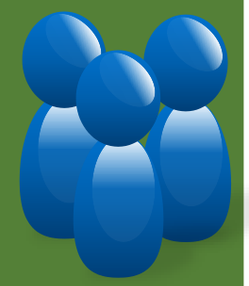
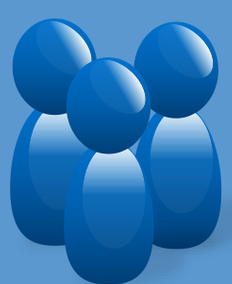
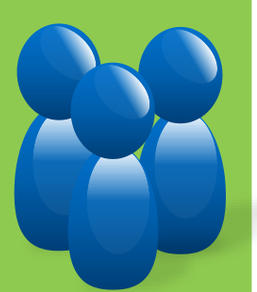
Criteria: Interest

- **Impact of the project:** Stakeholders who could be affected negatively or positively by the projects.
- **Role in the project:** Stakeholders who have direct roles in the projects.
- **Expectations from the project**: Stakeholders who expects the positive outputs created by the proposed projects.
- **Potential end product user:** Stakeholders who will be the customers of the treated FS end products, such as farmers or cattle breeders.

Stakeholder Matrix

FSM TOOLBOX

The findings and analysis process can be recorded and visualized on the Stakeholder Matrix.

"Influence" of Stakeholders on the Project	Low	High
	High Influence – Low Interest	**High Influence – High Interest**
High	**Group-1** The group of stakeholders may oppose the intervention; therefore, they should be kept informed and their views acknowledged to avoid disruption or conflict. In order to increase their involvement the following participation levels could be used. 	**Group-2** The group of stakeholders should be closely involved to ensure their support for the project. In order to increase their involvement the following participation levels could be used. 
Low	**Group-3** This group of stakeholder are unlikely to be closely involved in the project and require not more than information sharing aimed at the general public. 	**Group-4** This group of stakeholder needs special effort to ensure that their needs are met and their participation is meaningful. 
	Low Influence – Low Interest	**Low Influence – High Interest**

"Interest" of Stakeholder in the Project

FSM TOOLBOX

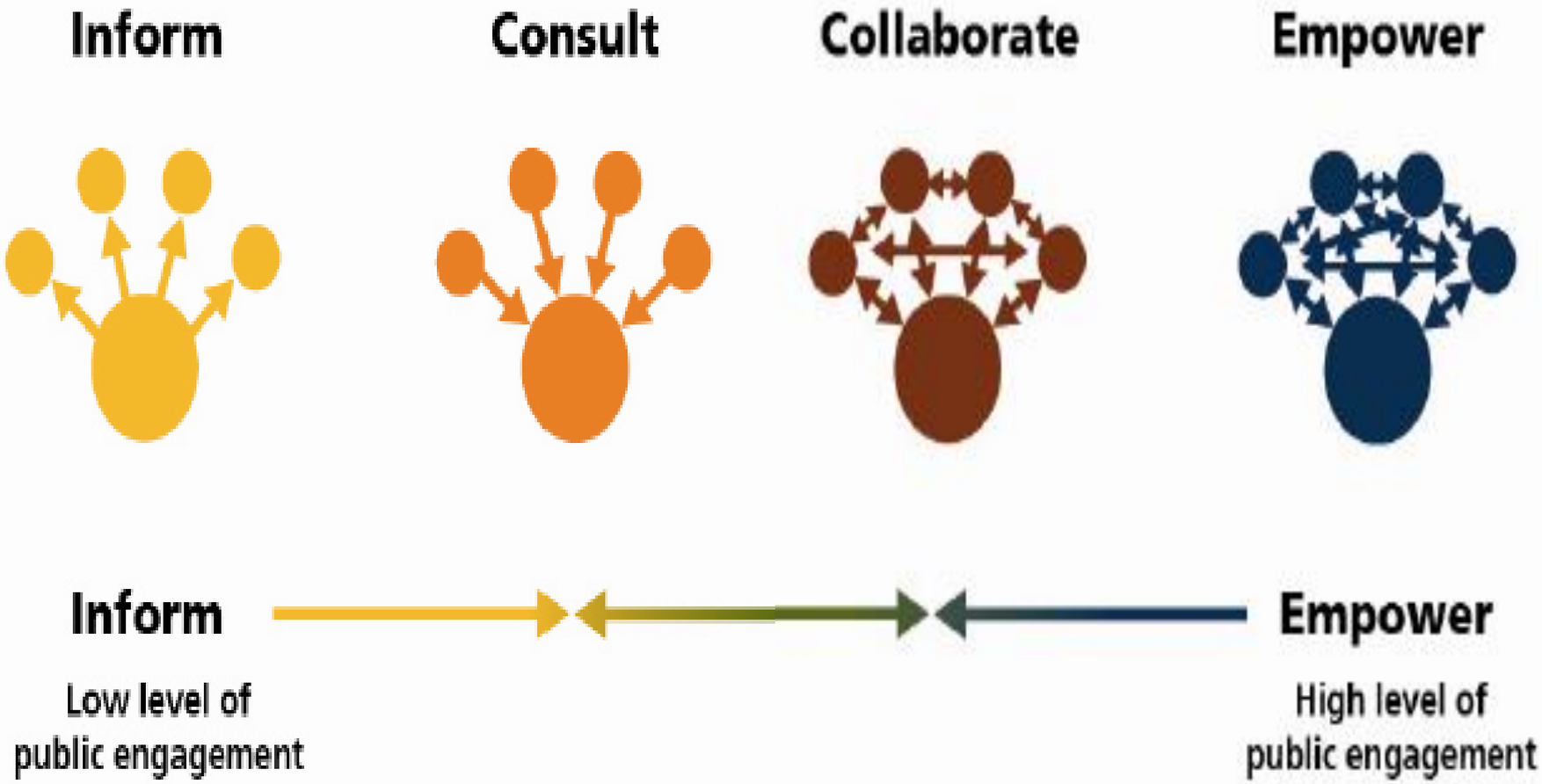
FSM TOOLBOX

Stakeholder Engagement

- Develop a stakeholder engagement or involvement strategy
- Defining the participation level of people in the process and how to best answer their needs
- Build a system that functions well and meets sanitation objective

FSM TOOLBOX

Participation Level



Source:http://www.burlingtongazette.ca/burlington-community-engagement-charter-version-two/

FSM TOOLBOX

Involvement Technique/ Activities

- Personal meetings
- Focus groups
- Workshops
- Site visits
- Media campaigns
- Household surveys
- Advocacy/ lobbying
- Mediation
- Logical Framework

FSM TOOLBOX

Participation level for each group

	Low Interest	High Interest
High influence	May oppose **(Consult - Inform)** **(Group – 1)**	Should be closely involved to ensure support **(Consult – Collaborate – Empower)** **(Group – 2)**
Low influence	**Unlikely to be closely involved**	**Require special effort to participate and meet needs**

FSM TOOLBOX

Stakeholder Analysis Tool

1. About – A brief introduction of SA & Tool
2. About – A brief introduction of SA & Tool
3. List of Stakeholder & Stakeholder Table
4. Stakeholder Matrix

Excel-based tool

Decision support for Stakeholder Engagement

- Participation level for each group
- Tools for each participatory approach

FSM TOOLBOX

Tool Manual

FSM TOOLBOX

Stakeholder Analysis Tool: First Sheet

FSM Stakeholder Analysis and Decision Support for Stakeholder Engagement Tool

Stakeholder Analysis

Stakeholder analysis is one of the most important processes to the success of every project. Likewise, it is also an essential tool for FSM planning, as it lays out the foundation and structure for follow-up activities of the project, such as participatory planning, implementation, and monitoring. Stakeholder analysis processes is mainly to know who will involve at what level in your project, and understand who has the potential influence, and impact on your project. Moreover, it is a power tool, and its finding will help to draw stakeholder management plan – how to best manage and communicate the different groups of stakeholders throughout the project for its highest success and less negative impacts.

The stages in performing stakeholder analysis are –

1. Identification of stakeholders – this is an initial stage, which identify who to be involved in the projects, by using expert opinion, focus groups, interviews, etc. However, in some countries, national sanitation strategy have defined the stakeholders to be involved in FSM.
2. Characterization of stakeholders – collecting the data on interest and power level of stakeholders on the project. The collected information will serve as the criteria to select them, and decide how to best manage them throughout the project.
3. Selection of stakeholders and drawing the management plan – Based on the characteristics of identified stakeholders, the key stakeholders will be prioritized. After that, the communication mechanism will be determined for different groups of stakeholders.

About this Tool

Stakeholder analysis is working with long lists of name, and related information. To do it manually, the process involves listing down the names of the stakeholder, collecting information, matching the criteria for each of them, drawing on the flip chart to categorize. It is time-consuming and workforce-intensive process. This excel based tool is to facilitate those tedious processes in more effective and less time-consuming way.

This tool includes three main parts: **Lists of potential FSM stakeholders**, **stakeholder table** (information of stakeholder to be filled up), and **stakeholder Matrix** (categorized based on the interest-influence methods). In addition to that, tool will also provide suggestions to assist in planning the stakholder engagement.

Please see the tool manul for the details instruction of tool application.

FSM TOOLBOX

Stakeholder Analysis Tool: 2nd Sheet

FSM Stakeholder Analysis and Decision Support for Stakeholder Engagement Tool

Definition of the Criteria

Influence

Political Power: Stakeholders who involve in making political decision, governmental roles.

Potential support: Stakeholders who could support the projects in any possible ways.

Potential Threat: Stakeholders who have deviated views on the projects' objective, but whose involvements and/or contributions are necessary in the projects.

Ability to get Funding: Stakeholders who could financially contribute to the projects to initiate or move forward.

Negotiating Position: Stakeholders who have got the powers to negotiate in conflicts or to agree on the proposals, and also for necessary changes.

Land Provider: Stakeholders who are the potential land owners of the planned treatment plants or disposal sites.

Interest

***Impact of the project*:** Stakeholders who could be affected negatively or positively by the projects.

***Role in the project*:** Stakeholders who have direct roles in the projects.

Expectations from the project: Stakeholders who expects the positive outputs created by the proposed projects.

***Potential end product user*:** Stakeholders who will be the customers of the treated FS end products, such as farmers or cattle breeders.

Stakeholder Analysis Tool: 3rd Sheet

FSM TOOLBOX

Add Stakeholder | Remove Stakeholder | Analyse

Stakeholder Table

Print

List of Petential FSM Stakeholder

National Authorities | Regional & Municipal | Doners and INGOs | Service Providers

Users and Facilitators | Potential Land owners | End Users

- Bill and Melinda Gates Foundatio
- World Bank
- Asian Development Bank
- African Development Bank
- UNICEF
- GIZ
- JICA
- DFID
- CIDA
- AUS AID
- SDC
- Local Donor (TYPE NAME)

Sno	Name of Stakeholder	Representative Person Name	Contact Information	Criteria for Influence	Influence on Project Outcome	Criteria for Interest	Interest on Project Outcome	Criteria for Influence
1	RD Health	Representative's Name	Contact Information	☐ Political Power ☐ Potential support ☐ Potential Threat ☐ Ability to get Funding ☐ Negotiating Position ☐ Land provider	Low Influence	☐ Impact of the project ☐ Role in the project ☐ Expectations from the project ☐ Potential end product user	Low Interest	
2	RD Urban development and Habitat	Representative's Name	Contact Information	☐ Political Power ☐ Potential support ☐ Potential Threat ☐ Ability to get Funding ☐ Negotiating Position ☐ Land provider	Low Influence	☐ Impact of the project ☐ Role in the project ☐ Expectations from the project ☐ Potential end product user	Low Interest	
3	Bill and Melinda Gates Foundation	Representative's Name	Contact Information	☐ Political Power ☐ Potential support ☐ Potential Threat ☐ Ability to get Funding ☐ Negotiating Position ☐ Land provider	Low Influence	☐ Impact of the project ☐ Role in the project ☐ Expectations from the project ☐ Potential end product user	Low Interest	

Stakeholder Analysis Tool: 4th Sheet

Stakeholder Analysis Tool

Print

Stakeholder Interest - Influence Matrix

Influence on the Project

High

Engage

- RD Water and Sanitation
- RD public works
- RD hydraulic
- RD Urban development and Habitat
- RD plan & Development
- RD Health
- RD Social Affairs
- Traditional Leaders
- Neighbourhood Leaders
- Religious Leaders
- NGO-2

Engage

- Municipal Authorities
- Mechanical Sludge Emptier-2
- NGO-1
- NGO-3
- NGO-4

- Mechanical Sludge Emptier-1
- Farmers/ Farmers Association
- Cattle Bredders/ Cattle Bredders Association

Low

Interest in the Project

High

STAKEHOLDER MATRIX

FSM TOOLBOX

Stakeholder Engagement

Suggestions for participation level selection for each group

Lists of tool for each participation level

Tools – explanations, key points, and suggested lists for further readings

Engagement Options

Stakeholder Engagement

Engage: High influence-Low interest group - Group 1

The group of stakeholders may oppose the intervention; therefore, they should be kept informed and their views acknowledged to avoid disruption or conflict. In order to increase their involvement the following participation levels could be used.

Consult

The following tools can be used for consultation of the stakeholders.

- Personal Meetings
- Focus groups
- Workshops
- Site visits
- Household surveys
- Mediation
- Logical framework

Inform

The following tools can be used for informing the stakeholders.

- Personal Meetings
- Workshops
- Site visits
- Media campaigns
- Advocacy/lobbying

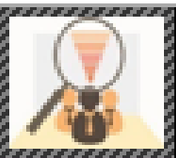
Go Back

Engagement Options

FSM TOOLBOX

Stakeholder Engagement

Print



Personal Meeting

Individual Meetings with stakeholders, opinion leaders or organizational representatives

Key points

- One-to-one meetings are often the first step in engaging with a particular stakeholder or group. Those meetings allow to gather information, build the trust, and create the personal relationships with the stakeholders.
- One-to-one meetings are conducted informally and allow two-way communications, open discussions without peer pressure.
- Individual meetings with key stakeholders are one of the most important ways in which expectations and issues are discussed. They also provide an understanding of existing situation, needs, and perceptions of the

References:

1. The stakeholder engagement manual **Volume 2: The practitioner's handbook on stakeholder engagement**
   http://www.accountability.org/images/content/2/0/208.pdf
2. **Chapter-15: Stakeholder Engagement**
   FSM: Systems approach for implementation and operation (IWA publishing)
   http://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/EWM/Book/FSM_Ch16_Stakeholder_Engagement.pdf

Source of further understanding

Fecal Sludge Management in Developing Countries A planning manual (1st edition, 2002), Sandec, Eawag ***Useful section*** : 2.3.4 Explore stakeholders' needs and perceptions
http://www.sswm.info/sites/default/files/reference_attachments/KLINGEL%202002%20Fecal%20Sludge%20Management%20in%20Developing%20Countries%20A%20planning%20manual.pdf

Go Back

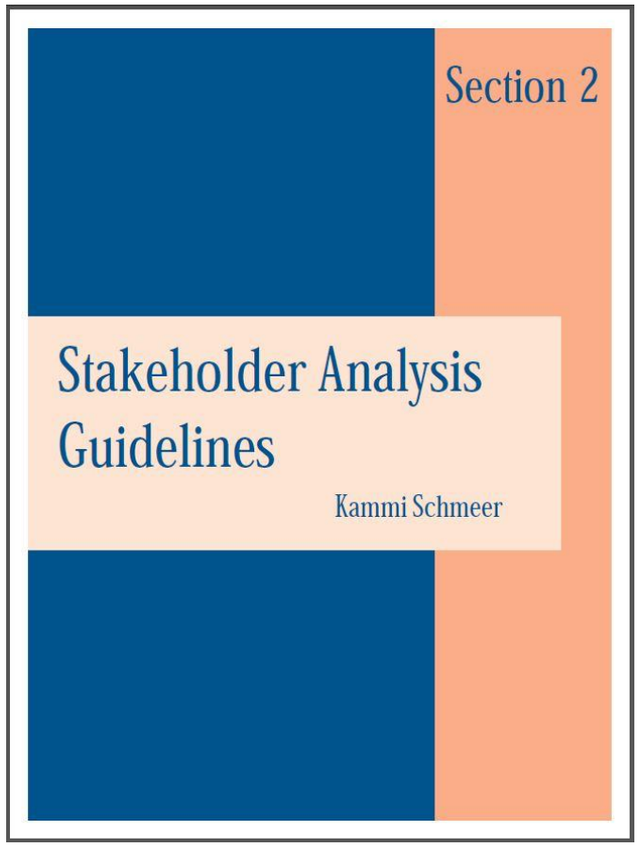
FSM TOOLBOX

Please tell two benefits that you see in using **Stakeholder Analysis Tool**

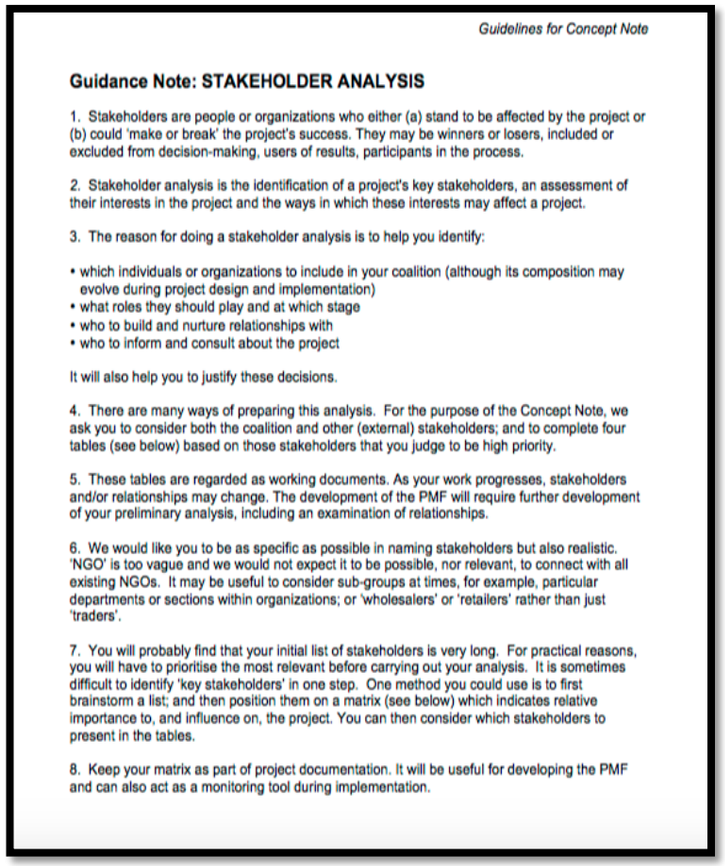
FSM TOOLBOX

Suggested Readings

Chapter-15, & 16
FSM book, IWA publishing



Stakeholder Analysis Guidelines,
Kammi Schmeer



Guidelines for Concept Note

Guidance Note: STAKEHOLDER ANALYSIS

1. Stakeholders are people or organizations who either (a) stand to be affected by the project or (b) could 'make or break' the project's success. They may be winners or losers, included or excluded from decision-making, users of results, participants in the process.

2. Stakeholder analysis is the identification of a project's key stakeholders, an assessment of their interests in the project and the ways in which these interests may affect a project.

3. The reason for doing a stakeholder analysis is to help you identify:

- which individuals or organizations to include in your coalition (although its composition may evolve during project design and implementation)
- what roles they should play and at which stage
- who to build and nurture relationships with
- who to inform and consult about the project

It will also help you to justify these decisions.

4. There are many ways of preparing this analysis. For the purpose of the Concept Note, we ask you to consider both the coalition and other (external) stakeholders; and to complete four tables (see below) based on those stakeholders that you judge to be high priority.

5. These tables are regarded as working documents. As your work progresses, stakeholders and/or relationships may change. The development of the PMF will require further development of your preliminary analysis, including an examination of relationships.

6. We would like you to be as specific as possible in naming stakeholders but also realistic. 'NGO' is too vague and we would not expect it to be possible, nor relevant, to connect with all existing NGOs. It may be useful to consider sub-groups at times, for example, particular departments or sections within organizations; or 'wholesalers' or 'retailers' rather than just 'traders'.

7. You will probably find that your initial list of stakeholders is very long. For practical reasons, you will have to prioritise the most relevant before carrying out your analysis. It is sometimes difficult to identify 'key stakeholders' in one step. One method you could use is to first brainstorm a list; and then position them on a matrix (see below) which indicates relative importance to, and influence on, the project. You can then consider which stakeholders to present in the tables.

8. Keep your matrix as part of project documentation. It will be useful for developing the PMF and can also act as a monitoring tool during implementation.

Guidance Note: Stakeholder Analysis
World Bank

FSM TOOLBOX

JOB-PROFILE MATRIX

Su Su Myat

FSM TOOLBOX

Can you list the points of information described in a job advert – you can refer to any job advert that you have read in the past?

Outline:

- KSA (knowledge, skill and ability), job task/ description.
- *Job Profile matrix (JPM)*
- Prepare a sample TOR by using *JPM*
- Assess the training needs of a selected FSM position, by using JPM

KSA (Knowledge, Skill, Ability)

Knowledge: An organized body of information, usually of a factual or procedural nature, which if applied, makes adequate performance on the job possible.

Skill: Skills are measurable through testing, can be observed, and are quantifiable. Often refers to expertise that comes from training, practice, etc.

Ability: The capacity to perform a physical or mental activity at the present time. Typically, abilities are apparent through functions completed on the job

FSM TOOLBOX

Job Task and Training Needs

Job task - the duties and responsibilities to perform the assigned job. Job task describes the breakdown activities to be carried out to accomplish the assigned positions."

Training Need – trainings are needed to bridge the relevant skill and knowledge gap of staff.

Exercise: FSM task categories and positions

- Place the FSM positions at relevant FSM task categories from the provided sheet from JPM
- Add the other positions if you can suggest

FSM Task Categories

Management and Development	Planning	Procurement/ Communication	Implementation/ Construction	Operation and Maintenance	Monitoring and Evaluation

FSM TOOLBOX

FSM Job Positions

1. Education specialist/ Capacity development expert
2. Technical support (Engineer)
3. Program/ Project Manager
4. Faecal sludge management specialist
5. Legal Expert
6. Communication professional/ Liaison officer
7. Procurement officer
8. FSM public-private partnership (PPP Expert)
9. Site Engineer
10. FSM Training officer
11. Truck driver
12. Financial specialist
13. Logistics Expert
14. Laboratory supervisor
15. Laboratory staff
16. M&E (Monitoring and Evaluation) expert
17. Engineer (Technical expert, planning)
18. Collection worker
19. Plant operator
20. General worker


MATRIX
JOB
PROFILE

What is Job Profile Matrix?

- An Excel sheet (information sheet)
- FSM position requires skills, knowledge, job task and training needs
- To assist in TOR preparation in hiring new FSM staff/ consultant
- To support training needs and job task analysis for FSM positions.

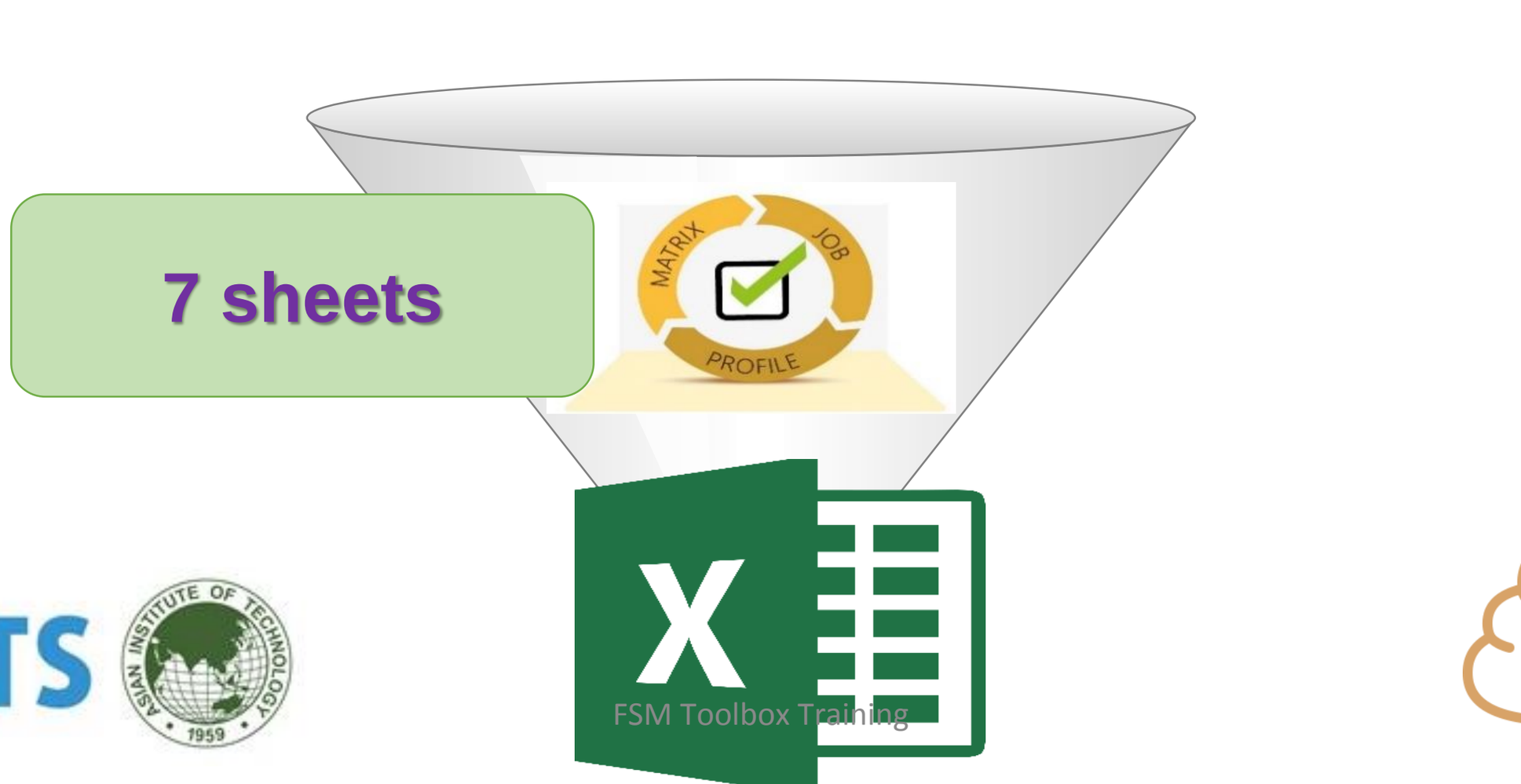
- **Edit the information**

according to the users' situations & needs

FSM TOOLBOX

What is Job Profile Matrix?

- About the tool
- FSM task categories and the relevant positions under them
- Skill, Knowledge requirements
- training need and job task of FSM positions.



Exercise I : Prepare TOR for FSM truck driver

- Exercise sheet – TOR template for FSM truck driver
- Prepare TOR for FSM truck driver.
- Use provided TOR Template, and fill in the blanks by using JPM
- Blanks are skill, knowledge, and abilities requirements

FSM TOOLBOX

Exercise II: Job Task & Training Needs

Exercise II: Job Task & Training Needs

- Identify the training need for a new hirer FSM truck driver.
- Use the assumption from the story – please see the given sheet
- Use Job Profile Matrix to get required information

Reflections on Lesson

- How useful the lesson was?
- Did you learn anything new from this session?
- Will JPM be relevant for your future FSM jobs to apply?

FSM TOOLBOX

AIT Asian Institute of Technology

NATS

FSM Financial and Technical Assessment Tool

Su Su Myat

FSM TOOLBOX

Content

1. Contents of the FSM Technical & Financial Tool
2. Successful case study
3. Exercise and results Interpretation
4. Discussion about contextualize the tool in Indian context
5. Evaluation

Why is financing important in FSM?

Why is it important to select appropriate technologies?

Content of FSM Technical & Financial Tool

- Excel-based tool for city planners, consultants & donors for proposed FSM projects

- Three main functional categories — baseline assessment, technology selection and financial viability assessment

- Focuses on the collection, transport & treatment phases of FSM

- Allows users to assess the technical and financial viability of various options and support the decision making in those aspects

FSM TOOLBOX

Tool Contents: 8 Sheets

1. FS Volume
2. Number of Trucks
3. Treatment Technology
4. Cost & Financing
5. Debt
6. Revenue
7. CS BS & IS
8. Summary

FSM TOOLBOX

Sheet 1: FS Volume

1	2	3	4	5
Input baseline data	Select basis for computing FS volume – either by **septic tank volume** or **FS generation rate**	Compute FS volume for Households, commercial establishments & institutions	Input growth rates	Get the FS volume projections for 10 years

FSM TOOLBOX

Sheet 1: FS Volume

Input baseline data

1

Total population in the coverage area	**100,000**	population
Average number of persons per household	**4**	persons per household
Estimated number of households	**25,000**	households

FSM TOOLBOX

Sheet 1: FS Volume

Select basis for computing FS volume – either by **septic tank volume** or **FS generation rate**

2

◉ Estimate by Septic Tank Volume

Percentage of homes with septic tanks	**70%**	% with septic tanks
Percentage of septic tanks that are desludgable	**83%**	% of septic tanks that are desludgable
Average volume of residential septic tanks	**3**	cubic meters
Frequency of desludging (3 to 5 years)	**3**	years
Number of days per week that the septage program will operate	**5**	days per week
Number of working days per year	**245**	working days per year
Estimated FS volume per day from households	**59**	cubic meters per day

◉ Estimate by FS Generation Rate

Estimated annual FS generation rate per capita	**0.25**	m^3/capita/year
Estimated annual FS generation rate per household	**1.00**	m^3/household/year
Percentage of septic tanks that are desludgable	**83%**	
Estimated annual FS generation rate in coverage area	**25,000**	m^3/year
Estimated annual FS volume to be desludged	**20,750**	m^3/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

FSM TOOLBOX

Sheet 1: FS Volume

Compute FS volume for households, commercial establishments & institutions

Number of commercial establishments in the coverage area	2,000	commercial establishments	
Percentage of commercial septic tanks that are accessible	80%	% of septic tanks that are accessible	
Average volume of commercial septic tanks	10	cubic meters	
Estimated FS volume per day from commercial establishments	22	cubic meters per day	

Number of institutional establishments in the coverage area	500	institutional establishments	
Percentage of institutional septic tanks that are accessible	90%	% of septic tanks that are accessible	
Average volume of institutional septic tanks	10	cubic meters	
Estimated FS volume per day from institutions	6	cubic meters per day	

3

FSM TOOLBOX

Sheet 1: FS Volume

Input growth rates

Households	4%
Commercial establishments	3%
Institutions	3%

4

FSM TOOLBOX

Sheet 1: FS Volume

Get the FS volume projections for 10 years

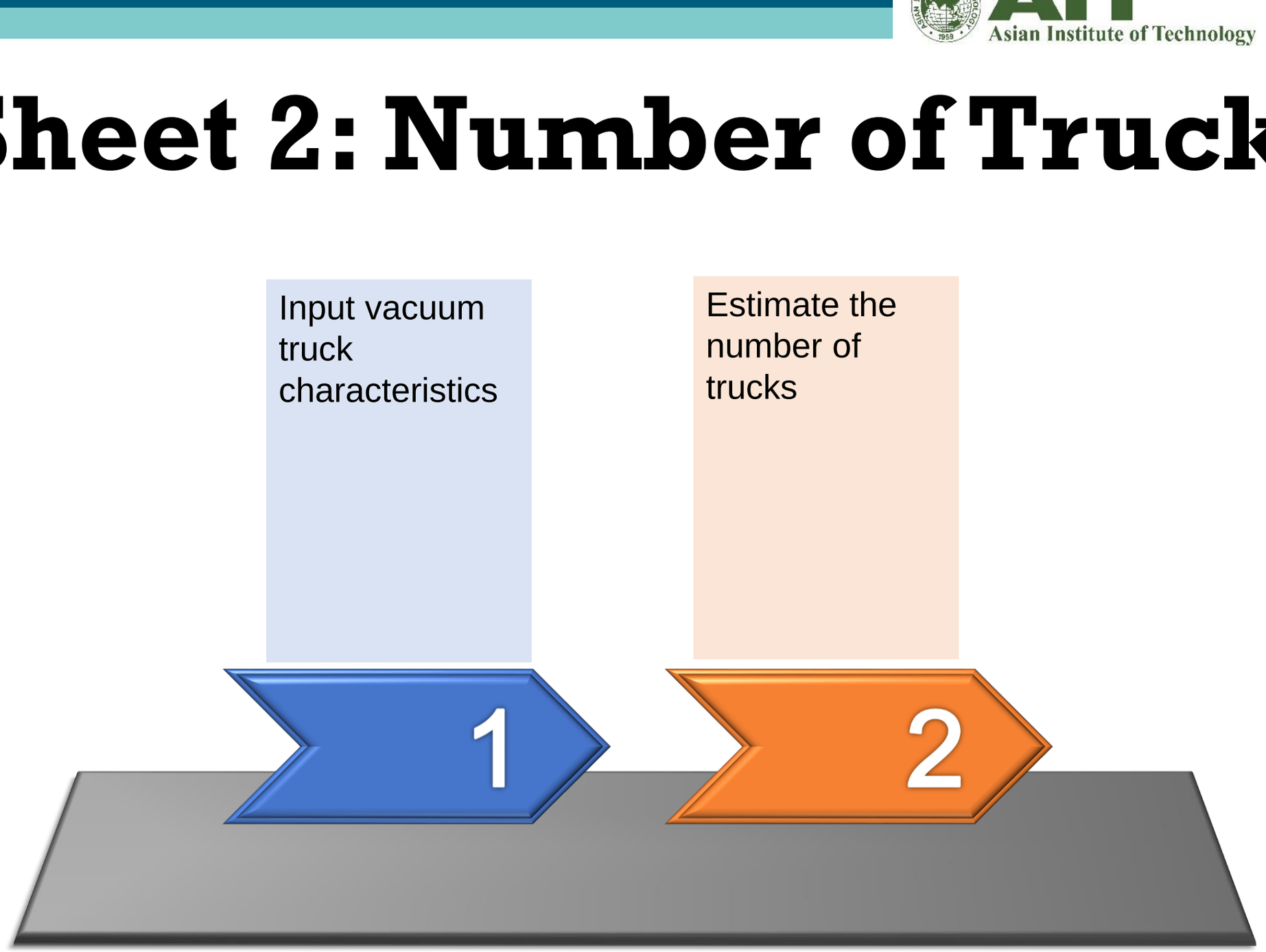
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Households	57	59	61	64	67	69	72	75	78	81	84
Commercial esta	22	22	23	24	25	25	26	27	28	28	29
Institutions	6	6	6	7	7	7	7	8	8	8	8
Total FS volume	**85**	**88**	**91**	**94**	**98**	**101**	**105**	**109**	**113**	**117**	**122**

5

Sheet 2: Number of Trucks

Input vacuum truck characteristics

Estimate the number of trucks

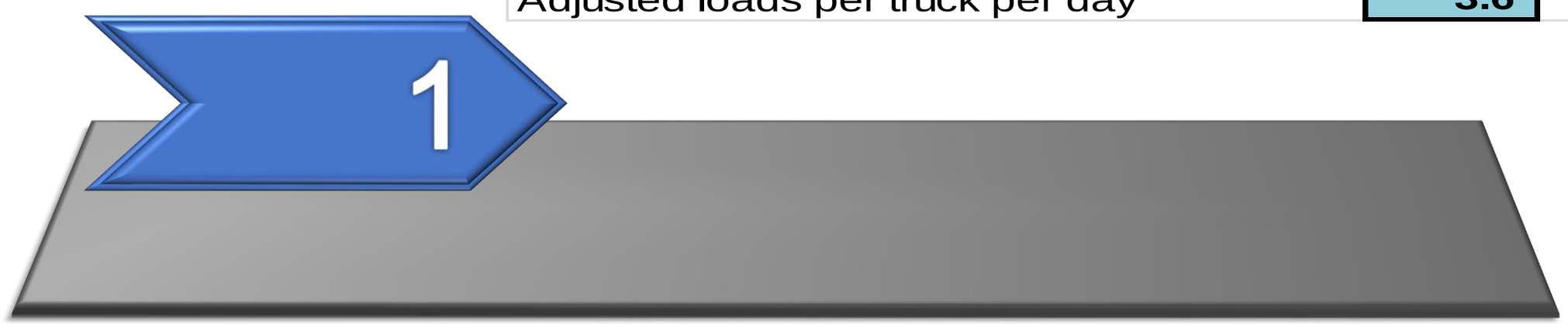


FSM TOOLBOX

Sheet 2: Number of Trucks

Input vacuum truck characteristics

Number of tank volumes accommodated in the truck		
Estimated drive time to home or business	0.50	hours
Estimated time to pump the septic tank	0.50	hours
Estimated drive time from collection site to treatment plant	0.50	hours
Estimated unloading time at treatment facility	0.50	hours
Estimated drive time to the next home or business	0.25	hours
Hours of operation per day	10	hours
Number of loads per truck per day	4.4	
Efficiency of trucking operations	80%	
Adjusted loads per truck per day	3.6	



FSM TOOLBOX

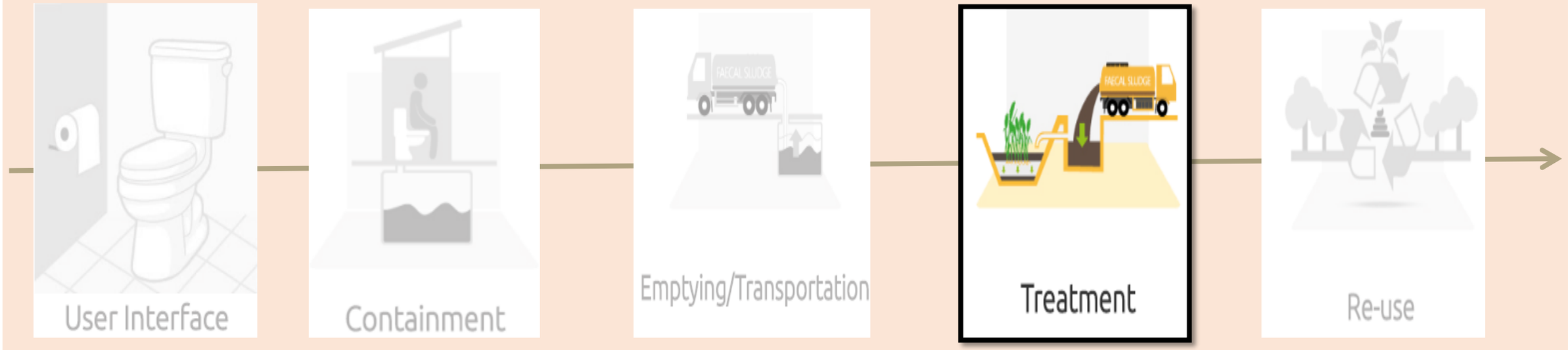
Sheet 2: Number of Trucks

Estimate the number of trucks

Truck capacity (cubic meters)	10	m^3	5	m^3	2.5	m^3
Accessible by truck size	40%		60%		100%	
Optimum coverage by truck size	40%		20%		40%	
Year 1 FS volume coverage by truck size (cubic meters)	35		18		35	
Number of tank volumes accommodated	3.3		1.7		0.8	
Number of trucks (Year 1)	1		1		4	

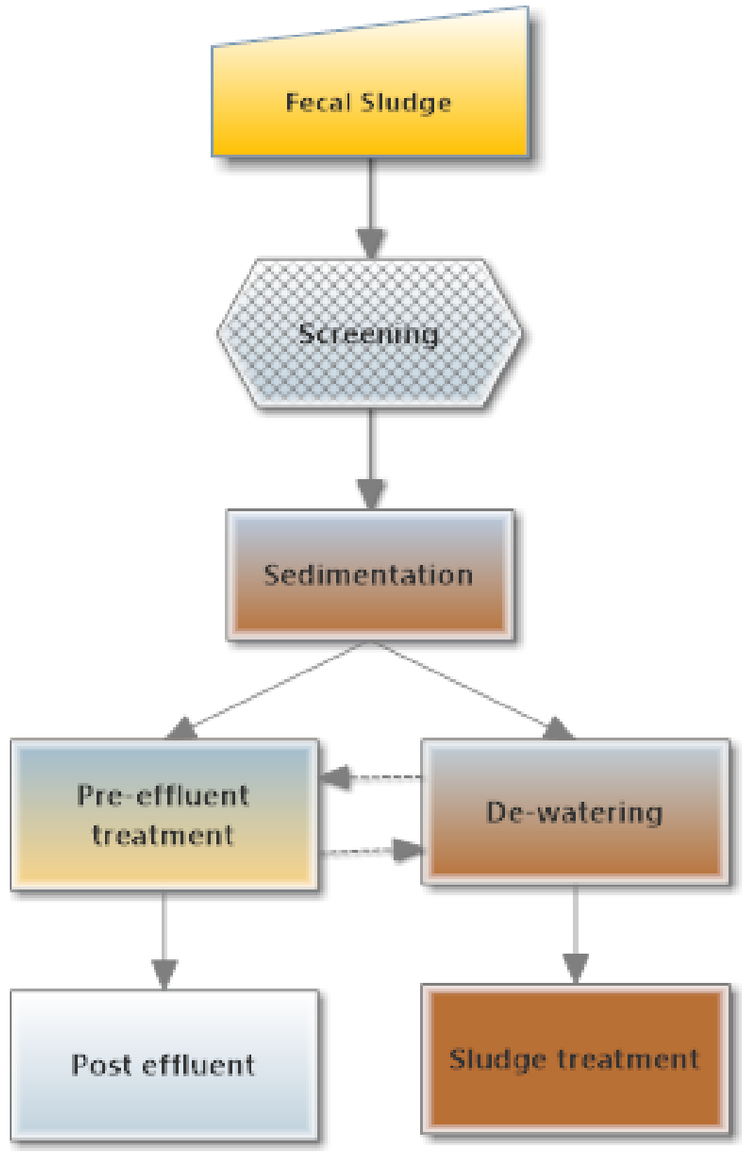
FSM TOOLBOX

Sheet 3: Treatment Technology



FSM TOOLBOX

Sheet 3: Treatment Technology



Fecal Sludge Treatment Process Flow in the Tool

FSM TOOLBOX

Sheet 3: FS Treatment Technology Sheets

- 3 Input
- 3.1 Primary Treatment Options
- 3.2 Dewatering Treatment Options
- 3.3 Pre- Effluent Treatment Options
- 3.4 Post- Effluent Treatment Options
- 3.5 Sludge Treatment Options
- 3.6 Dashboard

FSM TOOLBOX

Sheet 3: Treatment Technology

Untreated Fecal Sludge

Primary Treatment (Sedimentation)

Settler	Imhoff tank	Anaerobic digester	WSP (Anaerobic pond)	Thickening pond

Dewatering

Sand drying beds	Mechanical dewatering

Pre effluent Treatment options

ABR +AF	WSP(Facultative &Maturation pond)	Constructed wetland	Activated sludge

Post Effluent Treatment

Tertiary Filtration and Disinfection

Sludge Treatment options

Vermi composting	Co-composting	Deep row entrenchment	Thermal Drying	Lime addition	La de pa	Sludge Incineration

FSM TOOLBOX

Sheet 3: Treatment Technology

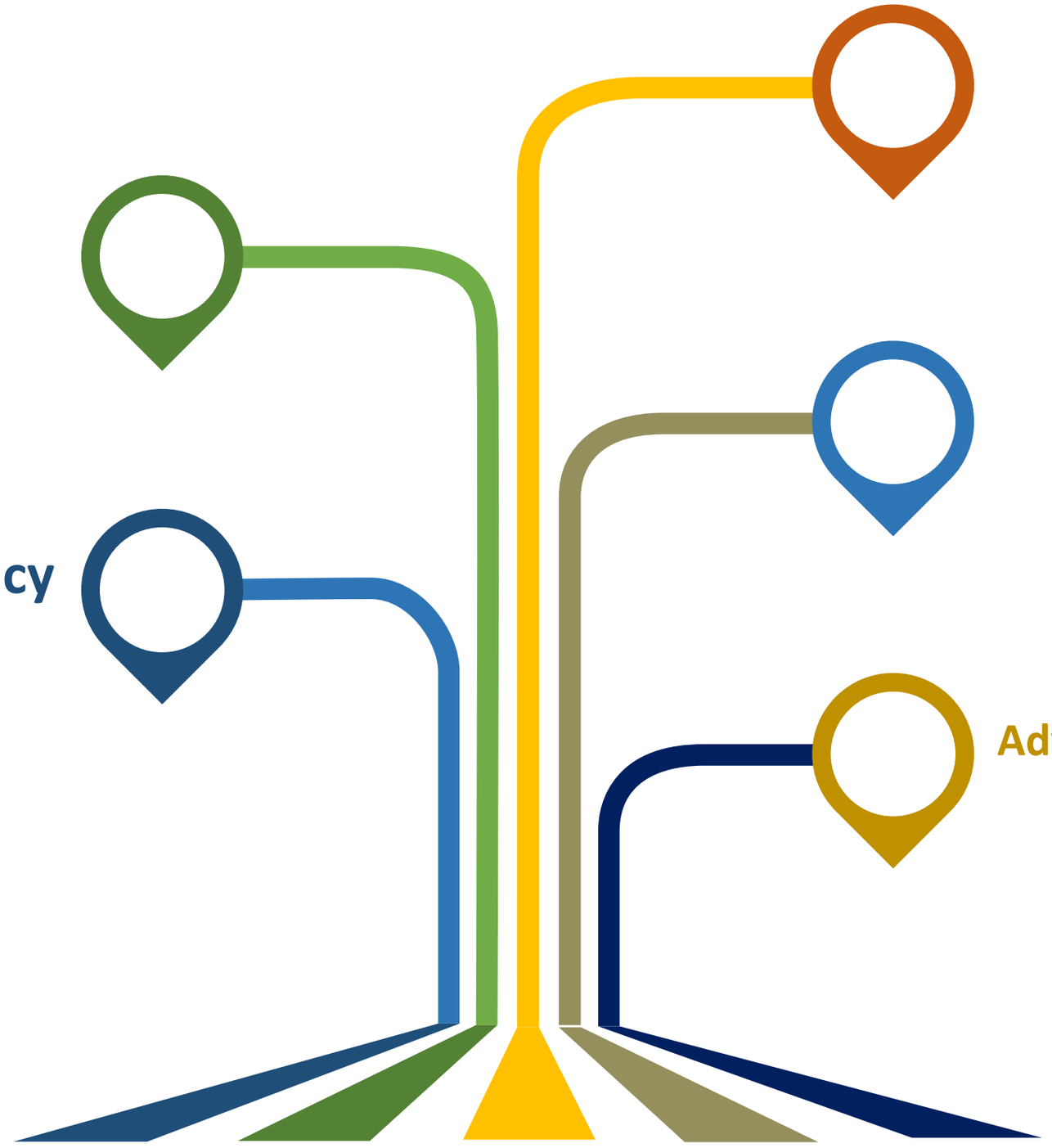
Specification of Each Technology

Cost

Capital investment costs include construction cost, design and supervision costs, and management cost.Operation& maintenance costs include personnel, electrical, chemical, maintenance and miscellaneous expenses.

Removal efficiency

Determine the effluent quality in terms of biological oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS) and pathogen removal after applying various treatment technologies.



Land Requirement

Land requirement for individual technology has been calculated in m2/m3, helps user to estimate over all land area requirement for FSTP.

Reuse

Products are ultimately returned to the environment, either as useful resources or reduced-risk materials. Reuse options for each output product has been presented in the toolkit

Advantages & Disadvantages

The advantages and disadvantages of individual technologies are also presented in the tool to help users in the decision making process.

Sheet 3: Steps for FS Treatment Technology Toolkit

Fecal Sludge Management Tool

The 7 sheets will be helpful for the user to select the FSM treatment technologies based on site-specific criteria. FSM Treatment Technologies are divided into Primary Treatment (sedimentation), Dewatering, Pre Effluent Treatment, Post Effluent Treatment and Sludge treatment.

Based on the initial selection of criteria, possible options will appear in all sheets that users will be able to select. Treatment technologies which appear with the green color are applicable with the selected criteria, while the yellow color technologies can be applied with corrective measures. Technologies, which does not suit with criteria will not be activated.

Sheets will also provide the information like cost, land requirement, removal efficiency, advantages etc. In this way, users will be able to compare all possible technology options and can select one. Through the next button they can move to the next sheet. Once technology will be selected from all sheets the output will be shown in the dashboard. The dashboard will deliver the FSM treatment flow diagram with the selected technologies. On the basis of the chosen technology, table will show the complete treatment system with their total capital cost, O & M cost and net land requirement.

Selection Criteria

Nature of Area	○ Urban	● Rural
Electricity Availability	● Yes	○ No
Flood Prone	○ Yes	● No
Groundwater Table	○ High	● Low
Limited Space	● Yes	○ No

Reset Next >>

- User has to select the option based on site conditions
- Based on criteria, possible options will appear on the screens; and user is allowed to choose any technology combination.
- Reset button to start the process again & Next button to move to the next sheet

FSM TOOLBOX

Sheet 3.1: Primary Treatment Options

Primary Treatment Options — Next >>

Option1	Settler	Imhoff tank	Anaerobic Tank	WSP (Anaerobic Pond)	Thickening Pond
Capital Cost (USD/m³/day)	262.00	435.00	2,043.00	282.20	645.00
O&M Cost (USD/m³/year)	114.78	131.35	199.86	99.24	127.15
Land Requirement (m²/m³)	0.4	0.4	10.8	11.46	45.08
Removal Efficiency (%)	BOD 20-40% COD 25-50% TSS 50-70%	BOD 25-40% COD 25-50% TSS 50-70%	BOD 60-70% COD 60-70% TSS 20-50%	BOD 60-70% COD 60-70% TSS 40-60%	BOD 60-70% COD 60-70% TSS 40-60%
Pathogen Removal	Pathogen Removal < 50%	Pathogen Removal < 50%	Pathogen Removal < 50-60%	Pathogen Removal < 50-60%	Pathogen Removal< 50-60%
Reuse	Needs secondary and tertiary treatment	Needs secondary and tertiary treatment	Generate 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 spraying (+) Can be built and repaired with locally available materials (+) No electrical energy is required

- **Primary Treatment allows the removal of suspended solids by sedimentation from fecal sludge. Treatment technologies which appear with the green color band are applicable with the selected criteria. Yellow color band technologies can be applicable with corrective measures.**

FSM TOOLBOX

Sheet 3.2: Dewatering Treatment Options

Dewatering Treatment Options Next >>

Option32	Sand Drying Beds	Mechanical Dewatering
Capital Cost (USD/m³/day)	1,914.00	3,000.00
O&M Cost (USD/m³/year)	560.33	220.00
Land Requirement (m²/m³)	27.38	1.5
Removal Efficiency (%)	Dry solid Level 30-50%	Dry solid level 20-40%
Pathogen Removal		
Reuse	Needs secondary and tertiary treatment	Needs secondary and tertiary treatment
Advantages	(+) Good dewatering efficiency, especially in dry and hot climates (+) Can be built and repaired with locally available materials (+) Simple operation, only infrequent attention required (+) No experts, but trained community	(+) Compact technology (+) Gives speed to the process (+) Good dewatering efficiency

- **Dewatering helps separate sludge into liquid and solid portions**

FSM TOOLBOX

Sheet 3.3: Pre- Effluent Treatment Options

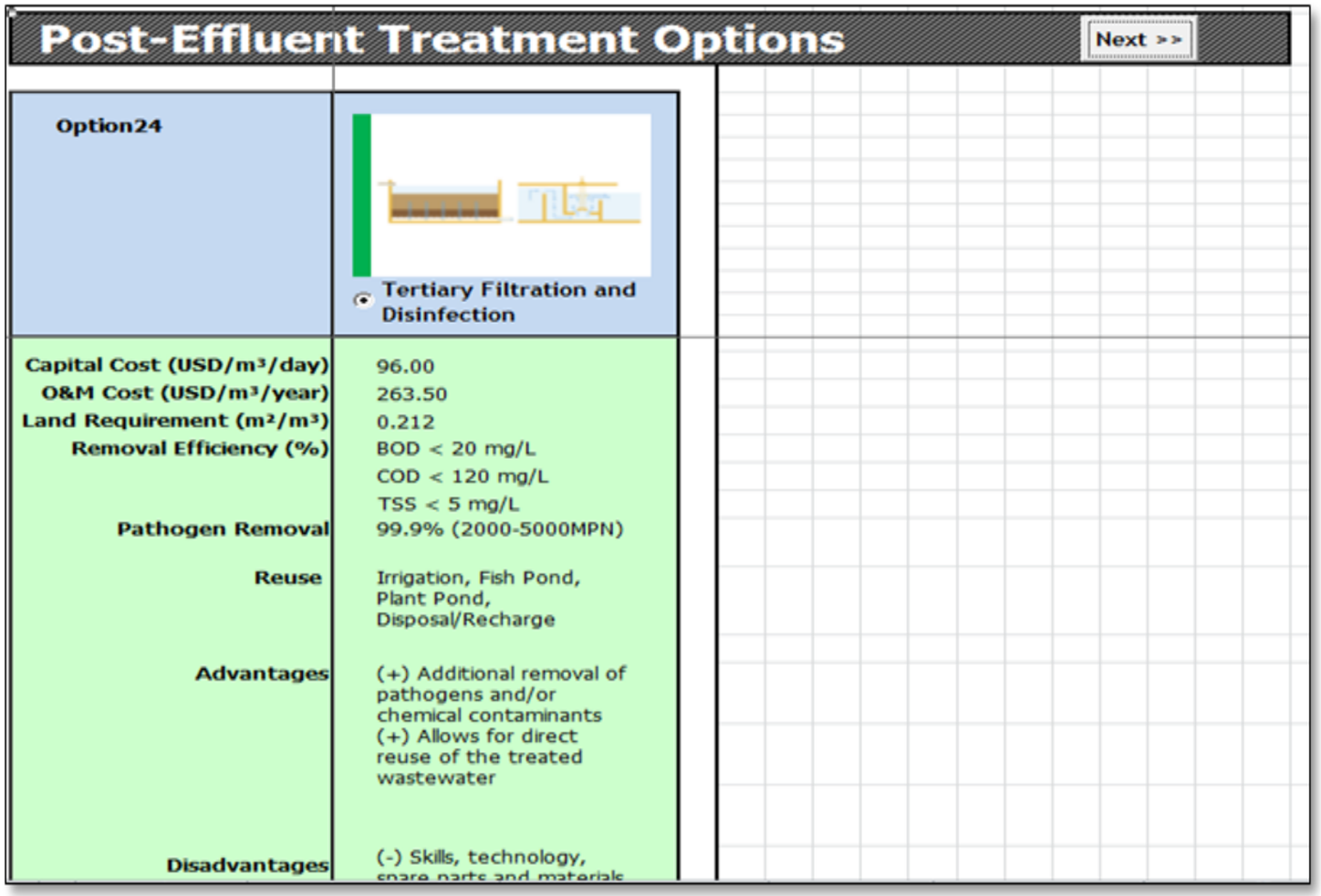
Pre-Effluent Treatment Options

Next >>

Option24	ABR+AF	WSP (Facultative & Maturation pond)	Constructed Wetland	Activated Sludge	Rotating Biological Contactors
Capital Cost (USD/m³/day)	320.00	457.00	1,210.00	1,308.00	2,500.00
O&M Cost (USD/m³/year)	211.64	117.40	156.50	887.40	395.60
Land Requirement (m²/m³)	0.97	21.29	89.46	12.1	5
Removal Efficiency (%)	BOD 70-90% COD 70-90% TSS 80-90%	BOD 80-90% COD 80-90% TSS 60-80%	BOD 80-90% COD 80-90% TSS 60-80%	BOD 80-90% COD 80-90% TSS 80-90%	BOD 80-90% COD 80-90% TSS 80-90%
Pathogen Removal	Pathogen Removal - 99%	Pathogen Removal 99.9%	Pathogen Removal 99.9%	Pathogen Removal < 99%	Pathogen Removal < 99%
Reuse	Needs tertiary treatment	Needs tertiary treatment	Needs tertiary treatment	Needs tertiary treatment	Needs tertiary treatment
Advantages	(+) Resistant to organic and hydraulic shock loads (+) No electrical energy required (+) High BOD reduction (+) Long service life (+) Low sludge production; sludge is stabilized (+) Moderate area requirement (can be built	(+) Resistant to organic and hydraulic shock loads (+) High reduction of solids, BOD and pathogens (+) High nutrient removal if combined with aquaculture (+) No electrical energy required (+) No real problems with	(+) High reduction of BOD, suspended solids and pathogens (+) Ability to nitrify due to good oxygen transfer (+) Does not have the mosquito problems of the Free-Water Surface or Horizontal Wetland (+) Less clogging than in a Horizontal Subsurface	(+) Resistant to organic and hydraulic shock loads (+) High reduction of BOD and pathogens at after secondary treatment (+) High nutrient removal possible (+) High effluent quality (+) Little land required compared to the	(+) High contact time and high effluent quality (both BOD and nutrients) (+) High process stability, resistant to shock hydraulic or organic loading (+) Short contact periods are required because of the large active surface (+) Low space

- **Liquid portion treatment options to remove pathogens, residual suspended solids and / or dissolved constituents**

Sheet 3.4: Post- Effluent Treatment Options



Post-Effluent Treatment Options Next >>

Option24	Tertiary Filtration and Disinfection
Capital Cost (USD/m³/day)	96.00
O&M Cost (USD/m³/year)	263.50
Land Requirement (m²/m³)	0.212
Removal Efficiency (%)	BOD < 20 mg/L COD < 120 mg/L TSS < 5 mg/L
Pathogen Removal	99.9% (2000-5000MPN)
Reuse	Irrigation, Fish Pond, Plant Pond, Disposal/Recharge
Advantages	(+) Additional removal of pathogens and/or chemical contaminants (+) Allows for direct reuse of the treated wastewater
Disadvantages	(-) Skills, technology, spare parts and materials

- **Liquid portion further treatment option to remove pathogens, residual suspended solids and / or dissolved constituents, so that the effluents can be reused for different purposes or discharged to water bodies.**

Sheet 3.5: Sludge Treatment Options

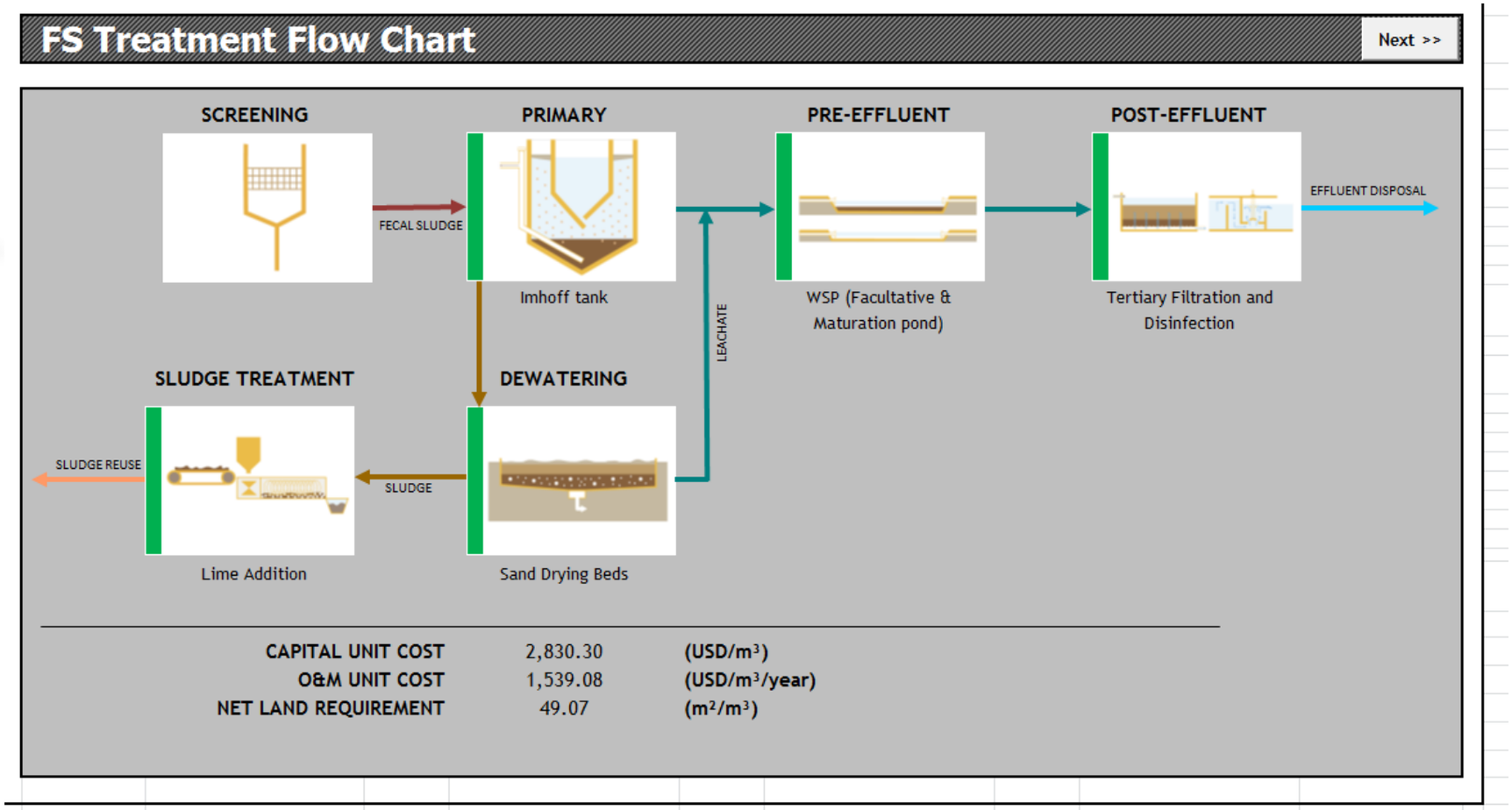
Sludge Treatment Options

Next >>

Option24	Vermi Composting	Co-Composting	Deep Row Entrenchment	Thermal Drying	Lime Addition	La De Pa	Sludge Incineration
Capital Cost (USD/m³/day)	20,476.60	4,602.00	484.90	62,970.00	24.30	62,970.00	123,943.60
O&M Cost (USD/m³/year)	0.80	33.30	0.10	10,428.00	730.00	10,428.00	20,867.00
Land Requirement (m²/m³)	30	200	7.5	1.5	1.33	1.5	1.5
Removal Efficiency (%)	Dry solid Level 20-30%	Dry Solid Level 20-30%		Dry Solid Level 65%-90% Temp. 80° Energy requirement 725K\	Dry solid Level 30-50% PH of sludge 11-12 Ova reduction 56%-83.8%	Dry solid Level < 10% Temp. 100°	Temp. 750°
Pathogen Removal	Pathogen Removal < 50%	Helminth egg < 1 viable egg/g Ts	Helminth egg < 0.1% viable egg/g Ts	Pathogen removal 100%	Pathogen removal 99%	Pathogen Removal 100%	Pathogen Removal 100%
Reuse	Soil Conditioner	Soil Conditioner	Forestry and Land Rehabilitation Purposes	Energy Source and Soil Conditioner	Energy Source and Soil Conditioner	Energy Source and Soil Conditioner	Energy Source
Advantages	(+) Economic and environment friendly waste management (+) Simple methods available (+) Compost is a valuable resource for gardeners/farmers (+) Selling of worms	(+)Large-scale composting reduces the amount of waste that needs to be transported to final disposal sites (+)Relatively straightforward to set up and maintain with appropriate training (+)Provides a valuable resource that can	(+) No expensive infrastructure or pumps are required (+) Growing trees have many benefits such as extra CO2 fixation, erosion protection, or potential economic benefits	(+) Significant reduction in volume as well as pathogen content (+) Dried sludge easy to handle and market (+) Product can be used for agriculture	(+) Reduction of pathogen (+) Reduction of odour and degradable organic matter (+)Benefit of lime is also that heavy metals can precipitate	(+) Technology is compact, mobile and robust (+) Pellets are free of pathogen, therefore safe for agricultural (+) Pellets can be used as a dry fuel	(+) Significant reduction in volume as well as removed all pathogen content

- **Treatment options for the solid portion so that the product can be used for different purposes or safely released into the environment..**

Sheet 3.6: Dashboard



- **The dashboard will display the FSM treatment flow diagram with the selected technologies.**
- **On the basis of the chosen technology combination, a table will be displayed to show the complete treatment system with capital unit cost, unit O & M cost and net land requirement**

FSM TOOLBOX

Manual of FSM Technical & Financial toolkit

FSM TOOLBOX

Manual of FSM Technical & Financial toolkit

ANNEX A: FS Treatment Technologies Selection Sheet

Prerequisites, Operation & Maintenance of Various FS Treatment Technologies

	TECHNOLOGY	PREREQUISITES	Operation & Maintenance
1.	**Settler**	• A settler is a primary treatment technology; it is designed to remove suspended solids by sedimentation.	• In settlers that are not designed for anaerobic processes, regular sludge removal is necessary to prevent septic conditions and the build-up and release of gas, which can hamper the sedimentation process by re-suspending part of the settled solids. Sludge transported to the surface by gas bubbles is difficult to remove and may pass to the next treatment stage. Frequent scum removal and adequate treatment or disposal, either with the sludge or separately, are also important.
2.	**Imhoff tank**	• The Imhoff tank is a primary treatment technology for raw wastewater, designed for solid-liquid separation and digestion of the settled sludge. • Imhoff tanks can be used in warm and cold climates (wastewater temperatures below 15°C or above 2000 m altitude; minimum winter temperature is 8°C, average for the year is 20°C)	• It consists of a V-shaped settling compartment above a tapering sludge digestion chamber with gas vents. • Settling of solids occurs in the upper compartment. Sludge falls through the slot to the bottom of the settling compartment into the lower tank where it is digested. • It requires daily cleaning of the scum and other floatables, desludging periodically (once or twice a year), regular cleaning of the sides of the settling chamber and slot by rake or squeegee, reversing the flow of water twice a month to even up the solids in the digestion chamber
3.	**Anaerobic tank**	• A small-scale anaerobic digester is an anaerobic treatment technology that produces (a) a digested slurry (digestate) that can be used as a fertilizer and (b) biogas that can be used for energy. However, significant gas production cannot be achieved if blackwater is the only input.	• If the reactor is properly designed and built, repairs should be minimal. • To start the reactor, it should be inoculated with anaerobic bacteria • Grit and sand that have settled to the bottom should be removed. • Depending on the design and the inputs, the reactor should be emptied .

- **The technical information about the various treatment options is presented in Annex A.**

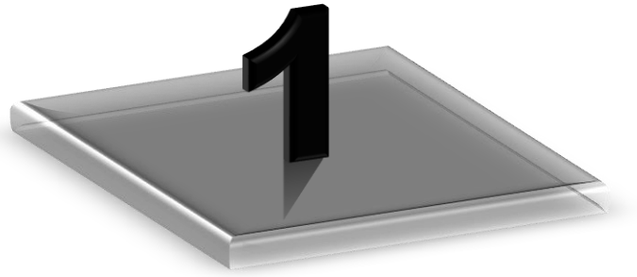
Data Requirement for FSM Financial & Technology Tool

DATA REQUIREMENTS FOR FSM FINANCIAL AND TECHNOLOGY ASSESSMENT IN YOUR CITY

SHEET 1: DATA FOR FS VOLUME SHEET		
QUESTION	**INPUT DATA**	**UNITS**
FS volume from households		
Total population in the coverage area		persons
Average number of persons per household		Persons per household
Estimate by Septic tank volume		
Percentage of homes with septic tanks		% with septic tanks
Percentage of septic tanks that are desludgable		% of septic tanks that are desludgable
Average volume of residential septic tanks		cubic meters
Frequency of desludging (3 to 5 years)		years
Number of days per week that the FSM program will operate		days per week
Number of working days per year		working days per year
Estimate by FS Generation Rate		
Estimated annual FS generation rate per capita		m3/capita/year
Percentage of septic tanks that are desludgable		%
Number of working days per year for FS trucks		working days/year
FS volume from commercial establishments		
Number of commercial establishments in the coverage area		commercial establishments
Percentage of commercial septic tanks that are accessible		% of septic tanks that are accessible
Average volume of commercial septic tanks		cubic meters

Sheet 4: Cost & Financing

Estimate the capital investment costs



Cost estimate per household (USD)		39.55
Estimated cost of treatment plant (USD)		904,047
Land acquisition cost (USD)		227,273
Total cost of FS treatment facility (USD)		1,131,320
10	m^3 vacuum trucks	
	number of trucks	1
	estimated cost per truck (USD)	136,364
	estimated cost (USD)	136,364
5	m^3 vacuum trucks	
	number of trucks	1
	estimated cost per truck (USD)	90,909
	estimated cost (USD)	90,909
3	m^3 vacuum trucks	Year 1
	number of trucks	4
	estimated cost per truck (USD)	45,455
	estimated cost (USD)	181,818
	Total cost of trucks (USD)	409,091
Total Capital Investment Cost		1,540,411

Sheet 4: Cost & Financing

Estimate the O&M costs

Annual O&M costs per household (USD)	**6.78**
Annual O&M costs for treatment plant (USD)	**154,980**
Annual O&M costs for vacuum trucks (USD)	**81,818**
Total O&M costs	**236,798**

Input the financing assumptions

Equity Infusion	**30%**
Debt	**70%**
Interest rate (% p.a.)	**7.0%**
Upfront fee	**1.05%**
Cost of equity	**15.0%**
Tariff collection start in year	**1**
Grace period (years)	**1**
Number of installments	**7**

Financing		**1,540,411**
	Equity	**462,123**
	Subsidy	**-**
	Loans	**1,078,288**

Sheet 4: Cost & Financing

Compute for the WACC

	Share	Interest rate	
Loan	70%	7%	4.90%
Grant	-	0%	0.00%
Equity	30%	15%	4.50%
		WACC	9.40%

Assumptions will be inputs to Sheets 5 & 7

Sheet 5: Debt

- **Loan repayment schedule is automatically generated by the model**

Year	Quarter	Opening balance	Principal repayment	Interest payment	Closing balance
0	1	1,078,288	-	18,870	1,078,288
	2	1,078,288	-	18,870	1,078,288
	3	1,078,288	-	18,870	1,078,288
	4	1,078,288	-	18,870	1,078,288
1	5	1,078,288	154,041	18,870	924,246
	6	924,246	-	16,174	924,246
	7	924,246	-	16,174	924,246
	8	924,246	-	16,174	924,246
2	9	924,246	154,041	16,174	770,205
	10	770,205	-	13,479	770,205
	11	770,205	-	13,479	770,205
	12	770,205	-	13,479	770,205
3	13	770,205	154,041	13,479	616,164
	14	616,164	-	10,783	616,164
	15	616,164	-	10,783	616,164
	16	616,164	-	10,783	616,164
4	17	616,164	154,041	10,783	462,123
	18	462,123	-	8,087	462,123
	19	462,123	-	8,087	462,123
	20	462,123	-	8,087	462,123
5	21	462,123	154,041	8,087	308,082
	22	308,082	-	5,391	308,082
	23	308,082	-	5,391	308,082
	24	308,082	-	5,391	308,082
6	25	308,082	154,041	5,391	154,041
	26	154,041	-	2,696	154,041
	27	154,041	-	2,696	154,041
	28	154,041	-	2,696	154,041
7	29	154,041	154,041	2,696	0
	30	0	-	0	0
	31	0	-	0	0
	32	0	-	0	0

Sheet 6: Revenue

- Allows the user to project the revenue streams based on either of two (2) revenue collection schemes

FSM revenue incorporated in water bill

- **Current FS tariff per cubic meter of water**

1 Current FS tariff per cubic meter of water (USD) 0.20 USD

2 Number of households, commercial establishments and institutions

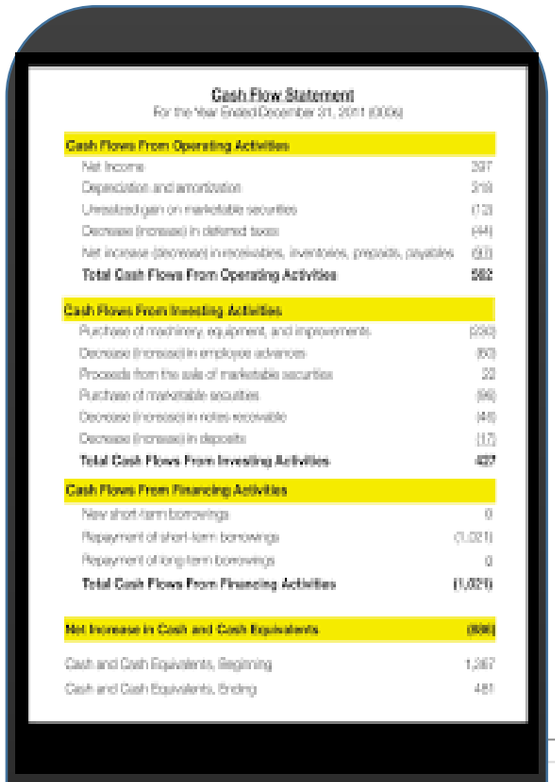
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Households	25,000	26,000	27,040	28,122	29,246	30,416	31,633	32,898	34,214	35,583	37,006
Commercial establishments	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688
Institutions	400	412	424	437	450	464	478	492	507	522	538

3 FS revenue projections

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Households											
Average water consumption per month (cubic meters)	24	24	24	24	24	24	24	24	24	24	24
Monthly revenues (USD)	-	124,800	129,792	134,984	140,383	145,998	151,838	157,912	164,228	170,797	177,629
Annual revenues (USD)	-	1,497,600	1,557,504	1,619,804	1,684,596	1,751,980	1,822,059	1,894,942	1,970,739	2,049,569	2,131,552
Commercial establishments											
Average water consumption per month (cubic meters)	20	20	20	20	20	20	20	20	20	20	20
Monthly revenues (USD)	-	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	10,438	10,751
Annual revenues (USD)	-	98,880	101,846	104,902	108,049	111,290	114,629	118,068	121,610	125,258	129,016
Institutions											
Average water consumption per month (cubic meters)	20	20	20	20	20	20	20	20	20	20	20
Monthly revenues (USD)	-	1,648	1,697	1,748	1,801	1,855	1,910	1,968	2,027	2,088	2,150
Annual revenues (USD)	-	19,776	20,369	20,980	21,610	22,258	22,926	23,614	24,322	25,052	25,803
Total annual revenues (USD)		1,616,256	1,679,720	1,745,686	1,814,255	1,885,529	1,959,614	2,036,623	2,116,671	2,199,879	2,286,371

Sheet 7: CS, IS & BS

- The model automatically generates the project's cash flow and income statements as well as balance sheet

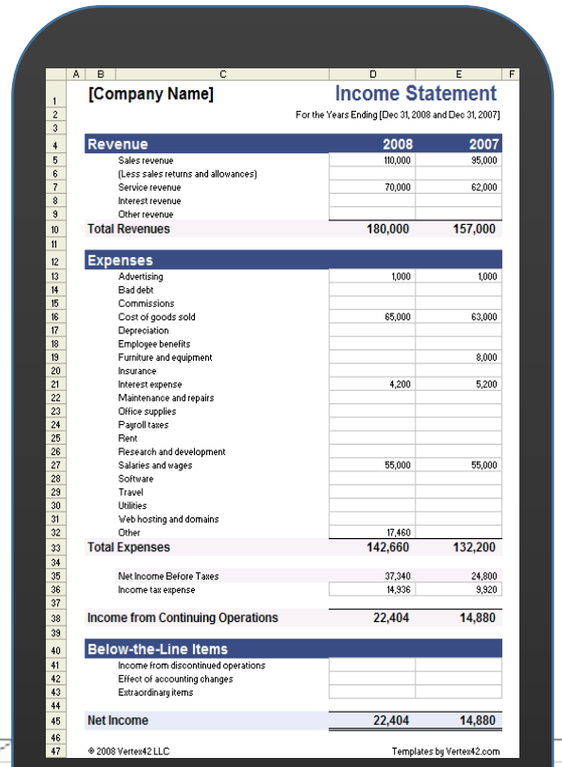


Cash Flow Statement

For the Year Ended December 31, 2011 ($000s)

Cash Flows From Operating Activities	
Net Income	397
Depreciation and amortization	216
Unrealized gain on marketable securities	(12)
Decrease (increase) in deferred taxes	(44)
Net increase (decrease) in receivables, inventories, prepaids, payables	(63)
Total Cash Flows From Operating Activities	**582**
Cash Flows From Investing Activities	
Purchase of machinery, equipment, and improvements	(230)
Decrease (increase) in employee advances	(50)
Proceeds from the sale of marketable securities	22
Purchase of marketable securities	(66)
Decrease (increase) in notes receivable	(40)
Decrease (increase) in deposits	(17)
Total Cash Flows From Investing Activities	**427**
Cash Flows From Financing Activities	
New short-term borrowings	0
Repayment of short-term borrowings	(1,021)
Repayment of long-term borrowings	0
Total Cash Flows From Financing Activities	**(1,021)**
Net Increase in Cash and Cash Equivalents	**(808)**
Cash and Cash Equivalents, Beginning	1,287
Cash and Cash Equivalents, Ending	481

Cash Flow Statement

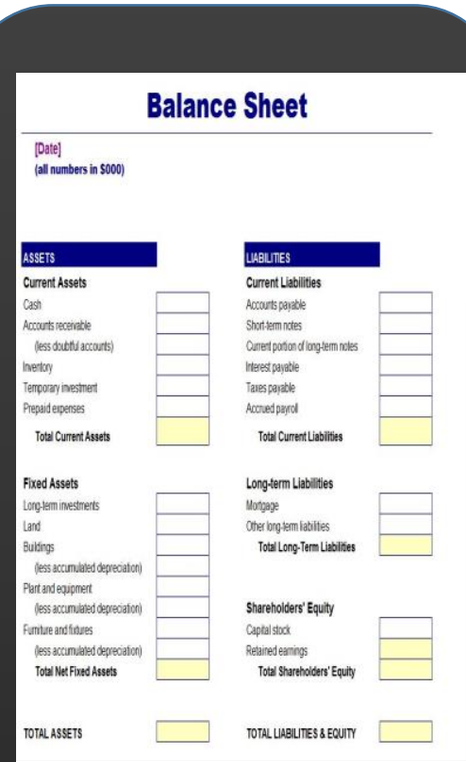


[Company Name] — Income Statement

For the Years Ending [Dec 31, 2008 and Dec 31, 2007]

	2008	2007
Revenue		
Sales revenue	110,000	95,000
(Less sales returns and allowances)		
Service revenue	70,000	62,000
Interest revenue		
Other revenue		
Total Revenues	**180,000**	**157,000**
Expenses		
Advertising	1,000	1,000
Bad debt		
Commissions		
Cost of goods sold	65,000	63,000
Depreciation		
Employee benefits		
Furniture and equipment		8,000
Insurance		
Interest expense	4,200	5,200
Maintenance and repairs		
Office supplies		
Payroll taxes		
Rent		
Research and development		
Salaries and wages	55,000	55,000
Software		
Travel		
Utilities		
Web hosting and domains		
Other	17,460	
Total Expenses	**142,660**	**132,200**
Net Income Before Taxes	37,340	24,800
Income tax expense	14,936	9,920
Income from Continuing Operations	**22,404**	**14,880**
Below-the-Line Items		
Income from discontinued operations		
Effect of accounting changes		
Extraordinary items		
Net Income	**22,404**	**14,880**

Income Statement



Balance Sheet

[Date]

(all numbers in $000)

ASSETS		LIABILITIES	
Current Assets		**Current Liabilities**	
Cash		Accounts payable	
Accounts receivable		Short-term notes	
(less doubtful accounts)		Current portion of long-term notes	
Inventory		Interest payable	
Temporary investment		Taxes payable	
Prepaid expenses		Accrued payroll	
Total Current Assets		**Total Current Liabilities**	
Fixed Assets		**Long-term Liabilities**	
Long-term investments		Mortgage	
Land		Other long-term liabilities	
Buildings		**Total Long-Term Liabilities**	
(less accumulated depreciation)			
Plant and equipment			
(less accumulated depreciation)		**Shareholders' Equity**	
Furniture and fixtures		Capital stock	
(less accumulated depreciation)		Retained earnings	
Total Net Fixed Assets		**Total Shareholders' Equity**	
TOTAL ASSETS		TOTAL LIABILITIES & EQUITY	

Balance Sheet

FSM TOOLBOX

AIT Asian Institute of Technology

NATS

Sheet 8: Summary

- **Generates a summary of financial viability indicators for the selected technology option**

			Concession period 10 years
A. Debt Amortization			
i. Repayment starts in year:			**2**
ii. Number of yearly installments			**7**
iii. Tenor of debt (years)			**8**
B. Debt service coverage ratio			
i. Minimum DSCR			**4.6**
ii. Average DSCR			**6.1**
C. IRR & NPV			
i. Project FIRR (post tax)			**68.62%**
ii. Project NPV@ WACC	**9.40%**	(USD)	**5,216,660**
iii. Equity FIRR (post tax)			**178.10%**
ii. Equity NPV@ cost of equity	**15.0%**	(USD)	**3,864,940**
D. Debt			**70.00%**
Equity			**30.00%**
E. Loan coverage ratios			
LLCR			**5.21**
PLCR			**7.69**

Similar Case study; Nonthaburi Bio – fertilizer Plant

Nonthaburi Bio – fertilizer Plant

EXERCISE

Exercise

FSM TOOLBOX

	GROUP 1	GROUP 2
City population	100,000	500,000
Persons per household	4	4
Percentage of homes with lined containment	60%	80%
Percentage of lined containment that are desludgable	70%	80%
Estimate by Septic Tank Volume		
• Average volume of residential lined containment	3 m^3	3 m^3
• Frequency of desludging	5 years	3 years
Number of commercial establishments	200	3,000
Number of institutional establishments	50	800
Technology Inputs		
• Nature of Area	Rural	Urban
• Electricity	Not available	Available
• Flood prone	No	Yes
• Groundwater table	Low	High
• Space limitations	No	Yes

Determine the following:

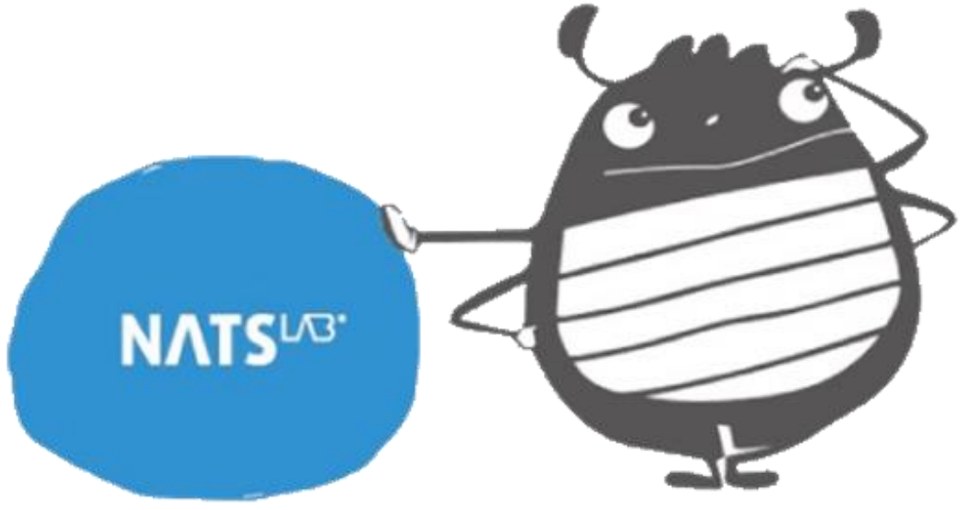
Choose the **cheapest technology combination.**

- What is the **minimum tariff** required to make the project financially viable?

Choose the **most expensive technology combination**.

- What is **the minimum tariff required** to make the project financially viable?

Thank you for your attention



Advocacy

Su Su Myat

FSM TOOLBOX

In this Section …

- Understand the definition of Advocacy
- Identify the steps and activities of Advocacy
- Find resources and guidelines for Advocacy

Define the Term "*Advocacy*"

FSM TOOLBOX

Advocacy

*"Advocacy means **taking action to bring about the change you are seeking**. Therefore, advocacy must necessarily take place in a particular context, and be aimed at a particular target."*

Source: Advocacy Source Book (WaterAid, 2007)

FSM TOOLBOX

“Local government thinks building toilet is important, however it doesn’t pay any attention to FSM.”

Dumping of faecal sludge at Solapur, Mahrashtra

Picture source: CSE, India

FSM TOOLBOX

Why Advocacy?

- Trigger the concerned Stakeholders to get engage them in FSM activities
- Sensitize the concerned Stakeholders to bring the changes
- Mobilize support and participation of public, community and civil society organizations

FSM TOOLBOX

What are the steps?

Arrange them in the correct order

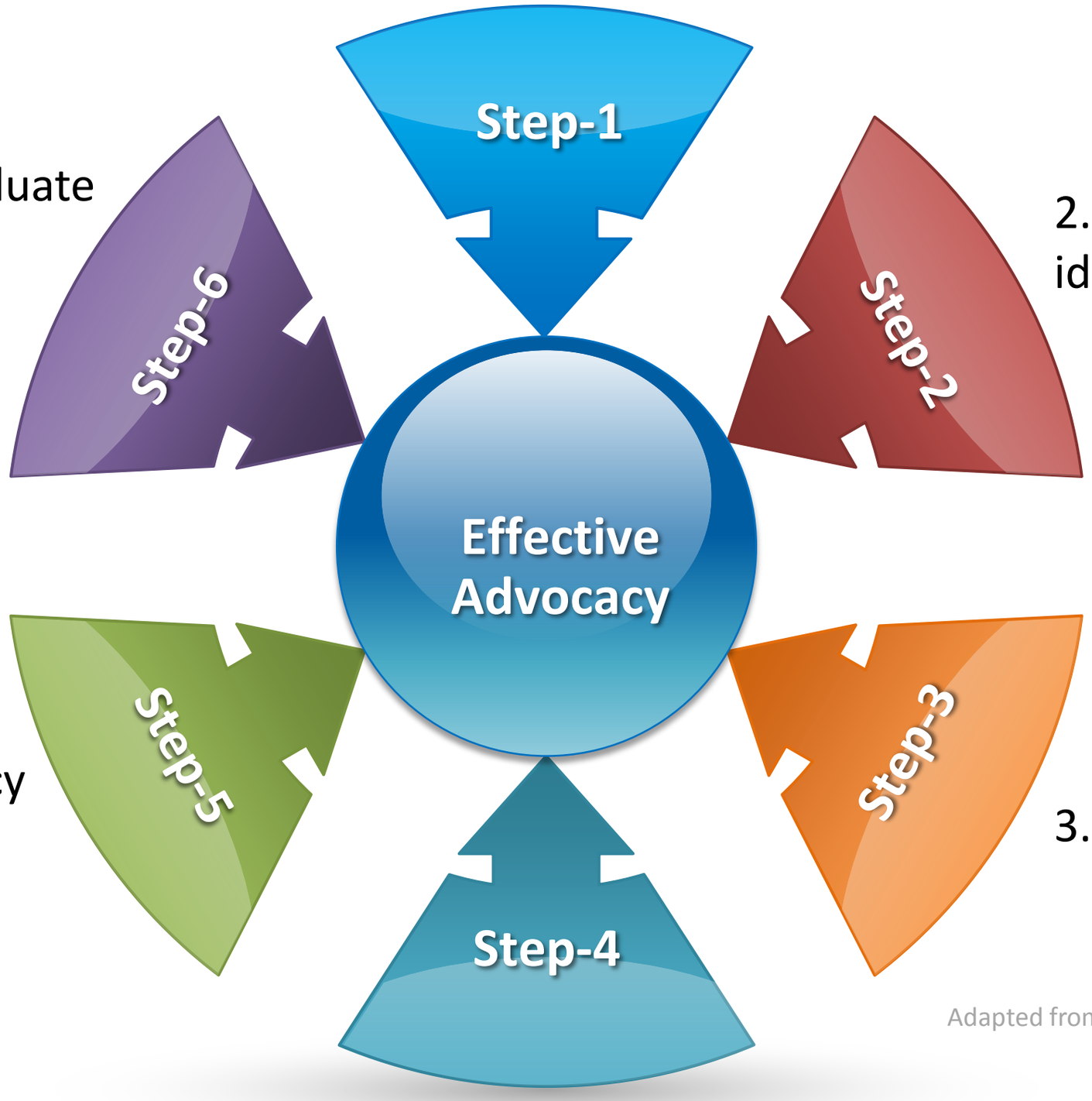
- **Assess the resources** and choose appropriate approaches and activities
- Drawing up action plan and implementation
- Assess the needs
- Set the objective and identify the targets
- Define the message
- Monitor and Evaluate

FSM TOOLBOX

6-steps toward Effective Advocacy

1. Assess the needs for Advocacy

6. Monitor and Evaluate



2. Set the objective and identify the targets

5. Draw up advocacy action plan and implement it

3. Define the message

Adapted from Advocacy Source Book (WaterAid, 2007)

4. **Assess the resources** and choose appropriate approaches and activities

FSM TOOLBOX

Advocacy Resources

- Advocacy Manual and Additional Readings
- Sample Video
- Sample Posters
- Sample Infographic

FSM TOOLBOX

AIT Advocacy Manual

Guidelines on Advocacy activities

Media

Campaigns

Events

Workshops

Press Release

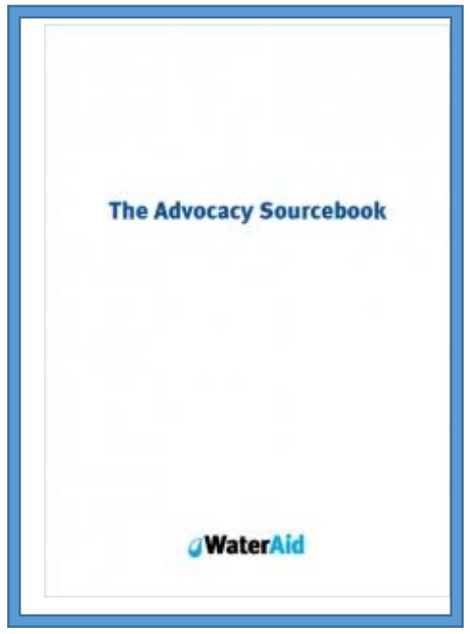
Engagement & Consensus Building

Promotions

Slogans

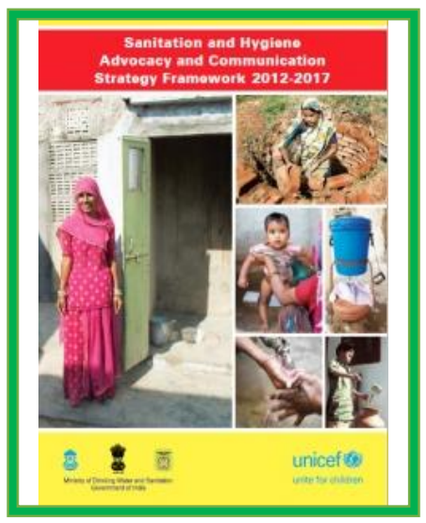
FSM TOOLBOX

Advocacy Readings



ADOCACY GUIDE BOOK

The Advocacy Sourcebook
Published by: WaterAid



Sanitation and Hygiene Advocacy and Communication Strategy Framework 2012-2017
Published by:UNICEF

Behavior Change Communication Strategy on Sanitation and Hygiene
Published by:UNHABITAT

Advocacy for Sanitation: A Brief Guide
Published by:UN-WATER

FSM TOOLBOX

- Share your cases, and materials that you used in your past advocacy activities