SAT Situational Assessment Tool

CASE STUDY: APPLICATION IN MINGALAR TAUNG NYUNT, YANGON

Mingalar Taung Nyunt, a township with an area of 25 km^2

Total population of 131, 563

95% population have OSS

What is SAT

Situational Assessment Tool (SAT) is a data entry platform that is designed to analyze the existing Faecal Sludge Management (FSM) situation and assist in decision-making process for the improvement of FSM services. SAT contains questionnaires that reflect on the key aspects such as infrastructure, regulation, institution, capacity, awareness, finance and management of FSM along the service delivery pathway.

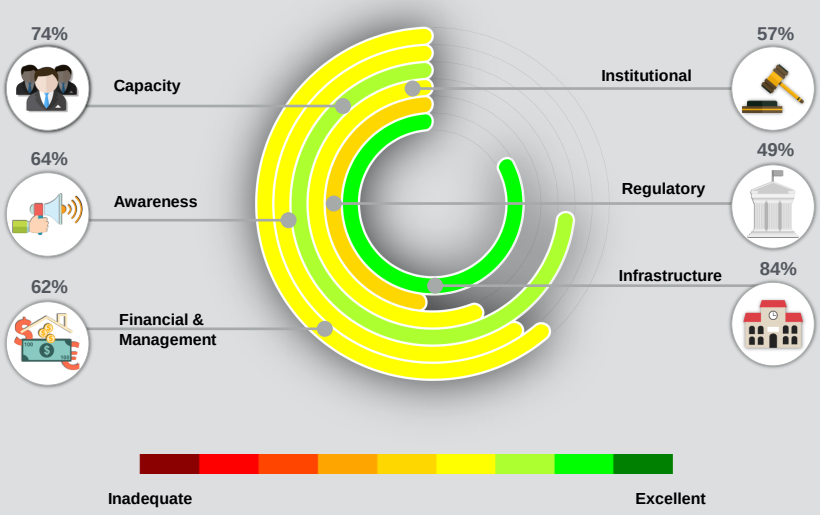
Background

Minglar Taung Nyunt is a township in Yangon, Myanmar which is spread across an area of 25 km^2 with total population of 131,563 and a population growth rate of 2.58%. It is regarded as one of the most populous townships in Myanmar.

The township is served with 95% on-site sanitation systems (OSS) and the rest is sewer. The area has high groundwater table (<3m).

Overall FSM Situation in Mingalar Taung Nyunt

The overall infrastructure of the township is very good with excellent coverage of containment systems and accessibility. The containment systems are frequently emptied and the collected faecal sludge (FS) is transported to the treatment facility. The treated effluent is then used for agricultural or agro-based purposes but limited to non food crops only. However, 25% of unlined containment systems, inadequate number of vehicles for transporting FS and unavailability of suitable and sufficient land for disposal facilities create a gap of 14% in this aspect.



The overall regulatory aspect in the township is just average. There are regulations that mandates proper infrastructure and its approval prior to construction. However, only guidelines and procedures are outlined for emptying, transportation and treatment services and are not effectively enforced. Lack of regulations on mandatory emptying, FS transport and design, and siting of treatment facilities have created a massive gap of 51% in this aspect.

The township authority are the sole actors responsible for providing and promoting the FSM services. Private organizations involvement is limited to advisory and consultation services, but lacks direct involvement in providing FSM services, thus, creating a gap of 47% in overall institutional aspect.

The overall capacity, here, refers to the magnitude of individual institutions involvement in each service chain components in terms of manpower, skills and expertise. Although private organization have sufficient capacity, no provision for their direct involvement constitute to a gap of 26%.

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The awareness level of the township in terms of FSM is above average as community, officials and NGOs are well aware of the need for proper containment system. However, lack of awareness among the community and operators for the safe transportation and reuse of FS constitutes 36% gap in the overall awareness aspect. In terms of overall financial and management aspect, the condition is above average as funds are allocated to provide FSM services. However, city authority in the township lack a database on the containment systems, monitoring system for FS transportation and proper infrastructures for effective operation of treatment facilities, thus, creating a gap of 38%.

Recommendations

FS is considered as a biohazard that poses serious threat to public health. It is of utmost importance that the concerned bodies adopt strong regulatory system for the safe collection, handling, emptying, transport, treatment and reuse or disposal of FS. There is a need for effective enforcement - prominently. An exemplary arrangement would include:

- Approval and monitoring of household OSS installations;
- Licensing and training of service providers involved in construction, emptying and transportation;
- Monitoring of the operations and scheduling;
- Safe treatment, disposal and reuse, compulsory use of personal protective equipment for workers, and
- Prohibition on illegal disposal and reuse.

In this case, FSM is not a part of regulatory framework, only guidelines and procedures are defined for functioning of FSM service chain components. The need for the formulation of regulations specific to FSM is immediate with regular inspection and compliance check. A market driven FS treatment approach will most likely generate substantial revenue from the selling of treated FS end product which supports operation and maintenance costs involved in treatment plant. This could further help in alleviating service charges to be paid by the users. A need for market research and promotion of potential benefits of treated FS end products is imminent considering the benefits of market driven approach.

For the FSM to be sustainable, people's participation coupled with the technology, policy, financial and monitoring systems are prerequisite factors. Public private partnership (PPP) with proper definition of ownership could help bring the informal service providers within the legal framework. The township should come up with proper business model to involve private organizations in the FSM sector. Awareness building campaigns should be in place to inform community, farmers and operators about the need for proper FSM. Further, field based operators must be trained adequately for safe handling, emptying and transporting of faecal sludge.

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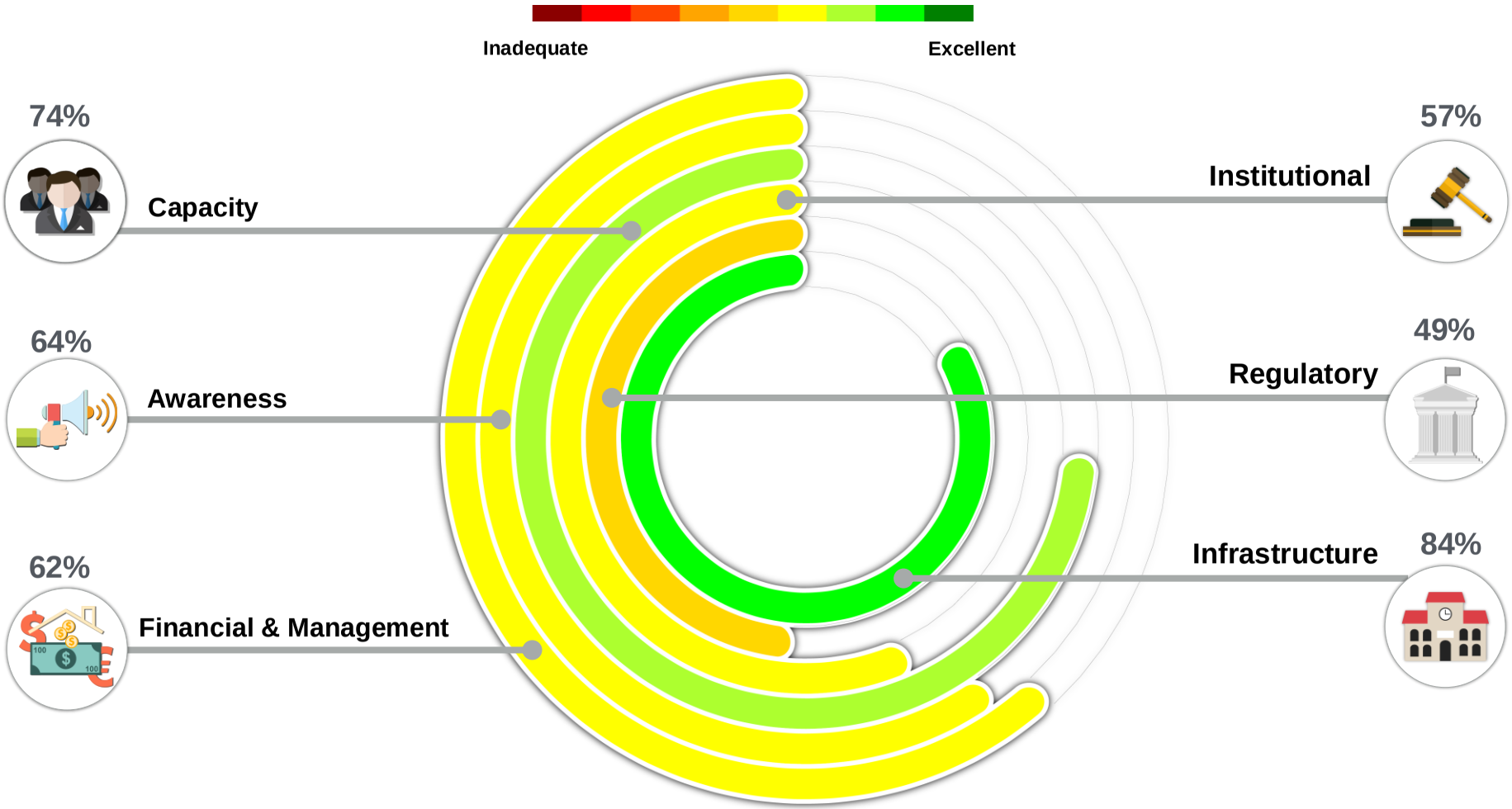

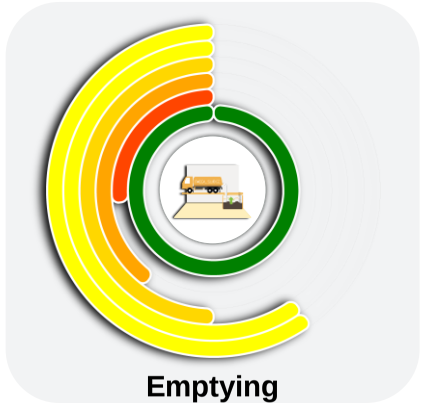

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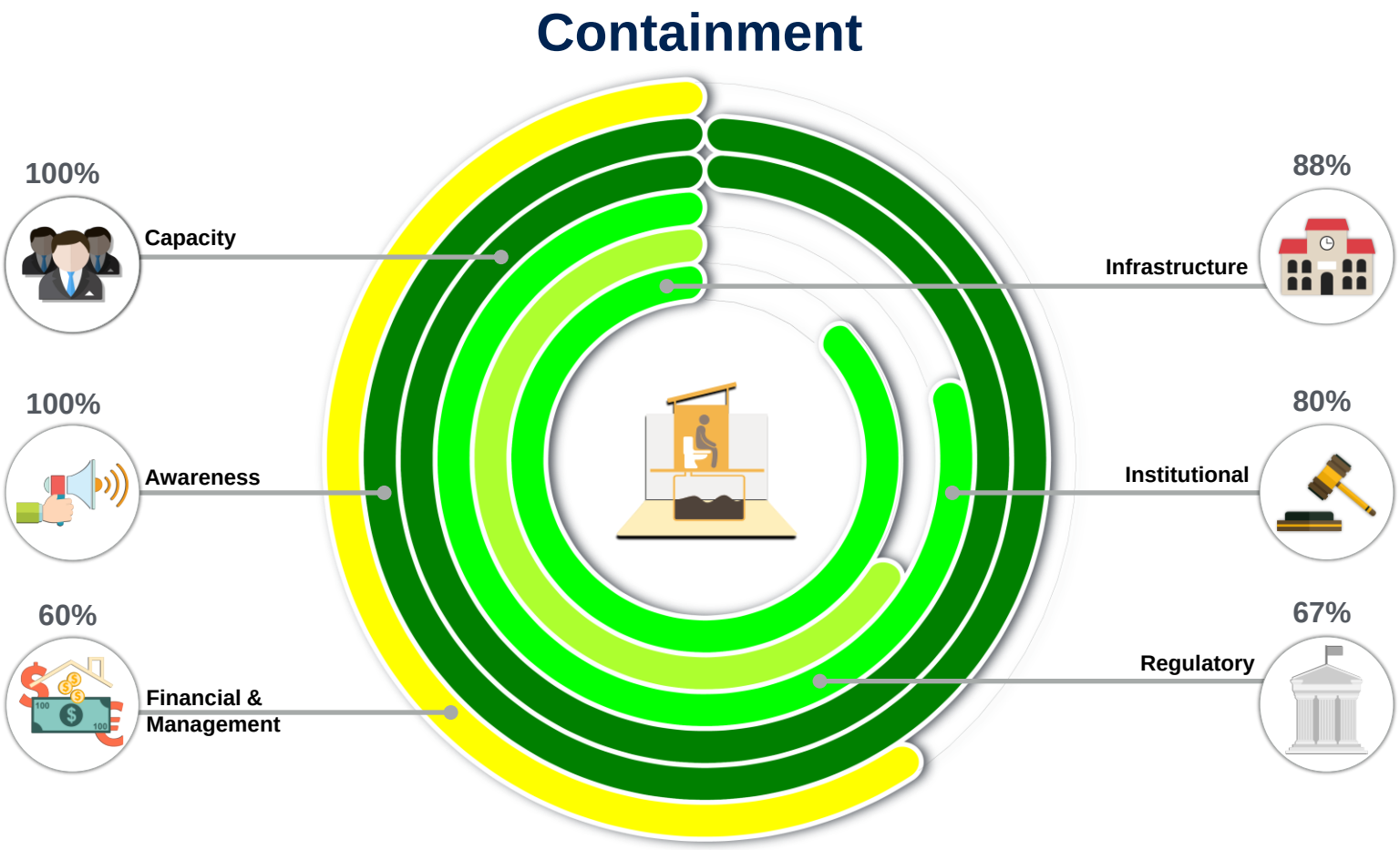

Infrastructure

In the township, 95% of the population practice onsite sanitation and 5% are connected to sewers. Of the total population practicing onsite sanitation, about 70% use lined containment systems (septic tanks) and 25% use unlined containment systems (single pit latrine). Since the groundwater table is high in the area - unlined containment systems pose a threat of pollution and health hazard, thus the score for this aspect reduces to 88%.

Regulatory

The presence of regulations and guidelines for the construction and maintenance of containment systems – is the regulatory aspect in this case. With the positive score of 67%, regulations and provision for proper containment systems are in place. On that note, design, construction and maintenance should be in par with the defined standards, guidelines and drawings. Further, contractors and masons need to register and obtain license from concerned unit prior to their occupational practices. The procedures are outlined for approval and inspection of containment systems, however, enforcement of these regulations is weak. Absence of regulations for the improvement or upgradation of sub-standard toilets, containment systems and lack of provision for penalties on non-compliance create a gap of 33%.

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Institutional

Institutions here are those entities that enforce regulations and provide design, advisory and construction services. The township units, private consultants, contractors and masons and non-governmental organizations (NGOs) can fall under the institutional category. In the township, private consultants are there to provide design and advisory services on containment systems, whereas, private contractors and masons are delivering construction and maintenance services. Despite having institutional units to apply regulations, lack of regular inspections and enforcement actions reduce the score to 80%.

Capacity

Capacity refers to the manpower, skills and expertise of the above mentioned institutional players. The capacity score is 100% as the township unit has enough manpower with sufficient knowledge of regulations, guidelines, design and specifications on containment systems. Whereas, private consultants with knowledge on regulations, guidelines and expertise in design and specifications of containment systems are also in place. Similarly, private contractors and masons are there to provide construction services on containment systems.

Awareness:

Awareness of the community, township officials, contractors and masons on the proper design, construction, use and maintenance of containment systems, is underlined here. The township is well aware of proper design, construction and maintenance of containment systems. NGOs involved in this sector are quiet aware of proper design and construction of containment systems.

Financial and Management

This aspect here refers to allocation of funds and having management system for the provision of containment systems their maintenance and improvement. Based on the study, the score is 60%, which is above average, as the township are well funded to provide and maintain public and community toilets. Provision for proper containment systems and mobile toilets for the floating population is readily present. However, unaffordability of household and lack of credit and financial support to construct proper containment systems or improve them have caused the gap of 40%. Those unlined containment systems can be attributed to the unaffordability of households despite their awareness.

Recommendations:

- Mobile and public toilets are to be constructed at public places to accommodate the *floating population*.
- Regular monitoring and enforcement actions on the regulations should be carried out.
- Township authority should develop strategy to help community upgrade the existing unlined containment systems to avoid and reduce health hazards. The construction of new containment systems in current buildings should be carried out according to the design standards.
- The township should come up with financing or subsidizing mechanism to support the people facing the problem of affordability for maintenance of containment system.
- Awareness campaign should be organized to maintain community participation in regular maintenance of containment system.

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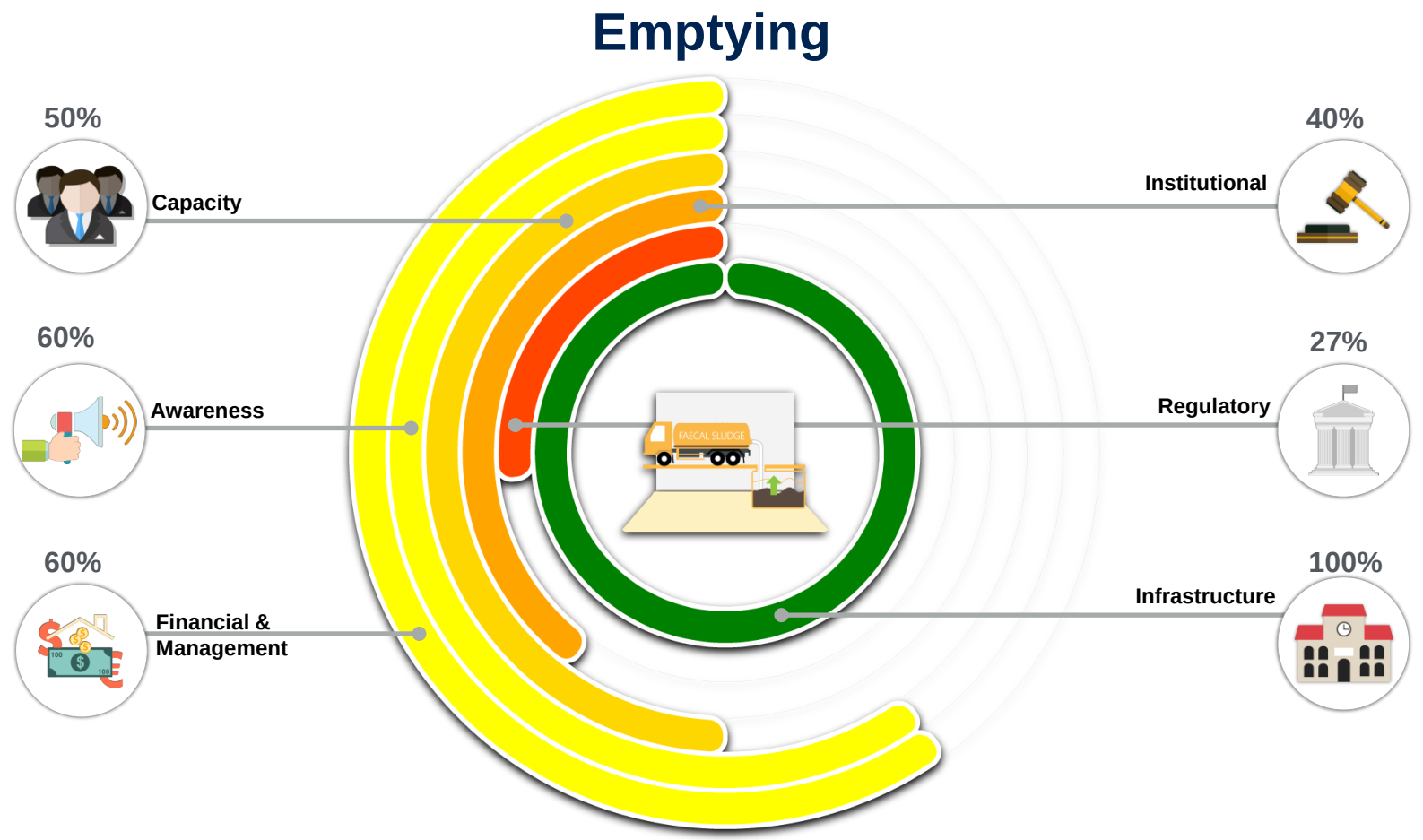

Infrastructure:
Infrastructure here refers to the percentage of accessibility of containment system and their emptying frequency. All the containment systems are accessible for emptying.

Regulatory
Regulatory aspect in this case is poor with the score of 27%. Emptying standards, guidelines and procedures for emptying of containment systems are outlined. However, regulations mandating regular emptying and inspections of containment systems are absent. Also, there is no provision for penalties on non-compliance. All these shortcomings create a huge gap in this aspect.

Institutional
The township unit is the only authority responsible for carrying out emptying services and private sectors are not directly involved as the service providers. The township units have no database for containment system for scheduled emptying. Despite having institutional units, regular inspection and enforcement action on regulations are missing. Absence of private service providers, lack of regular monitoring and database on containment systems contribute to a huge gap of 60%, which make this aspect below average.

Inadequate — Excellent

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Capacity

Capacity of the institutions involved in emptying service is average with the score of 50%. The township unit have sufficient manpower to provide emptying services including inspection and enforcement action on regulations. However, lack of manpower to compile database and absence of private operators to provide emptying service constitutes to a gap of 50%.

Awareness

Awareness is above average, the township officials are aware of importance of regular emptying. But no adequate information have been passed on to the operators deployed in the field. The frequent emptying of containment systems attributes to the awareness of the community for regular emptying. However, lack of awareness on safe emptying among the field operators creates a void of 40%.

Financial and Management

The township has sufficient funds to support operators to purchase suitable emptying equipment and safety gears; and also has a monitoring system to manage scheduled emptying services. However, the township lacks a database for scheduled emptying, and households find it difficult to pay for regular emptying. These shortcomings constitutes to the gap of 40%.

Recommendations

- There is a need for maintaining database for containment system to schedule regular safe emptying to ensure public health safety and should be mandated with the formulation of regulations on regular emptying considering the different nature of the containment systems.
- An environment must be created to involve the private sector. As a very populous township, involvement of the private sector will be a helping hand to the township units, consequently providing effective emptying services.
- Additional awareness campaigns and trainings on safe practices and compulsory use of protective measure should be provided to the workers.
- Semi-mechanical emptying and transport of FS should be carried out in the area where FS transport vehicles have no access. Further, proper safety gears should be used while carrying out emptying services.
- For the effective FSM and sustainability, city should come up with the approach and model to lower the service fee such that they could anticipate active community participation for safe FSM practice.

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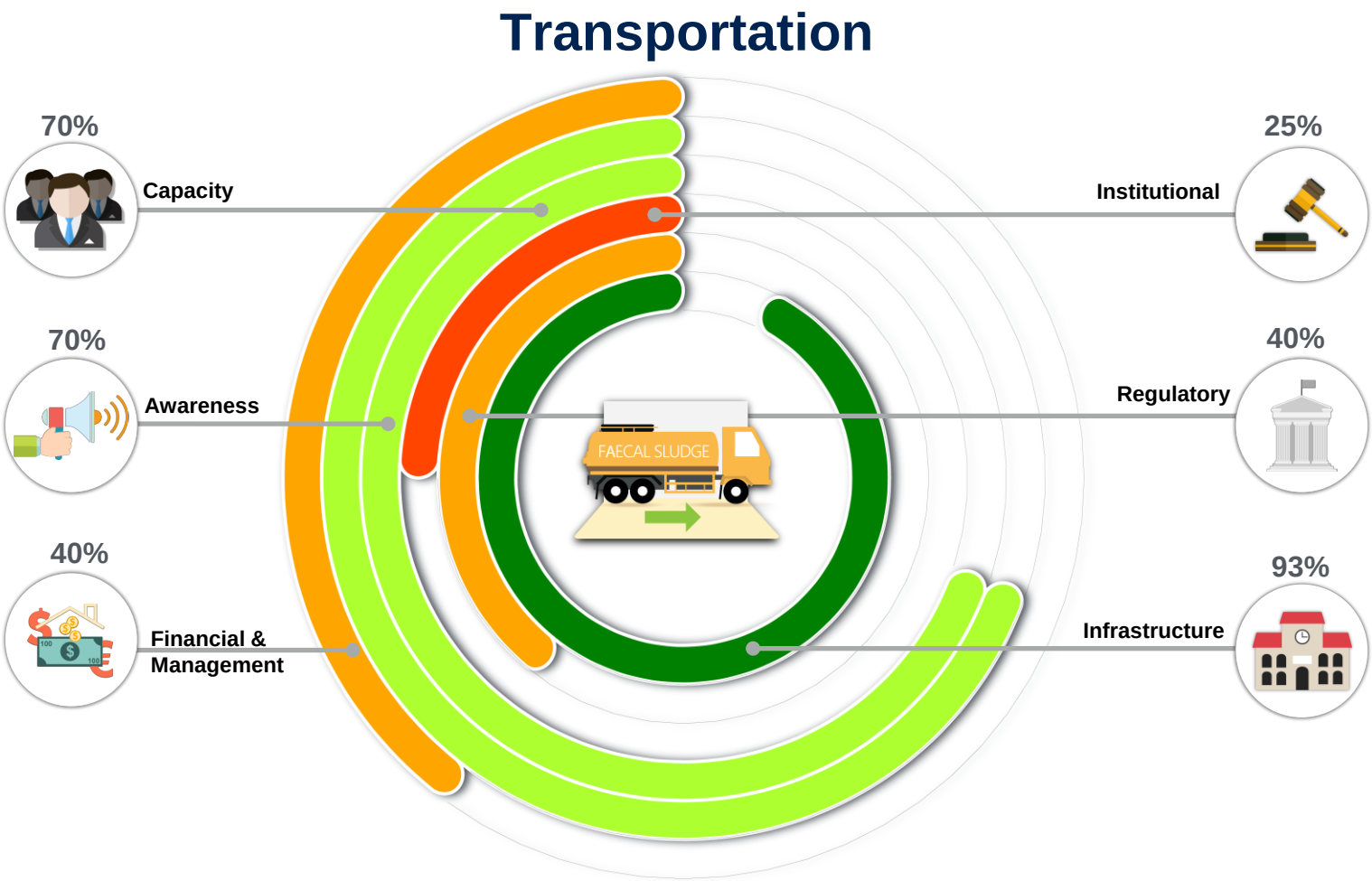

Infrastructure

Infrastructure refers to the adequacy of vehicles, their condition and suitability considering road types and accessibility owned by the FS transport service providers. With the score of 93%, the infrastructure aspect is excellent considering the number of vehicles, road suitability, accessibility and type. However, township unit still needs additional vehicles for the effective collection and transportation of FS.

Regulatory

Regulatory aspect for transportation is below average with the score of 40%. FS transportation is carried out based on the defined guidelines and procedures, and the operators have to compulsorily use PPE during operational process. However, regulations requiring zones and time of operations, accidents and spills, proper disposal, record keeping and route planning are absent. Also, there is no provision for penalties on non-compliance and absenteeism of major regulations causes the gap of 60%.

Institutional

The institutional aspect in this case is poor with the score of 25%. The township unit is the sole authority to provide the FS transportation services, with no involvement private operators to provide such services and lack of regular inspection creates a void of 75%.

Inadequate — Excellent

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Capacity

The township unit have sufficient capacity in terms of manpower, skills and expertise for safe transport and disposal of FS. As private operators are not involved, this constitutes to a gap of 30%.

Awareness

The township has good level of awareness on the importance of safe transportation and disposal of FS. The officials and operators involved on providing FS transportation services are aware of potential hazards of illegal dumping and reuse of untreated FS. However, lack of awareness among the community about the safe FS transportation constitutes to a gap of 30%.

Financial and management

The financial aspect here is to allocate the funds and support the operators to purchase FS transport vehicles. Whereas, management aspect refers to the availability of a system to manage the vehicles, optimization of routes and logistic planning system. Although the township has sufficient funding to purchase tankers and vacuum trucks, and has a system for route optimization to manage FS transporting vehicles, this aspect is still below average with the score of 40%. The lack of private sector involvement in FS emptying and transportation, inadequate financial support for operators and the lack of a functioning monitoring system to manage and regulate vehicle movement constitutes to the gap of 60%.

Recommendations

- The township needs to look for the ways to increase the numbers of vehicles and regularly maintain the existing vehicles to provide effective FS transportation.
- The online database system and GIS based tool for the FS transport is required to manage and regulate the FS transport vehicles to avoid illegal dumping. Since the township has the funds and private organizations have the capacity, township should take initiative to come up with the system and involve private sector as well.
- Regulations related to zone and time of operation of FS transport vehicles needs to be formulated.
- Regular inspection of FS transport should be carried out, and transport and discharge related regulations should be strongly enforced. Fine and penalties system should be adopted for non-compliance - to strengthen the enforcement.
- In long-term, to expand service capacity if no funding is available PPP (public private partnership) model should be adopted which, allows private sector to work in emptying and transportation services.
- Township should organize the awareness campaigns targeted to the community to inform community about the importance of safe transportation and disposal of FS and seek their participations to check the illegal dumping and disposal.

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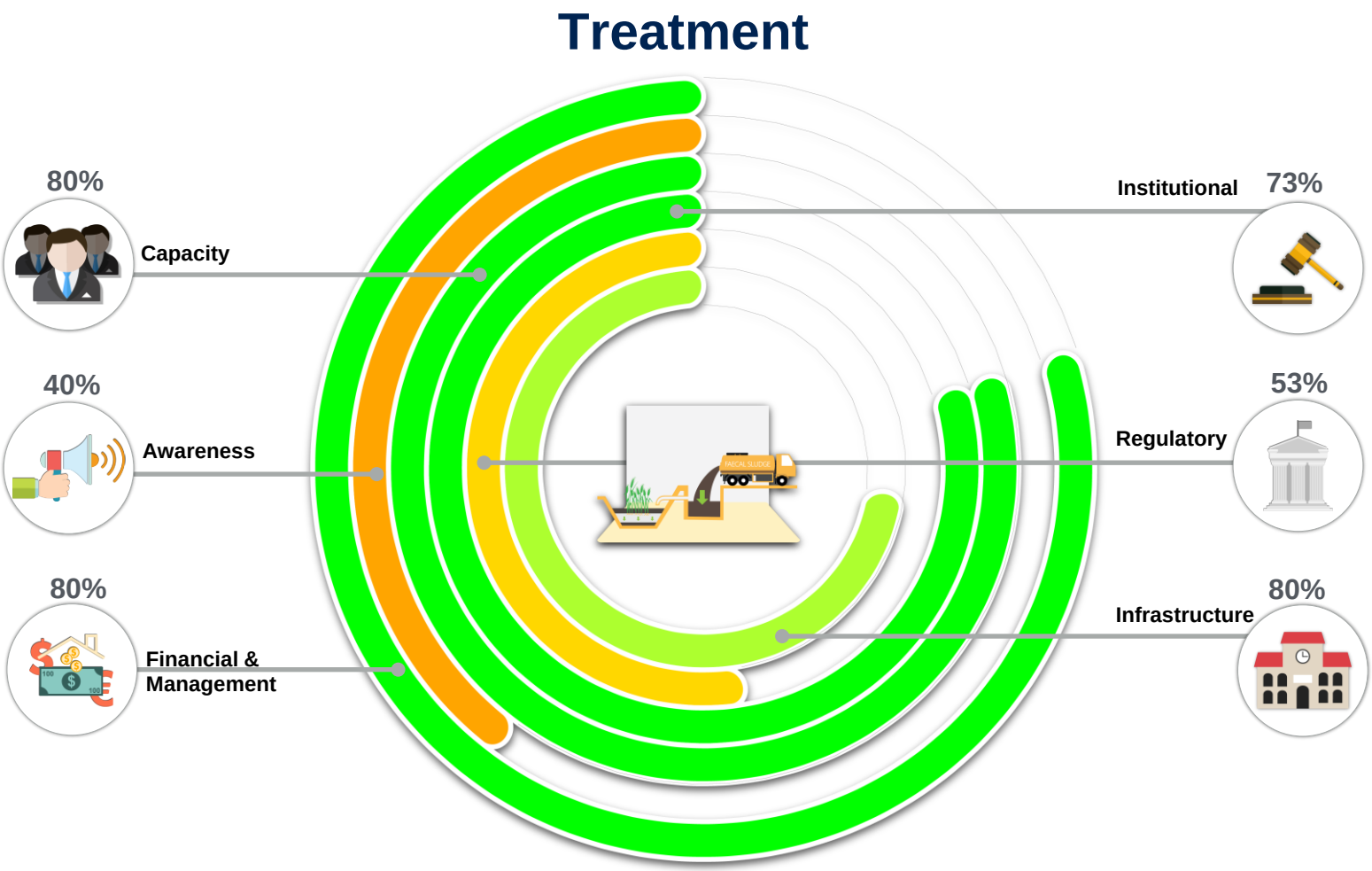

Infrastructure

The existence of treatment plant, its capacity and effectiveness to treat FS, sufficiency of land availability for treatment and disposal facility, and planned FSM facility for the future - are underlined under infrastructure. This aspect is good with the score of 72.5%, sludge treatment plant is available with sufficient capacity and effective treatment ability. Also, sewage treatment plant with capacity to co-treat FS is in operation. However, absence of land for disposal facility creates a gap of 27.5%.

Regulatory

The regulatory aspect is average with the score of 53%. The procedures are defined for operation and maintenance of facilities. Along with that, regulation mandates the use of PPE for the workers, and effluent and discharge standards are in also in place. However, absence of regulations and guidelines on design and siting of the facility and no provision for penalty on non-compliance, create a gap of 47%.

Institutional

The institutional aspect is very good with the score of 80%, the township unit is in place to plan and execute the establishment of the treatment facilities. The private consultants with expertise to plan, design and construct treatment facilities are available, and the government units are there to apply regulations. The gap of 20% is due to lack of regular inspections and enforcement actions on regulations and the unavailability of private operators to provide operation and maintenance.

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Capacity

Capacity of the institution in terms of manpower, skills and expertise is very good. Sufficient manpower and expertise is in place to plan and execute the establishment of treatment facility. Private consultants have adequate expertise to plan, design and construct treatment facilities. The township units have sufficient manpower to apply regulations on the management of treatment facilities including regular inspection and enforcement actions. The absence of private operators to provide operation and maintenance of treatment facilities constitutes to a gap of 20%.

Awareness

The awareness of the township in terms of FS treatment is below average. The township officials are the only ones who are aware of the importance of safe treatment and disposal, and the risks of untreated FS. The lack of awareness among the community, farmers and the operators regarding the safe handling and treatment of FS builds, create a void of 60%.

Financial and management

This aspect here refers to allocation of funds and manage systems for provision, improvement, operation and maintenance of treatment facilities. The township has allocated funds for operation and maintenance - also, the management and monitoring systems for treatment facility. However, lack of tools, equipment, instruments, laboratory and other support facilities to ease effective management of treatment facilities constitutes to the gap of 20%.

Recommendations

- Regulations outlining the design criteria and siting of facilities need to be formulated.
- FS treatment standards are to be regularly monitored and penalized for non-compliance.
- Collaboration with the universities and research team to conduct effective treatment monitoring, environmental and health risk assessment studies is required. Laboratory should be established with required equipment and tools to monitor the treatment standards.
- Trainings to TP operators and laboratory analysts should be regular and periodic assessment and evaluation of their performance is must.
- Proper business model should be developed for involvement of private sectors in achieving of sustainability for treatment services. As the households have the affordability issue for emptying fees, there is a need to consider the market potential for the treated FS products and upgrade treatment plant accordingly. However, the revenue generation from treated FS products could help reduce service charge.

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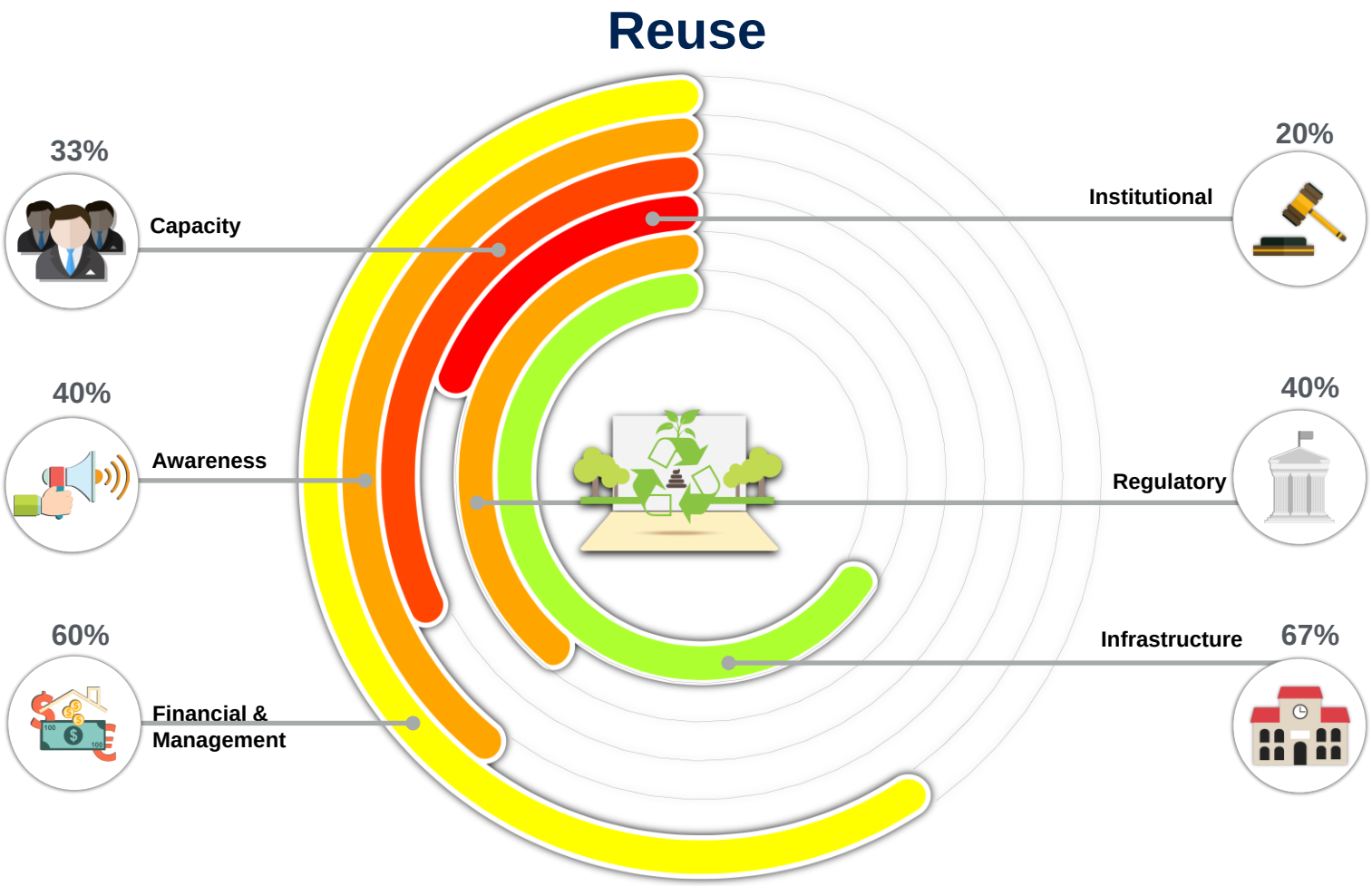

Infrastructure

Infrastructure refers to the use of raw or treated FS for various applications and potential market for the reuse of treated product. Here, the infrastructure score is 67%, which is good. Potential market for treated effluent is present - although raw FS is not in use for agriculture purposes, the treated sludge however, is used for *non-food crops*. Further, there is no market for reuse of treated bio-solids for agricultural or industrial use. Hence, exist a gap of 37%.

Regulatory

Regulatory aspect is below average with the score of 44%. Regulations and guidelines on standards of effluent for various uses, monitoring and safe handling of FS end products are in place. However, there are no regulation and guidelines for the reuse of bio-solids, no provision for penalties on non-compliance and reuse of FS end products, causing the void of 60%.

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Institutional

The township units are in place to monitor and apply regulations for proper reuse of FS. Neither the township unit nor private organizations are involved in the promotion of the treated FS end products. Hence, contributing to huge gap of 80%.

Capacity

Capacity of the institution is below average when it comes to promoting reuse of FS end products. Although the township units have the capacity in terms of manpower and expertise to promote reuse of FS end products, the lack of their active involvement in promoting use of treated FS contributes to the gap of 67%.

Awareness

The township officials are the only ones aware of the importance and advantage of promoting safe reuse of treated FS end products. But the community, farmers and industries lack awareness of safe reuse and potential benefits from it. Hence, the score is below average of 50%.

Financial and Management

The aspect here refers to allocation of funds and management systems for promoting reuse of FS end products. Financial and management aspect is above average as the township have enough funds market the reuse of treated FS end products. At present, availability of management and monitoring system is there to ensure safe reuse. However, the township lacks funds to promote and incentivize the reuse of FS, creating a gap of 40%.

Recommendations

- Proper bio-solid standards and guidelines should be adopted.
- Treated FS end products can be used as valuable soil amendment and bio-fuel that could generate substantial revenue. To harness such potential promotion of treated FS reuse is necessary.
- Market potential study for the treated FS products needs to be carried out. The township units need to develop strategy to promote treated FS products and attract industries to buy and implement them.
- Revenue generation from selling treated FS products could be significant to support the operational cost of the treatment plants. This in-turn will help to reduce the transport and emptying cost. A proper business model should be adopted to promote and implement treated FS products.
- People’s awareness and participation plays a vital role in the consumption of treated FS product. Hence, awareness campaigns on the importance of treated FS product need to be organized targeting farmers and industries.

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What are these colors?

	Colour	Percentage	Condition	Description
Excellent		88-100	Excellent	Low risk situation. Regular inspection and upgrade existing infrastructure.
		77-88	Very Good	
		66-77	Good	
Fair		55-66	Above average	Reflects moderate risk situation. Needs to reform the infrastructure, regulations, institutional bodies and their capacity and raise the awareness level for better FSM.
		44-55	Average	
		33-44	Below average	
Inadequate		22-33	Poor	Reflects very high risk situation requiring immediate FSM intervention. Regulations needs to be reformed in specific to FSM and strong enforcement is essential. There is an utmost need for FSM awareness campaigns.
		11-22	Very Poor	
		0-11	Inadequate	

Methodology

SAT generates score ranging from 0 (inadequate) to 100% (Excellent) in response to the questions relating to various aspects used, namely: Infrastructure, Regulatory, Institutional, Capacity, Awareness and Financial and Management. It uses 3 shades of individual red, yellow and green to represent the significance of the score. The description provided for the individual aspects for various service chain components are entirely based on the user's response to the questions in the tool. The overall FSM situation is described with the individual aspects. The scores for individual aspects are the unified score of the product of weightage from service chain components and individual aspect in the respective service chain components.

Note:
The descriptions provided below for the various colors are generalized and may differ from township-to-township or case-to-case. The colors depict the overall situation of the service chain components and the 6 cross-cutting aspects: infrastructure, regulatory, institutional, capacity, awareness & financial and management. The colors and the percentages describe the situation of a given location and provides the users with an idea of which aspects needs thorough attention / interventions to improve the overall situation of FSM in that particular location.