

MINISTRY OF URBAN DEVELOPMENT

CENTRE OF EXCELLENCE IN URBAN DEVELOPMENT

in the area

SOLID WASTE AND WASTE WATER MANAGEMENT

CAPACITY BUILDING OF ULBs FOR SOLID WASTE MANAGEMENT



CENTRE FOR ENVIRONMENT AND DEVELOPMENT

THIRUVANANTHAPURAM

OCTOBER 2011

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## 1.0 INTRODUCTION

**Capacity building** is defined as the "process of developing and strengthening the skills, instincts, abilities, processes and resources that organizations and communities need to survive, adapt, and thrive in the fast-changing world." (Ann Philbin, *Capacity Building in Social Justice Organizations*, Ford Foundation, 1996). It is the development of knowledge, skills and attitudes in individuals and groups of people relevant in the design, development and maintenance of institutional and operational infrastructures and processes that are locally meaningful. (Groot and Moolen, 2001). UNDP defined 'capacity building' as the creation of an enabling environment with appropriate policy and legal frameworks, institutional development, including community participation, human resources development and strengthening of managerial systems. It is a long-term, continuing process, in which all stakeholders participate. However, capacity building often refers to assistance that is provided to develop a certain skill or competence, or for general upgrading of performance ability.

Capacity Building is much more than training and includes the following:

- Human resource development, the process of equipping individuals with the understanding, skills and access to information, knowledge and training that enables them to perform effectively.
- Organizational development, the elaboration of management structures, processes and procedures, not only within organizations but also the management of relationships between the different organizations and sectors (public, private and community).
- Institutional and legal framework development, making legal and regulatory changes to enable organizations, institutions and agencies at all levels and in all sectors to enhance their capacities.
- Infrastructure development, which is known as "Economic Capacity Building", increases the capacity of any developed or developing society to improve trade, employment, economic development and quality of life. It is also true that where institutional capacity is limited, infrastructure development is probably constrained.
- Financial capacity building, which involves achieving adequate cost recovery, lowering cost by increasing management capacity, increasing revenue through careful implementation of the "Polluter Pays Principle" and reinforcement and follow through on cost-recovery practices.

In Solid Waste Management (SWM) the people, partnerships, coalitions, resources and skills are essential to its successful implementation and hence all these are included under the large umbrella of the term „capacity“.

### 1.1 Capacity Building Methods

There are many approaches to providing capacity building services, like:

- Providing access to repositories of information and resources (for example, databases, libraries and web sites)
- Trainings (public, customized or on-line)
- Consultation (for example, coaching, facilitating, expert advice and conducting research)

- Publications
- Coordinating alliances
- Web based forum for interaction among different players

The type of capacity building activities undertaken usually depends on certain factors, including:

1. Organizational resources (including time, skills, expertise, money, facilities and equipments)
2. Organizational readiness (especially the ability to discern real underlying causes of issues)
3. Organizational life cycle (for example, new ULBs or those who are about to start a waste management plant need help to create, while others who already have an existing facility will tend to focus on increasing efficiency)
4. Access to capacity builders and associated resources and tools (for example, to trainings, consultants or peer networks)

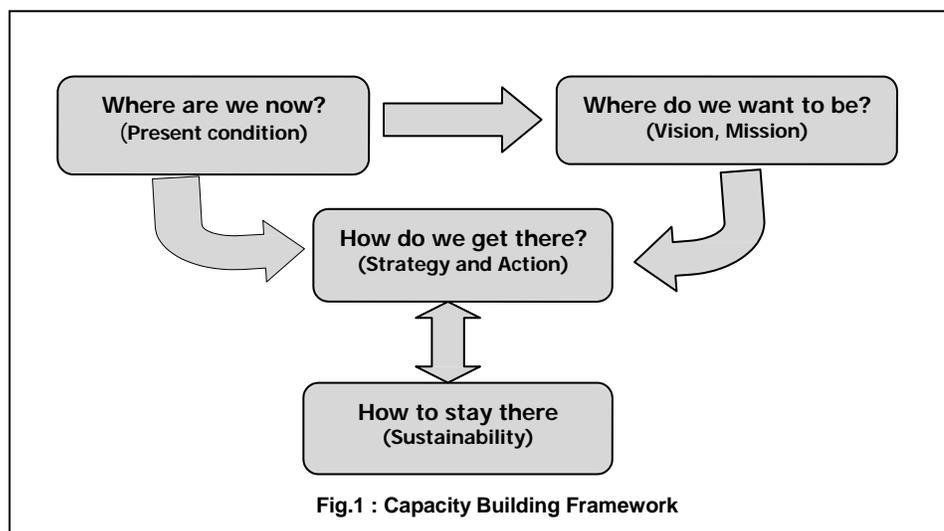
## 1.2 Capacity Building in Solid Waste Management

The approach to capacity building in SWM should be not only about technology and economics but also about:

- Understanding the administration systems for waste management and related activities (multidisciplinary and cross-sectoral).
- Understanding the need for human resource development to achieve better results in SWM.
- Focus on building sound institutions and good governance for attaining improved SWM.
- Delineating strategies for sustenance of achievements.

## 1.3 Strategic Framework for Capacity Building

The following diagram illustrates the capacity building framework in general. The framework is premised on four core areas: (i) situation analysis (ii) creating the right vision and mission (iii) drawing up the correct strategy and corresponding action, and (iv) measures for sustainability.



Another important task under the strategic framework for capacity building is identification of (i) the areas (functional & supportive) of capacity building (ii) the persons or agencies to be capacitated and (iii) deciding on the level of capacity development to be achieved for each category of target group. These subjects are discussed below under the title „ Capacity Building Plan under SWM“.

## **2.0 CAPACITY BUILDING PLAN FOR SWM**

Though the capacity building framework is structured on four core areas, the formulation of capacity building plan requires a deeper plunge. Analyzing the present scenario will mean examining not only the functional areas but also the organizational strengths and weaknesses, the institutional mechanism, the financial strength, legal mandate, political support etc. The different steps and activities for capacity building, covering these issues, are explained below:

### **2.1 Assessment of the Present Scenario**

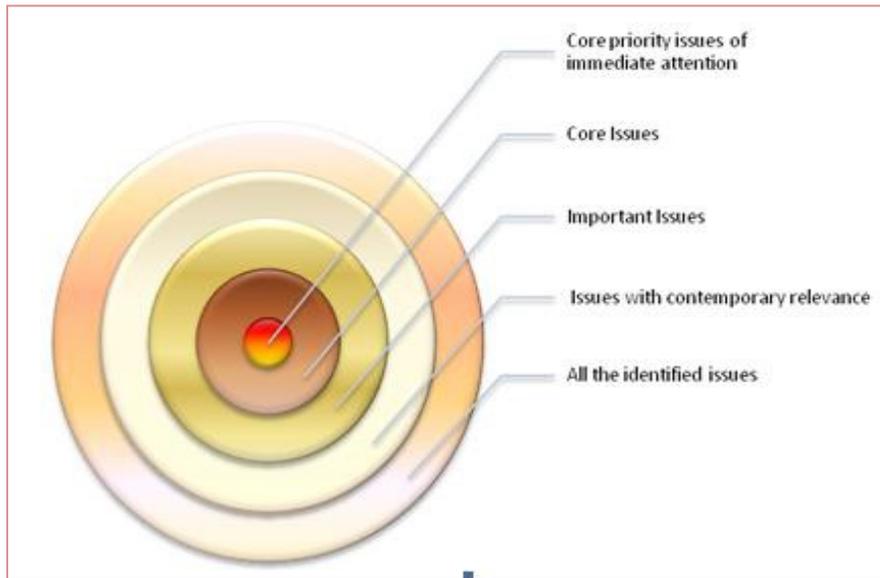
It is essential that the solid waste management system should encompass an effective and systematic mechanism for collection, segregation, storage and transportation of the waste generated and an effective processing and disposal mechanism that follows a locally suited technology option. In order to formulate a capacity development plan for solid waste management, knowledge about the present scenario is very important. Once the general scenario is understood and the issues are captured and prioritized, it is easy to draw up a capacity building plan

### **2.2 Capacity Assessment**

Once the existing scenario is understood and critically analyzed, the next step is organizational capacity assessment. Capacity assessment is an essential prelude to drawing up a capacity development plan. *The SWM Capacity Assessment Grid* given as Annexure 1 will help the ULB assess its capacity in SWM. The grid is a tool intended to capture the strength of the ULB in various capacity assessment areas. Part A relates to the critical functional components of solid waste management and Part B deals with Organizational Aspects affecting Solid Waste Management.

### **2.3 Planning and Scheduling of Capacity Building Activities including IEC**

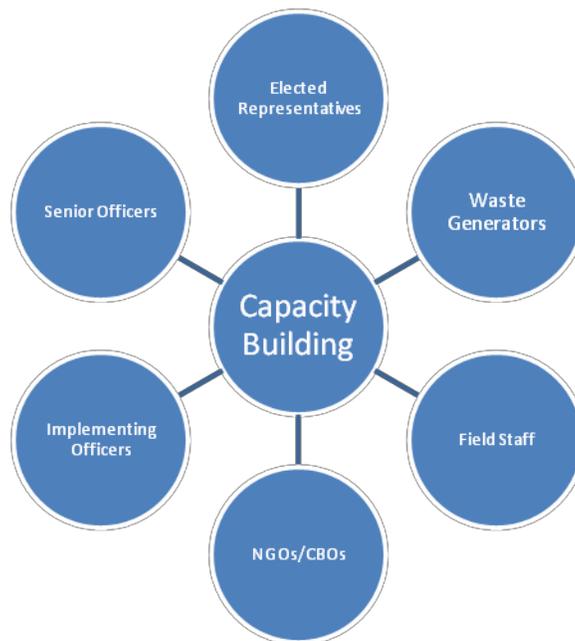
After understanding the existing SWM scenario in the ULB and assessing the ULB's organizational capacity to effectively manage the solid waste, a plan and schedule of capacity building activities could be prepared to fill the gap (between the present scenario and the vision plan). The plan can include both a short term plan and a long term plan. The short term plan will focus on issues of immediate importance whereas the long term plan will have a holistic and comprehensive outlook. For preparation of the short term plan some brainstorming with the participation of all the stakeholders (when the target group is too large, it can be representative participation), who freely express their views and ideas, could be conducted. The issues can be depicted in a competitive priority scorecard as shown below. The scorecard sorts through all the possible issues, then narrows the focus to higher and higher levels of priority improving decision-making as well as resource allocation.



**Figure 1: Competitive Priority Scorecard**

The short term capacity development plan can address issues starting from the nucleus and moving towards the outer circles considering the factors determining the choice of capacity building activities (mentioned earlier).

The plan should invariably indicate the persons or agencies to be capacitated. The following diagram shows a general picture as to whom the capacity building is aimed at.



**Fig.3: Target Group for Capacity Building**

Capability-building of stakeholders in implementation of solid waste management cannot be treated as an isolated training exercise. The rightful position of SWM as a potent tool that reflects the culture of citizens and the administrative efficiency of the ULB will need to permeate all capability building initiatives.

This is particularly important as SWM is an important cornerstone of effective governance. Keeping this in mind, the capacity building strategy for SWM should aim at a holistic set of activities. Apart from the SWM functional areas, there are other supportive areas or activities that contribute substantially to the success of SWM activities. A few of such supportive areas/activities are:

- Building the right mindset
- Basic skill building (like computer training)
- Consolidation through interaction and networking
- Ward level campaigns
- TV channel and radio programmes
- Formation of networks of ULBs/ networks of elected representatives
- Visits to identified „beacon“ ULBs
- Setting up of resource centres/ help lines etc

These are important in the sense that they will have direct or indirect bearing on the success of SWM activities. Hence the capacity development plan should take care of these areas also. Since IEC plays a vital role in capacity development, many of these items could be undertaken as part of the IEC plan.

Focus should be given to trainings in the major functional areas. There should be refresher trainings on a periodic basis for sharpening and updating the knowledge, skills and attitudes already acquired or assimilated. The two main objectives of the refresher trainings will be

- (i) to refresh and smolder the current skill, knowledge and attitude, and
- (ii) to upgrade and sharpen the skill and knowledge in consonance with the global advancement in technology and knowledge. A typical training programme for SWM mainly covering the various functional areas is given in Table 1 .

A model training schedule for a 12-days long duration training (for those who are directly responsible in the ULB for SWM) and a few short duration trainings for other players who have some say in municipal solid waste management is given as Annexure 1.

**Table.1 : Training Matrix**

Target Group	Area covered in brief	Duration	Timeline for completion
<b>Category 1: Long Duration Training Programme</b>			
Implementing Officers	Training on Solid Waste Management	12 days	On joining duty
<b>Category 2: Short Duration Training Programme</b>			
Elected Representatives-Group 1 (Mayor/Chairman, Dy Mayor/Vice Chairman, Standing Committee Chairman in charge of SWM)	General Orientation on 1. Solid Waste Management 2. SWM Plan Preparation and Implementation 3. Financial Management 4. Monitoring & Evaluation 5. Human Resource Management	1 day each	Within 3 months from election
Elected Representatives-Group 2 (All elected representatives except those mentioned above)	General Orientation on Solid Waste Management	1 day	Within 6 months from election
Senior Officers (Secretary, Engineer/s, Division Heads)	General Orientation on 1. Waste Management 2. SWM Plan Preparation and Implementation 3. Financial Management 4. Monitoring & Evaluation 5. Human Resource Management	1 day each	On joining duty in the SWM related department
Field Workers	1. Orientation on Effective Collection, Segregation and Transportation of Solid Waste 2. Orientation on Health and Hygiene Aspects of waste handling	1 day each	On appointment
Workers of Windrow Composting Plant	1. Orientation on Effective Collection, Segregation and Transportation of Solid Waste 2. Orientation on Health and Hygiene Aspects of waste handling 3. Operation and maintenance of Compost Plant	1 day 1 day 2 days	On appointment

Transportation Staff	<ol style="list-style-type: none"> <li>1. Maintenance of transportation vehicles</li> <li>2. Routing of vehicles</li> <li>3. Orientation on Health and Hygiene Aspects of waste handling</li> </ol>	1 day each	On appointment
NGOs/CBOs/Residents' Associations	Role of NGOs in SWM	1 day	
Waste generators	Importance of Segregation and Storage	through IEC	Continuous

## 2.4 Implementation of Capacity Building Activities

Once the capacity building plan is finalized, the ULB can proceed with implementing the plan. This requires careful consideration of many factors –both internal and external. The internal factors are:

- Resources (money, facilities, equipments, expertise, skills, time etc)
- Readiness (ability to understand the issues properly, willingness of participants)
- Scheduling of programmes (field visits etc)

The external factors are:

- Access and availability of external facilitators
- Climatic conditions (avoid extreme climates)
- Suitability of season (avoid festival seasons)
- Logistics and other facilities (conveyance, boarding & lodging etc)

There should be an efficient coordinator responsible for conducting and coordinating the entire capacity building activities.

## 2.4 Monitoring & Evaluation

Monitoring and evaluation (M&E) of activities provides with better means for learning from past experience, improving service delivery, planning and allocating resources, and demonstrating results as part of accountability to key stakeholders. Tools such as Performance Indicators, Formal surveys, Rapid Appraisal Methods, Participatory Methods, Cost-benefit and cost-effectiveness analysis, Impact Evaluation etc could be used for monitoring and evaluation. The output as well as outcome will be thoroughly monitored using the appropriate tool. This will help proper evaluation of the capacity building activities and taking corrective action, as found required.

## 2.5 Continual Improvement

The ULB will periodically revisit the functioning of the solid waste management system to ensure that the entire system is working properly and is meeting the desired objectives. The process will involve critical review aiming at adoption of continuous improvement measures. It is needless to say that the capacity building plan also will undergo continual improvement based on impact assessment.

### 3.1 Capacity Building at National Level

Solid Waste Management is an area where resources and facilities are quite inadequate to cater to the present needs, both qualitative and quantitative. Improvement of SWM warrants creation of a lot of basic resources and infrastructure, which are presently absent or inadequate but essential for successful functioning and sustenance. In this context, the most important immediate challenge the MoUD and local ULBs confront with is the absence of resource support- both (i) resource persons capable of providing support in different areas of SWM like community mobilization, NGO/CBO mobilization, technology transfer, strategy development, developing and implementing IEC etc and (ii) demonstrable working models to learn from. As part of CoE, MoUD can organize a few (say five) National Level Capacity Building Programmes of one week duration intended to create sufficient number of Key Resource Persons (KRPs) at the National Level. Resource persons representing each resource support area from all the States and UTs can participate in these training programmes, who in turn will provide resource support at their respective States/UTs. A typical programme schedule is given below:

<b>TYPICAL COURSE MODULE FOR ONE WEEK TRAINING OF KEY RESOURCE PERSONS (KRPs) ON SOLID WASTE MANAGEMENT</b>		
<b>Day</b>	<b>Topics Covered</b>	<b>Time requirement</b>
Day 1	SWM Scenario in India	$\frac{1}{2}$ day
	<ul style="list-style-type: none"> <li>• Solid Wastes: Classification, Waste Generation and Composition</li> <li>• Characteristics of Municipal Solid Waste (Physical &amp; Chemical Characteristics)</li> </ul>	
	Legal Framework: <ul style="list-style-type: none"> <li>• Municipal Solid Waste (Management &amp; Handling) Rules, 2000</li> <li>• Kerala Municipality Act or similar Acts of other States</li> <li>• By-laws for MSWM</li> </ul>	$\frac{1}{2}$ day
Day 2	Waste Stream Assessment (quantity, characteristics, composition and source of waste) Collection & Storage, Transfer Stations Purpose of Processing Mechanical Volume and Size Reduction Component Separation, Screening, Drying and Dewatering Source Reduction, Recycling	$\frac{1}{2}$ day

Day 3	Challenges in Solid Waste Management in India Causes for Non-compliance of Rules Steps for Improving Solid Waste Management	$\frac{1}{2}$ day
	Strategy and Framework for Integrated Solid Waste Management	$\frac{1}{2}$ day
Day 4	Technology Options for Municipal Solid Waste Management: Composting, Windrow Composting, Aerated Static pile composting, In-vessel composting, Anaerobic composting, Vermi Composting, Biomethanation, Incineration and energy recovery, Pelletization/Refuse Derived fuel system, Pyrolysis and Gasification, Plasma Pyrolysis, Sanitary Landfill	$\frac{1}{2}$ day
	Recycling of Municipal Solid Waste Reuse of Municipal Solid Waste Energy Management in Solid Waste Management Plants	$\frac{1}{2}$ day
	S W M Plant Design, Engineered Sanitary Landfill Design Leachate Treatment Plant design	$\frac{1}{2}$ day
Day 5	Hazardous Waste Management Bio-medical Waste Management	$\frac{1}{2}$ day
	Slaughterhouse Waste Management Design of Slaughterhouse	$\frac{1}{2}$ day
Day 6	Institutional Mechanism for Municipal Solid Waste Management	$\frac{1}{2}$ day

The suggested host cities and possible institutions and the corresponding participant States/UTs are indicated in the following table:

No	Host City	Participating States/UTs
1.	Thiruvananthapuram (CED)	1. Kerala 2. Tamil Nadu 3. Pondicherry 4. Lakshdweep
2.	Hyderabad (ASCI)	1. Andhra Pradesh 2. Karnataka 3. Andaman & Nicobar Islands
3.	Ahamedabad (SEPT)	1. Gujarat 2. Maharashtra 3. Madhya Pradesh 4. Goa 5. Daman & Diu 6. Dadra & Nagar Haveli

4.	Delhi (NIUA)	<ol style="list-style-type: none"> <li>1. Rajasthan</li> <li>2. Haryana</li> <li>3. Punjab</li> <li>4. Himachal Pradesh</li> <li>5. Jammu &amp; Kashmir</li> <li>6. Uttaranchal</li> <li>7. Utter Pradesh</li> <li>8. Delhi</li> <li>9. Chandigarh</li> </ol>
5.	Gauhati (IIT Gauhati)	<ol style="list-style-type: none"> <li>1. Sikkim</li> <li>2. Arunachal Pradesh</li> <li>3. Nagaland</li> <li>4. Manipur</li> <li>5. Tripura</li> <li>6. Assam</li> <li>7. Meghalaya</li> <li>8. Mizoram</li> </ol>
6.	Bhubaneswar (CED)	<ol style="list-style-type: none"> <li>1. West Bengal</li> <li>2. Bihar</li> <li>3. Jharkhand</li> <li>4. Orissa</li> <li>5. Chattisgarh</li> </ol>

Regarding identification of working models, MoUD can take the following action (the working model can be a ULB, a facility, a replicable practice or a system):

- i. Identify a few ULBs in different parts of the country where rather strong systems exist. Those who wish to learn could visit these ULBs and understand the systems, facilities and practices. The National level workshop to be conducted as part of CoE could be a forum to identify these beacon ULBs by gathering information from the participants. Or else, the MoUD can collect information directly and choose the best ULBs. Some reward system could be thought of to make good the inconvenience to these ULBs in entertaining frequent study teams.
- ii. Identify persons who are thoroughly exposed to and conversant with the replicable models and utilize their services to share their experience and understanding during the training programmes.
- iii. Document (preferably video documentation) the best systems, facilities and practices to be presented during the training programmes where field/exposure visit is not practical.

With the support of MoUD, CED can organize the National Level Training of KRPs.

#### **4.0 IEC FOR SOLID WASTE MANAGEMENT**

##### **4.1 What is IEC?**

Information, Education and Communication (IEC) is a process of working with individuals, communities and societies to develop communication strategies to promote positive behaviors which are appropriate to their setting. IEC combines strategies, approaches and methods that enable individuals, families, groups, organizations and communities to play active role in achieving, protecting and sustaining the desired behavioral change.

## 4.2 Importance of IEC

IEC plays a pivotal role in creating awareness, mobilizing people and making development participatory through advocacy and by transferring knowledge, skills and techniques to the people. It is also critical for bringing about transparency in implementation of programmes at the field level and for promoting the concept of accountability and social audit. There are various techniques of communication, which include mass communication as well as inter personal communication. There is no fixed formula and the techniques will vary from place to place, according to their specific problems.

## 4.3 Steps in Developing IEC Activities

The information gathered through needs assessment provides the framework for the development of suitable IEC activities. Any activity and material must always be culturally sensitive and appropriate. The major steps to be followed when designing an IEC activity are:

- Conduct a needs assessment.
- Set the goal. This is a broad statement of what is to be accomplished with the target audience in the end.
- Establish behavioural objectives that will contribute to achieving the goal.
- Develop the IEC activities and involve as many other partners as possible. The IEC activities should be developed in such a way that once these activities are implemented these should make a significant impact on achieving the behavioural objectives.
- Identify potential barriers and ways of overcoming them.
- Identify potential partners, resources, and other forms of support for your activities and gain their sustained commitment.
- Establish an evaluation plan.

The indicators should determine the level of achievement of the behavioural objectives. Having such specific indicators makes evaluating and monitoring the progress and impact of the activities much easier. Additionally, process indicators could be established to track to what extent and how well the planned activities have been carried out.

### **An objective must be *SMART***

It should be remembered that the objective should satisfy the following characteristics:

- **S**-pecific (what and who)
- **M**-easurable (something you can see, hear or touch – usually expressed with an action verb)
- **A**-rea specific (where)
- **R**-ealistic (achievable)
- **T**-ime-bound (when)

Find out if any IEC materials already exist, and if so, understand its impact on the local community. If that is found appropriate and relevant, use these instead of developing new ones. If development of new one is required, it may supplement the existing one instead of substituting it.

Pre-testing, by trying out the materials with small groups from the larger target audience, is an essential part of developing messages and educational materials. Pre-testing enables to understand whether people took the message as intended.

Determine suitable methods and channels of action and communication. Once the target audience is identified and the key messages chosen, find out which media and combinations of information channels will reach the target group. Each has its own strengths and weaknesses, depending on the role it will take in the communication programme

The development and refinement of messages and the choice of the communication channel or medium are inseparable. Very different messages will be developed for different media, for example radio, stories, poems, songs, posters or flip charts, for the nature of the medium affects what messages can be successfully used. The skills of those using the materials must also be considered. It may be necessary to provide training to those persons expected to use the materials in order to ensure effective use of materials and achievement of desired outcome.

#### **4.4 IEC Plan**

Solid Waste Management is an activity in which volunteerism and public participation are the keys to success. It is not only the technology but public attitude and behaviour that are going to make the difference. An IEC Plan focusing on solid waste management will therefore basically aim at the following:

- Creating behavioural change for scientific waste disposal. This will include (i) adoption of the 4R concept-reduce, reuse, recycle and recover the waste (ii) storage and segregation at source (iii) imbining the civic responsibility of keeping the premises clean (iv) willingness to accept the civic responsibilities of citizens, and (v) willingness to part with the ad hoc approach of unscientific solid waste disposal.
- Awareness creation on the dangers of unscientific SWM. E.g., (i) health hazards (ii) aesthetic damage (iii) environmental issues.
- Awareness creation on the various technical options of solid waste management.
- Exploring the possibility of converting waste as a resource.
- Proximity theory of SWM. (Scientific disposal of waste at the nearest point of source. E.g., biogas plant at a market; composting at households etc.)
- Willingness to pay for services.
- Community adherence to rules, orders and directives
- Adoption of integrated approach. (E.g. (i) The institutional mechanism created for collection and transportation of waste could, in return, be used for sale of manure manufactured at the compost plant (ii) using recycled materials for manure packaging (iii) the manure packets could contain IEC messages etc.

## ANNEXURE 1

### The SWM Capacity Assessment Grid

The SWM Capacity Assessment Grid will help the ULB assess its capacity in SWM. The grid is a tool intended to capture the strength of the ULB in various capacity assessment areas (functional and organizational). Part A relates to the following critical components of solid waste management:

1. Waste Segregation and Storage at Source
2. Primary Collection
3. Street Sweeping & Drain Cleaning
4. Secondary Waste Storage Depots and Transfer Stations
5. Transportation of Waste
6. Treatment
7. Recycling/ Reuse/Recovery
8. Final Disposal

Part B deals with Organizational Aspects affecting Solid Waste Management. Areas covered in this part are:

1. Strategy
2. Organizational Skills
3. Human Resources
4. Systems & Infrastructure
5. Organizational Structure

Capacity assessment is done by assigning scores (within a range of 1-4) against each capacity assessment area by selecting the text that best describes the current status or performance under each area. The grid may be used in different contexts like (i) to identify those particular areas of capacity that are strongest and those that need improvement (ii) to measure changes in the ULB's capacity in SWM over time and (iii) to gather different views (from among different categories/groups) within the ULB regarding its capacity in SWM.

The scores are meant to provide a general indication of an organization's capacity level. The results should be interpreted in the context of the ULB's state of development in solid waste management. Since the development of every ULB in solid waste management will be through an emerging process, lower score for a new entrant need not be considered as low. Right approach and sincere efforts will improve the score as time passes.

If a row is not relevant, designate the row "N/A" and in case of no knowledge, mark the row "N/K."

### SWM Capacity Assessment Grid

Person completing the assessment:

Period/ Time being assessed:

Area for Capacity Assessment	1 Clear need for increased capacity	2 Basic level of capacity in place	3 Moderate level of capacity in place	4 High level of capacity in place	Rating	
<b>Part A: Critical Components of Integrated Solid Waste Management</b>						
<b>1. Waste Segregation and Storage at Source</b>	(i) Role of waste generators	No segregation and storage at source;  No understanding of the importance of segregation and storage	Somewhat clear understanding of the importance of segregation and storage;  Segregation and storage not practiced by all; Those who practice, segregation done as organic and inorganic only	Clear and specific understanding of the importance of segregation and storage;  Segregation done separately for organic, inorganic, recyclable/ reusable and hazardous items.  Very limited external pressure needed for compliance. Very few violations.	Clear, specific and compelling understanding of the importance of segregation and storage;  Segregation done separately for organic, inorganic, recyclable and hazardous items.  No external compulsion required. There is no case of violation/failure.	
	(ii) Role of ULB	ULB not conscious of the importance of segregation and storage.  No rule framed, no direction issued, not concerned about the absence of source segregation	Importance of segregation and storage known to and held by a few in the ULB;  Some discussions took place on introduction of segregation and storage and framing of rules.	Clear and specific understanding of the importance of segregation and storage;  Rules/byelaws framed but needs improvement. The system works more or less satisfactorily.	Clear, specific and compelling understanding of the importance of segregation and storage;  A strong and sustained system of segregation and storage exists, which the ULB monitors continually.	
	(iii) Follow through	There is no effective mechanism to maintain the segregation and storage.  Even the segregated items are mixed at collection point or during transportation or at the	There is effective mechanism to maintain the segregation and storage.  On rare occasions, the segregated items get mixed at primary/secondary collection points or during	The entire system works well for maintaining segregation.  The collected items reach the destination without getting mixed up, but some items could be seen left/deposited at vacant plots, riversides	The entire system works excellently for maintaining segregation.  The collected items reach the destination without getting mixed up.	

	disposal point.	transportation or at the disposal point.	etc. The segregated items generally reach their destined disposal places.	There is high level of civic consciousness and no waste goes out of the collection mechanism.  The segregated items generally reach their destined disposal places and undergo recycle/reuse/value addition process	
<b>2. Primary Collection</b>	<p>Strategy for primary collection absent;</p> <p>No organized system for door to door/ kerb / block collection;</p> <p>No effective mechanism for bulk collection from non- domestic bulk generators.</p> <p>There is no fixed schedule for primary collection.</p>	<p>Strategy evolved for primary collection;</p> <p>Organized system for door to door/ kerb / block collection exists;</p> <p>No effective mechanism for bulk collection from non- domestic bulk generators.</p> <p>There is no fixed schedule for primary collection.</p>	<p>Strategy evolved for primary collection;</p> <p>Organized system for door to door/ kerb / block collection exists;</p> <p>Effective mechanism for bulk collection from non- domestic bulk generators;</p> <p>Fixed schedule for primary collection</p>	<p>The entire primary collection system works excellently. There is 100% primary collection and the collected items reach the destination without spillage at any point.</p> <p>The waste generators show high level of civic consciousness and no waste goes out of the collection mechanism.</p> <p>The collection staff are highly motivated and punctual.</p> <p>There is efficient monitoring and supervision mechanism for primary collection. There is effective mechanism for direct collection from bulk generators.</p> <p>There is fixed schedule for collection, prepared giving due care of the convenience of the waste generators.</p>	
<b>3. Street Sweeping &amp; drain Cleaning</b>  (i) Street Sweeping	<p>No strategy and fixed schedule for street sweeping;</p> <p>Only major roads or dense commercial areas are attended-that too not properly done; by-roads either not cleaned or done once in a while;</p>	<p>Strategy and schedule for street sweeping available but loosely followed;</p> <p>Most of the city streets are covered;</p> <p>Absence of quantitative and qualitative monitoring;</p>	<p>Strategy evolved for street sweeping like daily coverage of dense commercial areas; sweeping on all days including Sundays in city centres and market areas; alternate day coverage of medium density and dense housing area; and weekly coverage (twice/once) in</p>	<p>Strategy evolved for street sweeping like daily coverage of dense commercial areas; sweeping on all days including Sundays in city centres and market areas; alternate day coverage of medium density and dense housing area; and weekly coverage (twice/once) in other areas;</p>	

	<p>No mechanism for timely removal of dead animals/birds.</p> <p>There are CLR workers for street sweeping but their adequacy and work turn over not assessed.</p>	<p>Mechanism for removal of dead animals/birds exists;</p> <p>There are CLR workers for street sweeping but their adequacy not assessed but work turn over monitored.</p>	<p>other areas;</p> <p>Workers provided with necessary tools and accessories;</p> <p>Mechanism for speedy removal of dead animals/birds exists</p> <p>ULB takes fair responsibility in monitoring day-to-day street sweeping activities;</p> <p>There are CLR workers for street sweeping but their adequacy not assessed but work turn over monitored.</p>	<p>Workers provided with appropriate and modern tools and accessories;</p> <p>Mechanism for quick removal of dead animals/birds exists</p> <p>ULB takes keen responsibility in monitoring day-to-day street sweeping activities</p> <p>Street sweeping rationalized according to the ward maps, indicating specific area to be swept by each sweeper.</p> <p>ULB has introduced modern machineries like street sweeping machines which even remove the sand at the street sides that pose threat especially to two-wheeler users.</p>	
(ii) Drain Cleaning	<p>No strategy and fixed schedule for drain cleaning;</p> <p>Only drains of dense commercial areas are attended-that too not properly done;</p> <p>No mechanism for timely clearing of drain blockages; there are overflowing blocked drains;</p> <p>There are some CLR workers for drain cleaning but their adequacy not assessed.</p>	<p>Strategy and schedule for drain cleaning available for cleaning shallow drains (not deeper than 60 cm) but loosely followed;</p> <p>Drains are occasionally cleaned following ad-hoc approach;</p> <p>Blockages are attended but generally delay is experienced;</p> <p>The adequacy of CLR workers for drain cleaning not assessed.</p>	<p>There is strategy and operational schedule for drain cleaning, which includes attending urgent needs as well as periodic coverage of the entire shallow drainage system in the city(not deeper than 60 cm);</p> <p>There is clear rationale for determining the frequency of cleaning the drains;</p> <p>There is an emergency redress system to attend clogged/ overflowing drains.</p> <p>There is separate schedule for pre-monsoon cleaning (or for locally specific/special</p>	<p>There is strategy and operational schedule for drain cleaning which includes attending urgent needs as well as periodic coverage of the entire shallow drainage system in the city(not deeper than 60 cm);</p> <p>There is clear rationale for determining the frequency of cleaning the drains;</p> <p>There is an emergency redress system which acts very fast to clear clogged/overflowing drains. High quality professionalism and skills are demonstrated in attending emergency situations</p>	

			<p>occasions)</p> <p>Workers provided with tools and implements;</p> <p>ULB takes fair responsibility in monitoring the drain cleaning activities;</p> <p>There are CLR workers for drain cleaning but their adequacy not assessed but work turn over monitored.</p>	<p>There is separate schedule for pre-monsoon cleaning (or for locally specific/special occasions);</p> <p>There is no much variation in implementing the routine work schedule;</p> <p>Workers provided with modern tools and implements; there is proper system for storage, upkeep and maintenance of the tools and equipments;</p> <p>ULB takes fair responsibility in monitoring the drain cleaning activities;</p> <p>There are sufficient CLR workers engaged based on adequacy assessment;</p> <p>Work turn over closely monitored.</p> <p>There is some reward system for exemplary performances.</p>	
<p><b>4. Secondary Waste Storage Depots and Transfer Stations</b></p>	<p>The right strategy for secondary collection (i.e., abolition of all open collection points by placing containers- separate containers for organic and inorganic waste) is absent.</p> <p>There are open collection points along the streets.</p> <p>Presently there are overflowing secondary collection containers.</p> <p>Periodic emptying of secondary storage is</p>	<p>ULB has adopted the right strategy for secondary collection, i.e., abolition of all open collection points by placing containers- separate containers for organic and inorganic waste.</p> <p>ULB has placed community bins/dumper placer containers on roadsides and open places to deposit wastes collected from the doorstep as well as to facilitate the residents to drop their waste directly to</p>	<p>The ULB has a clear strategy for secondary collection whereby all open collection points are abolished by placing containers of suitable size and shape-separate for organic and inorganic.</p> <p>Timing for emptying the containers is conveniently fixed and the containers never overflow.</p> <p>An additional storage capacity of at least 30% is provided in order to avoid overflow of the containers.</p>	<p>The ULB has a clear strategy for secondary collection whereby all open collection points are abolished by placing containers of suitable size and shape-separate for organic and inorganic.</p> <p>Timing for emptying the containers is conveniently fixed and the containers never overflow.</p> <p>An additional storage capacity of at least 30% is provided in order to avoid overflow of the containers.</p>	

	absent.	<p>the bins.</p> <p>However, there are open collection points here and there along the streets.</p> <p>Periodic emptying of secondary storage is practiced but there are places where secondary collection containers often overflow.</p>	<p>The system aims to meet 100% removal of waste generated.</p> <p>The ULB has a system for periodic valuation of user behavior and motivation of staff to ensure sustainable hygienic secondary storage.</p> <p>Facilities for secondary storage (container/ dumper container, dumper placer, container station etc) are available.</p> <p>Manual handling and multiple handling of wastes either do not exist or done with proper safety precautions and care.</p> <p>Use of Personal Protection Equipments are used by the waste handlers</p>	<p>The system aims to meet 100% removal of waste generated.</p> <p>The ULB has a system for periodic valuation of user behavior and motivation of staff to ensure sustainable hygienic secondary storage.</p> <p>Providing facilities for secondary storage (provision of container/ dumper container, dumper placer, container station etc) is the sole responsibility of the ULB.</p> <p>Direct transfer of waste from primary collection vehicle to containers.</p> <p>Secondary storage facilities are attended daily/as per the waste removal schedule framed as part of the strategy for secondary storage.</p> <p>Manual handling and multiple handling of wastes do not exist or done with proper safety precautions and care.</p> <p>Use of Personal Protection Equipments are used by the waste handlers</p> <p>The handling of waste at secondary collection points is highly hygienic and cost effective and adopts application of modern techniques.</p>	
<b>5.Transportation of waste</b>	There is no scientific waste disposal system and hence transportation of waste is minimal. Waste	The ULB has a waste disposal system and transportation is a component of the entire	There is a scientific waste disposal system and transportation is a component of the entire	There is a scientific waste disposal system and transportation is one of the many components of the entire	

	<p>collected is deposited at some convenient site.</p> <p>Primary collection vehicles and secondary collection vehicles are inadequate.</p> <p>There are some transportation vehicles, but these are not covered as required by law.</p> <p>There is spillage of waste during transportation.</p> <p>Route and timing of transportation has not considered the convenience of the people.</p> <p>The staff of transportation vehicles are not properly oriented for safe handling of waste.</p>	<p>waste management activity.</p> <p>There are adequate no of vehicles, but the adaptability and complementarities among them do not match.</p> <p>For waste transportation obsolete, uncovered vehicles are used after providing temporary covering.</p> <p>Measures to prevent spillage on transportation is taken for the old model uncovered vehicles.</p> <p>The convenience of people is duly taken care of for deciding the route and timing for transportation of waste.</p> <p>The staff of transportation vehicles are oriented on safe handling of waste.</p>	<p>waste management activity.</p> <p>There are adequate no of vehicles, but the adaptability and complementarities among them generally match, which enables easy and trouble free handling of waste.</p> <p>The ULB is in the process of phasing out obsolete vehicles with modern covered vehicles.</p> <p>Waste transportation is considered as an important activity and is supplemented and supported with application of management tools like GIS/GPS.</p> <p>There is fairly good schedule for transportation designed for the convenience of the people. For deciding route and timing of transportation, economic factors and general convenience are considered.</p> <p>Measures to prevent spillage on transportation are taken wherever old model vehicles are used.</p> <p>The staff of transportation vehicles are oriented on safe handling of waste.</p>	<p>activity.</p> <p>There are adequate no of vehicles, small and large, matching each other, optimally used as per requirements. Thus handling of waste is easy and trouble free.</p> <p>The ULB has phased out old type uncovered vehicles with modern covered hi-tech vehicles.</p> <p>Waste transportation is considered as an important activity and is supplemented and supported with application of management tools like GIS/GPS. There is an effective system for tracking/monitoring transportation of waste .</p> <p>The schedule for transportation is designed to ideally suit to all concerned especially the people. For deciding route and timing of transportation, economic factors, convenience of people and optimum use of the vehicles are considered.</p> <p>There is no spillage on transportation.</p> <p>The staff of transportation vehicles are oriented on safe handling of waste. The capacity building package includes safe transportation and handling of waste as well as orientation on health of transportation staff.</p>	
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<p><b>6. Treatment</b></p>	<p>There is no scientific waste disposal system; waste disposal is ad hoc; waste is dumped at one or many vacant places in and around the city;</p> <p>Organic waste cause major hygienic and environmental problems.</p> <p>There is no segregation and resource recovery;</p> <p>Basic treatment facilities like composting, vermin-composting, biomethanation are either non-existent or quite inadequate.</p> <p>ULB is unaware of modern treatment options and has not taken serious initiatives to learn modern methods.</p>	<p>There is no scientific waste disposal system but waste is subjected to some crude treatment like burying in pits at the dumping yard; a little bit of separation and sale of reusable items;</p> <p>Organic waste causes some hygienic and environmental problems, but not a major problem.</p> <p>Segregation and resource recovery is existing, but not systematic, not based on any strategy;</p> <p>ULB has taken some efforts to provide basic treatment facilities like composting, vermi-composting, biomethanation etc but needs major qualitative and quantitative improvement.</p> <p>ULB is taking efforts to learn best practices and modern treatment options</p>	<p>The ULB practices scientific integrated waste management system; there is proper segregation ; reusable items go to separate channels and bio-degradable waste is scientifically treated; waste is considered not as a menace but a resource capable to produce wealth;</p> <p>Organic waste not allowed creating hygienic and environmental problems.</p> <p>Resource recovery is existing, there is clear strategy for recycling and reuse;</p> <p>ULB has established modern treatment facilities like windrow composting, vermi-composting, biomethanation etc and there is resource recovery in the form of compost, biogas and RDF.</p> <p>ULB is generally aware of contemporary technologies in waste management and is keen to learn best practices and modern treatment options practiced elsewhere</p>	<p>There exists proven scientific integrated waste management system; there is proper source segregation ; reusable/recyclable items go to separate channel; bio-degradable waste is scientifically treated; ULB has scientific disposal/treatment options for medical and hazardous waste; waste is wealth to the ULB;</p> <p>There is no hygienic and environmental problems caused by any kind of waste;</p> <p>Resource recovery is maximum tapped; there is clear strategy for recycle/reuse/ recovery;</p> <p>ULB is aware of all the modern technology options and clearly understands the best options suited for it; has established modern treatment facilities like windrow composting, vermi-composting, biomethanation etc; ULB has established facilities/set up alliances for resource recovery like compost, biogas, RDF etc; a model for other ULBs</p> <p>ULB is aware of contemporary technologies in waste management and is keen and sensitive to best practices and technological advancements; in a position to support other ULBs in introducing integrated SWM.</p>	

<p><b>7.Recycling/ Reuse/Recovery</b></p>	<p>There is no much of recycling or reuse of solid waste, but collection of reusable items by rag pickers may be available;</p> <p>ULB has not taken very little or no initiatives for recycle/ reuse/ recovery</p> <p>Recyclable/reusable items go to the landfill site/dumping site.</p>	<p>There is some recycling or reuse of solid waste; ULB is encouraging source segregation with the intention of recycle/ reuse of waste.</p> <p>ULB has taken some action to encourage recycling/ reuse/ recovery.</p> <p>Most of the recyclable/reusable items go to the landfill site/ dumping site.</p> <p>There is a strong need to upgrade and reorganize the recycling system, to increase effectiveness of the waste collection and recycling, and to improve the working conditions of rag pickers</p>	<p>ULB is insisting source segregation with the intention of recycle/reuse of waste;</p> <p>Most of the recyclable/ reusable items do not go to the landfill, instead these are routed to reuse channels and constitute a source of wealth;</p> <p>ULB has encouraged vendors to deal with these items; taken initiatives to set up recycling units under private or public sector. The compost plant includes a RDF unit.</p> <p>The ULB has a strategy for recycle/reuse encompassing upgrading and reorganizing the recycling system, increasing effectiveness of the waste collection and recycling, improving the working conditions for rag pickers/vendors and creating supportive infrastructure for promoting recycle/reuse of waste</p>	<p>ULB is insisting and ensuring source segregation with the intention of recycle/reuse of waste;</p> <p>All the recyclable/ reusable items are put to use/reuse and do not go to the landfill, These are considered as a source of wealth;</p> <p>ULB has encouraged vendors to deal with these items and also taken initiatives to set up recycling units under private or public sector. ULB has set up/supported setting up of RDF units.</p> <p>ULB has a strategy for recycle/ reuse/recovery encompassing reorganizing the recycling system, upgrading in line with technological advancements, increasing effectiveness of the waste collection and recycling, improving the working conditions of rag pickers/vendors and creating supportive infrastructure for promoting recycle/reuse of waste.</p> <p>For the ULB, waste recycling possesses untapped potential that can benefit the society and is committed to perform this function directly or through competent agencies in the public or private sector.</p> <p>The ULB takes proactive steps like ban on use of non-recyclable plastics or encouraging use of reusable/recyclable items.</p>	
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<p><b>8.Final Disposal</b></p>	<p>There is no scientific waste disposal system; waste disposal is ad hoc; solid waste is deposited in open dumps or in pits at the dumping ground or waste is dumped at one or many vacant places in and around the city;</p> <p>No or minimal treatment of organic fraction of waste;</p> <p>The ULB has not seriously thought of the importance of having a long-term disposal strategy including windrow composting and engineered sanitary landfill.</p>	<p>There is some efforts taken by the ULB to introduce scientific waste disposal system as provided in the MSW (M&amp;H) Rules, 2000; There is facilities like compost plant, landfill facility etc but day-to-day operation and management needs improvement. Proper leachate treatment at landfill not available; Quality of compost needs improvement.</p> <p>The strategy for final disposal is minimizing load on landfills and hence only the rejects and degraded waste go to the landfill. Recyclable/reusable items go to the usable channels.</p> <p>The ULB has understood the importance of having a long-term integrated waste management strategy which includes.</p>	<p>Very good efforts taken by the ULB to introduce scientific waste disposal system in line with the MSW (M&amp;H) Rules, 2000;</p> <p>There are facilities like compost plant, landfill etc which are efficiently operated and well maintained. Quality of compost is fairly good;</p> <p>Effective leachate treatment at landfill;</p> <p>The ULB has evolved integrated waste management strategy with reuse plans for all reusable items, minimizing load on landfill and strengthening community capacity etc.</p> <p>The ULB has clear understanding of the importance of having a long-term integrated waste management strategy and the annual plans reflect its commitment for effective waste management.</p>	<p>Excellent system for SWM existing;</p> <p>Locally suited technological options introduced based on validation of all available technology options with locality specific variations.</p> <p>Adequate facilities exist to cater to the present needs; setting up of facilities has taken care of future needs; facilities are efficiently operated and well maintained.</p> <p>No/least minimum environmental problem at every stage. Effective leachate treatment at landfill; Quality of products ensured.</p> <p>The ULB has evolved integrated waste management strategy encompassing every aspect of waste management like adoption of the 4R concept (reduce, reuse, recycle and recover the waste), storage and segregation at source, proximity theory of SWM, which is scientific disposal of waste at the nearest point of source (E.g., biogas plant at a market; composting at households etc.), adoption of proven technologies; encouraging indigenous initiatives; legislation for complementing and sustaining the initiatives, creating and vitalizing institutional support systems, implementation of an ongoing IEC plan to sustain the achievements etc.</p>	
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<b>Part B: Organizational Aspects affecting Solid Waste Management</b>					
<b>Area for Capacity Assessment</b>	<b>1 Clear need for increased capacity</b>	<b>2 Basic level of capacity in place</b>	<b>3 Moderate level of capacity in place</b>	<b>4 High level of capacity in place</b>	<b>Rating</b>
<b>1. Strategy</b>					
<b>Overall Strategy</b>	<p>For SWM, overall strategy for integrated solid waste management is either nonexistent, unclear or incoherent- what is available is largely a set of scattered initiatives;</p> <p>Strategy has no influence over day to day behavior</p>	<p>Strategy exists for integrated solid waste management but is either not clearly linked to goals or lacks coherence or is not easily actionable;</p> <p>Strategy is not broadly known and has limited influence over day to day activities</p>	<p>Coherent strategy for integrated solid waste management has been developed and is linked to goals and related activities but is not fully ready to be acted upon;</p> <p>Strategy is mostly known and day to day activities is partly driven by it</p>	<p>ULB has clear, coherent medium to long term SWM strategy that is both actionable and linked to goals;</p> <p>Strategy is broadly known and consistently helps to drive day to day activities</p>	
<b>Goals, performance targets</b>	<p>Targets for SWM are nonexistent or few;</p> <p>Targets are vague, or confusing, or either too easy or impossible to achieve;</p> <p>Targets not clearly linked to aspirations &amp; strategy and may change from year to year;</p> <p>Targets largely unknown to or ignored by staff</p>	<p>Realistic targets for SWM exist in some key areas, and are mostly aligned with aspirations and strategy;</p> <p>May lack aggressiveness, or be short term, lack milestones or mostly focuses on "inputs" (things to do right) or often renegotiated;</p> <p>Staff may or may not know and adopt targets</p>	<p>Quantified aggressive targets for SWM exist; linked to aspirations and strategy;</p> <p>Mainly focused on "outputs/outcomes" (results of doing things right) with some "inputs" typically multiyear targets, though may lack milestones;</p> <p>Targets are known and adopted by most staff who usually use them to broadly guide work</p>	<p>Limited set of quantified, genuinely demanding performance targets in all areas of SWM;</p> <p>Targets are tightly linked to aspirations and strategy, output/outcome focused (i.e. results of doing things right, as opposed to inputs, things to do right)</p> <p>Have annual milestones, and are long term nature;</p> <p>Staff consistently adopts targets and works diligently to achieve them</p>	

## 2. Organizational Skills

### 2.1 Performance Management

<p><b>Performance Measurement</b></p>	<p>Very limited measurement &amp; tracking of performance;</p> <p>All or most evaluations based on anecdotal evidence;</p> <p>ULB collects some data on activities and outputs (e.g., number of houses covered/ streets swept etc) but has no impact measurement (measurement of outcomes, e.g., segregated storage improved, reusable items put to reuse etc)</p> <p>Few external performance comparisons made; internal performance data rarely used to improve SWM activities</p>	<p>Performance partially measured &amp; progress tracked;</p> <p>ULB regularly collects data on activities and outputs but lacks data-driven, externally validated impact measurement</p> <p>Some efforts made to benchmark SWM activities and outcomes against outside world;</p> <p>Internal performance data used occasionally to improve SWM activities</p>	<p>Performance measured &amp; progress tracked in multiple ways, several times a year, considering social, financial, organizational and environmental impact of program and activities; multiplicity of performance indicators; social and environmental impact measured</p> <p>Effective internal and external benchmarking occurs but driven largely by top management and/or confined to selected areas;</p> <p>Learnings distributed throughout organization and often used to make adjustments and improvements in SWM activities</p>	<p>Well-developed comprehensive, integrated system used for measuring ULB's performance and progress on continual basis, including social, financial, organizational and environmental impact of program and activities;</p> <p>Small number of clear measurable and meaningful key performance indicators;</p> <p>Social and environmental impact measured based on longitudinal studies performed or supervised by third party experts</p> <p>There are comprehensive internal and external benchmarking of the SWM activities; these are used by staff in target-setting and for rating of operations;</p> <p>Systematic practice of making adjustments and improvements on the basis of benchmarking</p>	
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### 2.2 Planning

<p><b>Operational Planning</b></p>	<p>ULB runs SWM operations purely on day to day basis with no short or long term planning activities; no experience in operational planning</p>	<p>Some ability and tendency to develop high level operational plan either internally or via external assistance; operational plan loosely or not linked to strategic planning activities</p>	<p>Ability and tendency to develop and refine concrete, realistic operational plan;</p> <p>Some internal expertise in operational planning or</p>	<p>ULB develops and refines concrete, realistic and detailed operational plan;</p> <p>Has adequate internal expertise in operational planning or efficiently uses external, sustainable, highly qualified</p>	
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		and used roughly to guide operations	access to relevant external assistance;  Operational planning carried out on a near regular basis;	resources;  Operational planning exercise carried out regularly;	
<b>2.3 External Relationship Building and Management</b>					
<b>Partnerships and alliances development and nurturing</b>	In SWM, there is very limited use of partnerships and alliances with public sector, private sector or NGO/CBO	Early stages of building relationships and collaborating with other public / private sector or non-governmental entities	Effectively built and leveraged some key relationships with few types of relevant parties ( public /private or non-governmental entities);  Some relations may be precarious or not fully "win-win"	Built, leveraged, and maintained strong, high impact relations with variety of relevant parties;  Relationships deeply anchored in stable, long term, mutually beneficial collaboration	
<b>2.4 Other Organizational Skills</b>					
<b>Capacity development</b>	ULB makes no or limited initiatives for capacity building different actors of SWM	ULB takes opportunities for capacity building when need arises	ULB considers capacity building useful and actively seeks opportunities for capacity development of all categories of persons engaged in SWM	ULB is fully aware of power of capacity building activities and continually and actively engages in them.  There is a capacity building plan with clear objectives.  There is an internal system for capacity building and also make efficient use of highly qualified external resources for capacity building.	
<b>3. Human Resources</b>					
<b>(i) Staffing Levels</b>	Many positions within and peripheral to ULB (e.g. ULB staff, field workers, plant operators, drivers, mechanical staff etc) are unfilled, inadequately filled, or experience high	Most critical positions within and peripheral to ULB are staffed (no vacancies), and/or experience limited turnover or attendance problems	Positions within and peripheral to ULB are almost staffed (no vacancies);  Few turnover or attendance problems	Positions within and peripheral to ULB are all fully staffed (no vacancies);  No turnover or attendance problems	

	turnover and/or poor attendance				
<b>(ii) SWM Top Management Team</b>	<p>Possess limited knowledge and expertise; little or not relevant experience; low commitment to success of SWM;</p> <p>Provide little direction and support to the implementing team;</p> <p>Not fully informed about different spheres of SWM and organizational matters;</p>	<p>Some knowledge and expertise; moderate commitment to success; There are well-planned regular, purposeful meetings;</p> <p>Provide occasional direction and support to the implementing team;</p> <p>informed about different spheres of SWM and organizational matters in a timely manner and responses/decisions actively solicited</p>	<p>Good knowledge and expertise; good commitment to success;</p> <p>There are well planned purposeful meetings</p> <p>Provide direction and support to the implementing team</p> <p>Fully informed of all matters and inputs</p> <p>Field level responses actively sought and valued;</p> <p>Full participation in major decisions</p>	<p>Very good knowledge and expertise including functional related expertise; high willingness in learning about the SWM activities and addressing its issues;</p> <p>Outstanding commitment to the success of effective implementation;</p> <p>Frequent meetings for review and decision making</p> <p>Provide strong direction and support to the implementing team</p> <p>Communication with field level workers and leaders reflects mutual respect, appreciation for roles &amp; responsibilities, shared commitment &amp; valuing of collective wisdom</p>	
<b>4. Systems &amp; Infrastructure</b>					
<b>4.1. Systems</b>					
<b>(i) Planning systems</b>	Planning happens on an ad hoc basis only and is not supported by systematically collected data	Planning done regularly and uses some systematically collected data	Regular planning complemented by ad hoc planning when needed; some data collected and used systematically to support planning effort and improve it	Regular planning complemented by ad hoc planning when needed; clear, formal systems for data collection in all relevant areas; data used systematically to support planning effort and improve it	
<b>(ii) Decision making framework</b>	Decisions made largely on an ad hoc basis; highly informal	Appropriate decision makers known;  Decision making process fairly well established and process is	Clear, largely formal lines/systems for decision making but decisions are not always appropriately implemented or followed;	There exists clear, formal lines/systems for decision making exist along with dissemination/interpretation of decision, which are known to all	

		generally followed, but often breaks down and becomes informal	Dissemination of decisions generally good but could be improved		
<b>(iii) Financial operations management</b>	Financial activities on an ad hoc basis; not fully transparent; lacks clarity and consistency in record keeping and documentation; does not include checks and balances	Financial activities transparent, clearly and consistently recorded and documented, include appropriate checks and balances	Formal internal controls governing all financial operations; fully tracked, supported and reported	Robust systems and controls in place governing all financial operations and their integration with budgeting decision making, and organizational objectives, strategic goals	
<b>(iv) HR Management-incentives</b>	No incentive system to speak of; or incentive system that is ineffective and/or generates bad will	Some basic elements of incentive system in place; may include one of following: competitive salary (possibly partly performance based), attractive career development options, or opportunities for leadership & entrepreneurship; some evidence of motivational effect on staff performance	Many elements of incentive system in place; includes a few of following: competitive salary (partly performance based), attractive career development options, opportunities for leadership and entrepreneurship; obvious effect in motivating staff to over deliver	Well designed, clear and well accepted incentive system; includes competitive salary (partly performance based) , attractive career development options, opportunities for leadership and entrepreneurship; system effective in motivating staff to over-deliver in their job	
<b>(v) Knowledge management</b>	No formal systems to capture and document internal knowledge	Systems exist in a few areas but either are not user friendly or not comprehensive enough to have an impact; systems known by only a few people, or only occasionally used	Well designed, user friendly systems in some areas; not fully comprehensive; systems are known by many people within the organization and often used	Well designed, user friendly, comprehensive systems to capture, document and disseminate knowledge internally in all relevant areas; all staff is aware of systems, knowledgeable in their use and make frequent use of them	
<b>4.2. Infrastructure</b>					
<b>(i) Physical Infrastructure-building &amp; office space</b>	Inadequate physical infrastructure, resulting in loss of effectiveness & efficiency (e.g., obsolete plant/machinery/ vehicles, insufficient workspace etc)	Physical infrastructure can be made to work well enough to suit most important and immediate needs;  A number of improvements could greatly help increase effectiveness and efficiency	Fully adequate physical infrastructure for the current needs; infrastructure does not impede effectiveness & efficiency (e.g. sufficient workspace, modern equipments and vehicles, full-fledged processing plant with adequate facilities)	Physical infrastructure well tailored to current & anticipated future needs in SWM;  Infrastructure well designed and thought out to enhance efficiency & effectiveness (e.g., introduction of user friendly	

		(e.g., sufficient workspace, modern machinery/ vehicles, facilities at work space etc)		equipments, modernization of machinery etc increase efficiency)	
<b>(ii) Technological Infrastructure- web site</b>	ULB has no individual web site or call centre or grievance redress mechanism	Basic web site containing general information but little information on current developments; website maintenance is a burden and performed only occasionally  Call centre and grievance redress mechanism existing but not upto the mark	Comprehensive web site containing basic information on ULB as well as up to date latest developments; most information is ULB specific; regularly maintained and updated with useful information; there is idea exchange forum.  Call centre and grievance redress mechanism is generally satisfactory.	Sophisticated, comprehensive and interactive web site, regularly maintained and kept up to date on latest information on SWM; praised for its user friendliness and depth of information; includes links to related organizations and useful resources  Call centre and grievance redress mechanism is prompt and efficient	
<b>5. Organizational Structure</b>					
<b>(i) Governance</b>	SWM is considered to be the collective responsibility of the SWM team.  There are no individual targets and responsibilities. The ULB Council does not set performance targets and hold Division head accountable or does not operate according to formal procedures.	Council reviews activities and occasionally sets organizational direction and targets, but does not make regular review of individual and collective performance, monitor potential conflicts of interest	There is role clarity and the system functions well;  Council reviews individual and collective performance; Council defines performance targets and actively encourages Division head to meet targets;  There is annual review of performance of key players, but board not prepared to hire or fire the top players;  ULB generally cushions external pressures, but for the staff there are occasional left-alone feelings	Every player work well together from clear roles;  Council actively defines performance targets and holds Division head fully accountable;  Council reviews performance and is prepared to hire or fire top players if necessary;  ULB encourages staff to withstand external pressures	
<b>(ii) Organization design</b>	Organization entities (e.g., headquarters, zonal & local offices) are not designed, and	Organizational entities are defined and their roles and responsibilities are formalized but may not	Organizational entities are clearly defined;  All roles & responsibilities of	Roles & responsibilities of all organizational entities are formalized, clear and complement each other;	

	<p>roles, responsibilities of entities are neither formalized nor clear;</p> <p>Absence of organizational chart</p>	<p>reflect organizational realities;</p> <p>Organization chart is incomplete and may be outdated</p>	<p>organizational entities are formalized and reflect organizational realities;</p> <p>Organization chart is complete but may be outdated</p>	<p>Organizational chart is complete and reflects current reality</p>	
<b>(iii) Inter-function coordination</b>	<p>Different programs (other similar programmes of the ULB or other agencies) and organizational units (health, engineering, finance etc) function independently with little or dysfunctional coordination between them</p>	<p>Interactions between different programmes and organizational units are generally good, though coordination issues do exist;</p> <p>Some pooling of resources</p>	<p>All programs and units function together effectively with sharing of information and resources;</p> <p>Few coordination issues</p>	<p>Constant and seamless integration between different programs and organizational units with few coordination issues;</p> <p>Relationships are dictated by organizational needs (rather than hierarchy or politics)</p>	
<b>(iv) Individual job design</b>	<p>Positions do not exist to address a number of key roles;</p> <p>Unclear roles &amp; responsibilities with many overlaps;</p> <p>Job descriptions do not exist</p>	<p>Positions exist for most key roles, with a few till missing;</p> <p>Most key positions are well defined and have job descriptions; some unclear accountabilities or overlap in roles &amp; responsibilities;</p> <p>Job descriptions tend to be static</p>	<p>All key roles have associated positions (e.g., mechanical engineer for taking care of vehicles, machinery and equipments, social expert for community mobilization and capacity building etc);</p> <p>Most individuals have well defined roles with clear activities and reporting relationships and minimal overlaps;</p> <p>Job descriptions are continuously being redefined to allow for organizational development and individuals' growth within their jobs</p>	<p>All roles have associated dedicated positions;</p> <p>All individuals have clearly defined core roles which must be achieved and an area of discretion where they can show initiative and try to make a difference; core roles are defined in terms of end services rather than activities;</p> <p>Individuals have the ability to define their own activities and are empowered to continuously reexamine their jobs</p>	

## ANNEXURE 2

### SCHEDULE OF TRAINING FOR MUNICIPAL SOLID WASTE MANAGEMENT

#### Part A: Long Duration Training Programme

Pursuant to 74<sup>th</sup> Amendment of the Constitution of India, municipal solid waste management is a subject of the ULBs. ULBs have designated employees, who are responsible for the solid waste management. Besides, there will be a Standing Committee in the ULB primarily responsible for Municipal Solid Waste Management (MSWM). The dynamics of MSWM are myriad, challenges numerous and its kinetic forces multifaceted. For effective management of municipal solid waste, proper capacity building of officers and elected representatives is most essential. In order to capacitate the officers and elected representatives who directly supervise or deal with solid waste management, a 12-days training programme has been developed as part of the CoE activities. This training programme broadly covers the following major areas and each major area has been divided into different topics and a training module has been prepared accordingly. The following table shows the major areas and the different topics covered under each of these areas:

No	Major Area	Topics under each Major Area
1.	The background - Understanding Solid Waste and Solid Waste Management	<ul style="list-style-type: none"><li>• SWM Scenario in India</li><li>• Solid Wastes-An Overview</li></ul>
2.	SWM-Basic Activities	<ul style="list-style-type: none"><li>• Waste Stream Assessment</li><li>• Collection &amp; Storage, Transfer Stations</li><li>• Purpose of Processing, Mechanical Volume and Size Reduction, Component Separation</li><li>• Screening, Drying and Dewatering</li><li>• Source Reduction, Recycling</li><li>• Record Keeping and Documentation</li></ul>
3.	SWM-Special Focus Areas	<ul style="list-style-type: none"><li>• Bio-medical waste management</li><li>• Hazardous waste management</li><li>• Slaughterhouse Waste management</li></ul>
4.	Legal Framework and Related matters	<ul style="list-style-type: none"><li>• Municipal Solid Waste (Management &amp; Handling) Rules, 2000</li><li>• Kerala Municipality Act or similar Acts of other State Governments</li><li>• By-laws for MSWM</li><li>• Challenges in the SWM in India</li><li>• Causes for Non-compliance of Rules</li><li>• Steps for improving SWM</li></ul>
5.	Technology Options for SWM	<ul style="list-style-type: none"><li>• Composting</li><li>• Windrow Composting</li><li>• Aerated Static pile composting</li><li>• In-vessel composting</li><li>• Anaerobic composting</li><li>• Vermi Composting</li><li>• Biomethanation</li><li>• Incineration</li></ul>

		<ul style="list-style-type: none"> <li>• Pelletization/Refuse Derived fuel system</li> <li>• Pyrolysis and Gasification</li> <li>• Plasma Pyrolysis</li> <li>• Sanitary landfill</li> <li>• Recycling of MSW</li> <li>• Reuse of MSW</li> </ul>
6.	Technical Aspects	<ul style="list-style-type: none"> <li>• S W M Plant Design</li> <li>• Engineered Sanitary Landfill Design</li> <li>• Designing a Modern Slaughterhouse</li> <li>• Designing Leachate Treatment Plant at Landfill Site</li> <li>• Energy Management in SWM Plants</li> </ul>
7.	Strategy and Framework for Integrated Solid Waste Management	<ul style="list-style-type: none"> <li>• Segregation and Storage</li> <li>• Primary Collection</li> <li>• Street sweeping</li> <li>• Secondary Collection</li> <li>• Direct Collection</li> <li>• Transportation</li> <li>• Treatment</li> <li>• Landfill/Final disposal</li> <li>• Role of NGOs/CBOs</li> <li>• Capacity building and implementation</li> <li>• Integrated Waste Management</li> </ul>
8.	Related topics	<ul style="list-style-type: none"> <li>• Social Entrepreneurship in SWM</li> <li>• Health Linkages in SWM</li> <li>• GIS Networking</li> <li>• GHG Emission from Waste</li> <li>• Carbon Emission Trading Potential from Wastes</li> </ul>

A typical course module covering the above subjects is given below, which could be suitably modified to go well with the local conditions of the ULB where the training is conducted. Field visits have potential strength to facilitate easy understanding of complicated technicalities and the social dynamics of different activities. Hence field studies/visits should be arranged to the maximum extent possible. If field visits are impossible due to absence of facilities, video show capturing the entire activities in detail could be arranged.

<b>TYPICAL COURSE MODULE FOR 12-DAYS TRAINING ON SOLID WASTE MANAGEMENT</b>		
<b>Day</b>	<b>Topics Covered</b>	<b>Time requirement</b>
Day 1	SWM Scenario in India	1 1/2 hours
	<ul style="list-style-type: none"> <li>• Solid Wastes: Classification, Waste Generation and Composition</li> <li>• Characteristics of Municipal Solid Waste (Physical &amp; Chemical Characteristics)</li> </ul>	1 hour
	Legal Framework: <ul style="list-style-type: none"> <li>• Municipal Solid Waste (Management &amp; Handling) Rules,</li> </ul>	2 hours

	<p>2000</p> <ul style="list-style-type: none"> <li>• Kerala Municipality Act or similar Acts of other States</li> <li>• By-laws for MSWM</li> </ul>	
Day 2	Recap of Day 1	1/2 hour
	Waste Stream Assessment	1 1/2 hours
	Collection & Storage Transfer Stations Purpose of Processing	1 1/2 hours
	Mechanical Volume and Size Reduction Component Separation Screening	1 1/2 hours
Day 3	Recap of Day 2	1/2 hour
	Drying and Dewatering Source Reduction Recycling Record Keeping and Documentation	1 1/2 hours
	Challenges in Solid Waste Management in India Causes for Non-compliance of Rules	1 1/2 hours
	Steps for Improving Solid Waste Management	1 hour
Day 4	Recap of Day 3	1/2 hour
	Technology Options for Municipal Solid Waste Management: Composting, Windrow Composting, Aerated Static pile composting, In-vessel composting, Anaerobic composting, Vermi Composting	2 hours
	Technology Options for Municipal Solid Waste Management: Biomethanation, Incineration and energy recovery, Pelletization/Refuse Derived fuel system, Pyrolysis and Gasification, Plasma Pyrolysis	2 hours
	Technology Options for Municipal Solid Waste Management: Sanitary Landfill	1 hour
Day 5	Recap of Day 4	1/2 hour
	Recycling of Municipal Solid Waste Reuse of Municipal Solid Waste	1 hour
	Energy Management in Solid Waste Management Plants	1 1/2 hours
	<b>SWM-Case Study Presentation</b>	2 hours
Day 6	Recap of Day 5	1/2 hour
	S W M Plant Design, Engineered Sanitary Landfill Design	2 hours
	<b>Field Visit to Windrow Composting Plant</b> (or video show on windrow composting plant operations)	2-4 hours

Day 7	Recap of Day 6	1/2 hour
	Leachate Treatment Plant design	1 1/2 hours
	Hazardous Waste Management	1 1/2 hours
	Field Visit-Vermi composting (or video show on vermin-compost plant )	2-4 hours
Day 8	Recap of Day 7	1/2 hour
	Bio-medical Waste Management	1 1/2 hours
	Field Visit to bio gas plant or video show on functioning of biogas plant	2-4 hours
Day 9	Field Visit-slaughterhouse or video show on modern slaughterhouse	1-2 hours
	Slaughterhouse Waste Management	1 1/2 hours
	Design of Slaughterhouse	1 1/2 hours
	Recap of Day 8	1/2 hour
Day 10	Recap of day 9	1/2 hour
	Social Entrepreneurship in Solid Waste Management	1 hour
	GHG Emission from Waste	3/4 hours
	GIS Networking for MSWM	3/4 hours
	Health Linkages in SWM	1 hour
	Carbon Emission Trading Potential from Wastes	1 hour
Day 11	Recap of day 10	1/2 hour
	Exposure visit or video show on waste-transportation vehicles/road sweeping machines	2-4 hours
	Institutional Mechanism for Municipal Solid Waste Management	1 hour
Day 12	Strategy and Framework for Integrated Solid Waste Management	2 hours
	General Discussion	1 hour
	Evaluation, Feedback, Conclusion	1 hour

### Part B: Short Duration Programmes

Apart from the staff who are directly engaged on a day-to-day basis in MSWM, there are other parties whose role cannot be undermined in achieving effective waste management. They constitute elected representatives, officers and other staff, field workers, staff of the SWM plant, transportation staff, NGOs/CBOs and even the waste generators. Adequate capacity building to enable them play effective and timely role is critical. Hence their capacity building has to be properly addressed. The following trainings will help to address the initial training requirements. In the long run, appropriate trainings have to be provided on the strength of findings of some need assessment exercises.

### Short Term Initial Training Programmes

Target Group	Area covered in brief	Duration	Topics
<p>Elected Representatives-Group 1</p> <p>(Mayor/Chairman, Dy Mayor/Vice Chairman, Standing Committee Chairman in charge of SWM)</p>	<p>General Orientation on :</p> <p>1. Solid Waste Management- Technical, Institutional, Financial and legal aspects</p>	1 day	<p>Technical Aspects:</p> <p>(i) 4 R Concept-Reduce, reuse, recover, recycle</p> <p>(ii) Technology Options for SWM</p> <p>(a) Composting</p> <p>(b) Bio methanation</p> <p>(c) Vermi composting</p> <p>(d) Incineration</p> <p>(e) Pyrolysis</p> <p>(f) Landfill</p> <p>(g) Leachate Treatment</p> <p>Institutional Aspects:</p> <p>(i) Collection &amp; Storage</p> <p>(ii) Transportation</p> <p>(iii) Transfer Stations</p> <p>(iv) Role of NGOs/CBOs</p> <p>Financial Aspects:</p> <p>(i) Budgeting for SWM</p> <p>(ii) Cost recovery for SWM services</p> <p>Legal Aspects:</p> <p>(i) MSW(M&amp;H) Rules, 2000</p> <p>(ii) MSWM in Kerala Municipalities Act</p> <p>(iii) Byelaw</p>
	<p>2. Mobilization for Action, Human Resource Development</p>	1 day	<p>(i) Interactive process for Strategic thinking (by communities, NGOs, professionals &amp; ULB) to prioritize SWM issues and to identify resources to address them.</p> <p>(ii) Interactive process for improving the efficiency, effectiveness and the performance of local SWM systems.</p> <p>(iii) Steps for Improving SWM</p>
<p>Elected Representatives-Group 2</p> <p>(All elected representatives except those mentioned above)</p>	<p>General Orientation on Solid Waste Management</p>	1 day	<p>(i) SWM Scenario in India</p> <p>(ii) Solid Wastes-Overview</p> <p>(iii) Collection, Storage, Transfer Stations, Transportation</p> <p>(iv) Technology Options for SWM</p> <p>(v) Challenges in the SWM in India</p> <p>(vi) Causes for Non-compliance of Rules</p> <p>(vii) Steps for Improving SWM</p>
<p>Senior Officers</p> <p>(Secretary, Engineer/s, Division Heads)</p>	<p>General Orientation on</p> <p>6. SWM Plan Preparation and Implementation including technical &amp; technological aspects</p>	1 day	<p>(i) Need for Planning-present inadequacies and shortfalls.</p> <p>(ii) How to prepare an SWM Plan (preliminaries like quantitative and qualitative survey of solid wastes, Identification of technology options, community mobilization, facilitating</p>

			<ul style="list-style-type: none"> <li>alliances</li> <li>(iii) Implementation of SWM Plan</li> <li>(iv) Different technology options</li> <li>(v) Role of different players</li> </ul>
	7. Financial Management	1 day	<ul style="list-style-type: none"> <li>(i) Budgeting for SWM</li> <li>(ii) Cost recovery for SWM services</li> </ul>
	8. Legal Policy aspects	1 day	<ul style="list-style-type: none"> <li>(i) MSW(M&amp;H) Rules, 2000</li> <li>(ii) MSWM in Kerala Municipalities Act</li> </ul>
	9. Monitoring & Evaluation	1 day	<ul style="list-style-type: none"> <li>(i) What is Monitoring?</li> <li>(ii) What is Evaluation?</li> <li>(iii) Record keeping and Documentation</li> <li>(iv) Importance of Monitoring &amp; Evaluation</li> <li>(v) Monitoring Tools</li> </ul>
	10. Human Resource Management for SWM	1 day	<ul style="list-style-type: none"> <li>(i) Human resource for SWM-Capacity Assessment</li> <li>(ii) Human Resource Development for SWM (developing personal and organizational skills, knowledge, and abilities of staff; opportunities for employee training, employee career development, performance development, coaching, mentoring, succession planning, key employee identification etc )</li> <li>(iii) Human Resource Management System for SWM (payroll, work time, benefits, recruiting, training, performance record, service data record etc)</li> </ul>
Field Workers	<ul style="list-style-type: none"> <li>1. Orientation on Effective Collection, Segregation and Transportation of Solid Waste</li> <li>2. Orientation on Health and Hygiene Aspects of waste handling</li> </ul>	1 day each	<ul style="list-style-type: none"> <li>(i) Different Types of MSW</li> <li>(ii) Handling of Hazardous/dangerous items</li> <li>(iii) Primary Collection and Transportation</li> <li>(iv) Tips for effective collection and transportation</li> <li>(i) Health and safety aspects</li> <li>(ii) Safe handling of MSW</li> <li>(iii) Health Risks of Collection Staff</li> <li>(iv) Precautions against Health Risks</li> </ul>
Workers of Windrow Composting Plant	3. Operation and maintenance of Compost Plant	2 days	<ul style="list-style-type: none"> <li>i. Different Types of MSW</li> <li>ii. Handling of Hazardous/dangerous items</li> <li>iii. Composting Process</li> <li>iv. Management of Rejects</li> <li>v. Packing and sales of Compost</li> <li>vi. Machineries in Compost Plant- Operation and maintenance</li> </ul>
	4. Orientation on Health, Hygiene and Safety Aspects of waste handling	1 day	<ul style="list-style-type: none"> <li>i. Health Risks of Collection Staff</li> <li>ii. Precautions against Health Risks</li> </ul>

Transportation staff	<ol style="list-style-type: none"> <li>1. Maintenance of transportation vehicles</li> <li>2. Routing of vehicles</li> <li>3. Orientation on Health, Hygiene and Safety Aspects of waste handling</li> </ol>	1 day each	<ul style="list-style-type: none"> <li>• Daily cleaning and check up, break-down maintenance, periodic servicing, driving practices, meeting emergency situations</li> <li>• Basics of routing <ol style="list-style-type: none"> <li>i. Health Risks of Collection Staff and Hygienic Practices in waste handling</li> <li>ii. Precautions against Health Risks</li> <li>iii. Use of Personal Protection Equipments</li> </ol> </li> </ul>
NGOs/CBOs/Residents' Associations	Role of NGOs in SWM	1 day	<ol style="list-style-type: none"> <li>i. Role of NGOs in Community Capacity Building</li> <li>ii. Role of NGOs in decentralized SWM</li> </ol>
Waste generators	Importance of Segregation and Storage	Through IEC	

When planning for a capacity building programme, ULBs could modify the above training schedule to suit local conditions based on an Initial Training Need Assessment.

## ANNEXURE 1

### The SWM Capacity Assessment Grid

The SWM Capacity Assessment Grid will help the ULB assess its capacity in SWM. The grid is a tool intended to capture the strength of the ULB in various capacity assessment areas. Part A relates to the following critical components of solid waste management:

1. Waste Segregation and Storage at Source
2. Primary Collection
3. Street Sweeping & Drain Cleaning
4. Secondary Waste Storage Depots and Transfer Stations
5. Transportation of Waste
6. Treatment
7. Recycling/ Reuse/Recovery
8. Final Disposal

Part B deals with Organizational Aspects affecting Solid Waste Management. Areas covered in this part are:

1. Strategy
2. Organizational Skills
3. Human Resources
4. Systems & Infrastructure
5. Organizational Structure

The reader can assign scores (within a range of 1-4) against each capacity assessment area by selecting the text that best describes the current status or performance under each area. The grid may be used to identify those particular areas of capacity that are strongest and those that need improvement. This can also be effectively used to measure changes in the ULB's capacity in SWM over time. The grid may be useful to gather different views (from among different categories/groups) within the ULB regarding its capacity in SWM.

The scores are meant to provide a general indication of an organization's capacity level. The results should be interpreted in the context of the ULB's state of development in solid waste management. Since the development of every ULB in solid waste management will be through an emerging process, lower score for a new entrant need not be considered as low. Right approach and sincere efforts will improve the score as time passes.

If a row is not relevant, designate the row "N/A" and in case of no knowledge, mark the row "N/K."

### SWM Capacity Assessment Grid

Person completing the assessment:

Period/ Time being assessed:

Area for Capacity Assessment	1 Clear need for increased capacity	2 Basic level of capacity in place	3 Moderate level of capacity in place	4 High level of capacity in place	Rating
<b>Part A: Critical Components of Integrated Solid Waste Management</b>					
<b>1. Waste Segregation and Storage at Source</b>  (i) Role of waste generators	No segregation and storage at source;  No understanding of the importance of segregation and storage	Somewhat clear understanding of the importance of segregation and storage;  Segregation and storage not practiced by all; Those who practice, segregation done as organic and inorganic only	Clear and specific understanding of the importance of segregation and storage;  Segregation done separately for organic, inorganic, recyclable/ reusable and hazardous items.  Very limited external pressure needed for compliance. Very few violations.	Clear, specific and compelling understanding of the importance of segregation and storage;  Segregation done separately for organic, inorganic, recyclable and hazardous items.  No external compulsion required. There is no case of violation/failure.	
(ii) Role of ULB	ULB not conscious of the importance of segregation and storage.  No rule framed, no direction issued, not concerned about the absence of source segregation	Importance of segregation and storage known to and held by a few in the ULB;  Some discussions took place on introduction of segregation and storage and framing of rules.	Clear and specific understanding of the importance of segregation and storage;  Rules/byelaws framed but needs improvement. The system works more or less satisfactorily.	Clear, specific and compelling understanding of the importance of segregation and storage;  A strong and sustained system of segregation and storage exists, which the ULB monitors continually.	
(iii) Follow through	There is no effective mechanism to maintain the segregation and storage.  Even the segregated items	There is effective mechanism to maintain the segregation and storage.  On rare occasions, the	The entire system works well for maintaining segregation.  The collected items reach the destination without getting	The entire system works excellently for maintaining segregation.  The collected items reach the	

	are mixed at collection point or during transportation or at the disposal point.	segregated items get mixed at primary/secondary collection points or during transportation or at the disposal point.	mixed up, but some items could be seen left/deposited at vacant plots, riversides etc. The segregated items generally reach their destined disposal places.	destination without getting mixed up.  There is high level of civic consciousness and no waste goes out of the collection mechanism.  The segregated items generally reach their destined disposal places and undergo recycle/reuse/value addition process	
<b>2. Primary Collection</b>	<p>Strategy for primary collection absent;</p> <p>No organized system for door to door/ kerb / block collection;</p> <p>No effective mechanism for bulk collection from non- domestic bulk generators.</p> <p>There is no fixed schedule for primary collection.</p>	<p>Strategy evolved for primary collection;</p> <p>Organized system for door to door/ kerb / block collection exists;</p> <p>No effective mechanism for bulk collection from non- domestic bulk generators.</p> <p>There is no fixed schedule for primary collection.</p>	<p>Strategy evolved for primary collection;</p> <p>Organized system for door to door/ kerb / block collection exists;</p> <p>Effective mechanism for bulk collection from non- domestic bulk generators;</p> <p>Fixed schedule for primary collection</p>	<p>The entire primary collection system works excellently. There is 100% primary collection and the collected items reach the destination without spillage at any point.</p> <p>The waste generators show high level of civic consciousness and no waste goes out of the collection mechanism.</p> <p>The collection staff are highly motivated and punctual.</p> <p>There is efficient monitoring and supervision mechanism for primary collection. There is effective mechanism for direct collection from bulk generators.</p> <p>There is fixed schedule for collection, prepared giving due care of the convenience of the waste generators.</p>	

<p><b>3. Street Sweeping &amp; drain Cleaning</b></p> <p>(i) Street Sweeping</p>	<p>No strategy and fixed schedule for street sweeping;</p> <p>Only major roads or dense commercial areas are attended-that too not properly done; by-roads either not cleaned or done once in a while;</p> <p>No mechanism for timely removal of dead animals/ birds.</p> <p>There are CLR workers for street sweeping but their adequacy and work turn over not assessed.</p>	<p>Strategy and schedule for street sweeping available but loosely followed;</p> <p>Most of the city streets are covered;</p> <p>Absence of quantitative and qualitative monitoring;</p> <p>Mechanism for removal of dead animals/birds exists;</p> <p>There are CLR workers for street sweeping but their adequacy not assessed but work turn over monitored.</p>	<p>Strategy evolved for street sweeping like daily coverage of dense commercial areas; sweeping on all days including Sundays in city centres and market areas; alternate day coverage of medium density and dense housing area; and weekly coverage (twice/once) in other areas;</p> <p>Workers provided with necessary tools and accessories;</p> <p>Mechanism for speedy removal of dead animals/birds exists</p> <p>ULB takes fair responsibility in monitoring day-to-day street sweeping activities;</p> <p>There are CLR workers for street sweeping but their adequacy not assessed but work turn over monitored.</p>	<p>Strategy evolved for street sweeping like daily coverage of dense commercial areas; sweeping on all days including Sundays in city centres and market areas; alternate day coverage of medium density and dense housing area; and weekly coverage (twice/once) in other areas;</p> <p>Workers provided with appropriate and modern tools and accessories;</p> <p>Mechanism for quick removal of dead animals/birds exists</p> <p>ULB takes keen responsibility in monitoring day-to-day street sweeping activities</p> <p>Street sweeping rationalized according to the ward maps, indicating specific area to be swept by each sweeper.</p> <p>ULB has introduced modern machineries like street sweeping machines which even remove the sand at the street sides that pose threat especially to two-wheeler users.</p>	
<p>(ii) Drain Cleaning</p>	<p>No strategy and fixed schedule for drain cleaning;</p> <p>Only drains of dense commercial areas are attended-that too not</p>	<p>Strategy and schedule for drain cleaning available for cleaning shallow drains (not deeper than 60 cm) but loosely followed;</p> <p>Drains are occasionally</p>	<p>There is strategy and operational schedule for drain cleaning, which includes attending urgent needs as well as periodic coverage of the entire shallow drainage system in</p>	<p>There is strategy and operational schedule for drain cleaning which includes attending urgent needs as well as periodic coverage of the entire shallow drainage system in the city(not deeper than 60</p>	

	<p>properly done;</p> <p>No mechanism for timely clearing of drain blockages; there are overflowing blocked drains;</p> <p>There are some CLR workers for drain cleaning but their adequacy not assessed.</p>	<p>cleaned following ad-hoc approach;</p> <p>Blockages are attended but generally delay is experienced;</p> <p>The adequacy of CLR workers for drain cleaning not assessed.</p>	<p>the city(not deeper than 60 cm);</p> <p>There is clear rationale for determining the frequency of cleaning the drains;</p> <p>There is an emergency redress system to attend clogged/ overflowing drains.</p> <p>There is separate schedule for pre-monsoon cleaning (or for locally specific/special occasions)</p> <p>Workers provided with tools and implements;</p> <p>ULB takes fair responsibility in monitoring the drain cleaning activities;</p> <p>There are CLR workers for drain cleaning but their adequacy not assessed but work turn over monitored.</p>	<p>cm);</p> <p>There is clear rationale for determining the frequency of cleaning the drains;</p> <p>There is an emergency redress system which acts very fast to clear clogged/overflowing drains. High quality professionalism and skills are demonstrated in attending emergency situations</p> <p>There is separate schedule for pre-monsoon cleaning (or for locally specific/special occasions);</p> <p>There is no much variation in implementing the routine work schedule;</p> <p>Workers provided with modern tools and implements; there is proper system for storage, upkeep and maintenance of the tools and equipments;</p> <p>ULB takes fair responsibility in monitoring the drain cleaning activities;</p> <p>There are sufficient CLR workers engaged based on adequacy assessment;</p> <p>Work turn over closely monitored.</p>	
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				There is some reward system for exemplary performances.	
<b>4. Secondary Waste Storage Depots and Transfer Stations</b>	<p>The right strategy for secondary collection (i.e., abolition of all open collection points by placing containers- separate containers for organic and inorganic waste) is absent.</p> <p>There are open collection points along the streets.</p> <p>Presently there are overflowing secondary collection containers.</p> <p>Periodic emptying of secondary storage is absent.</p>	<p>ULB has adopted the right strategy for secondary collection, i.e., abolition of all open collection points by placing containers- separate containers for organic and inorganic waste.</p> <p>ULB has placed community bins/dumper placer containers on roadsides and open places to deposit wastes collected from the doorstep as well as to facilitate the residents to drop their waste directly to the bins.</p> <p>However, there are open collection points here and there along the streets.</p> <p>Periodic emptying of secondary storage is practiced but there are places where secondary collection containers often overflow.</p>	<p>The ULB has a clear strategy for secondary collection whereby all open collection points are abolished by placing containers of suitable size and shape-separate for organic and inorganic.</p> <p>Timing for emptying the containers is conveniently fixed and the containers never overflow.</p> <p>An additional storage capacity of at least 30% is provided in order to avoid overflow of the containers.</p> <p>The system aims to meet 100% removal of waste generated.</p> <p>The ULB has a system for periodic valuation of user behavior and motivation of staff to ensure sustainable hygienic secondary storage.</p> <p>Facilities for secondary storage (container/ dumper container, dumper placer, container station etc) are available.</p> <p>Manual handling and multiple handling of wastes either do not exist or done with proper</p>	<p>The ULB has a clear strategy for secondary collection whereby all open collection points are abolished by placing containers of suitable size and shape-separate for organic and inorganic.</p> <p>Timing for emptying the containers is conveniently fixed and the containers never overflow.</p> <p>An additional storage capacity of at least 30% is provided in order to avoid overflow of the containers.</p> <p>The system aims to meet 100% removal of waste generated.</p> <p>The ULB has a system for periodic valuation of user behavior and motivation of staff to ensure sustainable hygienic secondary storage.</p> <p>Providing facilities for secondary storage (provision of container/ dumper container, dumper placer, container station etc) is the sole responsibility of the ULB.</p> <p>Direct transfer of waste from primary collection vehicle to containers.</p>	

			<p>safety precautions and care.</p> <p>Use of Personal Protection Equipments are used by the waste handlers</p>	<p>Secondary storage facilities are attended daily/as per the waste removal schedule framed as part of the strategy for secondary storage.</p> <p>Manual handling and multiple handling of wastes do not exist or done with proper safety precautions and care.</p> <p>Use of Personal Protection Equipments are used by the waste handlers</p> <p>The handling of waste at secondary collection points is highly hygienic and cost effective and adopts application of modern techniques.</p>	
<b>5. Transportation of waste</b>	<p>There is no scientific waste disposal system and hence transportation of waste is minimal. Waste collected is deposited at some convenient site.</p> <p>Primary collection vehicles and secondary collection vehicles are inadequate.</p> <p>There are some transportation vehicles, but these are not covered as required by law.</p> <p>There is spillage of waste during transportation.</p> <p>Route and timing of transportation has not</p>	<p>The ULB has a waste disposal system and transportation is a component of the entire waste management activity.</p> <p>There are adequate no of vehicles, but the adaptability and complementarities among them do not match.</p> <p>For waste transportation obsolete, uncovered vehicles are used after providing temporary covering.</p> <p>Measures to prevent spillage on transportation is taken for the old model uncovered vehicles.</p>	<p>There is a scientific waste disposal system and transportation is a component of the entire waste management activity.</p> <p>There are adequate no of vehicles, but the adaptability and complementarities among them generally match, which enables easy and trouble free handling of waste.</p> <p>The ULB is in the process of phasing out obsolete vehicles with modern covered vehicles.</p> <p>Waste transportation is considered as an important</p>	<p>There is a scientific waste disposal system and transportation is one of the many components of the entire activity.</p> <p>There are adequate no of vehicles, small and large, matching each other, optimally used as per requirements. Thus handling of waste is easy and trouble free.</p> <p>The ULB has phased out old type uncovered vehicles with modern covered hi-tech vehicles.</p> <p>Waste transportation is considered as an important activity and is supplemented and</p>	

	<p>considered the convenience of the people.</p> <p>The staff of transportation vehicles are not properly oriented for safe handling of waste.</p>	<p>The convenience of people is duly taken care of for deciding the route and timing for transportation of waste.</p> <p>The staff of transportation vehicles are oriented on safe handling of waste.</p>	<p>activity and is supplemented and supported with application of management tools like GIS/GPS.</p> <p>There is fairly good schedule for transportation designed for the convenience of the people. For deciding route and timing of transportation, economic factors and general convenience are considered.</p> <p>Measures to prevent spillage on transportation are taken wherever old model vehicles are used.</p> <p>The staff of transportation vehicles are oriented on safe handling of waste.</p>	<p>supported with application of management tools like GIS/GPS. There is an effective system for tracking/monitoring transportation of waste .</p> <p>The schedule for transportation is designed to ideally suit to all concerned especially the people. For deciding route and timing of transportation, economic factors, convenience of people and optimum use of the vehicles are considered.</p> <p>There is no spillage on transportation.</p> <p>The staff of transportation vehicles are oriented on safe handling of waste. The capacity building package includes safe transportation and handling of waste as well as orientation on health of transportation staff.</p>	
<b>6. Treatment</b>	<p>There is no scientific waste disposal system; waste disposal is ad hoc; waste is dumped at one or many vacant places in and around the city;</p> <p>Organic waste cause major hygienic and environmental problems.</p> <p>There is no segregation and resource recovery;</p>	<p>There is no scientific waste disposal system but waste is subjected to some crude treatment like burying in pits at the dumping yard; a little bit of separation and sale of reusable items;</p> <p>Organic waste causes some hygienic and environmental problems, but not a major problem.</p>	<p>The ULB practices scientific integrated waste management system; there is proper segregation ; reusable items go to separate channels and bio-degradable waste is scientifically treated; waste is considered not as a menace but a resource capable to produce wealth;</p> <p>Organic waste not allowed creating hygienic and</p>	<p>There exists proven scientific integrated waste management system; there is proper source segregation ; reusable/recyclable items go to separate channel; bio-degradable waste is scientifically treated; ULB has scientific disposal/treatment options for medical and hazardous waste; waste is wealth to the ULB;</p> <p>There is no hygienic and</p>	

	<p>Basic treatment facilities like composting, vermin-composting, biomethanation are either non-existent or quite inadequate.</p> <p>ULB is unaware of modern treatment options and has not taken serious initiatives to learn modern methods.</p>	<p>Segregation and resource recovery is existing, but not systematic, not based on any strategy;</p> <p>ULB has taken some efforts to provide basic treatment facilities like composting, vermi-composting, biomethanation etc but needs major qualitative and quantitative improvement.</p> <p>ULB is taking efforts to learn best practices and modern treatment options</p>	<p>environmental problems.</p> <p>Resource recovery is existing, there is clear strategy for recycling and reuse;</p> <p>ULB has established modern treatment facilities like windrow composting, vermi-composting, biomethanation etc and there is resource recovery in the form of compost, biogas and RDF.</p> <p>ULB is generally aware of contemporary technologies in waste management and is keen to learn best practices and modern treatment options practiced elsewhere</p>	<p>environmental problems caused by any kind of waste;</p> <p>Resource recovery is maximum tapped; there is clear strategy for recycle/reuse/ recovery;</p> <p>ULB is aware of all the modern technology options and clearly understands the best options suited for it; has established modern treatment facilities like windrow composting, vermi-composting, biomethanation etc; ULB has established facilities/set up alliances for resource recovery like compost, biogas, RDF etc; a model for other ULBs</p> <p>ULB is aware of contemporary technologies in waste management and is keen and sensitive to best practices and technological advancements; in a position to support other ULBs in introducing integrated SWM.</p>	
<b>7.Recycling/ Reuse/Recovery</b>	<p>There is no much of recycling or reuse of solid waste, but collection of reusable items by rag pickers may be available;</p> <p>ULB has not taken very little or no initiatives for recycle/ reuse/ recovery</p> <p>Recyclable/reusable items go to the landfill</p>	<p>There is some recycling or reuse of solid waste; ULB is encouraging source segregation with the intention of recycle/ reuse of waste.</p> <p>ULB has taken some action to encourage recycling/ reuse/ recovery.</p> <p>Most of the</p>	<p>ULB is insisting source segregation with the intention of recycle/reuse of waste;</p> <p>Most of the recyclable/ reusable items do not go to the landfill, instead these are routed to reuse channels and constitute a source of wealth;</p> <p>ULB has encouraged vendors to deal with these</p>	<p>ULB is insisting and ensuring source segregation with the intention of recycle/reuse of waste;</p> <p>All the recyclable/ reusable items are put to use/reuse and do not go to the landfill, These are considered as a source of wealth;</p> <p>ULB has encouraged vendors to</p>	

	<p>site/dumping site.</p>	<p>recyclable/reusable items go to the landfill site/ dumping site.</p> <p>There is a strong need to upgrade and reorganize the recycling system, to increase effectiveness of the waste collection and recycling, and to improve the working conditions of rag pickers</p>	<p>items; taken initiatives to set up recycling units under private or public sector. The compost plant includes a RDF unit.</p> <p>The ULB has a strategy for recycle/reuse encompassing upgrading and reorganizing the recycling system, increasing effectiveness of the waste collection and recycling, improving the working conditions for rag pickers/vendors and creating supportive infrastructure for promoting recycle/reuse of waste</p>	<p>deal with these items and also taken initiatives to set up recycling units under private or public sector. ULB has set up/supported setting up of RDF units.</p> <p>ULB has a strategy for recycle/reuse/recovery encompassing reorganizing the recycling system, upgrading in line with technological advancements, increasing effectiveness of the waste collection and recycling, improving the working conditions of rag pickers/vendors and creating supportive infrastructure for promoting recycle/reuse of waste.</p> <p>For the ULB, waste recycling possesses untapped potential that can benefit the society and is committed to perform this function directly or through competent agencies in the public or private sector.</p> <p>The ULB takes proactive steps like ban on use of non-recyclable plastics or encouraging use of reusable/recyclable items.</p>	
<b>8.Final Disposal</b>	<p>There is no scientific waste disposal system; waste disposal is ad hoc; solid waste is deposited in open dumps or in pits at the dumping ground or waste is dumped at one or many vacant places in and</p>	<p>There is some efforts taken by the ULB to introduce scientific waste disposal system as provided in the MSW (M&amp;H) Rules, 2000; There is facilities like compost plant, landfill facility etc but day-to-day operation</p>	<p>Very good efforts taken by the ULB to introduce scientific waste disposal system in line with the MSW (M&amp;H) Rules, 2000;</p> <p>There are facilities like compost plant, landfill etc</p>	<p>Excellent system for SWM existing;</p> <p>Locally suited technological options introduced based on validation of all available technology options with locality specific variations.</p>	

	<p>around the city;</p> <p>No or minimal treatment of organic fraction of waste;</p> <p>The ULB has not seriously thought of the importance of having a long-term disposal strategy including windrow composting and engineered sanitary landfill.</p>	<p>and management needs improvement. Proper leachate treatment at landfill not available; Quality of compost needs improvement.</p> <p>The strategy for final disposal is minimizing load on landfills and hence only the rejects and degraded waste go to the landfill. Recyclable/reusable items go to the usable channels.</p> <p>The ULB has understood the importance of having a long-term integrated waste management strategy which includes.</p>	<p>which are efficiently operated and well maintained. Quality of compost is fairly good;</p> <p>Effective leachate treatment at landfill;</p> <p>The ULB has evolved integrated waste management strategy with reuse plans for all reusable items, minimizing load on landfill and strengthening community capacity etc.</p> <p>The ULB has clear understanding of the importance of having a long-term integrated waste management strategy and the annual plans reflect its commitment for effective waste management.</p>	<p>Adequate facilities exist to cater to the present needs; setting up of facilities has taken care of future needs; facilities are efficiently operated and well maintained.</p> <p>No/least minimum environmental problem at every stage. Effective leachate treatment at landfill; Quality of products ensured.</p> <p>The ULB has evolved integrated waste management strategy encompassing every aspect of waste management like adoption of the 4R concept (reduce, reuse, recycle and recover the waste), storage and segregation at source, proximity theory of SWM, which is scientific disposal of waste at the nearest point of source (E.g., biogas plant at a market; composting at households etc.), adoption of proven technologies; encouraging indigenous initiatives; legislation for complementing and sustaining the initiatives, creating and vitalizing institutional support systems, implementation of an ongoing IEC plan to sustain the achievements etc.</p>	
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<b>Part B: Organizational Aspects affecting Solid Waste Management</b>					
<b>Area for Capacity Assessment</b>	<b>1 Clear need for increased capacity</b>	<b>2 Basic level of capacity in place</b>	<b>3 Moderate level of capacity in place</b>	<b>4 High level of capacity in place</b>	<b>Rating</b>
<b>1. Strategy</b>					
<b>Overall Strategy</b>	<p>For SWM, overall strategy for integrated solid waste management is either nonexistent, unclear or incoherent- what is available is largely a set of scattered initiatives;</p> <p>Strategy has no influence over day to day behavior</p>	<p>Strategy exists for integrated solid waste management but is either not clearly linked to goals or lacks coherence or is not easily actionable;</p> <p>Strategy is not broadly known and has limited influence over day to day activities</p>	<p>Coherent strategy for integrated solid waste management has been developed and is linked to goals and related activities but is not fully ready to be acted upon;</p> <p>Strategy is mostly known and day to day activities is partly driven by it</p>	<p>ULB has clear, coherent medium to long term SWM strategy that is both actionable and linked to goals;</p> <p>Strategy is broadly known and consistently helps to drive day to day activities</p>	
<b>Goals, performance targets</b>	<p>Targets for SWM are nonexistent or few;</p> <p>Targets are vague, or confusing, or either too easy or impossible to achieve;</p> <p>Targets not clearly linked to aspirations &amp; strategy and may change from year to year;</p> <p>Targets largely unknown to or ignored by staff</p>	<p>Realistic targets for SWM exist in some key areas, and are mostly aligned with aspirations and strategy;</p> <p>May lack aggressiveness, or be short term, lack milestones or mostly focuses on "inputs" (things to do right) or often renegotiated;</p> <p>Staff may or may not know and adopt targets</p>	<p>Quantified aggressive targets for SWM exist; linked to aspirations and strategy;</p> <p>Mainly focused on "outputs/ outcomes" (results of doing things right) with some "inputs" typically multiyear targets, though may lack milestones;</p> <p>Targets are known and adopted by most staff who usually use them to broadly guide work</p>	<p>Limited set of quantified, genuinely demanding performance targets in all areas of SWM;</p> <p>Targets are tightly linked to aspirations and strategy, output/ outcome focused (i.e. results of doing things right, as opposed to inputs, things to do right)</p> <p>Have annual milestones, and are long term nature;</p> <p>Staff consistently adopts targets and works diligently to achieve them</p>	

**2. Organizational Skills**

**2.1 Performance Management**

<p><b>Performance Measurement</b></p>	<p>Very limited measurement &amp; tracking of performance;</p> <p>All or most evaluations based on anecdotal evidence;</p> <p>ULB collects some data on activities and outputs (e.g., number of houses covered/ streets swept etc) but has no impact measurement (measurement of outcomes, e.g., segregated storage improved, reusable items put to reuse etc)</p> <p>Few external performance comparisons made; internal performance data rarely used to improve SWM activities</p>	<p>Performance partially measured &amp; progress tracked;</p> <p>ULB regularly collects data on activities and outputs but lacks data-driven, externally validated impact measurement</p> <p>Some efforts made to benchmark SWM activities and outcomes against outside world;</p> <p>Internal performance data used occasionally to improve SWM activities</p>	<p>Performance measured &amp; progress tracked in multiple ways, several times a year, considering social, financial, organizational and environmental impact of program and activities; multiplicity of performance indicators; social and environmental impact measured</p> <p>Effective internal and external benchmarking occurs but driven largely by top management and/or confined to selected areas;</p> <p>Learnings distributed throughout organization and often used to make adjustments and improvements in SWM activities</p>	<p>Well-developed comprehensive, integrated system used for measuring ULB's performance and progress on continual basis, including social, financial, organizational and environmental impact of program and activities;</p> <p>Small number of clear measurable and meaningful key performance indicators;</p> <p>Social and environmental impact measured based on longitudinal studies performed or supervised by third party experts</p> <p>There are comprehensive internal and external benchmarking of the SWM activities; these are used by staff in target-setting and for rating of operations;</p> <p>Systematic practice of making adjustments and improvements on the basis of benchmarking</p>	
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<b>2.2 Planning</b>					
<b>Operational Planning</b>	ULB runs SWM operations purely on day to day basis with no short or long term planning activities; no experience in operational planning	Some ability and tendency to develop high level operational plan either internally or via external assistance; operational plan loosely or not linked to strategic planning activities and used roughly to guide operations	Ability and tendency to develop and refine concrete, realistic operational plan;  Some internal expertise in operational planning or access to relevant external assistance;  Operational planning carried out on a near regular basis;	ULB develops and refines concrete, realistic and detailed operational plan;  Has adequate internal expertise in operational planning or efficiently uses external, sustainable, highly qualified resources;  Operational planning exercise carried out regularly;	
<b>2.3 External Relationship Building and Management</b>					
<b>Partnerships and alliances development and nurturing</b>	In SWM, there is very limited use of partnerships and alliances with public sector, private sector or NGO/CBO	Early stages of building relationships and collaborating with other public / private sector or non-governmental entities	Effectively built and leveraged some key relationships with few types of relevant parties ( public /private or non-governmental entities);  Some relations may be precarious or not fully “win-win”	Built, leveraged, and maintained strong, high impact relations with variety of relevant parties;  Relationships deeply anchored in stable, long term, mutually beneficial collaboration	
<b>2.4 Other Organizational Skills</b>					
<b>Capacity development</b>	ULB makes no or limited initiatives for capacity building different actors of SWM	ULB takes opportunities for capacity building when need arises	ULB considers capacity building useful and actively seeks opportunities for capacity development of all categories of persons engaged in SWM	ULB is fully aware of power of capacity building activities and continually and actively engages in them.  There is a capacity building plan with clear objectives.  There is an internal system for capacity building and also make	

				efficient use of highly qualified external resources for capacity building.	
<b>3. Human Resources</b>					
<b>(i) Staffing Levels</b>	Many positions within and peripheral to ULB (e.g. ULB staff, field workers, plant operators, drivers, mechanical staff etc) are unfilled, inadequately filled, or experience high turnover and/or poor attendance	Most critical positions within and peripheral to ULB are staffed (no vacancies), and/or experience limited turnover or attendance problems	Positions within and peripheral to ULB are almost staffed (no vacancies);  Few turnover or attendance problems	Positions within and peripheral to ULB are all fully staffed (no vacancies);  No turnover or attendance problems	
<b>(ii) SWM Top Management Team</b>	Possess limited knowledge and expertise; little or not relevant experience; low commitment to success of SWM;  Provide little direction and support to the implementing team;  Not fully informed about different spheres of SWM and organizational matters;	Some knowledge and expertise; moderate commitment to success; There are well-planned regular, purposeful meetings;  Provide occasional direction and support to the implementing team;  informed about different spheres of SWM and organizational matters in a timely manner and responses/decisions actively solicited	Good knowledge and expertise; good commitment to success;  There are well planned purposeful meetings  Provide direction and support to the implementing team  Fully informed of all matters and inputs  Field level responses actively sought and valued;  Full participation in major decisions	Very good knowledge and expertise including functional related expertise; high willingness in learning about the SWM activities and addressing its issues;  Outstanding commitment to the success of effective implementation;  Frequent meetings for review and decision making  Provide strong direction and support to the implementing team  Communication with field level workers and leaders reflects mutual respect, appreciation for roles & responsibilities, shared commitment & valuing of collective wisdom	

<b>4. Systems &amp; Infrastructure</b>					
<b>4.1. Systems</b>					
<b>(i) Planning systems</b>	Planning happens on an ad hoc basis only and is not supported by systematically collected data	Planning done regularly and uses some systematically collected data	Regular planning complemented by ad hoc planning when needed; some data collected and used systematically to support planning effort and improve it	Regular planning complemented by ad hoc planning when needed; clear, formal systems for data collection in all relevant areas; data used systematically to support planning effort and improve it	
<b>(ii) Decision making framework</b>	Decisions made largely on an ad hoc basis; highly informal	Appropriate decision makers known;  Decision making process fairly well established and process is generally followed, but often breaks down and becomes informal	Clear, largely formal lines/systems for decision making but decisions are not always appropriately implemented or followed;  Dissemination of decisions generally good but could be improved	There exists clear, formal lines/systems for decision making exist along with dissemination/interpretation of decision, which are known to all	
<b>(iii) Financial operations management</b>	Financial activities on an ad hoc basis; not fully transparent; lacks clarity and consistency in record keeping and documentation; does not include checks and balances	Financial activities transparent, clearly and consistently recorded and documented, include appropriate checks and balances	Formal internal controls governing all financial operations; fully tracked, supported and reported	Robust systems and controls in place governing all financial operations and their integration with budgeting decision making, and organizational objectives, strategic goals	
<b>(iv) HR Management-incentives</b>	No incentive system to speak of; or incentive system that is ineffective and/or generates bad will	Some basic elements of incentive system in place; may include one of following: competitive salary (possibly partly performance based), attractive career development options, or	Many elements of incentive system in place; includes a few of following: competitive salary (partly performance based), attractive career development options, opportunities for leadership	Well designed, clear and well accepted incentive system; includes competitive salary (partly performance based) , attractive career development options, opportunities for leadership and entrepreneurship; system	

		opportunities for leadership & entrepreneurship; some evidence of motivational effect on staff performance	and entrepreneurship; obvious effect in motivating staff to over deliver	effective in motivating staff to over-deliver in their job	
<b>(v) Knowledge management</b>	No formal systems to capture and document internal knowledge	Systems exist in a few areas but either are not user friendly or not comprehensive enough to have an impact; systems known by only a few people, or only occasionally used	Well designed, user friendly systems in some areas; not fully comprehensive; systems are known by many people within the organization and often used	Well designed, user friendly, comprehensive systems to capture, document and disseminate knowledge internally in all relevant areas; all staff is aware of systems, knowledgeable in their use and make frequent use of them	
<b>4.2. Infrastructure</b>					
<b>(i) Physical Infrastructure- building &amp; office space</b>	Inadequate physical infrastructure, resulting in loss of effectiveness & efficiency (e.g., obsolete plant/machinery/ vehicles, insufficient workspace etc)	Physical infrastructure can be made to work well enough to suit most important and immediate needs;  A number of improvements could greatly help increase effectiveness and efficiency (e.g., sufficient workspace, modern machinery/ vehicles, facilities at work space etc)	Fully adequate physical infrastructure for the current needs; infrastructure does not impede effectiveness & efficiency (e.g. sufficient workspace, modern equipments and vehicles, full-fledged processing plant with adequate facilities)	Physical infrastructure well tailored to current & anticipated future needs in SWM;  Infrastructure well designed and thought out to enhance efficiency & effectiveness (e.g., introduction of user friendly equipments, modernization of machinery etc increase efficiency)	
<b>(ii) Technological Infrastructure- web site</b>	ULB has no individual web site or call centre or grievance redress mechanism	Basic web site containing general information but little information on current developments; website maintenance is a burden and performed only occasionally  Call centre and grievance redress mechanism existing	Comprehensive web site containing basic information on ULB as well as up to date latest developments; most information is ULB specific; regularly maintained and updated with useful information; there is idea exchange forum.	Sophisticated, comprehensive and interactive web site, regularly maintained and kept up to date on latest information on SWM; praised for its user friendliness and depth of information; includes links to related organizations and useful resources	

		but not upto the mark	Call centre and grievance redress mechanism is generally satisfactory.	Call centre and grievance redress mechanism is prompt and efficient	
<b>5. Organizational Structure</b>					
<b>(i) Governance</b>	<p>SWM is considered to be the collective responsibility of the SWM team.</p> <p>There are no individual targets and responsibilities. The ULB Council does not set performance targets and hold Division head accountable or does not operate according to formal procedures.</p>	<p>Council reviews activities and occasionally sets organizational direction and targets, but does not make regular review of individual and collective performance, monitor potential conflicts of interest</p>	<p>There is role clarity and the system functions well;</p> <p>Council reviews individual and collective performance; Council defines performance targets and actively encourages Division head to meet targets;</p> <p>There is annual review of performance of key players, but board not prepared to hire or fire the top players;</p> <p>ULB generally cushions external pressures, but for the staff there are occasional left-alone feelings</p>	<p>Every player work well together from clear roles;</p> <p>Council actively defines performance targets and holds Division head fully accountable;</p> <p>Council reviews performance and is prepared to hire or fire top players if necessary;</p> <p>ULB encourages staff to withstand external pressures</p>	
<b>(ii) Organization design</b>	<p>Organization entities (e.g., headquarters, zonal &amp; local offices) are not designed, and roles, responsibilities of entities are neither formalized nor clear;</p>	<p>Organizational entities are defined and their roles and responsibilities are formalized but may not reflect organizational realities;</p>	<p>Organizational entities are clearly defined;</p> <p>All roles &amp; responsibilities of organizational entities are formalized and reflect organizational realities;</p>	<p>Roles &amp; responsibilities of all organizational entities are formalized, clear and complement each other;</p> <p>Organizational chart is complete and reflects current reality</p>	

	Absence of organizational chart	Organization chart is incomplete and may be outdated	Organization chart is complete but may be outdated		
<b>(iii) Inter-function coordination</b>	Different programs (other similar programmes of the ULB or other agencies) and organizational units (health, engineering, finance etc) function independently with little or dysfunctional coordination between them	Interactions between different programmes and organizational units are generally good, though coordination issues do exist;  Some pooling of resources	All programs and units function together effectively with sharing of information and resources;  Few coordination issues	Constant and seamless integration between different programs and organizational units with few coordination issues;  Relationships are dictated by organizational needs (rather than hierarchy or politics)	
<b>(iv) Individual job design</b>	Positions do not exist to address a number of key roles;  Unclear roles & responsibilities with many overlaps;  Job descriptions do not exist	Positions exist for most key roles, with a few till missing;  Most key positions are well defined and have job descriptions; some unclear accountabilities or overlap in roles & responsibilities;  Job descriptions tend to be static	All key roles have associated positions (e.g., mechanical engineer for taking care of vehicles, machinery and equipments, social expert for community mobilization and capacity building etc);  Most individuals have well defined roles with clear activities and reporting relationships and minimal overlaps;  Job descriptions are continuously being redefined to allow for organizational development and individuals' growth within their jobs	All roles have associated dedicated positions;  All individuals have clearly defined core roles which must be achieved and an area of discretion where they can show initiative and try to make a difference; core roles are defined in terms of end services rather than activities;  Individuals have the ability to define their own activities and are empowered to continuously reexamine their jobs	

## ANNEXURE 2

### SCHEDULE OF TRAINING FOR MUNICIPAL SOLID WASTE MANAGEMENT

#### Part A: Long Duration Training Programme

Pursuant to 74<sup>th</sup> Amendment of the Constitution of India, municipal solid waste management is a subject of the ULBs. ULBs have designated employees, who are responsible for the solid waste management. Besides, there will be a Standing Committee in the ULB primarily responsible for Municipal Solid Waste Management (MSWM). The dynamics of MSWM are myriad, challenges numerous and its kinetic forces multifaceted. For effective management of municipal solid waste, proper capacity building of officers and elected representatives is most essential. In order to capacitate the officers and elected representatives who directly supervise or deal with solid waste management, a 10-days training programme has been developed as part of the CoE activities. This training programme broadly covers the following major areas and each major area has been divided into different topics and a training module has been prepared accordingly. The following table shows the major areas and the different topics covered under each of these areas:

No	Major Area	Topics under each Major Area
1.	The background - Understanding Solid Waste and Solid Waste Management	<ul style="list-style-type: none"><li>• SWM Scenario in India</li><li>• Solid Wastes-An Overview</li></ul>
2.	SWM-Basic Activities	<ul style="list-style-type: none"><li>• Waste Stream Assessment</li><li>• Collection &amp; Storage, Transfer Stations</li><li>• Purpose of Processing, Mechanical Volume and Size Reduction, Component Separation</li><li>• Screening, Drying and Dewatering</li><li>• Source Reduction, Recycling</li><li>• Record Keeping and Documentation</li></ul>
3.	SWM-Special Focus Areas	<ul style="list-style-type: none"><li>• Bio-medical waste management</li><li>• Hazardous waste management</li><li>• Slaughterhouse Waste management</li></ul>
4.	Legal Framework and Related matters	<ul style="list-style-type: none"><li>• Municipal Solid Waste (Management &amp; Handling) Rules, 2000</li><li>• Kerala Municipality Act or similar Acts of other State Governments</li><li>• By-laws for MSWM</li><li>• Challenges in the SWM in India</li><li>• Causes for Non-compliance of Rules</li></ul>

		<ul style="list-style-type: none"> <li>• Steps for improving SWM</li> </ul>
5.	Technology Options for SWM	<ul style="list-style-type: none"> <li>• Composting</li> <li>• Windrow Composting</li> <li>• Aerated Static pile composting</li> <li>• In-vessel composting</li> <li>• Anaerobic composting</li> <li>• Vermi Composting</li> <li>• Biomethanation</li> <li>• Incineration</li> <li>• Pelletization/Refuse Derived fuel system</li> <li>• Pyrolysis and Gasification</li> <li>• Plasma Pyrolysis</li> <li>• Sanitary landfill</li> <li>• Recycling of MSW</li> <li>• Reuse of MSW</li> </ul>
6.	Technical Aspects	<ul style="list-style-type: none"> <li>• S W M Plant Design</li> <li>• Engineered Sanitary Landfill Design</li> <li>• Designing a Modern Slaughterhouse</li> <li>• Designing Leachate Treatment Plant at Landfill Site</li> <li>• Energy Management in SWM Plants</li> </ul>
7.	Strategy and Framework for Integrated Solid Waste Management	<ul style="list-style-type: none"> <li>• Segregation and Storage</li> <li>• Primary Collection</li> <li>• Street sweeping</li> <li>• Secondary Collection</li> <li>• Direct Collection</li> <li>• Transportation</li> <li>• Treatment</li> <li>• Landfill/Final disposal</li> <li>• Role of NGOs/CBOs</li> <li>• Capacity building and implementation</li> <li>• Integrated Waste Management</li> </ul>
8.	Related topics	<ul style="list-style-type: none"> <li>• Social Entrepreneurship in SWM</li> <li>• Health Linkages in SWM</li> <li>• GIS Networking</li> <li>• GHG Emission from Waste</li> <li>• Carbon Emission Trading Potential from Wastes</li> </ul>

A typical course module covering the above subjects is given below, which could be suitably modified to go well with the local conditions of the ULB where the training is conducted. Field visits have potential strength to facilitate easy understanding of complicated technicalities and the social dynamics of different activities. Hence field studies/visits should be arranged to the maximum extent possible. If field visits are impossible due to absence of facilities, video show capturing the entire activities in detail could be arranged.

<b>TYPICAL COURSE MODULE FOR 12-DAYS TRAINING ON SOLID WASTE MANAGEMENT</b>		
<b>Day</b>	<b>Topics Covered</b>	<b>Time requirement</b>
Day 1	SWM Scenario in India	1 1/2 hours
	<ul style="list-style-type: none"> <li>• Solid Wastes: Classification, Waste Generation and Composition</li> <li>• Characteristics of Municipal Solid Waste (Physical &amp; Chemical Characteristics)</li> </ul>	1 hour
	Legal Framework: <ul style="list-style-type: none"> <li>• Municipal Solid Waste (Management &amp; Handling) Rules, 2000</li> <li>• Kerala Municipality Act or similar Acts of other States</li> <li>• By-laws for MSWM</li> </ul>	2 hours
Day 2	Recap of Day 1	1/2 hour
	Waste Stream Assessment	1 1/2 hours
	Collection & Storage Transfer Stations Purpose of Processing	1 1/2 hours
	Mechanical Volume and Size Reduction Component Separation Screening	1 1/2 hours
Day 3	Recap of Day 2	1/2 hour
	Drying and Dewatering Source Reduction Recycling Record Keeping and Documentation	1 1/2 hours
	Challenges in Solid Waste Management in India Causes for Non-compliance of Rules	1 1/2 hours
	Steps for Improving Solid Waste Management	1 hour
	Recap of Day 3	1/2 hour
Day 4	Technology Options for Municipal Solid Waste Management: Composting, Windrow Composting, Aerated Static pile composting, In-vessel composting, Anaerobic composting, Vermi Composting	2 hours
	Technology Options for Municipal Solid Waste Management:	2 hours

	Biomethanation, Incineration and energy recovery, Pelletization/Refuse Derived fuel system, Pyrolysis and Gasification, Plasma Pyrolysis	
	Technology Options for Municipal Solid Waste Management: Sanitary Landfill	1 hour
Day 5	Recap of Day 4	1/2 hour
	Recycling of Municipal Solid Waste Reuse of Municipal Solid Waste	1 hour
	Energy Management in Solid Waste Management Plants	1 1/2 hours
	SWM-Case Study Presentation	2 hours
Day 6	Recap of Day 5	1/2 hour
	S W M Plant Design, Engineered Sanitary Landfill Design	2 hours
	Field Visit to Windrow Composting Plant (or video show on windrow composting plant operations)	2-4 hours
Day 7	Recap of Day 6	1/2 hour
	Leachate Treatment Plant design	1 1/2 hours
	Hazardous Waste Management	1 1/2 hours
	Field Visit-Vermi composting (or video show on vermin-compost plant )	2-4 hours
Day 8	Recap of Day 7	1/2 hour
	Bio-medical Waste Management	1 1/2 hours
	Field Visit to bio gas plant or video show on functioning of biogas plant	2-4 hours
Day 9	Field Visit-slaughterhouse or video show on modern slaughterhouse	1-2 hours
	Slaughterhouse Waste Management	1 1/2 hours
	Design of Slaughterhouse	1 1/2 hours
	Recap of Day 8	1/2 hour
Day 10	Recap of day 9	1/2 hour
	Social Entrepreneurship in Solid Waste Management	1 hour
	GHG Emission from Waste	3/4 hours
	GIS Networking for MSWM	3/4 hours
	Health Linkages in SWM	1 hour
	Carbon Emission Trading Potential from Wastes	1 hour
Day 11	Recap of day 10	1/2 hour
	Exposure visit or video show on waste-transportation vehicles/road sweeping machines	2-4 hours
	Institutional Mechanism for Municipal Solid Waste Management	1 hour
Day 12	Strategy and Framework for Integrated Solid Waste Management	2 hours
	General Discussion	1 hour
	Evaluation, Feedback, Conclusion	1 hour

## PART B: SHORT DURATION PROGRAMMES

Apart from the staff who are directly engaged on a day-to-day basis in MSWM, there are other parties whose role cannot be undermined in achieving effective waste management. They constitute elected representatives, officers and other staff, field workers, staff of the SWM plant, NGOs/CBOs and even the waste generators. Adequate capacity building to enable them play effective and timely role is critical. Hence their capacity building has to be properly addressed. The following trainings will help to address the initial training requirements. In the long run, appropriate trainings have to be provided on the strength of findings of some need assessment exercises.

### Short Term Initial Training Programmes

Target Group	Area covered in brief	Duration	Topics
Elected Representatives- Group 1  (Mayor/Chairman, Dy Mayor/Vice Chairman, Standing Committee Chairman in charge of SWM)	General Orientation on : 1. Solid Waste Management- Technical, Institutional, Financial and legal aspects	1 day	Technical Aspects: (i) 4 R Concept-Reduce, reuse, recover, recycle (ii) Technology Options for SWM (a) Composting (b) Bio methanation (c) ) Vermi composting (d) Incineration (e) Pyrolysis (f) Landfill (g) Leachate Treatment  Institutional Aspects: (i) Collection & Storage (ii) Transportation (iii) Transfer Stations (iv) NGOs/CBOs  Financial Aspects: (i) Budgeting for SWM (ii) Cost recovery for SWM services  Legal Aspects: (i) MSW(M&H) Rules, 2000 (ii) MSWM in Kerala Municipalities Act (iii) Byelaw
	2. Mobilization for Action, Human Resource Development	1 day	(i) Interactive process for Strategic thinking (by communities, NGOs, professionals & ULB) to prioritize SWM issues and to identify resources to address them.  (ii) Interactive process for improving the efficiency, effectiveness and the performance of local SWM systems.

			(iii) Steps for Improving SWM
Elected Representatives-Group 2  (All elected representatives except those mentioned above)	General Orientation on Solid Waste Management	1 day	(i) SWM Scenario in India (ii) Solid Wastes-Overview (iii) Collection, Storage, Transfer Stations, Transportation (iv) Technology Options for SWM (v) Challenges in the SWM in India (vi) Causes for Non-compliance of Rules (vii) Steps for Improving SWM
Senior Officers  (Secretary, Engineer/s, Division Heads)	General Orientation on  1. SWM Plan Preparation and Implementation including technical & technological aspects	1 day	(i) Need for Planning-present inadequacies and shortfalls. (ii) How to prepare an SWM Plan (preliminaries like quantitative and qualitative survey of solid wastes, Identification of technology options, community mobilization, facilitating alliances (iii) Implementation of SWM Plan (iv) Different technology options (v) Role of different players
	2. Financial Management	1 day	(i) Budgeting for SWM (ii) Cost recovery for SWM services
	3. Legal Policy aspects	1 day	(i) MSW(M&H) Rules, 2000 (ii) MSWM in Kerala Municipalities Act
	4. Monitoring & Evaluation	1 day	(i) What is Monitoring? (ii) What is Evaluation? (iii) Record keeping and Documentation (iv) Importance of Monitoring & Evaluation (v) Monitoring Tools
	5. Human Resource Management for SWM	1 day	(i) Human resource for SWM-Capacity Assessment (ii) Human Resource Development for SWM (developing personal and organizational skills, knowledge, and abilities of staff; opportunities for employee training, employee career development, performance development, coaching, mentoring, succession planning, key employee identification etc )

			(iii) Human Resource Management System for SWM (payroll, work time, benefits, recruiting, training, performance record, service data record etc)
Field Workers	<ol style="list-style-type: none"> <li>1. Orientation on Effective Collection, Segregation and Transportation of Solid Waste</li> <li>2. Orientation on Health and Hygiene Aspects of waste handling</li> </ol>	1 day each	<ol style="list-style-type: none"> <li>(i) Different Types of MSW</li> <li>(ii) Handling of Hazardous/dangerous items</li> <li>(iii) Primary Collection and Transportation</li> <li>(iv) Tips for effective collection and transportation</li> <li>(i) Health and safety aspects</li> <li>(ii) Safe handling of MSW</li> <li>(iii) Health Risks of Collection Staff</li> <li>(iv) Precautions against Health Risks</li> </ol>
Workers of Windrow Composting Plant	<ol style="list-style-type: none"> <li>1. Operation and maintenance of Compost Plant</li> <li>2. Orientation on Health and Safety Aspects of waste handling</li> </ol>	<p>2 days</p> <p>1 day</p>	<ol style="list-style-type: none"> <li>i. Different Types of MSW</li> <li>ii. Handling of Hazardous/dangerous items</li> <li>iii. Composting Process</li> <li>iv. Management of Rejects</li> <li>v. Packing and sales of Compost</li> <li>vi. Machineries in Compost Plant-Operation and maintenance</li> <li>i. Health Risks of Collection Staff</li> <li>ii. Precautions against Health Risks</li> </ol>
NGOs/CBOs/Residents' Associations	Role of NGOs in SWM	1 day	<ol style="list-style-type: none"> <li>i. Role of NGOs in Community Capacity Building</li> <li>ii. Role of NGOs in decentralized SWM</li> </ol>
Waste generators	Importance of Segregation and Storage	Through IEC	

When planning for a capacity building programme, ULBs could modify the above training schedule to suit local conditions based on an Initial Training Need Assessment.