*Training Need Assessment Report*

# Solid Waste Management (SWM) Learning Program in India

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## Abbreviations Used

| | |
|---|---|
| AIILSG | All India Institute of Local Self Government |
| ASSOCHAM | Associated Chambers of Commerce and Industry of India |
| CEE | Centre for Environment Education |
| CII | Confederation of Indian Industries |
| CPCB | Central Pollution Control Board |
| CPHEEO | Central Public Health and Environmental Engineering Organization |
| HSMD | Hazardous Substance Management Division |
| HSMI | Human Settlement Management Institute |
| HUDCO | Housing & Urban Development Corporation |
| IPE | Infrastructure Professional Enterprise (P) Ltd. |
| JICA | Japanese International Cooperation Agency |
| MNES | Ministry of Non-conventional Energy Sources |
| MoEF | Ministry of Environment & Forests, Government of India |
| MoUD | Ministry of Urban Development & Poverty Alleviation, GoI |
| MSW | Municipal Solid Waste |
| MSWM Rules | Municipal Solid Waste Management & Handling Rules, 2000 |
| MSWM | Municipal Solid Waste Management |
| NEERI | National Environmental Engineering Research Institute |
| NIUA | National Institute of Urban Affairs |
| NPC | National Productivity Council |
| TAG | Technology Advisory Group |
| TERI | The Energy Research Institute |
| TL | Toxic Links |
| TNA | Training Need Assessment |
| ULB | Urban Local Bodies |
| USAEP | United Stated Asia Environment Partnership |
| WBI | World Bank Institute |
| WHO | World Health Organization |

## SUMMARY

Inappropriate systems of SWM, ineffective institutional arrangement, poor financial health of urban local bodies and apathy of citizens are primarily responsible for very poor SWM services in India has been a matter of great concern and area of improvement. According to Municipal Solid Waste Management (Management and Handling) Rules, 2000, all local bodies which are about 4378 in number, need to implement improved systems of waste management as spelt out in the rules. Keeping in view current situation of solid waste management in India and the status of compliance of MSWM Rules 2000, the Solid Waste Management Learning Programme in India is initiated by the World Bank Institute in 10 states to address the immediate need of raising inhouse capacity of municipal officials and solid waste operators/specialists to effectively address the problems of solid waste management and implement integrated and sustainable SWM systems in their respective cities.

Various aspects of solid waste management are proposed to be covered in training program which include storage of waste at source, primary collection of waste including source segregation and recycling of waste, transfer techniques; secondary storage, fleet management; transportation of waste, treatment and disposal technologies; community, NGO and private sector participation, institutional strengthening; cost recovery and financial management; economic instruments, including carbon finance; regulatory framework etc.

To validate the needs in proposed subjects, training need assessment has been conducted. Primary focus of this training need assessment/analysis has been to determine the gap in capabilities of municipal authorities, various institutions, operators and consultants in solid waste management in the country to improve solid waste management systems in terms of municipal solid waste (Management and Handling) rules 2000.

Training needs assessment was conducted through consultation with municipal officials at various local bodies, elected representatives and state government officials. As a part of this exercise, municipal officials were consulted in groups through training need assessment workshops organized in few selected states i.e. Tamlinadu, Rajasthan, Gujarat and Madhyapradesh. Stock of existing levels of SWM services & compliance to rules was taken and officials were asked to narrate their training needs in various subjects, duration of training that they consider appropriate. Simultaneously, they were consulted on the constraints, bottlenecks in improving the SWM services and their future plan of action for improving compliance of seven steps prescribed to MSWM rules to examine the areas of training needs of municipal officials at various levels as well as elected representatives.

Institutional arrangements and ongoing training delivery assessment indicated the training delivery trends and helped in identifying gaps in terms of funding mechanism, subjects covered, duration of training on SWM, best practices documented/shared, reference material/manual developed/distributed, institutional competency to handle SWM issues, through community, NGO & private sector participation. Analysis results

indicated that ongoing training delivery has been largely addressing legal framework i.e. Municipal Solid Waste (Management and Handling) Rules, 2000 and other allied rules but emphasis need to given to provide a clear understanding of the process of compliance to rules of waste management in the country. Subjects like role of private sector participation, contracting mechanisms, segregation, reuse & recycling, IEC activities, monitoring, enforcement and accountability, technical aspects of treatment and disposal, innovative SWM systems, institutional aspects, reflected training gaps and hence need to be included in the proposed module and training delivery.

With the view to get individual feedback on the training needs, target group specific training needs assessment was carried out, for which a special questionnaire was developed, tested and used. The questionnaire included the sections educational background, Job profile, responsibilities, abilities awareness levels, areas of training needs to meet operational goals & preferred duration and mode of training for each target group. Target group specific surveys were used in preparing responsibility charts, identify ability gaps, preferred areas of training to analyze the subjects and duration of training for each category of municipal official and elected representatives. Training need of SPCBs/NGOs/CBOs and Private Contractors were also assessed on the basis of roles, responsibilities, areas of interests, competency and ability gaps and preferred areas of training needs.

Looking at the educational levels, technical competencies, years of experience, responsibilities, abilities gaps, areas of training needs and preferred duration of training, the training modules and important subjects have been worked out and summarized in for each category.

# 1 BACKGROUND & PROGRAM OBJECTIVES

## 1.1 Background

The systems of solid waste management adopted by Indian cities are very inefficient and outdated, as the municipal authorities have given very little importance to the subject of waste management. Inappropriate systems, ineffective institutional arrangement, poor financial health of urban local bodies and apathy of citizens are some of the principal reasons for inefficiency of services. In view of the pathetic situation of waste management in the country, the matter was taken to the Supreme Court of India through public interest litigation in year 1996, where Hon'ble Supreme Court appointed an expert committee to look into all aspects of SWM in class-1 cities, identify the deficiencies and make recommendations to improve the situation.

Keeping in mind the recommendations made by the expert committee, the Ministry of Environment and Forests has also issued Municipal Solid Waste Management (Management and Handling) Rules, 2000 under the Environment Protection Act of 1986, mandating, not only class I cities of India, all municipal authorities which are about 4378 in number, to implement improved systems of waste management as spelt out in the rules.

To facilitate implementation of MSWM Rules, the Ministry of Environment and Forest as well as Ministry of Urban Development have extended technical support in the form of comprehensive manual on solid waste management and technology advice through several workshops. Consistent efforts by Ministry of Urban Development & Poverty Alleviation, the Ministry of Environment & Forests, directives from Honorable Supreme Court of India from time to time and the regulatory efforts by the Central Pollution Control Board, and State Pollution Control Boards have yielded some noticeable results during last five years as could be seen from the outcome of a study carried out for class-1 cities as under.

**Figure 1.1:** Status of compliance of MSWM Rules 2000 by class-1 cities as on 1.4.2004.

SWM learning program in India

Keeping in view current situation of solid waste management in India and the status of compliance of MSWM Rules 2000, the Solid Waste Management Learning Programme in India is initiated by World Bank Institute in 10 World Bank Presence states to address the immediate need of raising inhouse capacity of municipal officials and solid waste operators / specialists to address the problems of solid waste management effectively and implement integrated and sustainable SWM systems in their respective cities.

## 1.2 Program Objectives

The program aims at improving the capacity of municipal officials at various levels and upgrading the professions skills of local solid waste managers, operators, contractors, and consultants to implement integrated and sustainable SWM systems in India. It also aims at promoting national and regional networks of specialists and practitioners to exchange the ideas and disseminate best practices, linking those with existing international solid waste associations.

The program presently aims at focusing on general urban solid waste of a non-hazardous nature. However, the training will lay the foundation for eventual inclusion of any type of solid waste (e.g., medical wastes, construction debris, disaster debris, slaughter wastes, household hazardous wastes, and industrial hazardous wastes)

**The specific goals of this program are to:**

- Consolidate existing relevant and appropriate knowledge, materials, and other resources in a comprehensive and easily accessible manner.
- Support the preparation of relevant country-specific case studies capturing good practice examples of solid waste management.
- Prepare highly interactive training materials that can be adapted by local consultants and used for certification purposes of officials and practitioners.
- Built the capacity of local training institutes and specialists to deliver training courses, initially with support from the World Bank and other international institutions, but with the goal of self-sustainable training capacity.
- Develop activities and lay the foundation for associations / networks to facilitate long-term interaction and exchange of information between solid waste managers and operators, private sector service providers, commercial / industrial waste generators, and consultants at the national, regional, and local level.
- Develop criteria and procedures to certify trainers and solid waste operators and practitioners according to national standards, with a goal toward longer-term international standards.

**Training Material:**

The training materials will be based on internationally available training courses and on locally developed case studies. Among the themes identified are: storage of waste at source, primary collection of waste including source segregation and recycling of waste, transfer techniques; fleet management; transportation of waste, treatment and disposal technologies; community, NGO and private sector participation, institutional

strengthening and inter-municipal arrangements; cost recovery and financial management; economic instruments, including carbon finance; regulatory framework etc.

Infrastructure Professionals Enterprise (IPE) Pvt. Ltd.. New Delhi in association with Centre for Environment Education (CEE) have been entrusted the responsibility to carry out this programme.

***This Training Need Assessment Report has been divided into following sections:-***

*Chapter 1:* *Background & Program Objectives*

*Chapter 2:* *TNA Objectives & Methodology*

*Chapter 3:* *Existing Training Delivery Framework in India and Existing Training Delivery Gaps*

*Chapter 4:* *Training Need Assessment (TNA) Results - Target group specific training needs, the subject needs to be covered and duration of training for each category, etc.*

# 2 TRAINING NEED ASSESSMENT OBJECTIVES & METHODOLOGY

## 2.1 Training Need Assessment Objectives

The primary focus of this training need assessment/analysis is to determine the gap in capabilities of municipal authorities various institutions, operators and consultants in solid waste management in the country to improve solid waste management systems in terms of municipal solid waste (Management and Handling) rules 2000.

A training need exists when there is a gap between what is required of a person to perform competently and what he actual knows. A "training needs assessment", or "training needs analysis", is the method of determining if a training need exists and if it does, what training is required to fill the gap. The expectation of knowledge, skills and abilities of officials at different levels is different so there training needs are also different. Training needs assessment has therefore to be for different target groups for exactly knowing what training is required for each group.

The purpose of conducting a needs assessment is to validate the hypothetical judgment with actual training needs to ensure that solution addresses the most needed subjects and effectively focuses the appropriate resources, time and effort toward targeted solutions. Training need assessment is to identify the gap between the model situation and the actual situation and the way in which it can be bridged.

**Box 1. The reasons for doing training needs assessment is: -**

- To determine whether any training is needed
- To determine the areas in which training is needed
- To determine the gap to be bridged
- To determine desired training outcomes
- To provide a basis of monitoring and evaluation

As the gaps are identified, they are evaluated to determine the manner in which the gaps can be bridged. Some situations will indicate training needs. Some may need non–training solutions (e.g., financial aspects, institutional strengthening, providing the right tools etc.).

The results of training needs analysis will highlight the subject wise need to bridge the gap to, help in the preparation of training modules and facilitate in the development of SWM Learning Program.

## 2.2 Training Need Assessment Methodology

Keeping in view the status of solid waste management in the country and the constraints expressed by the municipal authorities, following steps were taken for conducting training needs assessment.

1. Consultation with Municipal and State Government Officials on deficiency - in the SWM services and gap in their capabilities to take corrective measures.

2. Training Need Assessment Survey among Municipal Officials
3. SWM Experts Opinion on SWM Training Needs
4. Analyzing Target Group Specific Training Needs
5. Assessment of Institutional Capabilities to provide Training
6. Validation of Training Needs

### 2.2.1 Consultation with Municipal and State Government Officials on deficiency in SWM services and gaps in their capabilities to take corrective measures.

The objective of consultations with municipal and state government officials is to assess the current status of SWM & shortcoming in the level of services in the urban local bodies. It was experienced that municipal authorities do not generally respond expeditiously if they are asked to send their views or comments on any issue, besides they are unable to comprehend and give their views on their training needs. Looking to the existing situation, it was felt appropriate to personally interact with group of municipal officials, identified the deficiencies in the SWM system, reasons for deficiencies, the legal requirements they are expected to meet, and then learn from them, their training needs to meet expectations of good quality of services as per the legal provisions.

Group of Municipal officials were summoned to interact with them. They were asked to narrate their systems of solid waste management, their deficiencies in service in terms of MSWM Rules 2000 and the reasons of their shortcomings etc. We activated their thought process to formulate their views on the actions that they need to take for improving the situation. Simultaneously the interaction was held with state level officials who are responsible for ensuring implementation of SWM Rules in their respective states and to learn from them, their perception of training needs of municipal officials at various levels. Individual interviews with different levels of municipal officials were also taken in addition to collective interviews to address the training needs.

As a part of this exercise, we had the consultations with Municipal Officials through training need assessment workshops organized in four states i.e. Tamlinadu, Rajasthan, Gujarat and Madhyapradesh on following dates.

- 1st Week of February 2006 – Tamilandu
- 27 march 2006 – Gujarat

- 13th April2006 – Madhyapradesh
- 17th April2006 – Rajasthan

Consultations with entire state of Tamil Nadu in four sittings, dividing 156 municipal authorities provided their inputs. The elected representatives, the chief executives, the engineer in-charge of the respective cities and the sanitary officers were explained the prevalent situation of waste management in the urban areas and were thereafter appraised of various directions contained in the Supreme Court Committee Report and Municipal Solid Waste Management and Handling Rules, 2000 and were asked to narrate their training needs as well as the needs in various subjects, duration of training that they consider appropriate.

During consultation in the state of Gujarat, Madhya Pradesh, Rajasthan, Chief Administrative Officers from 90 Urban Local Bodies of different sizes provided the information on the compliance levels to the 7 steps of municipal solid waste management prescribed by Municipal Solid Waste & Handling Rules. Assessment included system design for storage of waste at sources, its primary collection, secondary storage, transportation and treatment and disposal in an environmentally acceptable manner. The representatives also suggested the areas of improvements for betterment of SWM systems i.e. cost recovery & cost efficiency, public/private partnerships and private sector participation in SWM sector, contractual mechanisms, training and capacity building, IEC activities, public participation, etc.

Besides this, Team Leader have had consultations on the SWM scenarios, constraints, bottlenecks and future plan of action for improving compliance of seven steps prescribed to MSWM rules and simultaneously assess the capabilities and training needs of state government and

urban local bodies. He has discussed the training needs and plan of action for training delivery with state governments of Tamilnadu, Andhrapradesh, Madhyapradesh, Gujarat, Rajasthan.

### 2.2.2 Training Need Assessment Survey among Municipal Officials

With the view to have individual feedback on the training needs, target specific training needs assessment was carried out for which a special questionnaire was developed, tested and used. The views of 143 municipal officials and elected representatives from more than 100 different sized local bodies were obtained in the questionnaire with the help of respective state governments.

**The questionnaire included the following sections (Provided as Annex-2.1)**

- Educational background, technical qualifications and experience levels of the respondent.
- Job profile, main duties and/or tasks related to solid waste management of the respondent.
- Abilities for fulfillment of assigned responsibilities
- Awareness to MSWM rules and seven steps
- Areas of training needs to meet operational goals, fulfilling responsibilities and improving service delivery and management.
- Preferred duration and mode of training

Following categories of ULB staff were requested to fill up the questionnaires.

- **Chief Administrative Officials** i.e. Commissioners, Assistant Commissioners, Zonal Officers, Executive Officers and other Senior Administrative officials
- **Elected Representatives** i.e. Mayors, Chairmen, Councilors and other elected representatives.
- **Health Officers** i.e. Chief Medical Officers, Medical Officers and Assistant Medical Officers
- **Engineering Officials** i.e. Engineers, Assistant Engineers, Junior Engineers and other Engineering Staff
- **Sanitary Officials** i.e. Chief Sanitary Inspectors, Inspectors, Assistant Sanitary Inspectors and other Sanitary Officials
- **Accounting and Finance official** i.e. Accounts officers, Auditors, Head clerks and other concerned Accounting Staff.

### 2.2.3 SWM Experts Opinion on SWM Training Needs

Structured interview were conducted with knowledgeable experts, institutions and NGOs involved in SWM activities at national level. This provided perceptions regarding SWM training needs for various stakeholders involved in the SWM at various levels. Their views were obtained on the current status of the SWM, areas of improvements and the training needs of various target groups for improvement of government institutions, local bodies, private sector participation, community, NGO, CBOs, etc.

Structured interviews were conducted with knowledgeable Experts in Government bodies, Institutions and NGOs involved in SWM activities like Ministry of Environment & Forests, (MoEF), Ministry of Urban Development, Central Pollution Control Board (CPCB), National Institute of Urban Affairs (NIUA), Human Settlement Management Institute (HSMI), National Productivity Council (NPC), The Energy Research Institute (TERI), Toxic Links (TL), Confederation of Indian Industries (CII), Centre for Environment Education (CEE) involved in SWM activities at State and National Level. This provided us their perceptions regarding SWM training need for various stakeholders involved in the SWM at various levels. Their specific views were also be obtained on the current status of the SWM, the short comings in the systems, areas of improvements and training needs of specific target audiences.

### 2.2.4 Analyzing Target Group Specific Training Needs

After collecting the feedback through institutional visits, state level interactions, city consultations, questionnaire survey, we analyzed the data of identified areas of improvements, target group specific training needs and preferred training delivery mechanisms.

Institutional arrangements and ongoing training delivery assessment indicated the training delivery trends and helped in identifying gaps in terms of funding mechanism, subjects covered, duration of training on SWM steps, best Practices documented/shared, reference material/manual developed/distributed, institutional competency to handle SWM issues, through community, NGO & private sector participation.

City level consultations and compliance status analysis has also indicated the areas where training is necessary for different level of stakeholders..

Target group specific surveys were converted to prepare responsibility charts, identify ability gaps, preferred areas of training to analyze the subjects and duration of training programmes for each category of municipal official and elected representatives

Training need of SPCBs/NGOs/CBOs and Private Contractors were also identified on the basis of roles, responsibilities, areas of interests, competency and ability gaps and preferred areas of training needs.

### 2.2.5 Finalization and Validation of Training Needs and Finalize contents

All target groups specific training needs would be summarized in the form of preferred training modules. A consultation workshop would be organized to validate the results of the TNA, SWM experts, local, state and national level training institutes, organizations, Government agencies and World Bank officials would be involved in the process of reviewing the TNA results. In consultation with advisory committee, we would finalize the training needs and course content for each module that would be developed accordingly for imparting training to various target groups.

# 3 EXISTING TRAINING DELIVERY FRAMEWORK IN INDIA AND TRAINING DELIVERY GAPS

## 3.1 Assessment of Institutional Framework for delivery of Training

The details of institutions engaged in training and capacity building programs and their mandates for improving SWM systems have been compiled through secondary and primary sources. We have also collected the information on training and capacity building initiatives undertaken by various agencies and institutions in the country.

With the help of institutional linkages, information on all types of training Programs, which have been/are being conducted by various institutions, NGOs and Government Bodies has been collected. Information on course contents, coverage, target groups, outcomes, etc. has also been collected through primary sources. This has helped in the assessment of missing links/gaps in the existing framework. By visiting a few institutions, information has also been collected on the institutional capacities.

Thus information on 75 past and ongoing training programmes has been collecting on the following aspects: -

- **Type and nature of the programme**
- **Duration**
- **Source of funding**
- **Target audiences**
- **Outreach**
- **Subjects covered**
- **SWM steps Covered**
- **Best Practices documented/shared**
- **Reference material/manual developed/distributed**
- **Institutional Subject Competency**
- **Participation Response in the training programmes**
- **Motivation to Learn - amongst participants**
- **Level of self/institutional sponsorships**
- **Suggestion to enhance participation**
- **Feedback or training evaluation mechanism**
- **Suggested areas of future training**
- **Training of trainers**

This exercise helped us in assessing the ongoing training delivery and identification of the missing links, gaps and constraints in effective training delivery. This also indicated the areas of competency, interests and subject trends of training delivery.

Role and initiatives taken by various government & non-government institutions/ organisations is discussed hereunder.

**Ministry of Environment & Forests (MoEF)**

The Ministry of Environment and Forest is the nodal agency of the Central Government, for the protection of environment and for the planning, promotion, co-ordination and overseeing the implementation of environmental laws in India. The Hazardous Substances Management Division (HSMD) of the Ministry has the responsibility for Solid Waste Management besides two other main thrust areas, viz. Biomedical Waste Management, Chemical Safety and Hazardous Wastes Management.

Although the primary mandate of MoEF is to develop legislation but it also provide technical advice and financial assistance for training and capacity building to the States and Municipalities. This Ministry has notified comprehensive Municipal Solid Waste (Management and Handling) Rules, 2000 under the Environment Protection Act, 1986. MoEF has taken several direct and indirect initiatives for the facilitation of implementation of MSWM Rules.

As the deadlines set under Schedule 1 of MSWM Rules 2000 in respect of the improvement in the existing landfill sites and identification of a new landfill sites for future use are already over in December 2003 and the compliance status all over the country is still very still dismal. The Ministry has sponsored training programmes to effectively implement the Municipal Solid Waste (Management and Handling) Rules 2000 and Recycled Plastic Manufacture and Usage Rules 1999.

MoEF has provided financial assistance to 7 institutions i.e. ASSOCHAM, New Delhi, HRD Foundation, New Delhi, CII, New Delhi, Disaster Management Institute, Bhopal, Multi Disciplinary Centre on Safety, Health & Environment, Bhubaneswar, Environmental Planning and Coordination Organization, Bhopal and TERI, New Delhi. List given below shows the number of training programmes undertaken, states covered, subjects covered, target groups, number of participants and duration of each training programme being organised by these institutions.

Role and initiatives taken by various government and non government institutions / organizations is described hereunder:

**Table 1: - Training Programmes Supported by MoEF during 2005 - 06**

| Sr. No. | Institution | No. | Tentative Venue | Programme Contents | Target Groups | Participants | Duration |
|---|---|---|---|---|---|---|---|
| 1 | Associated Chambers of Commerce and Industry of India (ASSOCHAM) | 4 | Delhi, Mumbai, Bangalore & Kolkata | MSWM scenario, legislation, compliance of steps, technological options, innovative methods of | Industries, municipal officials, government bodies, private entrepreneurs | 40 | 2 days |

| Sr. No. | Institution | No. | Tentative Venue | Programme Contents | Target Groups | Participants | Duration |
|---|---|---|---|---|---|---|---|
| | | | | MSWM, monitoring, role of corporate, community, NGOs and authorities in MSWM and plastic waste management | | | |
| 2 | HRD Foundation | 6 | Delhi, Shimla, Agra, Dehradun, Ahmedabad & Indore. | Legislation, segregation and community participation, new techniques for collection, transportation and treatment and management of waste | Municipal engineers, health officers, senior Sanitary inspectors, NGOs, SPCBs, hospitals, hotel and township builders | 25 | 2 days |
| 3 | Confederation of Indian Industry, (CII) | 4 | Delhi, Bangalore, Pune and Bhubaneswar | Best practices, waste to energy, opportunities in CDM, private partnerships models. | Industries, private entrepreneurs, SPCBs, NGOs, municipal officials | 40 | 1 day |
| 4 | Disaster Management Institute, Bhopal | 3 | Bhopal, Indore and Gwalior | Legislation, compliance status, bottlenecks, treatment technologies, experience sharing | Municipal Officials, NGOs, state institutions and other stakeholders | 30 | 2 days |
| 5 | Multi Disciplinary Centre on Safety, Health & Environment, | 6 | Puri, Balasore, Rayagada, Balangir, Bargarh and Bhawanipatna | Legislation, compliance status, issues and constraints options for treatment technologies, strategy formulation | Municipal Officials, NGOs, state institutions and other stakeholders | 50 | 2days each |
| 6 | Environmental Planning Coordination Organization | 4 | Bhopal, Indore, Gwalior and Jabalpur | MSWM scenario, legislation, compliance of steps, innovative methods of MSWM, monitoring,, role of various | State and city government representatives,. Municipal Officials, NGOs, state institutions and other stakeholders | 30 | 1 day |

| Sr. No. | Institution | No. | Tentative Venue | Programme Contents | Target Groups | Participants | Duration |
|---|---|---|---|---|---|---|---|
| | | | | stakeholders | | | |
| 7 | The Energy and Resources Institute (TERI) | 4 | Chandigarh, Bangalore, Guwahati and Raipur | | | 30 | 2 days |

**Ministry of Urban Development & Poverty Alleviation (MoUD &PA)**

This ministry formulates policies, sponsors and supports programmes, coordinate the activities of various Central Ministries, State Governments and other nodal authorities and monitor the programmes concerning all the issues of urban development and housing in the country including SWM activities.

In this ministry "Technology Advisory Group (TAG)" was constituted on the advise of Supreme Court of India, and given the task to collect information on appropriate tools and equipments and various proven technologies for processing and disposal of wastes. Expected to identify, appropriate cost effective technologies and provide technical guidance to State Governments and Urban local bodies. The Technology Advisory Group as under constituted three core groups:

1) Appropriate technologies,
2) Research and development group,
3) Financial resources and private sector participation,
4) Capacity building, human resource development, information, education and communication.

**Box 2. Subjects covered in the MSWM manual**

- Principles of municipal solid waste management
- Composition and quantity of solid waste
- Construction and demolition waste
- Slaughter house waste and dead animals
- Industrial solid waste
- Biomedical waste
- Sorting and material recovery
- Storage of waste at source
- Primary collection of waste
- Street cleansing
- Transportation of waste
- Composting
- Energy recovery from municipal solid
- Emerging processing technologies
- Landfills
- Community participation
- Institutional aspects & capacity building
- Prospects of private sector participation
- Economic and financial considerations
- Environmental and health impact
- Assessment
- Legal aspects
- Policy guidelines
- Preparation of a municipal solid waste management plan

The report of Technology Advisory Group has recently been released for the guidance of municipal authorities in the Country. The Central Public Health & Engineering

Organization, MoUD brought out a detailed manual on MSWM to provide guidance to ULBs in regard to all the essential steps to be taken to improve solid waste management service. This manual was prepared by an expert group constituted by Ministry of Urban Development. The members comprised of advisor Central Public Health and Environmental Engineering Organization (CPHEEO), Additional Director Central Pollution Control Board (CPCB), Representation from National Environmental Engineering Research Institute (NEERI), Senior Scientist, Ministry of Non-Conventional Energy Sources (MNES), Municipal Corporations, World Health Organization (WHO), academic institutes, Housing & Urban Development Corporation (HUDCO) and United Stated Asia Environment Partnership (USAEP). Local bodies in India are extensively using this manual.

The MoUD has also constituted an inter-ministerial task force on integrated plant nutrient management using city compost. The task force has prepared a detailed report on the existing composting plants and has come out with the reasons for failure of composed plants or inadequate utilization of the treatment facilities and has made recommendations for improving the efficiency of the composed plants and marketing of composed.

The 12th Finance Commission has allocated to State Governments devaluation of grants for the urban local bodies to the tune of Rs. 5000 crores for the period 2005-2010 out of this amount Rs. 2500 crores have been earmarked for setting up of SWM Systems in Urban areas to ensure the management of MSW in accordance with MSWM Rules.

CPHEEO on its part made efforts to launch and promote PHE Training Programme from 1956. The coverage of these activities has increased considerably over the years. In order to cater to the needs of training of various Public Health Engineering Departments, Water Supply & Sanitation Boards, Urban Local Bodies, State Pollution control Boards and other Water Supply & Sanitation agencies like Jal Sansthans, the following training programmes have been introduced and are being conducted through research & academic Institutes and field departments:

**Box 3. Institutions recognized with MoUD**

MoUD recognized eleven academic institutes so far as listed below. The annual intake capacity in 11 Institutes is 88. During the year 2005-2006, 58 refresher courses are proposed through 20 recognized Institutes. The duration of refresher courses vary from one week to four weeks. Intake capacity in refresher courses vary from course to course from 15 to 30 candidates in each course which depend upon the level of participants, nature of course, duration etc.

- Post Graduate Course in Public Health Engineering/Environmental Engineering.
- Short Term Course in Public Health Engineering/Environmental Engineering
- Refresher courses on various aspects of design, construction, operation and maintenance of water supply and sanitation facilities, including solid waste management.

**Table 2. PHE Courses run by MoUD**

| S. No. | Name of the Course | No. of Persons Trained |
|---|---|---|
| 1 | Post Graduate Course in PHE/Environmental Engineering | 2425 |
| 2 | Short Term Course in PHE/Environmental Engineering | 2553 |
| 3 | Refresher Courses in PHE/Environmental Engineering | 24,365 (Tentative) |
| | Total | 29,343 |

The number of in service Public Health Engineers & Para-Engineering staff trained under the PHE Training programme of the Ministry in Post Graduate Course, Short Term Course & Refresher Courses till 31st March, 2005 is as under:

**Central Pollution Control Board (CPCB)**

The Central Pollution Control Board (CPCB), a statutory organization has a mandate to promote prevention, control and abatement of various types of pollution. It also provides technical services to the Ministry of Environment and Forests as per the provisions of the Environment Protection Act, 1986.

**Box 4. CPCB has completed the following studies and brought out these publications on solid waste management during last few years: -**

- Guidelines for constructing sanitary landfills
- Reference manual on technology and processing of municipal waste
- Reference manual on MSWM Rules for urban local bodies
- Report on assessment of health in conservancy staff and other communities associated with handling of MSWM
- Characterization of compost quality and its application in agricultural crops.
- Report on assessment of methane emission from landfill sites
- Status of solid waste management in 59 metro cities and capitals
- Characterization of compost quality prepared from Municipal Solid Wastes.
- Recycling of plastics waste and using it in construction of roads

The responsibility for implementation of MSWM Rules lies with the Pollution Control Planning Division. The Central Pollution Control Board, through the State Pollution Control Boards is responsible for the enforcement of the MSWM Rules. They also provide necessary technical advice through various publications and guidelines to the Urban Local Bodies.

**Box 5. ULBs with Good Initiatives on SWM with CPCB's Support**

Some of the local bodies who have taken good initiatives are in the states of Maharashtra (Pune, Nasik, Nagpur), West Bengal (North Dum Dum, Barrackpore, Kumar-hati, Kulti, Suri) Gujarat (Ahemdabad, Surat, Bejalpur), Nagaland (Kohima), Chandigarh (UT), Goa (Panjim), Andhra Pradesh (Hyderabad, Vishakhapatnam, Vijaywarda, Suryapet), Tamil Nadu (Tiruppur, Namakkal, Udumalpet, Udagamandalam).

With the technical guidance from CPCB, initiatives have been taken

by many local bodies to create awareness among the citizens for proper collection, segregation, storage and transportation of waste.

Through Human Resource Development Programme (HRDP), training and capacity building programmes were organized on various environmental planning and management issues. This aimed at capacity building of planning institutions and authorities, consultants and stakeholders. Through institutions like CSIR, NEERI, ITRC, ICMAR, NIOH, DMI, etc, it organized training programme on environment management for different stakeholders.

**Ministry of Non Conventional Energy Sources (MNES)**

MNES is the nodal agency of the Government of India for all matters relating to non-conventional/ renewable energy. It undertakes policymaking, planning, promotion and coordination functions relating to all aspects of renewable energy, including fiscal and financial incentives. Ministry of Non-Conventional Energy Sources is promoting setting up of Waste-to-Energy projects through National Programme on Energy Recovery from Urban and Industrial Wastes and a UNDP/ GEF assisted project on Development of High Rate Biomethanation Processes as a means of reducing Green House Gases emission.

The National Programme on Energy Recovery from Urban and Industrial Wastes was launched during the year 1995-96 with the objectives to create conducive conditions with financial and fiscal regime to promote, develop and demonstrate the utilization of wastes for recovery of energy; improve the waste management practices through adoption of renewable energy technologies for processing and treatment of wastes prior to disposal and promotion of projects for recovery of energy from wastes from Urban and Industrial sectors.

**Ministry of Agriculture**

The Ministry of Agriculture is responsible for the formulation and implementation of National policies and programmes aimed at achieving rapid agricultural growth through optimum utilization of the country's land, water, soil and plant resources. The Department of Agriculture undertakes all possible measures to ensure timely and adequate supply of inputs and services such as fertilizers, seeds pesticides, agricultural implements and also provides agricultural credit, crops insurance and ensures remunerative returns to the farmer for his agricultural produce. Ministry’s interest in solid waste is related to the fact that biodegradable stream of the municipal solid waste can be used for producing compost which can be used as organic fertilizer by the farmers and others.

**State Pollution Control Board (SPCBs)**

The functions of the SPCBs include planning and execution of programs for prevention and control of water and air pollution, advising the State Government on matters concerning abatement of water pollution, laying down standards for water and air quality,

ensuring compliance with various laws, ensuring legal action against the polluters and evolving techno-economic methods for treatment, disposal and utilization of effluents. The SPCBs are responsible for prevention and control of water, air and land pollution. They advise the State Government on matters concerning the prevention, control of water and air pollution and improvement of the quality of air and water.

Municipal Solid Waste (Management and Handling) Rules 2000 put additional responsibilities on the SPCBs with respect to management of municipal solid waste. According to the Rules, the SPCBs or a Committee formed under it are required to monitor the compliance of the standards regarding ground water, ambient air quality, and leachate quality.

The State Board or the Committee is also supposed to look into applications from the municipal authority or the operator of a facility for setting up waste processing and disposal facility including landfills and grant authorization. These authorities also conduct training workshops from time to time to educate Municipal Officials on the scientific management of municipal solid waste.

**Urban Development Department of State Governments**

Urban Development Departments in the states are responsible for formulation of state level policy and oversee the implementation of State level regulations pertaining to management of urban issues. It also provides necessary guidance and assistance to the functioning of the Municipalities and Corporations in the State. The Secretary in-charge of the Department of Urban Development has the overall responsibility of the implementation of MSWM Rules in the municipal corporations and the District collectors are made responsible for implementation of the rules in the municipalities under their jurisdiction. The department reviews the position of implementation of MSWM Rules in their states.

**Box. 6. According to the MSWM Rules, Municipal Authorities or the ULBs are responsible for following functions: -**

- Implementation of the Rules at the municipality level including Infrastructure development for segregation, collection, storage, transportation, processing and disposal of MSW.
- Applying for grant of authorization for setting up waste processing and disposal facilities including landfills from the State Pollution Control Board or Committee.
- Notify the waste collection schedule to the generators of these wastes, to help them comply.
- Organize awareness programmes for citizens to promote reuse or recycling of segregated materials and community participation in waste segregation.
- Write an annual report and submit to a) Secretary-in-charge of the Department of Urban Development of the State or Union Territory in case of metropolitan cities. b) The District Magistrate or the Deputy Commissioner in case of non-metropolitan cities. The State Pollution Control Board or Committee on or before June 30 of every year.

**Urban Local Bodies**

Urban Local Bodies, being responsible for complying to MSWM rules are required to undertake primary collection of waste from the waste generators, street sweeping, secondary storage, transportation, processing and disposal of solid waste. However, due to lack of accountability services provided by local bodies are inadequate. Some of the key problems faced by the municipalities include lack of resources, technical know-how, planning and attitudes towards management of waste. The decision makers do not consider this subject worth their personal attention though solid waste management consumes large part of the municipal budget. In most municipalities, up to 75% (in some up to 90%) of the SWM budget goes towards the staff salaries. The productivity of the staff engaged in Solid Waste Management, is extremely low, partly due to indifference of the staff and liberal labour laws, in particular, and union activities having political patronage.

In most ULBs, 30-50% of the total municipal staff is engaged in waste management. It is established that the ULBs spend Rs. 500 to Rs. 1500 per tonne for collection, transportation, treatment and disposal of solid waste. About 70-75% of this amount is spent on collection, 20-30% on transportation and less than 5% on final disposal of waste. The administrative and supervisory structure for solid waste management varies with different municipalities.

To improve the solid waste management services, the capacity of the municipal staff needs to be built to manage the entire system of solid waste management. This can be done through training programmes for the municipalities.

There seems to be very little interaction between the key governmental agencies and ULBs in the matter of Solid Waste Management Systems and technologies that must be adopted.

**NGO/ Research Institutes**

**National Institute of Urban Affairs (NIUA)**

This is an institute created by the Government of India to assist and advise the Central Government on Urban issues it carries out studies and research on urban issues to facilitate the Government of India to take appropriate decisions. NIUA, through conferences, seminars, workshops, symposia and lectures provide an important platform for policy advocacy, academic exchange and sharing of research findings and experiences. Institute has been providing support to the All India Mayors' Council, International City/Country Management association (ICMA) and different city Manager's association in India, in conducting seminars and workshops on urban infrastructure related subjects. NIUA assesses training requirements of urban organizations, conduct the training and also produces the necessary training material for distribution among the participants.

NIUA has conducted following seminars and conferences concerning functioning of local bodies.

- National Workshop on State Finance Commissions
- Policy Seminar on Property Tax Innovations in India
- Seminar on Pricing and Cost Recovery of Urban Services
- Seminar on Capacity Building for Urban Governance

Under Indo-USAID collaborative programme, it conducted training workshops, seminars and research under the, the Financial Institutions Reform and Expansion (FIRE-D) programme. It sensitized the State Governments to the concept of full cost recovery for directly chargeable urban infrastructure and motivated city governments to increasingly go in for credit rating. Under this programme, it has been providing regular support for imparting capacity building training to elected representatives, top and middle level functionaries of municipal bodies and professionals of urban infrastructure agencies in a wide range of areas.

NIUA has developed a network of more than 15 state level training institutions in the country. A few relevant areas covered in training programme conducted/supported by NIUA

- Municipal Finance & Accounting
- Project formulation for Urban Infrastructure
- Management of Urban Environment
- Management of Urban Services
- Financing Urban Infrastructure
- Resource Mobilization, Public Private partnership and Pricing and Cost Recovery
- Empowerment of Municipal Government
- Solid Waste Management
- Project Development
- Resource Mobilization for Empowerment of City Government

NIUA has brought out a study document of the innovative initiatives taken by the local government of selected cities of India to improve solid waste management through various measures including improving efficiency, finding administrative and technical solutions to improving waste collection and disposal, involving the private sector and NGOs in improving the service and exploring new ways of financing investment.

Currently, NIUA is also working as a coordination agency for implementation of project called "National Strategy for Urban Poor-NCR Component" supported by United Nations Development Programme (UNDP). In this project support has also been provided to 6 agencies for demonstrating community based solid waste management through training and capacity building of target groups.

**Human Settlement Management Institute (HSMI)**

HSMI has conducted a large number of programmes on SWM for Government of India as well as other international agencies. HSMI has also been conducting customized programmes for various ministries and international agencies.

HSMI has a network with all the state level training institutions in the country and has a HUDCO chair in all institutions. They have residential facilities for participants at Delhi and also in states. HSMI's training programme responds to the felt needs of housing and urban development sector. They aim at improving the knowledge, skills and attitudes of the middle, senior level mid career professionals engaged in SWM sector working as administrators, professionals, researchers, economists. Architects, computer professionals and community development agents with state and local governments, private sector, NGOs, CBOs, and civil society as also for the employees of the corporation on selected themes.

**Box 7. Course contents of Courses run by HSMI: -**

- Basic issues in solid waste management
  Option for domestic waste water disposal
- Technological interventions for waste disposal
- Recovering wealth from waste
- Best practices in waste collection, transportation and disposal
- Social and environmental aspects of waste handling and recycling
- Life cycle analysis for urban waste management
- The Government policies and support in waste management

**Some of the training programmes organized by HSMI are as follows: -**

- Training on SWM on Kohima, Nagaland for state of Nagaland -This one week long training programme covered municipal waste management and planning as applicable to small and medium towns.

- Capacity building of the Urban Environment, Institute for Housing and Urban Development Studies, Totterdam, the Netherlands- for development of national capacity building strategies.

- PHE Training, Ministry of Urban Development & Poverty Alleviation, Government of India- training programme in the area of solid waste management, waste recycling and cost recovery.

- Preparation of training manual on solid waste management – sources, collection, transport and treatment & disposal options for SWM.

**National Productivity Council (NPC)**

NPC is a Government of India undertaking. It is created to enhance productivity of industries and in associated sectors. Besides providing professional services to several industries and organizations it also provides training to municipal authorities, pollution control boards, financial institutions, policy makers and other stakeholders in all aspects of municipal solid waste management.

NPC assisted CPCB, SPCB and more than 1000 industries in building their capacity for managing environmental issues.

It has published:

- Compendium of success stories on waste minimization/cleaner technology implementation in India.
- "Waste to Profit" generic waste management manual.
- Industrial sector specific "from Waste to Profit" waste minimization manual.

**Table 3. Training programmes conducted by national productivity council, in the area of municipal solid waste management**

| Programme | Contents covered |
|---|---|
| Five- day Training Programme on Municipal Solid Waste Management for the ULBs from India, sponsored by Central Pollution Control Board. | MSW Introduction -Composition & Quantification<br>MSW Management -Regulatory Requirements<br>Segregation, Collection and transportation of MSW<br>Biomedical Waste Management<br>Plastic Waste Management<br>Industrial Hazardous Waste Management<br>Municipal Solid Processing Technologies - Composting<br>Municipal Solid Waste Incineration<br>Seven Step Strategy for Municipal Solid Waste Management for a City<br>Municipal Solid waste management –Role of Public & NGO's<br>Environmental Impact Assessment of Existing Dumpsites and up-gradation – A Case Study<br>Field / Site Visits<br>Design and Development of Sanitray Landfill Facility<br>GIS and Remote sensing techniques in Site selection<br>Group Discussions<br>Presentation on Group Discussion and & Discussions on Field visit<br>Summary and valedictory |
| One-day workshop on Situation Analysis, Strategies to implement Municipal Solid Waste Rules, 2000 in Gujarat | Review of status of Municipal Solid Waste Management practices<br>Assessment of gaps & strategies to implement MSWM rules in Gujarat<br>Concept of regionalisation for setting up of disposal facilities through state government funds<br>Adoption of public & private partnerships for Operation & Maintenance of MSW management facilities<br>Cost-recovery of solid waste management aspects<br>Training needs assessment in human resources development with respect to MSW management in ULBs |
| One day Training Programme on Municipal Solid Waste Management for the municipal Engineers of Nagpur Municipal Corporation | MSWM Rules 2000,<br>Up-gradation plan for existing dumpsite at Nagpur, Principles and components of Sanitary Landfill Facility & operation of SLF. |
| One-day workshop on Municipal Solid Waste Management for the ULBs in Gujarat | Legal Framework & Provisions of MSWM Rules, 2000<br>Municipal solid waste management overview in Gujarat<br>Waste processing & disposal facilities – technical details<br>Financing for municipal solid waste management projects<br>Municipal solid waste minimization – issues & strategies. |

| Programme | Contents covered |
|---|---|
| One day programme on Municipal Solid Waste Management for the municipal engineers and solid waste in-charges of ULBs | Overview of municipal solid waste management scenario in India & Abroad<br>Municipal Solid Waste Management Rules and its interpretation<br>Sanitary Landfill Facility – Concepts, sitting & operational aspects<br>Assessment & up-gradation of existing MSW dumpsites<br>NPC case studies on MSW Management |
| Two -day programme on Municipal Solid Waste Management for the municipal engineers and solid waste in-charges of ULBs | Requirements & interpretations of MSW Rules<br>Overview of municipal solid waste management scenario in India & Abroad<br>Segregation, Collection & transportation of MSW<br>Sanitary Landfill Facility – Design & operational aspects<br>EIA for site selection, Assessment & up-gradation of MSW dumpsites – Case Studies<br>Overview of MSWM composting technologies<br>Industrial Hazardous waste Management<br>Machinery for Municipal Solid Waste Disposal<br>Plastic Waste Management |
| Training programme on Municipal Solid Waste Management – Development & operation of processing & disposal facility for officials of CIDCO, Navi Mumbai. | Requirements & features of MSWM rules, 2000<br>Principles of integrated Sanitary Landfill Processing & Disposal Facility .<br>Operation & Maintenance of Sanitary Landfill Facility |
| Training programme on MSW Management for the officials of Ferozpur Cantonment Board | Overview of Municipal Solid Waste Management practices<br>MSW Rules 2000<br>Municipal Solid Waste Processing & Disposal<br>Principles & elements of Sanitary Landfill Facility |
| Training programme on MSW Management for the officials of Bareilley Cantonment Board | Do |
| One Day Workshop on Municipal Solid Waste Management for the Urban Local Bodies of Chhattisgarh State | Municipal Solid Waste management -Overview<br>Municipal Solid Waste (Management & Handling) Rules, 2000<br>Municipal Solid Waste Management – Storage, collection and transportationMunicipal Solid Waste Processing and disposal<br>Best Practices in Municipal Solid Waste Management |
| One Day Workshop on Municipal Solid Waste Management for the Urban Local Bodies of Madhya Pradesh State | |

**UEIR/USAEP/USAID**

It has organized workshops in many states of India. Through these workshops, they have been providing the training to city and state government bodies/institutions. Participants include elected representatives, municipal commissioners, administrative officers, health officers and engineers.

**Table 4. State level Workshops conducted by UEIR, US AEP/USAID to improve SWM services**

| Sr. No. | State | Details/Number of Participants |
|---|---|---|
| 1 | Rajasthan | ❑ Representatives from 20 Class Cities of the State<br>❑ Two More workshops were Organized |
| 2 | Karnataka | ❑ 4 Divisional Workshops i.e. Bangalore , Mysore, Hubli Dharwar and Gulbarga<br>❑ 60 cities participated In each workshop<br>❑ State level workshop was organized through satellite communication at about 70 locations, 7000 participants |
| 3 | Tamilandu | ❑ State level workshop at Chennai, nearly 300 representatives participated |
| 4 | Gujarat | ❑ State level workshop, all 153 towns participated, attended by 700 participants<br>❑ 4 regional workshops at Ahemdabad, Gandhinagar, Rajkot and Badodara |
| 5 | Maharashtra | ❑ A large state level workshop at Mumbai<br>❑ Participants by 1000 representatives from entire state<br>❑ Chief Minister, all secretaries also participated |
| 6 | Uttranchal | ❑ A state level workshop, participated by all 63 local bodies<br>❑ 150 participants |
| 7 | Madhyapradesh | ❑ Workshop organized through Madhya Pradesh State Academy of Public Administration<br>❑ All Municipal Commissioners and Engineers participated<br>❑ Two state level workshops to study the compliance<br>❑ One state level workshop for evaluating compliance status and assessing training needs |
| 8 | West Bengal | ❑ State level workshop by WB-PCB and regional workshop organized by Urban Development Authorities |
| 9 | Kerala | ❑ State level workshop at Trivendrum<br>❑ Participated by all ULB representatives from the state |
| 10 | Orissa | ❑ State level workshop<br>❑ All ULB representatives participated |
| 11 | Andhra Pradesh | ❑ Regional workshop<br>❑ Mayors and commissioners participated<br>❑ Action Plan developed |

## Toxic Links

Toxics Link is and NGO working on Toxics, hazardous waste and bio-medical waste sector. It has also developed training manual and other reference material for implementing, scaling and sustaining community-based municipal solid waste management projects. In the training context for MSWM, currently it is holding a series of awareness and knowledge workshops in different regions of the country. It is organizing a series of 8 skill share workshop for up-scaling people's

**Box 8. Course Content-Toxic Links**
Contents of the training programmes are designing and implementation of community based SWM systems, concept and principles of zero garbage systems, rules, regulations and policies, community mobilization, financial sustainability, role of NGOs, composting challenges and future, challenges and strategy for action.

participation in solid waste management. It has already conducted 4 programmes at Coiambatore, Shilong, Kolkata and Lucknow.

**The Energy Research Institute (TERI)**

TERI (The Energy Research Institute) has been working in research and consulting related to policy, status and institutional aspects of solid waste management in the country. TERI is funded by both national and international agencies. They also raise funds through seminars, training programmes and consulting services. TERI prepared a Plastic waste management plan for Delhi for Department of Environment and a study on community participation in urban solid waste management: a framework for action.

TERI Organized a 15 days programme on waste management addressing all technical, institutional and financial aspects related to municipal solid waste, biomedical and hazardous waste management.

**Asian Centre for Organization Research and Development (ACORD)**

ACORD is an NGO based at Delhi facilitated series of thematic workshops on segregation of waste at source during "Bhagidari" meetings. The Bhagidari system is a forum for the urban local bodies and citizens to initiate a dialogue and take joint decisions to improve the quality of life in Delhi. Multi stakeholder workshops included representatives from resident welfare association, school eco clubs, NGOs, employees of Municipal Corporation from all zones in Delhi. The purpose of the workshop was to draw up an action plan for segregation of waste at source, based on various issues or problems perceived by the various "stakeholders", and identify some core issues to be agreed upon by all involved in the discussions. Although, it is a good starting point, the Municipal Corporation is not prepared themselves to maintain segregation throughout the waste management chain.

**Centre for Environment Education (CEE)**

CEE is an NGO having its head quarter at Ahmedabad and several nodes outside Ahmedabad. CEE has been involved in several initiatives that deal with better environmental management of resources. Such as garbage management, environmental improvement of slums and human development, cleaner production in industries, healthcare waste management and conservation of natural resources through reduction, reuse and eco-friendly recycling and energy management.

CEE has developed a large number of educational and awareness materials on solid waste management and bio-medical waste. Through it training and capacity building initiatives, it has trained municipal officials and elected representatives. It has also targeted concerned government bodies, NGOs, rag pickers, slum dwellers, and other disadvantaged groups, citizens, schools, colleges both teachers and students, govt. officials and NGOs from South Asian countries.

**CEE's activities are briefly described as under:**

CEE has been conducting community awareness and capacity building programmes in 4 Ecocities (Vrindavan, Tirupathi,Puri & Ujjain) for establishing integrated waste management systems

- 
- Creating awareness in Ward14 (Nagpura) area of Bangalore (community based) and creating educational material on Waste Management under the Urban Waste Expertise Programme.
- Training programmes in organic farming, alternative technology, medicinal plants, conservation of sacred groves, recycling
- Technology (Plastic and Paper) for school children, communities, teachers and government staff.
- Community mobilization programme in three areas of Delhi
- Training programmes for SHG groups at Tirupur on Paper recycling
- Associated with the Pune Municipal Corporation (PMC) in their recent initiative titled 'Chakachak', which aims to enhance citizens' participation in cleanliness and waste management, and other local environmental issues.
- Information & Communication Campaign on Solid Waste Management' was initiated in Gulbarga city of Karnataka.
- Training Programme on Hand Making Paper for the community at Ujjain, Mahakaaal area under AAWaM project so as to make Mahakaal area plastic free zone, at Tirupathi and Patna
- CEE East in collaboration with OPDC, NGO Gopalpur organized a state level workshop on solid waste management in Gopalpur. NGO representatives and municipality personnel were given a 2 days orientation on the solid waste management. About 40 participants were oriented during this training programme.
- CEE along with representatives from Green Youth Foundation conducted a workshop on Plastic Recycling and Paper making on 16th March 2005. The workshop had about 50 women participating from various self help groups and NGO's. CEE and Green Youth Foundation first introduced the concept of Solid Waste Management and necessities of source segregation importance of 'reduce, recycle and reuse'

**Box–9. Educational materials developed by CEE on SWM**

- Had developed AAWaM (Achieving Action in Waste Management) posters (English,Hindi,Telugu)
- AAWaM financial year calendar containing award winning painting of children of four Ecocities (Vrindavan, Puri, Tirupathi and Puri)
- Pamphlet on Composting (English/Hindi), Lesser Plastics for better future, Garbage (English/Hindi), Combating Solid Waste
- Kodagu-Pavitra Bhoomi-A need to conserve, pamphlet published by CEE
- Garbage to Gardens- Publication on SWM
- Solid Waste Management-A Community based Project-Multimedia presentation on SWM
- 'Lurking Dangers', 'Don't Scrap it', 'Wait until Dark' films produced on awareness regarding hazardous household wastes and importance of safe segregation & recycling
- Color Green –Coloring the Urban Habitat Green- Hand Book for growing trees in urban areas under SWM project in Bangalore.
- SWAACH posters developed for MCD
- Pamphlet on Composting (English/Hindi, Garbage (English/Hindi), Combating Solid Waste also developed under JICA project

- The orientation programme was conducted for the newly appointed staff undertaken under Information Education Campaign on SWM in Gulbarga City as a part of training programme carried out by CEE South for teachers and students at Bidar and at Bijapur. CEE South and Infosys Foundation jointly organized both the functions.

**All India Institute of Local Self-Government (AIILSG)**

Institute is designed to promote & support activities in the area of Research and Training in Municipal Administration, was launched in 1926. Since its inception, the Institute has covered various states through its regional offices.

Its activities, which began in 1926, are both at Regional and National levels. The Institute undertakes research studies, and organizes and conducts specialized courses, seminars, and conferences and provides open forum for officials and non-officials of Municipal Administration. Institute conduct regular as well as one time training programmes. Content and structure of one each of such programme is provided below.

**Table 5. Training Programme -AIILSG**

**One Time Programme**

| | |
|---|---|
| Recognised by | Not applicable |
| Duration | Two Days (including field visit) |
| Qualification | Minimum S.S.L.C. |
| Objective | To train the fresher as well as Municipal staff members to discharge their duties efficiently in managing Solid Waste disposal and familiarizing them with its various methods and stages. Also to make them conversant with the various provisions contain in the Municipal Solid Waste Management and Handling Rules. |
| Date of Commencement | Nov 2005 |

**Regular programme**

| | |
|---|---|
| Recognized by | Recognized by Government of India (Ministry of Health) vide letter No - F13-4-56 ISM (L) |
| Duration | 1 Yr / 18 Months as may be applicable |
| Qualification | Graduates from any stream (excluding Fine Arts, Music, Classical Dance and Languages)<br>Technical Diploma Holder<br>12th Science pass/ undergraduates Science stream |
| Objective | To train and develop essential skills of Public Health and Sanitation in students. |
| Offering Centers of AIILSG | Mumbai, Nagpur, Jodhpur, Bangalore, Lucknow, Pune, Bhopal, Ahmedabad, New Delhi, Belgaum, Thiruvanthapuram Cochin, Nashik |

### 3.2 Source of Funding: -

Various multilateral, bilateral, national and state level agencies have been providing the funds to the training institutions for different levels of training programmes/workshops.

- Central government ministries i.e. MoEF, MoUD, CPCB, MNEF are the main central agencies, which are providing the financial support for conducting training programmes, workshops and seminars.

- Bilateral agencies involved are Ford Foundation, USAEP/ USAIR/USAID, NORAD, DANIDA, CIDA, etc.
- Multilateral agencies like World Bank, UNDP, ADB, JBIC also provide one time financial assistance for formal and informal training on solid waste management and urban programmes.
- Few state governments have also taken their own initiatives to organize training workshops from state funds.
- Institutional funding or sponsorship for organizing/participating in workshops is very rare.

### 3.3 Target audiences

Looking at the target audiences for the past and ongoing training programme, we can observe the following points: -

- Municipal administrative & technical officials have been the most preferred/targeted group in the training programmes. Generally heads of the institutions and senior officials participate in these training programmes and workshops. Exposure to junior officials and sanitary officials is lesser. Participation of municipal elected representatives is also very rare. It has been specially addressed by USAEP in their training programme/ workshops.

**Fig. 3.1 Target group coverage in various past and existing training Programmes/ Workshops**

- NGOs, institutions, CBOs and state pollution boards representatives also participate in these training programmes.

- Recognizing the role of industrial and private sector, recently, some of the institutions like CII, ASSOCHAM have targeting industries and private contractors.

- State government representatives from the concerned departments and some other stakeholders also send their representatives in the consultation workshops

### 3.4 Outreach

Prevalence of state level training programmes is highest followed by regional and city levels.
Factors responsible for these may be financial and Institutional to ensure maximum number of participation in these workshops.

**Fig. 3.2. Outreach - Existing Training Programmes**

### 3.5 Training on 7 MSWM steps

- To ensure compliance to Municipal Solid Waste & (Management & Handling) Rules, 2000, most of training programmes stress on the seven steps mentioned in the rules.

- Training on source storage, segregation, primary collection and community participation is addressed in almost every training programme.

**Fig. 3.3. Ongoing coverage on 7 MSWM steps**

- A high percentage also addresses the issue of treatment and disposal. Best practices and new technical innovations are given significant emphasis.

- Other aspects i.e. cleaning of streets, intermediate transfer, secondary storage of waste and transportation are also addressed but comparatively lesser frequently.

### 3.6 Subjects covered in the training programmes and workshops

Assessment of subject's covered/being covered in the past and ongoing training programmes are shown in the graph below.

**Fig. 3.4. Commonly addressed subjects in past/ongoing training delivery on SWM in India**

**Workshops highlight the followings aspects: -**

- Interest and subject capabilities of the training institutions
- Importance and preference given by the training and funding institution
- Availability of subject experts/resource persons
- Linkages of training programmes with other ongoing schemes/ programmes being conducted by the training institutions
- Although it may presume that subject covered are the areas of interest to the participants, but it may not be a true indicator, as ongoing programmes are generally not based on training needs.

**Observations on Subjects covered: -**

- Legal framework i.e. Municipal Solid Waste (Management and Handling) Rules, 2000 and other allied rules like Plastic Waste and Non Biodegradable Waste Recycling Rules, 2000 and Biomedical Waste (Management & Handling) Rules are addressed in the ongoing training programs. This does help in the sensitization and creation of awareness regarding existence of such rules. However it is more important to understand and initiate the process of compliance to the seven steps mentioned in the rules, which is still dismal. So emphasis need to given to provide a clear understanding of the process of compliance to rules of waste management in the country.
- Prevalence of training programmes on community participation brings it focus on

NGOs, CBOs to play an important role in training delivery to community.

- As most of these programmes are being organized as consultation workshops, issue, scenarios and bottlenecks are discussed.

- Development of action plan for the state and city level implementation and cost efficiency and recovery are also frequently addressed.

**Fig. 3.5 Participation Response- Existing Training Delivery**

- Subjects like role of private sector participation, contracting mechanisms, segregation, reuse & recycling, health & environment, IEC activities, monitoring, enforcement and accountability, technical aspects of treatment and disposal, innovative SWM systems, institutional aspects, training & capacity building are rarely addressed and reflect training gaps.

### 3.7 Participation Response

Participation response in the training has been claimed to be excellent or good by most of the institutions. This is measured by the ratio of expected target audience to total number of participants but Institutions complained about the comparatively poor response from the local bodies. Motivation level among participants in is found to be average.

### 3.8 Methods used for enhancing participation

On examining the methods used to attract participants in training programs it is observed that amongst methods used for enhancing participation, state government pressure has been found to be the most significant and useful method.

**Fig. 3.6 Methods used for enhancing participation**

- Next important method to attract participant is sponsorship either in full or part by the organizers to motivate them for attending training programmes
- The participants rarely relate the importance of recognition & certification and its subsequent academic & professional significance.

**Fig. 3.7. Host institutional support to participations**

### 3.9 Parent Institutional Support to the participants

- In almost all cases travel cost has been borne by the parent organization.
- Some of the training institutions provide lodging and boarding as an incentive for maximizing participation.
- Paying the course fee/registration fee has been very rare in past and ongoing training initiatives

### 3.10 Provision of support materials

**Fig. 3.8. Best practices shared-training manual provided**

- 45% of the training programmes/works hop share best practices with the participants.
- Only in 1/3 of the training programmes, reference materials and training manual are provided to participants.

### 3.11 Duration

- Duration of training programs/ workshops is generally one to 2 days with few programmes for 3 to 5 days.

### 3.12 Training Delivery Gaps vis a vis Areas of Entry of SWM Learning Program

- Workshops are generally focusing on consultations and discussions and lack in terms of setting specific training objectives. Formal training framework is missing.

- Experts generally design training programs without consulting the target audiences, so conducting training need assessment exercise would be useful.

- Institutions compile subject specific training materials from secondary sources but provision of specific training modules and reference materials reflects a significant gap in the training delivery mechanism.

- Poor participation in the workshops, especially from the municipal bodies, is a serious concern, so involvement of state government would be very necessary for effective delivery of the program

Fig. 3.9.

- Lower levels of municipal staff are hardly exposed to training so development of specific programmes for middle and lower levels of municipal officials would be essential. Similarly increased role of elected representatives in implementation, decision-making and monitoring make them a mandatory target group to be addressed.

- Due to mixed group of participants in the training programs/workshops, specific training needs remains un-addressed so development of target audience specific training materials is required.

- Lack of mechanisms for training of master trainers. There is dearth of competent number of resource persons at state level. So identification, training and capacity building of resource person need be specially addressed.

- Training workshops are repetitive and monotonous in term of content and structure and there are no feedback & post training follow up mechanism, so feedback and evaluation would be of utmost importance. Training programs need to be more interactive with sharing of best practices/case studies.

- Training programs/workshops are organized as one time activity and there is no mechanism for sustaining the continuous training mechanism. So an action plan for the same is important.

# 4 TARGET SPECIFIC TRAINING NEEDS ASSESSMENT (TNA) RESULTS

## 4.1 Chief Administrative Officers

This category includes the Municipal Commissioners, Deputy and Assit. Commissioner of the Municipal Corporations and Executive Officers of Nagar Panchayats, Municipalities and Municipal Councils in the Country. In our sample, most of the Chief Administrative Officers are from smaller or middle levels local bodies. As they are large in number, it would be a true reflection of training needs.

**Educational Level and Experience**

According to sample survey, 69% of the Chief Administrative Officers are postgraduate, 25% are graduates but some of them have studied only upto higher secondary levels. Approximately 31% of them possess technical diploma or degree, may it be in law, engineering, management, health or any other discipline. In terms of number of years of experience, maximum fall in the range of 15 to 25.

**Responsibilities**

Chief Executive Officers being the executive heads, coordinate all the functions of urban local bodies. Their role in the solid waste management operations depends largely on the city size, personal interests and individual capabilities of the Chief Administrative Officers. According to the training needs survey, average time spent by this category on SWM activities is 25 to 30% of the total time.

**Fig. 4.1.1 Chief Administrative Officers- Responsibilities**

Looking to the survey results, the following observations are made about the responsibilities of Chief Executive Officers / Executive Officers: -

- Coordination and management
- Planning & scheduling of SWM activities
- The staff management and control
- Managerial decisions regarding budgeting, costing and financial aspects
- Legal obligations

- Field supervision, public interaction and complaint redressal
- Official communications
- Training & capacity building and initiatives for prompting community participation is largely dependent on individual interests and capabilities

**Ability Gaps – Self Assessment**

Self-assessment and assessment of abilities of colleagues has been mapped to indicate the following gaps.

- As is depicted in the graph 3/4th of the Chief Administrative Officials have reported that they and their colleagues lack the understanding and abilities in all listed

**Fig. 4.1.2. Chief Administrative Officers- Ability Gaps**

disciplines necessary for improving solid waste management in their cities and complying to MSWM rules.

- 70 to 80% of them are not sufficiently aware of the Municipal Solid Waste Management & Handling, Rules, 2000 and lack the understanding of seven SWM steps prescribed therein.

- Only 20 to 25% of them have claimed to possess the understandings of standard contracting mechanisms, budgeting and costing, institutional and technical understanding of these subjects.

- A large number amongst them have also reported to lack the sufficient skills in communication, training and capacity building and supervision and coordination.

- Only 1/5th of them are friendly to the computer applications.

## Preferred Areas of Training

Following are the most preferred aspects of training needs identified by the Chief Administrative Officials for them and their peer groups.

**Fig. 4.1.3. Chief Administrative Officers- Preferred areas of training**

They have sought training in all areas but are arranged as priority preference levels: -

- Legal framework i.e. understanding MSWM rules
- Cost Recovery, Cost Efficiency & Financial management
- Enhancing Community Participation
- Private Sector Participation & Contracting Mechanisms
- Information, Education & Communication
- Monitoring, Enforcement & Accountability
- Segregation, Reuse & Recycling
- Seven steps to manage SWM
- Technical & Engineering Aspects
- Motivation & Job Performance

## Preferred Duration

Responding to the question for providing preferred duration of training; Chief Administrative Officers have suggested that 2 to 3 days of training would be most appropriate their category. Some of them have even suggested it to be one day. Only 1/4th of them prefer it to be of 5 days or more.

**Fig. 4.1.4. Chief Administrative Officers- Preferred duration**

**Conclusion**

Looking at the educational levels, technical competencies, years of experience, responsibilities, abilities gaps, areas of training needs and preferred duration of training, we get can conclude the following directions.

- Diverse educational qualification, long experience and relatively low technical competency need to be considered while finalizing training needs and development of training materials.

- **Duration of Training should be 2 days**.

- As Chief Executive Officers are responsible for the compliance of MSWM in their respective cities and most of them lack understanding so **"understanding MSWM rules and seven steps mentioned therein"** is significant.

- **"Budgeting, costing and financial management"** is one their prime responsibility but were they lack ability; it is therefore an important area of training.

- **For efficient service delivery in a cost effective manner they need to learn the role of private sector participation and "understanding of contracting mechanisms"**.

- As an institutional head, they need to learn **"institutional and legal aspects for improving SWM services"**.

- Other aspects like methods of enhancing community participation, segregation, reuse & recycling, technical & engineering aspects of SWM can be covered briefly in the training of this group.

- As this group is responsible for decision-making, acquainting them with **good and bad practices** on different aspects of solid waste management would be highly significant to improve their **decision-making**

## 4.2 Elected Representatives

This group comprising of Mayors of Municipal Corporations, Chairpersons of the Municipalities and Councilors.

**Educational Level and Experience**

According to sample survey, 39% of the elected representatives are postgraduate, 39% are graduates and only 22% of them reported to have studied up to higher secondary levels. Approximately 28% of them even possess technical diploma or degree, may it be in law, engineering, management, health or any other discipline. They are having experience between 0 to 10 Years.

**Responsibilities**

Practically all the elected representatives have to deal with solid waste management issues on a day-to-day basis. Their role in the Solid waste management operations however depends largely on their personal interests and individual capabilities. Although they are

**Fig. 4.21.1 Elected Representatives – Responsibilities for SWM**

involved in several municipal activities they have to devote quite a good time on solid waste management. According to the training needs survey, SWM and sanitation is an issue of everyday concern for the elected representatives. The average time spent on these is 25 to 30% of their total time.

Responsibilities for solid waste management include following aspects. Looking at the results, we can make the following indicative observations: -

- They are responsible for supervision and monitoring of SWM activities in their respective wards/areas.
- They are involved in planning & scheduling, budgeting costing & financial

management and are responsible for taking financial decisions through executive committees.

- Field supervision, public interaction, citizen complaint redress and community involvement are among their primary responsibilities. They are an important link between the citizen and the local body.
- Their substantial time goes in coordination, meetings and communications.
- Their responsibilities for looking into the legal and technical aspects depend on the individual interests and capabilities.
- Not directly involved but need to possess the basic knowledge and understanding in technical and engineering aspects.
- Training & capacity building and initiatives for prompting community participation is largely dependent on individual interests and capabilities

**Ability Gaps – Self Assessment**

Self-assessment and assessment of abilities of colleagues is revealing the following results. Assessment of the ability gaps indicates the following references.

**Fig. 4.2.2. Elected Representatives – Ability Gaps for SWM**

- As is visible from the results, elected representatives have reported that they and their colleagues substantially lack the abilities in all listed disciplines necessary for improving solid waste management in their cities and complying with MSWM rules.

- Merely 15% of them have said that they are aware the existence of municipal solid management and handling rules and seven SWM steps prescribed therein.

- Only 10 to 15% of them have claimed to possess the understandings of process of standard contracting mechanisms, budgeting and costing, institutional and technical understanding of these subjects.

- A large number amongst them have also reported to lack the sufficient skills in

communication, training and capacity building and supervision and coordination.

- Familiarity with computer applications is very low in this group.

**Preferred Areas of Training**

Elected Representatives were requested to suggest the areas of training needs for them. Following are the most preferred aspects of training needs identified by this group.

- Legal framework i.e. understanding of MSWM rules,
- Methods to enhance community participation.
- Private sector participation & contracting mechanisms
- Methods for better monitoring, enforcement & accountability.
- Understanding of seven essential steps of solid waste management,
- Segregation, reuse and recycling of solid.

**Fig. 4.2.3. Elected Representatives – Preferred Areas of Training for SWM**

- They have given low priority to cost recovery & financial management and technical engineering aspects.

Module on motivation & Job performance is least preferred.

**Preferred Duration**

Responding to the question of preferred duration of training; elected representatives have preferred the duration of the training program to be 2 to 3 days. This is contrary to our hypothesis that one day training

**Fig. 4.2.4.Elected Representatives – Preferred duration of training**

program is sufficient for the category of elected representatives.

**Conclusion**

Looking at the educational levels, their responsibilities, years of experience and abilities, their training need preferences, the following training program is considered appropriate for elected representatives.

**Duration of Training should be 2 Days**.

- Elected representatives are decision makers. They must therefore have the exposure to **"Understanding of MSWM rules and seven steps of compliance mentioned therein"**.

- Elected representatives directly deal with community so for enhancing community participation, a module of training for **promoting Community participation for improvements of SWM** through **information education and communication activities** would be beneficial for this group.

- As decision makers they need to understand the "**role of private sector participation** and **contracting mechanisms"** and its benefits to stakeholders and total SWM in the city need be appropriately addressed.

- "**Budgeting, costing and financial issues"** are matters of their prime concern. They need to be given exposure in this aspect though they are reluctant to prefer training in this area.

- **"Institutional aspects, monitoring, enforcement & accountability** may also be included in their training as minor subject.

- Technical & engineering aspects may be excluded from their training.

- This group needs to be provided a module on the **role of elected representatives to improve of SWM services**. Training programme for this group need to **be highly interactive through visuals and sharing of best practices**. Field exposure to see best practices would give the best results.

## 4.3 Health Officials

Health Officials generally head the SWM department in the most of the cities in India. Very few cities have engineers heading this department.

**Educational Level and Experience**

Most of the health officials are medical graduates with postgraduate diploma in public health. They have wide experience of 20 to 30 Years.

**Responsibilities**

According to the training needs survey, SWM and preventative health is their prime responsibility, the average Time spent on SWM services is 40 to 50% of their total time and sometimes even more in the larger cities.

**Fig. 4.3.1. Health Officers – Responsibilities for SWM**

Their responsibilities for solid waste management include following aspects.: -

- They are responsible for legal aspects related to solid waste management and are answerable for noncompliance.
- They are responsible for overall staff management and control for solid waste management, street cleaning and sanitation services.
- They are involved in planning & scheduling, budgeting costing & financial management and are responsible for taking financial decisions through executive committees.
- Field supervision, public interaction, citizen complaint redressal and community involvement are among their prime responsibilities for Solid waste management.
- Their substantial time goes in coordination meetings and communications.
- Although they need to take technical decisions, they substantially lack the knowledge

and understanding in technical and engineering aspects.

- Training & capacity building initiatives for promoting community participation is largely dependent on individual interests and capabilities.

**Ability Gaps – Self Assessment**

Self-assessment assessment of abilities of health officials indicates the followings aspects. Health officials have reported that they and their colleagues substantially lack the abilities in all listed disciplines necessary for complying with MSWM rules in their respective cities.

- This category has reported in adequate knowledge of municipal solid waste (management and handling) Rules 2000 and suggested seven steps for betterment of SWM services.

- Understanding of contracting mechanisms, budgeting and costing, institutional and technical aspects of these subjects.

**Fig. 4.3.2. Heath Officers – Ability Gaps for SWM**

- A large number amongst them have also reported lack of the sufficient skills in communication and supervision and coordination.

- Familiarity with computer applications is reported to be nil.

## Preferred Areas of Training

Following are the most preferred aspects of training:.

- Legal framework i.e. understanding of MSWM Rules, and seven steps to improve SWM services.

**Fig. 4.3.3. Health Officers – Preferred Areas of Training**

- IEC and other Methods to enhance community participation and improve segregation, reuse and recycling of wastes.
- Private sector participation & contracting mechanisms, methods for better monitoring, enforcement & accountability.
- Technical aspects of SWM.
- Module on motivation & Job performance is least preferred.

## Preferred Duration

For the category of health officials, the most preferred duration of the training is 2 to 3 days followed by preference for 5 days.

**Fig. 4.3.4. Health Officers – Preferred Duration of Training**

## Conclusion

Looking at the educational levels, technical competencies, years of experience, responsibilities, abilities, their expression of training needs and preferred duration of training, the following conclusions are drawn.

- **Duration of Training should be 3 Days**.

The area of Training should be as under:

- Understanding of **"Municipal Solid Waste (Management and Handling) Rules, 2000**". Provisions on SWM in state laws, provisions of environment protection act 1986, Supreme Court committee report on solid waste management.

- Training on various steps to be taken to improve "**module on steps of solid waste management"** such as storage of waste at source, segregation of recyclables, primary collection of waste from doorstep, cleaning of streets, secondary storage of waste, transportation of waste and waste processing & disposal.

- **Role of private sector participation** and **"understanding of contracting mechanisms"**.

- "**Promoting Community participation"**

- **"Training & Capacity Building of staff"**

- **"Institutional aspects for improving SWM services, monitoring, enforcement & accountability towards the service delivery.**

- **"Budgeting, costing and financial issues" and "Job performance"**.

- **"Technical & engineering aspects".**

## 4.4 Engineering Officials

This group comprises of engineers working as city executive engineers, assistant engineers and junior engineers. Their role in the solid management has been only recently recognized. Expect in few states, they are primarily concerned with only engineering and technical aspects such as construction of waste storage depots, maintaining fleet of vehicles, construction of treatment and disposal facilities etc. With the induction of more environmental engineers in solid waste management, their role in solid waste management has to be broadened.

**Educational Level and Experience**

Engineers have bachelors or masters degree in engineering. Few have diploma in engineering. More and more environmental engineers are now joining Municipal Service in this department.

**Responsibilities**

According to the training needs survey, the average time spent on these is 25 to 30% of their total time. In comparison to responsibility charts discussed for other categories, till date their role and involvement in SWM services is lesser.

Their responsibilities for solid waste management include following aspects.

**Fig. 4.4.1. Engineering Officials – Responsibilities for SWM**

- They are responsible for technical and engineering aspects of solid waste management. Their role is to develop technical proposals, invite tenders and award contracts for

designing and management of treatment plants and sanitary landfills. Their duties also include execution and supervision of treatment and disposal facilities. They also procure vehicles and equipments and maintain the same.

- In some of the cities, municipal engineers are also handling the responsibilities of planning & scheduling, field supervision, coordination, etc.

- In the cities where a health officer does not exist, municipal engineers are responsible for ensuring compliance to the rules and seven steps prescribed.

**Ability Gaps – Self Assessment**

Self-assessment of abilities of engineers indicates the followings aspects.

- Engineers have reported that they and their colleagues substantially lack the abilities in all listed disciplines necessary for complying with MSWM rules in their respective cities.

- This category has reported ignorance to the municipal waste management and handling rules and suggested seven steps for betterment of SWM services.

**Fig. 4.4.2 Engineering Officials – Ability Gaps for SWM**

- The group has indicated a gap in the technical and engineering aspects as they lack the capabilities to design, supervise and monitor treatment and disposal systems.

- They lack understandings of process of standard contracting mechanisms, budgeting and costing, institutional and technical understanding of these subjects.

- A large number amongst them have also reported lacking skills in communication, training and capacity building and supervision and coordination.

- Familiarity with computer applications is also very low.

**Preferred Areas of Training**

Following are the most preferred aspects of training needs:
Legal framework i.e. understanding MSWM rules, and seven steps to improve SWM services.

**Fig. 4.4.3. Engineering Officials – Preferred Areas of Training on SWM**

- Private sector participation & contracting mechanisms.
- Enhancement of technical capabilities for better execution of solid waste management components.
- IEC and other Methods to enhance community participation and improve segregation, reuse and recycling of wastes.
- Methods for better monitoring, enforcement & accountability.

**Preferred Duration**

For the category of engineers, the most preferred duration of the training is 5 days followed by 2 to 3 days.

**Fig. 4.4.4. Engineering Officials – Preferred Duration**

**Conclusion**

Looking at the educational levels, technical competencies, years of experience, responsibilities, abilities, areas of training needs and preferred duration of training, we can conclude the following training needs.

- **Duration of Training should be 3 Days. For more technical aspects they could be**

**sent for specialized courses.**

- **"Municipal Solid Waste (Management and Handling) Rules, 2000**" with emphasis on **the "technical aspects" of the Rules.**

- **Seven steps of solid waste management"** especially **technical aspects** of storage of waste at source-segregation of recyclables, primary collection of waste from doorstep, cleaning of streets, secondary storage of waste, transportation of waste and managerial & technical aspects of waste processing & disposal of waste.

- **"Role of private sector participation" and** "**contracting mechanisms"**.

- Some understanding on "**promoting Community participation for betterment of SWM", "Concept of segregation, reuse & recycling of waste materials" and "budgeting, costing and financial issues" may be covered in the training.**

## 4.5 Sanitary Officials

This group comprises of chief sanitary inspectors, inspectors and assistant sanitary inspectors. Sanitary officials generally report to health officers and are responsible for solid waste management services in assigned wards / areas. In smaller towns chief sanitary inspectors / sanitary inspector are put in charge of overall solid waste management operations.

### Educational Level and Experience

In the sample survey 23% are postgraduates, 35% graduates and 45% are higher secondary. Approximately 90% of them possess a diploma in public health & sanitation. An average year of experience is in the range of 10 to 20 years.

**Fig. 4.5.1. Sanitary Officials – Responsibilities for SWM**

### Responsibilities

According to the training needs survey, as SWM and sanitation is their prime area of work, the average time spent on these services is 80 to 90% of their total time.

Responsibilities for solid waste management include following aspects. Looking at the results, we can make the following indicative observations: -

They are primarily responsible for field supervision, coordination and field staff mobilization and control.

- Ensuring street sweeping, & cleanliness in their wards.
- Ensure source storage and prevent littering of garbage on the streets.

- Primary collection of waste from households wherever introduced.
- Secondary storage and regular lifting of garbage from the municipal bins/dhalaos.
- Planning & scheduling of services in their respective wards.
- Public interaction and citizen's complaint redressal.

**Ability Gaps – Self Assessment**

Self-assessment of abilities of sanitary officials indicate the followings aspects.

- Sanitary officials have reported that they and their colleagues have heard that rules have been notified but they are not well versed with these rules and seven steps of managing solid waste management.

**Fig. 4.5.2. Sanitary Officials – Ability Gaps for SWM**

- They lacks the understandings contracting mechanisms, budgeting and costing,
- Lack the skills in communication, supervision and coordination.
- Familiarity with computer applications is reported to be very low.

**Fig. 4.5.3. Sanitary Officials – Preferred Areas of Training**

**Preferred Areas of Training**

Following are the most preferred areas of training needs:

Legal framework i.e. understanding MSWM rules, and seven steps to improve SWM services is the most preferred area of training.

IEC and other Methods to enhance community participation and improve segregation, reuse and recycling of wastes.

Private sector participation & contracting mechanisms, supervision monitoring, enforcement & accountability.

Technical aspects need to be introductory.

**Preferred Duration**

For the category of sanitary officials, the most preferred duration of the training is 5 days followed by 2 to 3 days.

**Fig. 4.5.4. Sanitary Officials – Preferred Duration of Training**

**Conclusion**

Looking at the educational levels, technical competencies, years of experience, responsibilities, abilities, indication of training needs and preferred duration of training, the following training needs are concluded.

- **Duration of Training should be 3 Days as 5 days appears to be excessive. They do not need in depth training in several areas**. They can be combined with the health officials for first two days but last day of training can be different for this group as some of the subjects are to be addressed exclusively for this category.

- Understanding of **"Municipal Solid Waste (Management and Handling) Rules, 2000**".

- **"Seven steps of solid waste management"** with detailed understanding on storage of waste at source-segregation of recyclables, primary collection of waste from doorstep, cleaning of streets, secondary storage of waste, transportation of waste and introductory aspects of waste processing & disposal of waste.

- **"Promoting Community participation for betterment of SWM"**

- **"Concept of segregation, reuse & recycling of waste materials"**

- **Role of private sector participation at local level** and **"understanding of contracting**

**mechanisms"**.

- **Monitoring, enforcement & accountability**

- Technical & engineering aspects, if at all included, can just be introductory and basic for this group.

## 4.6 Accounting & Finance Officials

This group comprises of chief accounts officers, auditors, head clerks and other concerned accounting staff of urban local bodies.

**Educational Level and Experience**

In the sample survey 29% are postgraduates, 50% graduates and 21% are undergraduates. Approximately 90% of them are from commercial and accounting background. Average years of experience lies in the range of 10 to 20 years.

**Responsibilities**

According to the training needs survey, accounting for SWM is one of their prime area of work, the average time spent on these only for SWM and cleanliness services is 10 to 15% of their total time.

**Fig. 4.6.1. Accounting & Finance Officials – Responsibilities**

- Responsibilities for solid waste management include following aspects. Looking at the results, we can make the following indicative observations: -

- They are primarily responsible for budgeting, costing and financial aspects

- They are also involved in planning and scheduling for SWM, coordination and meetings.

**Fig. 4.6.2. – Accounting & Finance Officials – Ability Gaps**

**Identified Ability Gaps**

Self-assessment of abilities of accounting and finance officials indicate the followings aspects.

- Awareness regarding MSWM rules is nil.
- This group lacks in the understandings contracting mechanisms and role of private sector participation.
- Lack the understanding and skill for better and separate budgeting and costing, for SWM services
- A large number amongst them have also reported to lack the sufficient skills in communication, training and capacity building and supervision and coordination.
- Familiarity with computer applications is reported to be very low.

**Preferred Areas of Training**

- Following are the most preferred aspects of training needs: -
- Legal framework i.e. understanding MSWM rules and seven steps to improve SWM services is the most preferred area of training.

- Cost recovery, cost efficiency and financial management and private sector participation& contracting mechanisms are also the most preferred subjects for training.

**Fig. 4.6.3 Accounting & Finance Officials – Preferred Areas of Training**

- IEC and other Methods to enhance community participation and improve segregation, reuse and recycling of wastes are also preferred.

**Preferred Duration**

Half of the people suggested a one-day training whereas other half of them suggested it to be for 2 to 3 days.

**Fig. 4.6.4. Accounting & Finance Officials – Preferred Duration**

**Conclusion**

Looking to the role of account officials in SWM they does not seem to be any need to give them any training on Solid Waste Management. They could be trained in accounts matters separately by municipal authorities.

### 4.7 Summary table indicating the training needs of each category of ULB Officials and Elected Representatives

| Sr. No. | Training Needs – (Subjects arranged according to preference levels) | Duration of Training programme |
|---|---|---|
| 1 | **Municipal Commissioner / Executive Officers**<br>❑ Understanding MSWM rules and seven essential steps<br>❑ Budgeting, costing, cost recovery and financial management<br>❑ Role of private sector participation.<br>❑ Understanding of contracting mechanisms<br>❑ Institutional aspects for improving SWM services<br>❑ Monitoring, enforcement & accountability<br>❑ Introduction to community participation, IEC activities, segregation, reuse & recycling, technical & engineering aspects can just be introductory and basic for this group.<br>❑ Best Practices | 2 days. |
| 2 | **Elected Representatives**<br>❑ Understanding MSWM rules and seven steps mentioned therein<br>❑ Role of elected representatives in betterment of SWM services<br>❑ Promoting Community participation for betterment of SWM<br>❑ Role of private sector participation understanding of contracting mechanisms<br>❑ Budgeting, costing and financial issues<br>❑ Institutional aspects for improving SWM services" through improved monitoring, enforcement & accountability<br>❑ Concept of segregation, reuse & recycling of waste materials<br>❑ Training Need to be highly interactive through visuals and sharing of best practices. Field exposure to show the best results. | 2 Days. |
| 3 | **Health Officials**<br>❑ Municipal Solid Waste (Management and Handling) Rules, 2000<br>❑ Module on seven steps of solid waste management<br>❑ Role of private sector participation<br>❑ Understanding of contracting mechanisms<br>❑ Promoting Community participation for betterment of SWM<br>❑ Concept of segregation, reuse & recycling of waste materials<br>❑ Training & Capacity Building of staff<br>❑ Institutional aspects for improving SWM services" through improved monitoring, enforcement & accountability | 3 Days |

| | | |
|---|---|---|
| | ❑ Budgeting, costing and financial issues"<br>❑ Technical & engineering aspects of treatment and disposal of waste | |
| 4 | **Engineers**<br>❑ Municipal Solid Waste (Management and Handling) Rules, 2000<br>❑ Module on seven steps of solid waste management<br>❑ Technical aspects for MSWM specially treatment & disposal<br>❑ Role of private sector participation<br>❑ Contracting mechanisms<br>❑ Promoting Community / NGO / private sector participation for betterment of SWM<br>❑ Brief training on "budgeting, costing and financial issues" | 3 Days |
| 5 | **Sanitary Officials**<br>❑ Municipal Solid Waste (Management and Handling) Rules, 2000<br>❑ Seven steps of municipal solid waste management<br>❑ Promoting Community participation for betterment of SWM<br>❑ Public private sector participation<br>❑ Concept of segregation, reuse & recycling of waste materials<br>❑ Role of NGO / private sector participation at local level<br>❑ Understanding of contracting mechanisms<br>❑ Monitoring, enforcement & accountability<br>❑ Brief Technical & engineering aspects of treatment and disposal of waste. | 3 Days |
| 6 | **Accounting & Finance Officials**<br>❑ No SWM Training Required | - |
| 7 | **State Pollution Control Board – Scientists, Engineers**<br>❑ Understanding of MSWM rules and seven steps of compliance mentioned therein<br>❑ Decision making and institutional aspects<br>❑ Community participation for improvements of SWM through information education and communication activities<br>❑ Concept of Zero Waste Community<br>❑ Institutional aspects, monitoring and enforcement mechanism<br>❑ Technical & engineering aspects especially in terms of environmental implications of each available technology. | 3 Days |
| 8 | **Formal Private Sector**<br>❑ Understanding of the relevance of MSWM rules and seven steps of compliance mentioned therein<br>❑ Training on performance standards and performance evaluation process<br>❑ Cost recovery, efficiency, public accountability, | 3 Days |

| | | |
|---|---|---|
| | management, finance, economies of scale, legislation, institutional linkages<br>❑ Module covering the cost benefits in collection, street sweeping, transportation, transfer, treatment and disposal of waste material<br>❑ Understanding on different methods of private sector participation in solid waste management i.e. contracting, concession, franchise, etc with particular emphasis on the roles and responsibilities of local government and private contractor.<br>❑ Module addressing the socio economic and environmental appropriateness of innovative technologies | |
| 9 | **Informal Private Sector**<br>❑ Awareness on MSWM rules especially regarding source storage, segregation and primary collection, street sweeping.<br>❑ Training on their roles and responsibilities while managing various waste management and handling services<br>❑ Module addressing the socio economic and environmental appropriateness of innovative technologies<br>❑ Training on work standards and operating procedures<br>❑ Public accountability and job performance<br>❑ Cost benefits of solid waste service - collection, street sweeping, sorting and recycling<br>❑ Aspects related to occupational health hazards and importance of using safety gears while handling waste and providing other sanitary services | 1 Day |
| 10 | **NGOS/CBOs**<br>❑ Seven steps of compliance of mswm rules<br>❑ Segregation, source storage, primary collection<br>❑ Understanding the role of NGO participation and benefits to stakeholders and total SWM in the city.<br>❑ Decision making and institutional aspects.<br>❑ Promoting community participation for improvements of SWM through information education and communication activities<br>❑ Concept of "Zero Waste Community"<br>❑ Institutional aspects, monitoring, enforcement & accountability<br>❑ Technical & engineering aspects can be provided only on interest basis. | 2 - 3 days |
| 10 | **Sanitary Workers**<br>❑ Their important Role in the SWM system & self respect while performing work<br>❑ Segregation, source storage, primary collection | 1 day |

| | | |
|---|---|---|
| | ❑ Occupational health hazards and Safety<br>❑ Personal hygiene and cleanliness<br>❑ Work standards and operating procedures<br>❑ Public accountability and Job performance | |
| 11 | **Rag pickers**<br>❑ Training on occupational health hazards and precautions they need to take to while handling waste.<br>❑ Awareness of SWM system<br>❑ Personal hygiene and cleanliness. | 1/2 day |

# 5 CONCLUSION OF THE ASSESSMENT AND OUR FOLLOW-UP STRATEGIES

- City level consultations and compliance status analysis has indicated the areas where training is necessary for different level of stakeholders for enhancing compliance of 7 steps of municipal solid waste management prescribed by Municipal Solid Waste & Handling Rules, 2000. Indicated subjects to be covered include system design for storage of waste at sources, its primary collection, secondary storage, transportation and treatment and disposal in an environmentally acceptable manner. The respondents also suggested the areas of training needs i.e. cost recovery & cost efficiency, public/private partnerships and private sector participation in SWM sector, contractual mechanisms, IEC activities, public participation, etc.

- Institutional arrangements and ongoing training delivery assessment has indicated the training delivery trends and helped in identifying gaps which need to be bridged.

- Target groups specific training needs assessment has highlighted the training needs and recommending most appropriate training modules/subjects for each target group. Training needs results would be validated by consulting SWM experts, local, state and national level training institutes, organizations, government agencies and World Bank officials.

- On the basis of the training needs that would be finalized and detailed course content for each module would be developed for imparting training to various target groups. Training needs of each target group being specific, customized training packages would be developed for each category. These modules would cover all essential steps, which are most important for each category to improve the SWM practices. International materials and local best practices would be included, highlighting the most relevant aspects for each category. Supporting materials like power point presentations, audio- video material, posters, pamphlets would be developed for each category.

## Annex 2.1

### Training Need Assessment Questionnaire for Urban Local Bodies
**(Under SWM Learning Program – Supported by World Bank Institute)**

**To be responded by Municipal Officials and Staff**

**Objective**

The Government of India, Ministry of Environment & Forests has notified Municipal Solid Waste (Management & Handling) Rules, 2000 under the Environment Protection Act, 1986 mandating several steps to be taken by the municipal authorities in the Country to improve the solid waste management. The implementation of the rules is far from satisfactory as municipal authorities lack in-house capacity to deal with the situation. The World Bank Institute has come forward to support an initiative for training and capacity building of urban local bodies and other stakeholders for improving the municipal solid waste management expeditiously.

The objective of this questionnaire is to get opinion of various category of staff and stakeholders regarding training needs to enhance their skills for improving the SWM systems and help in developing appropriate training modules and teaching aids for the training and capacity building of their group.

The interviewee is requested to fill this form carefully and give his inputs to help designing of the course content of training modules.

**1. General Information**

**1.1. Name of the Urban Local Body**

……

**1.2. Name & Designation of the Respondent/s**

……

**1.3. Address**

……

…..……

**Contact Details**……

**1.4. Academic Qualification (please mention the highest class/degree/diploma).**

……

……

**1.5. Number of years of Experience**

……..…
……

**2. Job Responsibilities as regards to SWM in the city**

**2.1 In your present position, how much time you devote for carrying work related to Solid Waste Management. (Indicate time in %ages)**

……

**2.2 In your present position, what are your responsibilities for Solid Waste Management?**

| Sr. No. | Activity | (Please Tick as Appropriate) |
|---|---|---|
| 1 | Planning & Scheduling | |
| 2 | Budgeting, Costing and other Financial Aspects | |
| 3 | Field Supervision | |
| 4 | Coordination & Meetings | |
| 5 | Technical & Engineering Aspects | |
| 6 | Training & Capacity Building | |
| 7 | Communication | |
| 8 | Staff Management, Control | |
| 9 | Public Interaction and Complaint Redress | |
| 10 | Legal aspects | |
| 11 | Enhancing Community Participation | |
| Any Other (Please Specify) | | |
| 12 | | |
| 13 | | |
| 14 | | |

**2.3. Which are the steps you are involved with in managing Solid Waste Management in your city. Please tick appropriate and specify.**

1) Storage at source, Segregation and Primary collection
2) Cleanliness and Sweeping

3) Secondary Storage and Transportation of waste
4) Treatment, Processing and Disposal of Waste

**3. Awareness, Knowledge to MSWM Rules Manual on SWM**

**3.1. How aware are you of Municipal Solid Waste Management & Handling Rules, 2000, notified by Ministry of Environment & Forests, Government of India?**

Fully aware (1) Partially Aware (2) Not Aware (3)

**3.2. Are you aware of the manual on Municipal Solid Waste Management published by CPHEEO, Ministry of Urban Development & Poverty Alleviation, Government of India?**

Fully aware (1) Partially Aware (2) Not Aware (3)

**3.3. According to you, what is the level of compliance in your ULB as regards to various steps described in MSWM Rules? Please tick, as you feel appropriate.**

| Sr. No. | SWM steps | Very Good | Good | Fair | Poor |
|---|---|---|---|---|---|
| 1 | Storage at source | | | | |
| 2 | Segregation | | | | |
| 3 | Primary collection | | | | |
| 4 | Cleaning of streets | | | | |
| 5 | Secondary Storage | | | | |
| 6 | Transportation | | | | |
| 7 | Treatment & Processing | | | | |
| 8 | Disposal of waste | | | | |

**3.5. What are your suggestions for improving the further compliance to MSWM rules in the city? Please tick as you feel appropriate**

1) Privatization of SWM Services
2) Betterment of primary collection
3) Improvement of Secondary Storage/ Transfer Stations/Dhalaos
4) Improvement of Transportation system
5) Setting up composting, waste to energy plant
6) Establishing sanitary landfill
7) Improvement of cost recovery mechanisms

8) Betterment of enforcement mechanisms
9) Recycling of waste
10) Institutional Strengthening & Financial Reforms
11) Training & Capacity Building of staff
12) Enhancing Community/NGO/CBO participation
13) Better coordination and reporting mechanisms

Any other…Please add

4. **Training Need**

4.1 **Please read each of the abilities carefully and rate yourself and your colleagues on the same on the basis of five point rating scale. (Five is the highest and one is lowest)**

| S. No | Ability | Self | Colleague |
|---|---|---|---|
| 1 | Understanding MSWM Rules | | |
| 2 | Understanding of Seven steps to manage SWM in the city | | |
| 4 | Technical & Engineering aspects | | |
| 5 | Institutional aspects | | |
| 6 | Supervision and Coordination | | |
| 7 | Computer Applications | | |
| 8 | Budgeting & Costing for SWM | | |
| 9 | Contracting mechanisms | | |
| 10 | Training & Capacity Building | | |
| 11 | Communication Skills | | |

**4.2. Please indicate the areas of training needs for you and colleagues in your category to increase the competencies in managing SWM services.**

| Sr. No | Topics | (Please Tick as your feel appropriate) |
|---|---|---|
| 1 | Legal Framework for MSWM | |
| 2 | Seven steps to manage SWM in the city | |
| 3 | Cost Recovery, Cost Efficiency & Financial Management | |
| 4 | Private Sector Participation & Contracting Mechanisms | |
| 5 | Technical & Engineering Aspects | |
| 6 | Enhancing Community Awareness & Participation | |
| 7 | Promoting Segregation, Reuse & Recycling of waste | |
| 8 | Information, Education & Communication | |
| 9 | Monitoring, Enforcement and Accountability | |
| 10 | Motivation and Job Performance | |
| 11 | Any Other, you wish to add (Please specify) | |

**4.3. Has you or any one of your Colleagues received training on the subject of SWM? If yes, please provide details.**

1) Name & Designation of Staff/s……

2) Name of Institution/s……

3) Subject/Topic/s ……

4) Duration ……

5) Period ……..

**4.4. Please suggest the duration of training of training for your group. Please tick appropriate.**

1) ½ day
2) One day
3) Two to three days
4) Five days
5) Five to fifteen days

**4.5 What is your preferred mode of training? You may tick more than one.**

1) Class Room Teaching
2) Workshop, Seminar
3) Interactive Discussion
4) Explore trips
5) Reference material
6) Hands on Training

4.6. **Are you willing to go to a certified training institution for receiving training on the identified areas of improvements for SWM? If yes, how do you propose to meet the cost of training?**

……
……
……

**Thank you,**

**Signature**

## Annex 3.1.

**List of Institutions Visited for Assessing Existing Training Delivery Framework and Identification of Training Delivery Gaps**

- Associated Chambers of Commerce and Industry of India
- Centre for Environment Education
- Confederation of Indian Industries
- Central Pollution Control Board
- Central Public Health and Environmental Engineering Organization
- Human Settlement Management Institute
- Housing & Urban Development Corporation
- Hazardous Substance Management Division
- Ministry of Urban Development & Poverty Alleviation, GoI
- National Institute of Urban Affairs
- National Productivity Council
- The Energy Research Institute
- Toxic Links
- Urban Local Bodies
- Multi Disciplinary Centre on Safety, Health & Environment
- Environmental Planning Coordination Organization
- Human Resource Development Institute
- Disaster Management Institute, Bhopal
- Asian Centre for Organization Research and Development (ACORD)
- State Government of Rajasthan, Orissa, Tamilandu, Gujarat, Rajasthan and Madhya Pradesh
- Local Bodies
- State Pollution Control Boards
- State Training Institutions
- City Manager's Associations