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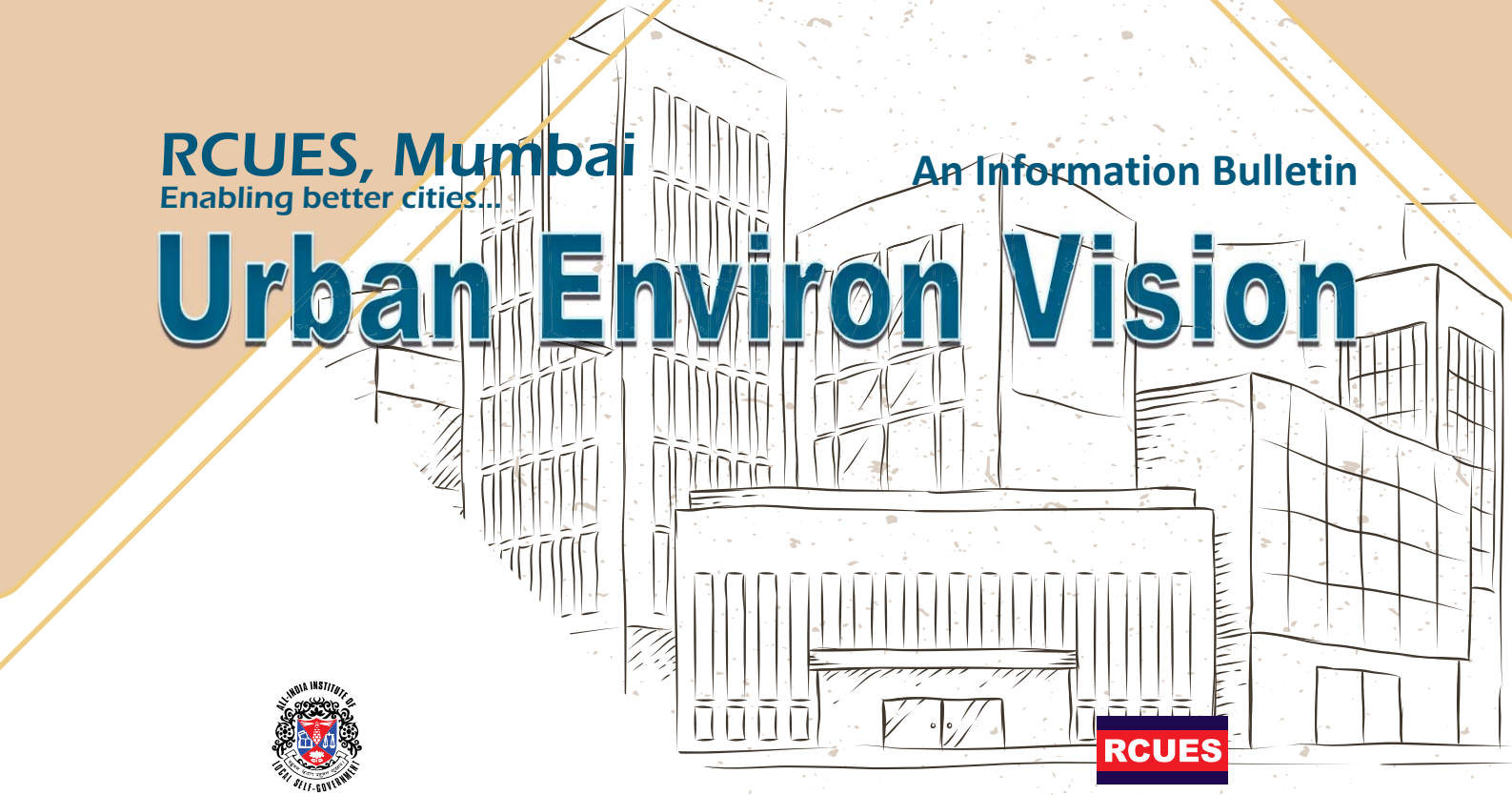
RCUES, Mumbai

Enabling better cities...

An Information Bulletin

Urban Environ Vision



Regional Centre for Urban & Environmental Studies

All India Institute of Local Self-Government, Mumbai

Established in the year 1968, is fully supported by Ministry of Urban Development, Government of India

The Contents

Urban Environ Vision aims to take its readers through the journey of RCUES, Mumbai while providing encouragement and inspiration. It offers a platform to display the efforts undertaken by RCUES, Mumbai and showcase its achievements.

Solid Waste Management with a focus on 100% Segregation of Solid Waste

18th & 19th May 2017, Mumbai, Maharashtra

This programme was focused on 100% segregation. The session would help participants to acquire more knowledge on segregation.

Introduction

The Swachh Bharat Mission (SBM) emanates from the vision of the Government articulated in the address of the Hon'ble Prime Minister to the Joint Session of Parliament on 9th June 2014, "We must not tolerate the indignity of homes without toilets and public spaces littered with garbage. For ensuring hygiene, waste management and sanitation across the nation, a "Swachh Bharat Mission" will be launched. This will be our tribute to Mahatma Gandhi on his 150th birth anniversary to be celebrated in the year 2019". With this background SBM was launched on 2nd October, 2014 and is being implemented by the Ministry of Urban Development, Government of India in urban areas.

Municipal Solid Waste Management (MSWM) is an important component of this Mission and the most essential service for maintaining the quality of life of people in the urban areas for ensuring better standard of health, sanitation and environment. MSWM in the country has emerged as a severe problem not only because of environmental and aesthetic concerns but also because of sheer quantities generated every day. According to Central Pollution Control Board 144,165 TPD of MSW was generated in India during 2013-14. Of the total waste generated, approximately 115,742 TPD (80%) of MSW was collected and only 32,871 TPD (22.8%) was treated. SBM offers an opportunity to address the issues linked with this situation.

Solid Waste Management Rules 2016 is mandatory for all municipal bodies to effectively manage urban solid waste in the city. It is mandatory for waste generators to store segregated waste at source and for municipal bodies to collect such a waste in a segregated manner directly from the households and transport it to designated places for appropriate treatment and processing. Major focus of SWM Rules 2016 is on segregation at source & zero garbage concepts.

It is essential for municipal bodies to adopt more systematic approach towards planning and management for solid waste and develop capacities of their staff / officials towards effective & efficient solid waste management system.

Against this background Regional Centre for Urban & Environmental Studies (RCUES) of All India Institute of Local Self Government (AIILSG), Mumbai organised **Regional Specialised Training Programme on "Solid Waste Management with a focus on 100% Segregation of Solid Waste" on 18th & 19th May, 2017 at Mumbai (Maharashtra). The training programme was fully supported by Ministry of Urban Development (MoUD), Government of India (GoI).**

Key Objective

The key objective of this training programme was to expedite the process of achieving goals of effective solid waste management in India with a focus on 100% segregation of waste at source, as envisaged in SBM, Urban & SWM Rules 2016.

Participation

A total of 33 participants comprising of Presidents, Vice-Presidents, Municipal Councillors, Environmental Engineers, Electrical Engineers, Health Officers, Fire Supervisors, Sanitary Inspectors, attended this training programme.

Inauguration

On first day, Mrs. Maleka Ansari, Research Officer, RCUES of AIILSG, Mumbai welcomed participants of Maharashtra, Gujarat & Goa State. Introductory session highlighted on

the activities conducted by RCUES of AIILSG, Mumbai in training & research area. She also briefed about the programme coverage & activities to be conducted in the training programme. Two days programme was followed by presentations, experience sharing, participatory activities & site visit to observe good practices developed by Municipal Corporation of Greater Mumbai. The introduction of the programme followed by inaugural session.

Ms. Utkarsha Kavadi, Director, RCUES of AIILSG, Mumbai addressing the participants.

Specialised Training Programme was inaugurated by Ms. Utkarsha Kavadi, Director, RCUES of AIILSG, Mumbai in presence of participants and guest faculties by lightening the traditional lamp of light. During the inaugural address she mentioned about the SWM rules, 2016 & its effective implementation towards solid waste management which is one of the major objectives to achieve swachh bharat mission. Further she pointed to segregation of solid waste and it should be start from household level. Urban local bodies need to play a proactive role in making people more aware and educated in segregation of waste at household level. She concluded her inaugural address by wishing a great success to the training programme.

Technical Sessions

Mr. Parthiv Soni, Manager, Crisil Risk and Infrastructure Solutions Ltd., addressing the participants.

Mr. Parthiv Soni, Crisil Risk and Infrastructure Solutions Ltd. , discussed on 'Solid Waste Management in Indian Cities' . According to SWM rules, 2016, segregation of solid waste is the focus area. He described that waste can be broadly segregate into biodegradable, recyclable, domestic hazardous waste at household level. In present scenario sorting of waste is mostly accomplished by unorganized sector under unsafe and hazardous conditions and the effectiveness of segregation is reasonably low due to segregation of valuable discarded constituents from waste stream which can guarantee them comparatively higher economic returns in the recycling market. With help pf non-governmental organisation urban local bodies can integrate this informal sector.

Mr. Sanket Thorat, Research Associate, RCUES of AIILSG, Mumbai discussed on 'SWM Rules 2016 & Legal Framework for SWM with a focus on Segregation of Solid Waste'. He explained all the mandatory provisions of SWM Rules, 2016

Mr. Sanket Thorat, Research Associate, RCUES of AIILSG, Mumbai addressing the participants.

by emphasizing on segregation at source of waste, a basic need for channelizing the waste to wealth by recovery, reuse and recycle of waste. He also focussed on upgradation of ragpickers as mentioned in SWM Rules 2016.

Mr. Debartha Banerjee, Director, Sampurna Earth, Mumbai addressing the participants.

Mr. Debartha Banerjee, Director, Sampurna Earth, Mumbai presented his theme on 'Segregation and Recycling Technologies'. He discussed about the increasing rate of waste generation in urban areas of different cities and urgently required to change our mind-set about waste management process. Waste should be treated as a source of energy. Later he explained composting solutions at household levels; community levels viz., aerobic or drum based composting, composting pits, vermi-composting, mulching and earthworm composting. Lastly he presented two case studies. 1) Biogas-BARC Nisargruna Technology (Two Digester) implemented in Tata institutes canteen in Mumbai & 2) Biogas-Modular Plant with the help of kitchen wet waste processing and material recovery centre separating dry waste.

Mr. Deepak Chabukswar, Dy. President, Janadhar, Latur addressing the participants

Mr. Deepak Chabukswar, Dy. President, Janadhar, Latur shared his views on 'Role of waste pickers & their value addition in segregation process'. Janadhar organisation of Latur has made efforts to upgrade rag pickers livelihood & explained these efforts to the participants through a role play. He also shared his experiences in organising rag pickers through NGO – JANADHAR and addressing their challenges at community level.

Mr. Subhash Dalvi, Nodal Officer, SBM / SWM, Municipal Corporation of Greater Mumbai, (MCGM) shared his experiences of SWM efforts at city level. He explained about clean-up programme implemented in Mumbai slums through Swachh Probodhan Abhiyan. He also showcased the cases on portable vermi composting projects implemented in R. N.

Mr. Subhash Dalvi, Chief Nodal Officer, SMPA, MCGM, Mumbai addressing the participants.

Cooper Hospital, Vile Parle (West) & Veermata Jijabai Udyan (Rani Baug), Byculla, Mumbai as a success stories through community participation. He concluded by encouraging participants to implement SWM composting projects through community participation in their own cities.

Mr. Nitin Kamble, Health Officer, Kagal Municipal Council, Maharashtra addressing the participants.

Mr. Nitin Kamble, Health Officer, Kagal Municipal Council, Kolhapur district of Maharashtra State presented on 'Solid Waste Management in Kagal - A Journey towards Zero Waste'. He discussed the problems and constraints faced by them to make the ity garbage free. He also very proudly focused on the success achieved by their city.

Site Visit

On second day of the training programme, after the technical sessions on waste composting, the site visit was organised to see the portable vermi composting plants developed by Municipal Corporation of Greater Mumbai (MCGM) in R. N. Cooper Hospital at Juhu Vile Parle (West) & Veermata Jijabai Udyan (Rani Baug) at Byculla, Mumbai through community participation.

These plants treat green waste with the help of earthworms. The plant at Byculla has set up on 1,387 sq. ft. of land. Mr. Subhash Dalvi, Chief Nodal Officer, SMPA, MCGM, Mumbai explained the traditional method which is lengthy and time consuming. Earthworms play a crucial role in converting waste into manure in 4 to 6 weeks. The plant treats 1000 kg. of waste daily. The manure developed through vermi-composting in year would be used for gardening.

Municipal Official explained that, traditional vermi-composting processing plants need to separate manure and earthworm behaviour after production. However, the plant set up at the zoo has been specially developed by studying earthworm behaviour and will not require traditional methods. This will enable instant use of manure after production. 10000 kg of biological waste is generated every day in the zoo.

Glimpses of site visit

Solid Waste Management with a focus on 100% Segregation of Solid Waste

1st & 2nd June 2017, Nashik, Maharashtra

The key highlight of the programme was the site visit to understand the technologies in solid waste management and explore possibilities of replicating them in other cities.

Introduction

The Swachh Bharat Mission (SBM) emanates from the vision of the Government articulated in the address of the Hon'ble Prime Minister to the Joint Session of parliament on 9th June 2014. "We must not tolerate the indignity of homes without toilets and public spaces littered with garbage." For ensuring hygiene, waste management and sanitation across the nation, a "Swachh Bharat Mission" was launched on 2nd October 2014 and is being implemented by the Ministry of Urban Development, Government of India in urban areas.

Municipal Solid Waste Management (MSWM) is an important component of this mission and most essential service for maintaining the quality of life of people in the urban areas for ensuring better standard of health, sanitation and environment. MSWM in the country has emerged as a severe problem not only because of environmental and aesthetic concerns but also because of sheer quantities generated every day. According to Central Pollution Control Board 144,165 TPD of MSW was generated, approximately 32,871 TPD (22.8%) was treated. SBM offers an opportunity to address the issues linked with this situation.

Solid Waste Management Rules 2016 is mandatory for all municipal bodies to effectively manage urban solid waste in the city. It is mandatory for waste generators to store segregated waste at source and for municipal bodies to collect solid waste from households and transport it to designated places for appropriate treatment and processing. Major focus of SWM Rules 2016 is on segregation at source and zero garbage concepts.

It is essential for municipal bodies to adopt more systematic approach towards planning and management for solid waste and develop capacities of their staff/officials towards effective & efficient solid waste management system.

In view of the above background, Regional Centre for Urban & Environmental Studies (RCUES) of All India Institute of Local Self-Government (AIILSG), Mumbai organized a **Regional Specialized Training Programme on "Solid Waste Management with a focus on 100 % Segregation of Solid Waste" on 1st & 2nd June 2017 at Nashik, Maharashtra. This programme was fully supported by Ministry of Urban Development (MoUD), Government of India (GoI).**

Key Objective

The key objective of the programme was to expedite the process of achieving goals of effective solid waste management in India with a focus on 100% segregation of waste at source, as envisaged in SBM (Urban) & SWM Rules 2016.

Participation

A total of 25 participants comprising of President, Vice President, Municipal Elected Representatives, Chief Officers, Sanitary Inspectors, Municipal Engineers, from the State of Maharashtra attended this training programme.

Inauguration

This training programme commenced with the introduction by Ms. Divyanka Dhok, Research Associate, RCUES, AIILSG, Mumbai. She explained the objectives & outline of the training programme. She also briefed about activities undertaken by RCUES, Mumbai. The training programme was inaugurated by Mr. Rajaram Sadamate, President of Palus Municipal Council, Maharashtra.

Technical Sessions

Technical sessions began after inauguration of the programme. The first technical session was taken by

Mr. Alok Gogate, Research Associate, RCUES, AIILSG, Mumbai addressing the participants.

Mr. Alok Gogate, Research Associate, RCUES, AIILSG, Mumbai on 'Solid Waste Management in Indian Cities'. He focused on Maharashtra as all the participants were from Maharashtra State. While explaining the current scenario on municipal solid waste generation in India, he emphasized on Swachh Bharat Mission with focus on 100% segregation. He gave an overall perspective about solid waste management service chain by briefing on collection, transportation, segregation, treatment and disposal methods of solid waste. He explained how councils can opt for a particular solid waste treatment technology considering size of population and generation of solid waste in the particular area. Later he concluded the talk emphasizing importance of segregation of municipal solid waste.

Mr. Jitendra Yadav, Technical Expert, GIZ, took the session on 'SWM Rules 2016 & Legal Framework with a focus on Segregation of Solid Waste'. He spoke on Solid Waste Management rules and also talked about agenda of Swachh Bharat Mission and integrated solid waste management representing its hierarchy, right from least preferred to most preferred techniques in waste management. He stated that in the SWM rule framework, priority has been given to Reduction, Reuse and Recycling (3Rs) of municipal solid waste. He explained various terminologies mentioned in SWM Rules 2016 viz. “buffer zone” - zone of no development, “decentralised processing”, “domestic hazardous waste”,

Mr. Jitendra Yadav, Technical Expert, GIZ, addressing the participants.

“extended producer responsibility” (EPR) , “Refused Derived Fuel"(RDF), etc. He also focused on policy framework in India incorporating relevant rules to ULBs. He displayed many photos and through them explained various types of segregated waste such as plastic, cloth, wood, glass, E-waste etc. He concluded by explaining recycling market and various influencing factors in it.

Mr. Debarta Banerjee, Director, Sampurna Earth, Mumbai started with explaining 'Zero Waste' concept and various

Mr. Debarta Banerjee, Director, Sampurna Earth, Mumbai addressing the participants.

technologies in solid waste management. Initially he focused on waste generation issues and tried to explain the chain

from waste generation to recycling industry. He emphasized on segregation at source by showing Segregation System followed by Karnataka state government (2 Bin 1 Bag system). He also explained various technologies to be used in Integrated Waste Management System according to the different types of waste. He concluded by giving an overview of importance on public private partnership with integrated solid waste management.

Mr. Swaroop Dandnaik, Designer, Earth Care Designs, Nashik addressing the participants.

Mr. Swaroop Dandnaik, Designer, Earth Care Designs, Nashik showcased their waste composter system popularly in use within Nashik region. He explained thoroughly scientific process of composting. He briefed about the domestic and community waste composters developed by Earth Care Designs and its functioning.

Ms. Kishori Gadre, Advisor, Janawani, Pune spoke on people's participation in waste management. She emphasized that people's role is extremely effective in segregation process. Based on example of 'Swachh' and Janwani (Pune based NGO), she explained to the participants how small intervention in planning of solid waste segregation and collection by municipal body could result in active people's participation. She emphasized on need and area based planning for solid waste management. Community participation and effective government administration goes hand in hand. She explained this by giving example of

Ms. Kishori Gadre, Advisor, Janwani, Pune addressing the participants.

'Swachh Saswad'. Saswad Municipal Council effectively implemented solid waste management schemes with the society participation. While stating the importance of people's participation in waste management, she also showed 2 short films where waste picker explains importance of segregation.

Lt. Col. Suresh Rege (Retd), Executive Director, Mailhem Ikos Enviroment Pvt. Ltd., Pune addressing the participants.

Lt. Col. Suresh Rege (Retd.), Executive Director, Mailhem Ikos Environment Pvt. Ltd., Pune, spoke on Solid Waste Management technologies and showcased their waste management project at Nashik. He explained to the participants how waste should not be considered as 'Aapatti' (liability), instead it be called 'Sampatti' (asset). He briefed

about the various projects in all over India maintained by Mailhem Ikos Environment Pvt. Ltd. He stated that segregation at source is a key to successful solid waste management. Hence in India 100% segregation at source is very much necessary. He concluded stating the importance of three R's i.e. reduce, reuse and recycle in solid waste management with emphasis on recovery.

Site Visit

After the technical session on various components of solid waste management on day one of the training programme, to understand technology applications, RCUES, Mumbai conducted a site visit to Nashik Municipal Corporation's 'Manure project' maintained by Mailhem Ikos Environment Pvt. Ltd., Nashik. Lt. Col. Suresh Rege (Retd) in the visit showed all the technologies used in Nashik plant. He explained the segregation techniques, functioning of biogas plant, incinerators also making of RDF inside the plant.

Glimpses of site visit

Sustainability of Water Supply Schemes

7th & 8th June 2017, Jaipur, Rajasthan

The key highlight of the programme was to acquaint participants with new technologies in water supply management, 24x7 water supply and its implementation in various cities.

Introduction

Urbanization represents challenge for water & sanitation management for developed as well as in developing countries. While cities in developed countries often struggle with high operation & maintenance costs and the decay of existing infrastructure, rapid urban growth in the developing world is seriously exceeding the capacity of most cities to provide adequate services of water & sanitation to their citizens.

The demand for urban water supply and allied services is increasing rapidly as globalization accelerates economic development and brings about improvements in living standards in the country due to the dynamics of demography i.e., the interactive effects of demographic growth and migration to cities under its push & pull effect. Provision of reliable and safe water supply services to urban areas is an essential contribution to overall economic & welfare advancement. However in India, ULBs are facing constant budgetary bottlenecks in regards to mobilizing resources to meet the water consumption targets of the present as well as future population.

The 14th Finance Commission (FC) recommendations give emphasis to water & sewerage. The Atal Mission for Rejuvenation and Urban Transformation (AMRUT), the former JNNURM, is the national flagship programme driving capital investments in water supply and Swachh Bharat Mission (SBM), which will help city managers to satisfy the demands of water supply & improved sanitation.

Sustainability of water supply schemes is a process which facilitates the existing or new water supply projects to provide water in adequate quantity, even during distress period, duly addressing equity, gender, vulnerability, convenience and consumer preference issues, through conjunctive use of ground water, surface water and roof water harvesting. The main aim of providing sustainability of water supply schemes is to ensure that such schemes do not slip back from universal access of water to the community through the design period of the schemes.

In view of the above background, **Regional Centre for Urban & Environmental Studies (RCUES) of All India Institute of Local Self-Government (AIILSG), Mumbai organized a Regional Specialised Training Programme on "Sustainability of Water Supply Schemes" on 7th & 8th June 2017 at Jaipur, Rajasthan. This programme was fully supported by Ministry of Urban Development (MoUD), Government of India (GoI).**

Key Objective

The key objective of the programme was to discuss issues in sustaining various Water Supply Schemes in urban areas and their probable solutions.

Participation

A total of 11 participants comprising of municipal engineers from Maharashtra State attended this training programme.

Inauguration

The introduction of the training programme was commenced by Ms. Divyanka Dhok, Research Associate, RCUES, AIILSG, Mumbai. She briefed the objective of the programme, followed by inauguration. The programme was inaugurated by Mr. M. R. Sohani, Retd. Dy. Municipal Commissioner, Municipal Corporation of Greater Mumbai (MCGM), Mumbai.

Technical Sessions

Mr. M. R. Sohani, Retd. Dy. Municipal Commissioner, MCGM, Mumbai addressing the participants.

Technical sessions commenced after the inauguration. The first technical session was taken by Mr. M. R. Sohani, Retd. Dy. Municipal Commissioner, MCGM, Mumbai on "Overview of Water Supply Management". He explained the significance of planning in water supply to acquire adequate water supply. He also focused on sustainability in water supply with emphasis on ground water sustainability. Successively, he took a session on "Challenges in Sustaining Water Supply Schemes" & "Operation and Maintenance for Sustainability". He concluded by sharing his experiences during his tenure in MCGM .

Ms. Pallavi Mukane, Research Associate, PAS project, AIILSG, Mumbai & CEPT University, Ahmedabad took a session on "Role of Service Level Benchmarking in sustainability of water supply". She started with the Performance Measurement System, where

Ms. Pallavi Mukane, Research Associate, PAS Project, AIILSG, Mumbai & CEPT University addressing the participants.

service level parameters are measured. She further discussed on 5 point agenda for ULBs. Later, she discussed SLB initiative and major group of indicators under SLB. There are 9 indicators of SLB for Water Supply. She further explained about online SLB module. It is a platform to collect, review and share related data of performance assessment for UWSS sector in various states. She presented national database of 1800 cities captured under PAS project and further explained the system for filling data online by the cities. She concluded the session by stating the importance of water supply sustainability.

Mr. Rajesh Mathpal, Sales & Business Development Officer, SUEZ addressing the participants.

Mr. Rajesh Mathpal, Sales & Business Development Officer, SUEZ explained water treatment process and clarification technologies. He pointed out limitations of conventional methods and benefits of latest technologies in water treatment. Further he described technologies in sewerage treatment. He concluded by explaining benefits and latest trends in sewerage treatment.

After the technical sessions, cities presented their Good Practices in "Sustainability of Water Supply Schemes". Malkapur case study on 24 X 7 water supply was presented by Mr. Manohar Shinde, Vice President, Malkapur municipal council. Initially, he described the situation of water supply in Malkapur prior to the efforts taken to improve the water supply. The old system of water supply was inadequate and need of new system was emerged. Through the dedicated efforts by team from Malkapur, the system resulted into 24 X 7 water supply to the city. This system is sustainable since 2009. He also showed key achievements after this project. Some of them are listed as; water is 100 % potable, 100% O & M cost recovery through this system, very less NRW (12%) is observed. This good practice was replicated in some of the cities from Maharashtra like Badlapur, Nagpur, Navi Mumbai, Amravati & Yavatmal etc.

Mr. Virendra Kumar Balana, EE Project, DN. II, Surajpura explained the success case of Jaipur in water supply schemes. The new project was commissioned of 200 MLD and converted into total 600 MLD. This helps in reducing pressure on ground water.

Site Visit

The site visit was organized at Balawala intermediate pumping station. The water supply made to Jaipur city from Surajpura Dam is treated in this Balawala plant. This pumping station started in 2004 & gradually fully functional from 2009. The daily lift of water is 870 MLD which comes from Bisalpur dam. Jaipur city's daily need of water supply is 470 MLD, which is fulfilled through Balawala's treated supply. This has reduced the city's dependence on the ground water. This treatment plant is capable to treat raw water from Bisalpur Dam.

Further participants visited to Jawahar circle water pumping station. The plant is located underground at the prime area of the city. This plant has a facility of air cool transformers which is the key component of the said plant. This plant has a capacity of 370 MLD water supply. Both the plants are operated and monitored by PNC SCADA system.

Glimpses of site visit

Solid Waste Management with a focus on 100% Segregation of Solid Waste

14th & 15th June 2017, Surat, Gujarat

The key highlight of this programme was the site visit, in which the participants were acquainted with segregation, recovery, reuse, recycling through visits at various sectors of solid waste.

Introduction

The Swachh Bharat Mission (SBM) emanates from the vision of the Government articulated in the address of the Hon'ble Prime Minister to the Joint Session of Parliament on 9th June 2014, "We must not tolerate the indignity of homes without toilets and public spaces littered with garbage. For ensuring hygiene, waste management and sanitation across the nation, a "Swachh Bharat Mission" will be launched. This will be our tribute to Mahatma Gandhi on his 150th birth anniversary to be celebrated in the year 2019". With this background SBM was launched on 2nd October, 2014 and is being implemented by the Ministry of Urban Development, Government of India, in Urban areas.

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Against this background **Regional Centre for Urban & Environmental Studies (RCUES) of All India Institute of Local Self Government (AIILSG), Mumbai organised Regional Specialised Training Programme on "Solid Waste Management with a focus on 100% Segregation of Solid Waste" from 14th to 15th June, 2017 at Surat, Gujarat. The training programme was fully supported by Ministry of Urban Development (MoUD), Government of India (GoI).**

Key Objective

The key objective of this training programme was to expedite the process of achieving goals of effective solid waste management in India with a focus on 100% segregation of waste at source, as envisaged in SBM, Urban & SWM Rules 2016.

Participation

A total of 34 participants comprising of Presidents, Vice-Presidents, Municipal Councillors, Environmental Engineers, Electrical Engineers, Health Officers, Fire Supervisors, Sanitary Inspectors, attended this training programme.

Inauguration

Hon'ble Mrs. Ashmita Shiroya, Honble' Mayor of Surat City inaugurated the programme along with Ms. Utkarsha Kavadi, Director, RCUES, AIILSG, Mumbai. The key objective of this training

Hon'ble Mayor of Surat Mrs. Ashmita Shiroya inaugurating the training programme also seen Ms. Utkarsha Kavadi, Director, RCUES, AIILSG, Mumbai.

programme was achieving goals of effective solid waste management in India with a focus on 100% segregation of waste. Various experts in the field of MSWM from different universities, industries, municipal corporations delivered the lectures on the topics like SWM rules 2016, different technologies for solid waste management, decentralized solid waste management, overview of Surat city's solid waste management and many more. The second day of the training programme was about multiple site visits for better understanding of different technologies involved in the MSWM. The programme concluded with certificate distribution to the participants by Ms. Hansa Patel, Executive Advisor, AIILSG India and participants sharing their experience.

Technical Sessions

The first technical session was taken by Dr. C.N. Ray from CEPT University, Ahmedabad. He gave us an overview of Municipal Solid Waste Management & Swachh Bharat Mission, talked about what is MSW, classification of MSW and which Indian States are the largest producer of MSW. After this the focus was on projected growth in the quantities of MSW generated per day in 2030 which was exponential, to handle such quantities of waste do we have the capacity to manage. Further he discussed about the harmful effects on environment due to improper management of MSW.

The second part of his session was focused on new Municipal

Dr. C. N. Ray, CEPT, University, Ahmedabad addressing the participants.

Solid Waste Management Rules 2016. He gave a brief overview of the rules to the participants for better understanding and better implementation of MSW management practices in their respective councils and corporations. He concluded his session with issues in MSW which need to be tackled to improve quality of life and protect the environment.

The second session was taken by Mr. Vrushank Karnataki from Excel Industries Ltd., he spoke about the different technologies

Mr. Vrushank Karnataki, Excel Industries, Mumbai addressing the participants.

available to manage MSW and classified by them into two broad categories, centralized and decentralized solid waste management system. He then briefed participants about

Centralized MSW management system which handle about 100-300 TPD of MSW and are for bigger cities and Decentralized MSW management systems which have the capacity of 5-10 TPD and can be used in smaller cities or adopted in bigger cites in multiple location. Another type of system was the OWC model which was adopted at the vegetable and fruit markets or the places where the waste generation is from 0.1 to 2 TPD. He concluded his lecture by clearing the doubts raised by the participants regarding the initial capital expenditure and the O&M cost for maintaining the plant.

Dr. K.D Yadav, Professor, SVNIT, Surat focused on Decentralized Solid waste management System and focused on segregation of MSW for better handling. He then explained the advantages of decentralized waste management system over centralized

Dr. K.D. Yadav, Professor, SVNIT, Surat, addressing the participants.

waste management systems, decentralized waste management systems can be easily adopted at hotels, restaurants, vegetable markets where the majority of the waste is in a segregated manner. He then spoke about Flower waste management a case study in Surat, where they have successfully made compost out of the flower waste from religious places. He concluded his lecture with stating that adopting right technology as per requirements instead of randomly implementing them.

Surat being the 4th cleanest city in Swachh Sarvekshan 2017, it was essential to have a lecture on how Surat Municipal Corporation functions for keeping the city clean. Dr. Ashish Naik, Medical Officer of Health, Surat started his lecture with introduction of Surat city, how the city bounced back from the plague in 1994 and floods in 2000 to be amongst the top five

Dr. Ashish Naik, Medical Officer Health, SMC addressing the participants.

cleanest city in India. After that Mr. Naik explained about the measures taken to keep the city clean like door to door collection of waste, night sweeping to keep the streets clean, cleaning roads through sweeper trucks, Disinfecting the areas surrounding bins by sprinkling lime powder, training and educating the staff about SWM and providing them with personal protective equipment, SMC regularized the waste collection from different bins around the city now Surat is aiming to be a bin free city in the future. Just having measures is not the only solution one needs to have proper administration. Surat has a very efficient administration system, Fines are collected efficiently on the spot by squad marshals by the offenders, and SMC has a coherent customer redressal system. Mr. Naik concluded with saying that it is because of the collective effort of SMC and its citizens that Surat is amongst the top five cleanest cities in India.

The next session was about a recently introduced Public Private Partnership in Municipal Solid Waste Management regarding recycling the plastic. En-vision Enviro Technical Consultants Pvt Ltd. have been given the responsibility by Surat Municipal Corporation to collect all plastic waste of Surat and recycle it. Mr. Nihar Doctor, Director, Envision Enviro-Technical Consultant Pvt. Ltd., briefed on the new plastic waste management rules and the different types of plastics in the market and their properties, also talked about the harmful effects of plastic if not handled properly. After that he showed us the layout of the plastic recycling plant which we would be visiting the next day. This is

Mr. Nihar Doctor, Director; Envision Enviro Technical Consultants Pvt Ltd. addressing the participants.

one of its kind model which has been implemented in Surat city on PPP based.

Mr. Pushpak Shah, General Manager, Saurashtra Enviro Projects Pvt. Ltd. Detox Group, Surat addressing the participants.

Mr. Pushpak Shah from Detox group gave the lecture on effective implementation of Solid Waste Management, Treatment & Recovery. Waste disposal is nowadays a big problem as the landfills are under stress and availability of land for new landfill sites is a concern. Mr. Pushpak Shah Talked about the 600MT Waste to Energy Plant which Detox Group have set up in new dumpsite of SMC at Khajod on PPP based Model. He then explained about the plant details, the plant has two parts, one is for making organic compost out of the organic waste and the other part of the plant is for making RDF (Refuse Derived Fuel) from the non-compostable waste. This is one of the biggest waste to energy plant in India, but operating and maintaining such a big plant is still a difficult task. He then concluded his lecture with what are the challenges in MSW management and measures to make such project sustainable.

Mr. E.H. Pathan, Executive Engineer, Surat Municipal Corporation addressing the participants.

Mr. E.H Pathan, Executive Engineer, Surat Municipal Corporation, the man behind Surat city's successful implementation of MSW management, he gave last lecture of the day about Treatment and Disposal of Municipal Solid Waste in Surat. This question was in everyone's mind where the solid waste of Surat city goes and how it is being treated. He started with new Municipal Solid Waste Management Rules 2016 and what are its implications. He then shared his experience regarding implementation of New MSW management rules and the challenges faced during implementation. After that he explained how the Organic waste of Surat is treated at 600MT per day plant at Khajod on PPP basis and other decentralized plants in the city. Then he talked about Plastic Waste Management and its Recycling Plant which will commissioned by SMC in the coming days. He then focused on Bio-Medical Waste that how important it is to treat and segregate Bio-Medical Waste, also talked about the new C&D Waste recycling plant which is coming up at Surat. Currently all the MSW of Surat is being dumped at its new dumpsite at Khajod. He concluded his lecture by answering the questions of participants and sharing his experience. With this the day one concluded and day two was about gaining ground experience by visiting SMC office and various types of Treatment & Recycling Plants.

Site Visit

The site visit was organised to Plastic Recycling Plant set up by En-vision Enviro Technical Consultants. The plant is based on PPP model and En-vision Enviro Technical Consultants are responsible for collection & recycling of all the plastic waste of Surat city.

The process of recycling of plastic through this plant was explained to the participants. Different types of plastics are segregated and shredded into finer particles and washed thoroughly in the washing line, after washing the shredded plastic is pre heated to the required temperature ranging from 60C to 250C, reprocessed in the form of wires and final product is obtained.

The next visit was to Surat Municipal Corporation's Sarojini Naidu Vegetable Market. The unique feature of this market was the organic compost machine installed by SMC for making compost out of the vegetable waste. The waste at the vegetable market is relatively segregated as majority of the organic waste is organic in nature so installing such machines is quite easy and beneficial.

The last visit was to the Surat Municipal Corporation's Solid Waste Transfer Station located at Pal. This Solid Waste Transfer Station is used for transferring the MSW of West Zone. All the MSW collected through primary collection comes to Solid Waste Transfer Station which forms the secondary stage. At the Transfer Station the, MSW collected through the primary collection is weighed at the Way Bridge, then the waste is compacted into the containers for further transferring to the sanitary landfill.

The visit was ended with these three different types of sites.

Glimpses of site visit

Solid Waste Management with a focus on 100% Segregation of Solid Waste

22nd & 23rd June 2017, Navi Mumbai, Maharashtra

The key highlight of this training programme was ULBs presentation on good efforts taken by them in achieving 100% segregation.

Introduction

The Swachh Bharat Mission (SBM) emanates from the vision of the Government articulated in the address of the Hon'ble Prime Minister to the Joint Session of parliament on 9th June 2014. We must not tolerate the indignity of homes without toilets and public spaces littered with garbage. For ensuring hygiene, waste management and sanitation across the nation, a "Swachh Bharat Mission" was launched on 2nd October 2014 and is being implemented by the Ministry of Urban Development, Government of India in urban areas.

Municipal Solid Waste Management (MSWM) is an important component of this mission and most essential service for maintaining the quality of life of people in the urban areas for ensuring better standard of health, sanitation and environment. MSWM in the country has emerged as a severe problem not only because of environmental and aesthetic concerns but also because of sheer quantities generated every day. According to Central Pollution Control Board 144,165 TPD of MSW was generated, approximately 32,871 TPD (22.8%) was treated. SBM offers an opportunity to address the issues linked with this situation.

Solid Waste Management Rules 2016 is mandatory for all municipal bodies to effectively manage urban solid waste in the city. It is mandatory for waste generators to store segregated waste at source and for municipal bodies to collect solid waste from households and transport it to designated places for appropriate treatment and processing. Major focus of SWM Rules 2016 is on segregation at source and zero garbage concepts. It is essential for municipal bodies to adopt more systematic approach towards planning and management for solid waste and develop capacities of their staff / officials towards effective & efficient solid waste management system. In view of the above background, Regional Centre for Urban & Environmental Studies (RCUES) of All India Institute of Local Self-Government (AIILSG), Mumbai organized a **Regional Specialised Training Programme on "Solid Waste Management with a focus on 100 % Segregation of Solid Waste" on 22nd & 23rd June 2017 at Navi Mumbai, Maharashtra. This programme was fully supported by Ministry of Urban Development (MoUD), Government of India (GoI).**

Key Objective

The key objective of the programme was to expedite the process of achieving goals of effective solid waste management in India with a focus on 100% segregation of waste at source, as envisaged in SBM (Urban) & SWM Rules 2016

Participation

Total 48 participants comprising of President, Municipal Elected Representatives, Chief Officers, Municipal Engineers from Maharashtra & Gujarat State attended this training programme.

Inauguration

The training programme started with the introduction by Mrs. Neha Hardikar, Research Officer, RCUES, AIILSG, Mumbai. She welcomed all guest faculties and participants and briefed the objective of the programme. She further added that, solid waste management is a crucial component of Swachh Bharat Mission (SBM), where focus is given on 100% segregation. After the introduction, the programme was inaugurated by Ms. Kishori Gadre, Advisor, Janwani, Pune.

Introduction

Mr. Alok Gogate, Research Associate, RCUES, AIILSG, Mumbai addressing the participants.

Technical sessions started after inauguration. Mr. Alok Gogate, Research Associate, RCUES, AIILSG, Mumbai took the first session on "Review of SWM and SBM". Initially he talked about MSW Rules 2000 and 2016. Subsequently, he overviewed waste generation scenario in Maharashtra. He also discussed about waste management and related MoUD guidelines. Mainly he talked about Government of Maharashtra's strategies on solid waste management, as majority of the participants were from Maharashtra. He further added, Detailed Project Report (DPR) for SWM should be prepared by each city within 10 to 15 years' time scale. He highlighted on total waste management chain and concluded his session.

Dr. Sudha Kashelikar, Sr. Project Officer, WMRC, AIILSG, Mumbai addressed the participants on "MSW Rules 2016 & Legal Framework for SWM with 100% focus on Segregation". Initially she presented solid waste management present scenario in Indian cities. She discussed present key notification (Environmental Rules) for management of solid waste in India. She focused on byelaws under Environmental Protection Act, which needs to be revised. She presented comparative chart of MSW Rules 2000 and 2016 depicting the difference between the two and need for MSW Rules 2016. According to MSW Rules 2016, waste generators should segregate the waste generated in three different categories namely biodegradable, non-biodegradable & domestic

Dr. Sudha Kashelikar, Project Officer, WMRC, AIILSG, Mumbai addressed the participants.

hazardous waste. The emphasis would be on segregation of waste. She concluded by raising a concern towards plastic waste which needs to be addressed at city level.

Dr. Ketna Matkar, Consultant, NSWAI, Mumbai addressing the participants.

Dr. Ketna Matkar, Consultant, NSWAI, Mumbai presented on "SWM - Segregation First" and "Technologies in SWM". Initially she expedited knowledge on segregation by representing Karnataka Government's waste segregation policies. Then, she explained "Zero Waste" concept and strategy can develop to arrive at zero waste focusing more on segregation at source. She discussed & explained the coding for bins and significance of 3 R's – Recycle, Reuse and Reduce. Gradually, she moved towards SWM technologies and discussed them in

detail. SWM technologies such as composting, waste to energy, landfill, bio-methanation process & RDF etc.

Mrs. Kishori Gadre, Advisor, Janwani, Pune addressing the participants.

Ms. Kishori Gadre, Advisor, Janawani, Pune spoke on people's participation in waste management. She emphasized that people's role is extremely effective in segregation process. Based on example of 'Swachh' and Janwani (Pune based NGO), she explained to the participants how small intervention in planning of solid waste segregation and collection by municipal body could result in active people's participation. She emphasized on need and area based planning for solid waste management. Community participation and effective government administration goes hand in hand. She explained this by giving example of 'Swachh Saswad'. Saswad Municipal Council effectively implemented solid waste management schemes with the society participation. While stating the importance of people's participation in waste management, she also showed 2 short films where waste picker explains importance of segregation.

Mr. Nathuram Mundhe, Chief Manager (Marketing & Sales), Excel Industries, Mumbai took the session on "SWM – Composting". During the discussions, he explained the process of converting organic waste into composting. It is very simple method to convert large amount of organic waste such as kitchen waste, garden waste and food processing waste into compost. He concluded by mentioning composting as one of the best technologies in decentralized waste management system.

Mr. Nathuram Mundhe, Chief Manager (Marketing & Sales), Excel Industries, Mumbai addressing the participants.

After the technical sessions, city managers / officials presented efforts taken by their own cities.

Mr. Ramdas Kokare, Chief Officer, Vengurla Municipal Council explained the entire process to make their city clean. He explained how waste disposal site is converted into beautiful garden. He further added, waste is a problem but segregated waste is a wealth. Vengurla Municipal Council gets good amount of revenue out of recyclable items. Recyclable plastic waste is used in road construction in Vengurla city. The efforts of Vengurla city can be replicated in other cities.

Mr. Ramanand Kalaskar, Municipal Engineer, Saswad Municipal Council addressing the participants.

Mr. Ramanand Kalaskar, Municipal Engineer, Saswad explained the efforts taken by Saswad Municipal Council to make 'Swachh Saswad'.

Mr. Rajendra Sonawane, Chief Sanitary Officer, Navi Mumbai Municipal Corporation (NMMC) explained the solid waste management scenario in Navi Mumbai city. He explained the procedure of waste segregation and collection of segregated waste adopted in Navi Mumbai city. The entire process can be monitored through the GPS system.

Site Visit

The site visit was organized to residential societies from Navi Mumbai & Waste Processing Centre at Turbhe. Navi Mumbai is the first city in the country to implement Radio Frequency Identification Device (RFID) chips fixed to the garbage bins and containers. Navi Mumbai has given contract to MOBA to lift the city's waste. Secondly, residents are motivated to segregate the dry and wet waste at source and provided bins to residential societies with 130 lit. / 240 lit. / 360 lit. capacities and cost of the bin is incorporated in property tax bill. Bharat Petroleum, Panchratn society was shown to the participants to study the RFID & MOBA system.

Later, participants visited to waste processing unit at Turbhe site where waste is processed in various ways. The entire city waste is collected, transported to sanitary landfill, weighed and separated into wet and dry components. Recyclable waste are separated and recycled. Wet waste is used for production of Refuse Derived Fuel (RDF) and compost. The rejects are disposed of into sanitary landfill at the site. The operation & management of sanitary landfill is given to private contractor on PPP basis. The whole process was explained to the participants to understand the waste management entire chain.

Glimpses of site visit

Testimonials

Training Programme on Solid Waste Management with a Focus on 100% Segregation of Solid Waste, 18th - 19th May, 2017, Mumbai, Maharashtra.

"This training was thought provoking & very much interactive. Site visit to composting plant would help the participants in applications. The sessions were very informative."

Mr. Subhash Dalvi, Chief Nodal Officer, SMPA, MCGM, Mumbai

Training Programme on Sustainability of Water Supply Schemes, 7th - 8th June, 2017, Jaipur, Rajasthan.

"It was good experience sharing our efforts with people from other cities. The training programme was well organized."

Mr. Manohar Shinde, Vice President, Malkapur Municipal Council

Training Programme on Solid Waste Management with a Focus on 100% Segregation of Solid Waste, 15th - 16th June, 2017, Surat, Gujarat.

"The training was very informative. I am thankful to your organization for conducting such a useful training programme. I would like to attend many more such, training programmes in future."

Mr. Rakesh Khairnar, Chairman, Health Committee, Satara Municipal Council

Training Programme on Solid Waste Management with a Focus on 100% Segregation of Solid Waste, 22nd - 23nd June, 2017, Navi Mumbai, Maharashtra.

"RCUES, Mumbai has developed an excellent platform to share views and exchange ideas through dissemination of knowledge. I appreciate the efforts taken by RCUES, Mumbai to make this programme successful"

Mr. Ramdas Kokare, Chief Officer, Vengurla Municipal Council

Training Programme on Solid Waste Management with a Focus on 100% Segregation of Solid Waste, 22nd - 23nd June, 2017, Navi Mumbai, Maharashtra.

"This training programme was very insightful and made absolute sense in terms of the technical coverage and their application through site visit."

Ms. Netra Shirke, Elected Representative, Navi Mumbai Municipal Corporation

Other than RCUES activities

AIILSG, Vadodara started new batch of Sanitary Inspector's Course. This programme was inaugurated by Hon'ble Mayor of Vadodara, Shri Bharatbhai Dangar at AIILSG's Nehru Bhavan Centre, Vadodara on 28th June, 2017, around 700 students enrolled for this batch.

Shri Bharatbhai Dangar, Hon'ble Mayor of Vadodara inaugurated Sanitary Inspector's batch at AIILSG, Vadodara. Also seen Shri. Ranjit Chavan, President of AILLSG.

RCUES, Mumbai
Advisory Committee

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