

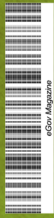


TO GET THE LATEST UPDATES ON EGOVERNANCE IN INDIA, VISIT
egov.eletsonline.com



elets

egovonline @egovonline eGov Magazine eletsvideos



₹ 200/US \$20/ISSN 0973-161X | NOVEMBER 2021 | VOLUME 17 | ISSUE 11



Special Focus on SDG 11.6

By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.





PROF. DINESH MEHTA
Executive Director, Centre for Water and Sanitation, CRDF



PROF. MEERA MEHTA
Executive Director, Centre for Water and Sanitation, CRDF

10

Cover Story

MANAGING URBAN WATER & SANITATION USING PAS

14



D. R. SARIN
Chairman and Managing Director ALIMCO

17



ATUL BAGAI
Head, UNEP Country Office, India

24



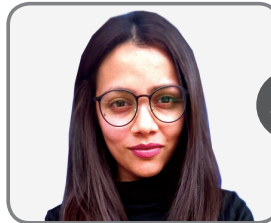
AKHILA SIVADAS
Executive Director, Centre for Advocacy and Research (CFAR)

28



PARAMITA DATTA DEY
Head Resources and Waste, NIUA

32



GAURI SRIVASTAVA
Programme Officers - Sanitation Capacity Building Platform (SCBP), National Institute of Urban Affairs (NIUA).

36



SONALI MEHRA
Research Associate National Institute of Urban Affairs (NIUA)

39



PRARTHANA BORA
India Director-Clean Air Asia

43



GAURAV THAPAK
Research Associate National Institute of Urban Affairs (NIUA)

**HITESH VAIDYA**

Director, NIUA

**PARAMITA DATTA DEO**Head, Resources and Waste,
NIUA

Launched on October 2, 2014, the Swachh Bharat Mission (Urban) or SBM (U) is one of the most ambitious initiatives undertaken by the Government of India. The mission had the twin objectives of making urban India open defecation free along with 100 per cent scientific management of solid waste. To achieve this, it was important to build the



Municipal officials in a workshop

From 2016-2020, NIUA has conducted 154 workshops across 58 locations in India that witnessed the participation of 6160 officials and elected representatives from 3221 Urban Local Bodies.

capacity and knowledge of the municipal officials, who had the challenging task of implementing and ensuring the guidelines stated in the Solid Waste Management Rules, 2016.

On behalf of MoHUA, NIUA was entrusted with the task of organising training and exposure workshops for the Urban Local Bodies (ULBs) from 2016 up to 2020. In these five years, the institute conducted 154 workshops spread across 58 locations in India that

witnessed the participation of 6160 officials and elected representatives from 3221 Urban Local Bodies.

This programme was designed keeping in view the needs of the participants. Hence a variety of features were incorporated which eventually led to its popularity. These include providing on-ground exposure, enabling cross-learning efforts, workshops designed for smaller cities and towns, incorporation and use of sustainable and green products, and a focus on convergence. This consistent plan helped build an effective and easily replicable model. To begin with, the institute conducted Training of Trainer Workshops and partnered with experts and organisations that had a rich knowledge of the subject as well as local conditions. This enabled the effective dissemination of knowledge.

Each three-day workshop began with the orientation of the participants regarding policies, practices and technologies for effective management of solid waste management, wastewater and Fecal



Composting facility at Panchkula

Source: Author

Sludge and Septage Management (FSSM) on the first day. The second day was exclusively reserved for field visits for the demonstration of centralised and decentralised waste management technologies. These sites were carefully chosen to highlight innovative and good practices being implemented across the nation for uptake by other ULBs of the cluster. These sites were chosen from 58 cities across India and included visits to the landfill sites, Waste to Energy Plants, Construction and Demolition Waste Recycling Plants, decentralised wet waste composting sites, Material Recovery Facilities (MRF), bio-methanation plants, Fecal Sludge Treatment Plants (FSTP) and Solid and Liquid Resource Management (SLRM) Centre. Visits were also organised to Integrated Waste Management Facilities to show how a combination of technologies can work when bundled together.

The last day began with a summary of what was communicated during the previous two days. This recapitulation was done through group activities and a quiz to test how much knowledge the participants were able to assimilate during the course of training and the field visits. One of the most pivotal sessions of the closing day focused on developing a financially viable and sustainable waste management plan for

NIUA team has developed an interactive GIS platform that provides the user with an opportunity to traverse through the journey of several sustainable and innovative practices adopted across Indian cities.

the cities. It concluded with a presentation by the participants on the business models they came up with. It was followed up by feedback and impact assessment. These assessments done at the individual and group level helped in comparing the knowledge pre and post-workshop and if the participants' perspectives had widened and myths dispelled. The pre and post-workshop assessments were mapped through a survey in the last lap. The feedback indicates an improvement of nearly 12 per cent in the understanding and knowledge of the participants. To practice what was preached, care was

taken to ensure that these were green events that included the workshop kits comprising metal or glass water bottles, notepads made of recycled paper, and token prizes and mementoes made up of upcycled materials.

As an outcome of this journey and with an overall purpose to disseminate the takeaways and experiences with a wider audience keen on working towards sustainable waste management, NIUA has produced a series of knowledge products and compendiums. These documents are a compilation of the various waste management practices and innovative approaches undertaken and initiated across the nation. It provides information on cities that have shown commendable efforts in solid waste management practices. Additionally, keeping in view the appetite and ease of learning, the team developed a portal collating the information and data gathered across various cities over the past five years. The portal is an interactive GIS platform that provides the user with an opportunity to traverse through the journey of several sustainable and innovative practices adopted across Indian cities. Through the click of a button, one can browse through the entire value chain of waste management beginning from the collection, transportation, processing, treatment

and disposal, across cities classified into different population sizes and characteristics (like tourist cities, capital and administrative cities, industrial and commercial cities and trailblazers). The impact of the project has been far-reaching across the country and the same is showcased through the 'impact stories' and 'feedback' from participants.

The achievements of these workshops have been due to the comprehensive and inclusive format of the workshop. The workshops provided a holistic opportunity for cross-learning. We present some of the key takeaways:

The twinning of cities: Going forward, the various annual "Swachh Survekshans" or National Cleanliness Surveys have been collating information and awarding well-performing cities. Those that have achieved considerable success at scale can be the mentors and thus help a recipient city (mentee) or a small cluster of cities to imbibe lessons and hand-hold to implement good practices.

Cross learning among cities: Cities can be clubbed and dedicated workshops can be designed for cities with similar challenges and opportunities (e.g. those located in hilly areas, coastal areas or famous as religious or pilgrim towns).

Upscale the workshops for elected representatives: Based on the good response received from the workshops conducted for elected representatives, it is worthwhile to scale it up for all elected representatives in the country.

Workshops for targeted groups of stakeholders: Our experience has shown that there is a need to conduct workshops for some target groups like ground functionaries (Swachh Mitras and Safai Mitras) and Bulk Waste Generators (e.g. RWAs, Educational institutes, office complexes, hotels, etc.). Workshops for Safai Mitras have



Composting pit at Panchkulathe Pokhri, Puri

Source: Author

already been initiated for those ULBs that have participated in the 'Safai Mitra Suraksha Challenge' (the challenge for 'Machine Hole to Man Hole').

Link waste management with the creation of green jobs and a circular economy: The concept of circularity in waste management holds a lot of promise when promoted through the use of biodegradable, upcycled and recycled products. This will also facilitate the skill development of marginalised groups in the preparation of such products and add to a reduction in GHG emissions, thereby aiding in the achievement of Sustainable Development Goal 11.6.


Periodic 'Swachh Melas' or Fairs can act as marketplaces for the exhibition of innovative, affordable and home-grown technologies and products in waste management along with the display and sale of biodegradable, up-cycled and recycled products.

The conduct of an SBM Fellowship Programme can give students and youth the much-needed exposure to understand ground realities by working

with institutions and stakeholders in this sector (e.g. working with ULBs).

Thesis competitions on waste management and circularity will be a good channel to enrich the sector with fresh and innovative ideas from young minds.

Creation of a National Waste Management Alliance: The empanelment of training institutes, agencies and experts will make collaborations faster to achieve outcomes. This has been incorporated in the guidelines of SBM 2.0 and efforts on creating dedicated 'Centres of Excellence' has been initiated.

Establishing Learning Platforms: Development of curriculum, e-modules, learning and gamification apps, online and face-to-face training and site visits, customized courses linked to citywide projects, certified courses endorsed by MoHUA and NIUA linked to 'Swachh Survekshan' or the annual cleanliness surveys and related protocols, are imperative. Much of this is being taken up as part of the National Urban Learning Platform of MoHUA and NIUA. 

Exploring Business Opportunities In Waste Management Beyond CSR

Waste to Energy Plant, Ghazipur

Source: Authors

Improving sanitation has been a national priority over the past few years owing largely to the Government of India's Swachh Bharat Mission (SBM) launched in 2014. With an ambitious goal to end open defecation in India by 2019, the campaign witnessed collaborative participation from all stakeholders including policymakers, governments, citizens, and corporates, write **Paramita Datta Dey**, Head, Resources and Waste, NIUA and **Tavishi Darbari**, Research Associate, NIUA.



PARAMITA DATTA DEY

Head
Resources and Waste, NIUA



TAVISHI DARBARI

Research Associate, National
Institute of Urban Affairs (NIUA)

The Companies Act, 2013 and the CSR (Policy) Rules (the Act) was passed on April 1, 2014. India is one of the pioneering countries that has made Corporate Social Responsibility (CSR) obligatory post this act which is an open call to businesses to collaborate and respond to India's multidimensional development issues. According to the Act, companies with a net worth of Rs 500 crore (or 5000 million) or more, or a turnover of Rs 1000 crore (or 10,000 million) or more, or a net profit of Rs 5 crore (or 50 million) or more in a given financial year must spend two per cent of their net profits on CSR programmes (to be calculated as per Section 198 of the Act).

Leveraging Section 135 of the Companies Act, 2013, the companies responded by contributing towards the 'Swachh Bharat Kosh', an initiative by the Government of India to promote health, hygiene, cleanliness, and sanitation. Approximately, Rs 53 crore (or 530 million) has been contributed as Corporate Social Responsibility (CSR) expenditure by 207 companies towards the 'Swachh Bharat Kosh' for the Financial Year 2019-20.¹ As per the India CSR Outlook Report for the year 2021, water, sanitation and health emerged as one of the top thematic areas. While the contribution of the corporates to the campaign seems more compliance-driven, there are several other drivers that interest corporates to work in the waste management sector.

Waste management has strong linkages to a range of national and global challenges such as health (SDG 3), climate change (SDG 13), clean water and sanitation (SDG 6), and sustainable production and consumption (SDG 12). SDG 11, "Make cities and human settlements inclusive, safe, resilient and sustainable", explicitly discusses solid waste management. Besides the opportunity of aligning and contributing towards the national and global priorities, the opportunities in the waste management sector have shown a great potential for companies to get a good return as well as contribute to society. Earlier, the involvement of the corporates ended with assigning a certain amount towards the mission as a CSR initiative, however, the push from the 'Swachh Bharat Campaign' has catalysed the conversation around the business opportunities in the waste management sector. The corporates have identified new avenues and opportunities wherein they can

actively engage. The conversations have now moved from cost to value, from risk to opportunity, and from infrastructure development to integrated waste management and resource revolution, thereby, strongly establishing a business case for improved, safe and sustainable sanitation services.² Turning sanitation and waste management ventures into profitable business models have led to long term engagement of the private sector besides leading to revenue-generating mechanisms for small and medium enterprises. This kind of ecosystem where skill development, advocacy, and profit could co-exist is ideal for the corporates to pitch in for long-term collaborations and

The 'Swachh Bharat Campaign' has catalysed the conversation around the business opportunities in the waste management sector. The corporates have identified new avenues and opportunities wherein they can actively engage.

contribute towards sustainable and holistic development.

Considering the targets outlined in COP 26, the 26th United Nations Climate Change conference, held in Glasgow this year, and as per India's National Action Plan on Climate Change (NAPCC), a low carbon development path is the need of the hour. Inappropriate waste management contributes to global warming through the emission of greenhouse gases (GHG) like methane and nitrous oxide across the value chain. IPCC 2006 model estimated GHG emissions from the waste sector across India considering a gross domestic product (GDP) growth rate of 6.5 per cent as 70.13 million tonnes CO₂eq in 2011. This is further anticipated to rise 1.6 times by 2031.³ Adopting newer approaches to resource recovery and converting waste into clean and green energy can help in large-scale reductions in greenhouse gas emissions. The study sponsored by the Waste-to-Energy Research and Technology Council (WTER) and conducted by Ranjith Kharvel Annepu states that every ton per day of recyclables collected informally saves an amount of Rs 24,500 per year. This averts the emission of 721 kg of carbon dioxide per year. In view of providing greater resource efficiency and ultimately turning waste into a resource, the corporates have engaged themselves across various such activities in the recycling and processing sector as a part of their CSR programme. For instance, Godrej Consumers Products Ltd has collaborated with a social enterprise in Guwahati to convert plastic waste into fuel. They have also collaborated with an organisation in Assam that recycles forest and agricultural residue into briquettes for biofuel. Through these

1. National CSR Data Portal. 2020. Swachh Bharat Kosh. [online] Available at: <<https://www.csr.gov.in/mactivity.php?year=FY%2019-20&mact=Swachh%20Bharat%20Kosh>>
2. 2017. THE SANITATION ECONOMY IN INDIA Market estimates and Insights. [online] THE TOILET BOARD COALITION. Available at: <https://www.toiletboard.org/media/38-The_Sanitation_Economy_in_India.pdf>
3. Manuja, S., Kumar, A. and Pandey, S., 2018. Greenhouse Gas Emissions and Reduction Stratagems from Waste Sector in India. International Journal of Latest Engineering Research and Applications (IJLERA). [online] Vol 3(1). Available at: <<https://www.teriin.org/research-paper/greenhouse-gas-emissions-and-reduction-stratagems-waste-sector-india>> [Accessed 19 November 2021].



Segregated waste Collection, Pammal

Source: Authors

projects, the target is to process up to 150 MT of solid waste per day.⁴ Apart from resource recovery and commercial benefits, the initiative has helped in reducing air, water, and land pollution.

Turning waste into energy is one of the other popular commercial and social options selected by corporates. According to the Ministry of New and Renewable Energy (MNRE) estimates, the solid waste generated from cities in India has the potential to generate power of approximately 500 MW, which can be enhanced to 1,075 MW by 2031 and further to 2,780 MW by 2050. As a Public-Private Partnership (PPP) initiative for the East Delhi Municipal Corporation (EDMC), the IL&FS Environment has set up a Waste to Energy plant at the Ghazipur dumpsite. Built with the capacity to process 2000 TPD of waste, the plant processes 1300 tons per day (TPD) of municipal solid waste and generates 12 MW of Green Power. It is estimated that the plant shall contribute to combating global warming by mitigating 8.2 million tons of greenhouse gases

Sale of recyclable waste offered an income source to support 'Zero Waste' campaign in the Pammal district. Also, it was instrumental in creating infrastructure, cleaning roads & transforming streets.

over the life of the project. Waste is converted into Refuse Derived Fuel with high calorific value. Treated sewage water is used in the plant operations thereby fully complying with the four Rs (Reduce, Reuse, Recover, and Recycle) principle of waste management. Besides creating

a positive impact on the health and hygiene of the nearby communities, the project's initiatives for the generation of employment, alternative livelihoods, and functional literacy are creating societal benefits.⁵

By investing and engaging in the waste management sector, companies have explored the opportunities to not only generate revenue from waste but also boost alternative fuel and give impetus to employment generation, thus creating phenomenal return on investment and social capital. However, while the participation of corporates is encouraged in the sector, it is important to highlight the fact that working in silos cannot create sustained impact. The corporates have realised the fact that for handling the multiplicity of components within the waste management sector, active participation from all stakeholders through partnerships and

4. CSRBOX. 2020. CSR Project By: Godrej Consumer Products Limited. [online] Available at: <https://csrbox.org/India_CSR_Project_Godrej-Consumer-Products-Limited-Waste-Management-Program-18407>
5. IL&FS. 2017. Waste to Energy Plant, Ghazipur. [online] Available at: <<https://www.ilfsindia.com/our-work/environment/waste-to-energy-plant-ghazipur/>> [Accessed 19 November 2021].



Dry and wet waste management, Pammal




Source: Authors

collaborations is the need of the hour. Pepsi Co India and EXNORA, a leading environmental NGO, effectively implemented a model project in the Pammal district in Tamil Nadu. The project created a perceptible change in the local environment of the region. It was executed in a few wards of the Pammal district and impacted more than 22,000 persons. The program emphasised recycling the waste in contrast to just relocating it. Households were nudged to segregate waste into two main streams bio-degradable and recyclable. The bio-degradable waste was converted into high-quality organic manure through the process of vermiculture.

The sale of recyclable waste offered a source of income to support the project. It improved the environment of the Pammal district. Additionally, it was instrumental in creating

By investing and engaging in the waste management sector, companies have explored the opportunities to generate revenue from waste, boost alternative fuel and give impetus to employment generation, thus creating phenomenal ROI and social capital.

infrastructure, cleaning roads and transforming streets. Programmes on sanitation awareness and tree plantation were the other components. 'Each Child Adopt a Tree' was well received. Every aspect of the programme was built around civic engagement and people's partnership which helped the programme evolve into a self-sustaining model. This distinct model was awarded the environmental Golden Peacock Award for Innovation in 2006. It was acknowledged as an exemplary project by UNICEF in 2007.⁶ Thus, while a sound financial, social, and technical concept, as well as an adequate institutional arrangement, are prerequisites and key for sustainable management of any initiative, a cohesive ecosystem wherein all stakeholders collaborate for knowledge sharing and leveraging each other's key competencies and skills is equally important for building a self-sustaining model. 

6. Kulkarni, P., 2021. Pepsico-Corporate Social Responsibility. [online] Available at: <https://www.academia.edu/27535802/Pepsico_Corporate_Social_Responsibility> [Accessed 19 November 2021].

Behavioural Change: An Efficient Strategy for Waste Management

Inadequate management of municipal solid waste has become a global concern, affecting the quality of life in cities, especially within developing nations. The case of India is no different. High population density, rapid urbanisation and increasing consumption have made solid waste management a challenge. India is presently among the top 10 MSW-generating countries, given its large urban population and increasing adoption of high-consumption lifestyles (World Watch Institute, 2012). The current MSW generation is around 62 million tonnes annually and is expected to reach 436 million tonnes per year by 2050¹, write **Sonali Mehra** and **Tavishi Darbari**, Research Associates, National Institute of Urban Affairs (NIUA).



SONALI MEHRA

Research Associate, National Institute of Urban Affairs (NIUA)



TAVISHI DARBARI

Research Associate, National Institute of Urban Affairs (NIUA)

Over the years, the Government of India has introduced several policies at various levels to address the issue of waste management. However, there are some gaps that need to be addressed and fulfilled. One of the critical phases of effective waste management is the segregation of waste at its source. Segregation of waste and recycling practices are not merely technical matters but, require behavioural and social changes. Though policies that address solid waste management have been in place for a long time, the most significant push to improve waste management came with

1. <https://www.downtoearth.org.in/news/waste/pm-modi-launches-campaign-to-make-india-garbage-free-79472>

the launch of the Swachh Bharat Mission in October 2014.²

The Swachh Bharat Mission (SBM) is a leading example of an all-hands-on-deck approach towards achieving a national goal.³ Prime Minister Narendra Modi envisioned SBM to become a people's movement and it has truly become everyone's priority. The partnerships and convergence that this programme has achieved, across the central, states, between public and private sectors and most importantly between the government and its citizens are unique. Since the launch of SBM in 2014, the world's largest behaviour change programme has managed to make incredible strides – increasing India's sanitation coverage from 39 per cent to nearly 100 per cent in just five years. It has actively mobilised and exhilarated 1.3 billion people⁴. The main reason behind the successful implementation of SBM is the bottom-up approach of the programme towards behaviour change, and a widespread partnership-driven approach. Managing waste is essential for sustainable development. From a social, economic, and environmental perspective, Solid Waste Management plays a key role in achieving at least seven of the 17 SDGs. Specifically Targeting no. 11.6 of SDG 11 (sustainable cities and communities), reducing the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management⁵. Therefore, it is important for policymakers to comprehend the linkages between SWM targets and other SDGs.

As stated by (Ajzen, 1991), the Theory of Planned Behaviour (TPB)⁵ is one of the most effective theoretical frameworks to explore the effectiveness of the policy design in the case of SBM. TPB is considered more systematic in explaining behavioural change and assumes that people behave rationally



Unsafe disposal and collection of waste

Source: Authors

Since the launch of the Swachh Bharat Mission in 2014, the world's largest behavioural change programme, India's sanitation coverage increased from 39 per cent to nearly 100 per cent in five years.

and that they take into consideration the implications of their actions.

The individual's intention to perform or not to perform the behaviour is a critical pre-determinant of the practice. Understanding how to promote more sustainable behaviors across a range of contexts remains a key challenge for policymakers and researchers.

To make our cities more sustainable and livable appropriate behavioral change strategy needs to be adopted to promote citizen engagement for managing the waste at its source. There are two strategies that have been effective at motivating environmentally responsible behaviours. These include Information, Education and Awareness (IEC), and the reward-penalty approach.

The IEC informs, educate and inspires people to realise their roles and responsibilities and benefits accruing from investing in the right waste management practices. In the reward-penalty approach, a penalty refers to a punishment imposed for breaking a law, rule, or contract. It includes a monetary fine that is assigned for individuals who abstain from obeying the by-laws. Whereas, rewarding a citizen refers to a monetary incentive that will be offered for any environmentally and socially responsible behaviour.

With the successful implementation of SBM 1.0 various cities across India initiated innovative approaches to

2. https://www.pmindia.gov.in/en/government_tr_rec/swachh-bharat-abhiyan-2/

3. <https://www.hindustantimes.com/analysis/the-distinctiveness-and-success-of-swachh-bharat/story-ZGcii1fPctfKUL3ck7nRIM.html>

4. <https://www.adb.org/sites/default/files/publication/652121/adbi-pb2020-7.pdf>

5. <https://www.mdpi.com/2313-4321/3/3/43/pdf>

transform the individual behaviour to make the cities clean and sustainable and a step towards becoming more Swachh.

As a part of IEC activities, in the city of Indore, citizens played a significant role in making the city neat and clean. The cleanliness scenario of Indore was changed by the improved habits of its people. The Indore Municipal Corporation involved 850 self-help groups in spreading awareness for source segregation at home and conducting mass campaigns. For enlightening the citizens, several religious leaders came together on a common platform and conducted mass road-sweeping exercises at various locations. The composting awareness campaigns have been conducted by the Indore Municipal Corporation which resulted in more than 50,000 households doing home composting by converting kitchen waste into compost. Within a span of one year the Municipal Corporation successfully sensitised citizens for segregation at source, and not dumping garbage in open areas. The Swachhata story of Indore is a true transformation through community participation.

In Mumbai, the Municipal Corporation of Greater Mumbai (MCGM) organised city-level exhibitions for promoting segregation and processing of solid waste at the source. Similar exhibitions were also arranged at ward levels to create awareness about segregation, decentralised processing of waste techniques and options in the market. MCGM conducted public awareness and participation programmes by staging "Street Plays" and involving dignitaries which had a compelling effect in transforming the cities and attaining the desired goal.

In Madukkarai, the ACC Madukkarai Cement Works has evolved and launched the "Clean & Green

Madukkarai". This programme is implemented by Thidakazhivu Melanmai Thittam – SHG Groups consisting of 55 women. The programme aims to create and strengthen the mechanisms for the effective disposal of solid and domestic waste of the community. The programme has been successful due to active community participation. It aimed at bringing a behavioural change in the community for proper disposal of waste and to strengthen the existing Panchayat waste management programme. The continuous education and awareness generation resulted in

Persistence and innovation is the key to a sustainable and effective behavioural change for achieving household level source segregation of municipal solid waste in India.

100 per cent participation of the community in effectively disposing of waste. After the implementation of this initiative, Madukkarai Panchayat has turned out to be a cleaner community.

As a part of the reward-penalty approach, in Panchgani, the council has come up with a penalty to deal with the issue of plastic and littering waste. A fine of Rs 500 is levied for the first time offender and those repeatedly not complying with the norms are fined Rs 5000. Also, they have levied a penalty for any activity that creates dirt in the city. To keep the citizen well informed about the reward-penalty approach, the council

had put up signboards everywhere to inform tourists and citizens that throwing of garbage would be penalised. Every tourist entering Panchgani was politely intercepted by a Swachh volunteer and handed over an eco-friendly bag wherein they could collect all their trash generated during the visit. It is also complete bin free as alternative arrangements have been made for collecting fallen leaves by placing gunny bags at frequent intervals. Similarly, in Uttar Pradesh, a penalty will be charged for violating the provisions of the Solid Waste Management Rules, 2016 including littering in public spaces. The fine ranges from Rs 100 to Rs 2500.

Improved solid waste management systems have the potential to address multiple SDGs, both explicitly and implicitly. However, while many cities already have recycling and other domestic solid waste separation systems in place, there is a lack of support and understanding of their importance among citizens. The journey of SBM 1.0 clearly depicts to successfully implement any model in the cities, it is very important to opt for an integrated and collaborative approach for a targeted outcome. The behavioural change model can help cities to understand the behaviour and actions of individuals but to implement that behaviour requires a combined and dedicated effort. We should acknowledge that the actual change in the behaviour and practices in the communities take time and the interventions need to be designed accordingly to be delivered with relevant and progressive messaging. The SBM took five years to transform the cities. Persistence and innovation is the key to a sustainable and effective behavioural change for achieving household level source segregation of municipal solid waste in India. 