Global Methane Hub

No Time to Waste: How Circular Economy Principles can Address India's Waste-Related Emissions

THEMATIC TRACK SUMMARY

Venue: Magnolia Hall, India Habitat Centre

Date: 23rd February 2023

Time: 11:30 am - 1: 00 pm (IST)

Suggested Citation

World Sustainable Development Summit (2023), No Time to Waste: How Circular Economy Principles Can Address India's Waste-Related Emissions, Thematic Track Summary (Rapporteur/s: Videesha Velijala and Krishnapriya Nair), New Delhi: The Energy and Resources Institute.

Actionable Messages

Message 1: Partnership among the stakeholders, such as waste generators, processors, NGOs, CBOs, and financing institutions, is critical to implementing an action plan to achieve the objectives of a circular economy and, in return, a sustainable waste management system.

Message 2: Since the offset of the Swachh Bharat Mission, India has seen a paradigm of change by introducing decentralized waste management approaches such as Material Recovery Facilities (MRF), biomethanation plants, and community-based models at cities and panchayats.

Message 3: Behavioural change among the population still remains a vital step for the progress in the achievement of a sound waste management system.

Message 4: Waste has to be seen as a resource and it is important to comprehend the need to better innovate and manage waste from cities, based on their individual waste profiles.

Message 5: Opportunities to divert organics from the landfill have to be undertaken to avoid the methane, rather than trying to capture the landfill gas after already generating it. Similarly, in relation to the food loss and waste, it is essential to focus on routing food to families and livestock instead of focusing on composting it after it has been wasted.

Message 6: Cities should work towards reviving their learnings that they have from the different technologies as practised in the past – that learning can be used and good practices from one city too can be used as a South-South learning, and not only as a learning from developed economies – as that cooperation can help as we have similar challenges in terms of finances and waste generation.

Narrative

The thematic track session titled "No Time to Waste: How Circular Economy Principles can Address India's Waste-Related Emissions" was conducted as part of the World Sustainable Development Summit (WSDS). The aim of the session was to (i) elevate the importance of managing the food loss and waste in India given the nutritional, health, and livelihoods benefits and potential for waste-related emissions reductions; (ii) identify the current gaps and challenges in applying circular economy principles to waste management; (iii) share current best practices that are applied in India and globally to address this issue; (iv) discuss how robust data and technological interventions drive better decision-making at the subnational and national level, while delivering better health, livelihoods and nutritional benefits to people and communities. The moderator for the session was Ms Manjyot Kaur Ahluwalia. Discussions on various topics unfolded, which included: progress and challenges in the current waste management practices in Delhi and Ekurhuleni, available tools for policymakers and other stakeholders to make better policies and interventions for waste management, and how can platforms like the WSDS be used for South-South collaboration for technical exchange and financial investment to imbibe circular economy principles for waste management across the Global South.

The session started with a framing presentation by **Ms. Manjyot Kaur Ahluwalia, Regional Lead-Asia, Global Methane Hub**, who mentioned that the Government of India's (GoI) "Swachh Bharat Mission" (SBM) made significant strides in solid waste management and yet some of the major metropolitan Indian cities are hotspots for landfill legacy waste, dumpsites, and open waste burning. This is creating a significant public health hazard regarding air and water quality. She mentioned that these activities contribute to ~20% of India's waste-related emissions. The emissions are short-lived climate pollutants that are 84% times more potent than CO_2 in a 20-year time frame. Ms. Manjyot pointed out that with rising the gross domestic product (GDP) and population, waste-related emissions are expected to increase by 13 megatons per year over the next decade, with most emissions coming from South Asia and Sub-Saharan Africa. Therefore, to reduce emissions by 2030 and to be net-zero in line with 1.5 degree Celsius, tackling emissions from the waste sector is crucial for emerging economies such as India and the African continent. Furthermore, she added that to tackle the issue, cities can transform their waste management practices using circular economy principles across the value chain while directly delivering on social, environmental, and health benefits to communities and citizens. Ms Manjyot concluded by highlighting the outcome of the session that will help elevate the importance of reducing waste emissions in India while complementing the significance efforts of the Swachh Bharat Mission as well as the LiFE Mission introduced by the GoI.

Following the framing, **Ms Roopa Mishra, Ministry of Housing and Urban Affairs**, delivered the keynote address. She highlighted the various successful steps taken as part of the SBM or "Clean India Mission" since 2014. She pointed out that under the mission, sanitation became the core focus of every forum, and now with this, India is seeing a paradigm of change by introducing decentralized waste management approaches such as Material Recovery Facility (MRF), biomethanation plants, community-based models, and so on, at cities and panchayats. Ms. Roopa mentioned that the Indian Budget for FY 2023-24 is highly significant in waste management and climate change. In the budget, there was a declaration addressing scientific waste management of dry and wet waste in cities and 500 bioCNG waste-to-wealth plants to be envisaged over the next year with a primary focus on 75 urban growth centres in convergence with Govardhan and Satak before the off-take of Bio-CBG and Bio-CNG. There also has been the declaration of PM Pranam that alternate fertilizers are going to substitute chemical fertilizers. She mentioned that the GoI policies are three-pronged: a) managing and scientific processing of the waste generated, b) promoting behavioural change for strengthening waste management, and c) integrating the circular economy concept in the waste management sector. She highlighted that the SBM successfully incorporated these pillars and shared some targets of the mission to be achieved in the coming years, which include:

- Presently, the wet waste processing capacity is 70%, and under the mission, a 100% management facility is set-up in all cities.
- The quantum of legacy waste in India is around 16 to 17 crore metric tonnes. In the first year of the SBM, work on 14 crore metric tonnes of legacy dumpsite was initiated.
- The mission ensures that the waste enters circularity, where employment generation is there, powerful informal sector integration, formation of women-led self-help groups, and sustainable revenue generation are achieved.

Ms Roopa pointed out that India is a country where the policy addresses the end-to-end part of dry waste as well. With door-to-door waste collection, setting up of MRF, linking of the waste pickers with the MRF, and Extended Producers Responsibility (EPR), the dry waste is securely carried through the value chain and recycled. She mentioned that within the mission period, the conservative estimates have pegged an additional facility wherein by 2026, the Indian cities should have composting facilities of 1 lakh TPD, MRFs of 1 lakh TPD, bio-methanation facilities of 15,000 to 20,000 TPD during the next two to three years with specific focus on the million plus cities. Ms Roopa concluded by highlighting the thrust areas where the concerned stakeholders need to come together and take actions. The areas include: partnership to work on tier II and tier III cities for some innovative, affordable, and easy-to-implement technologies; partnership to change the narrative around waste-to-electricity and support the SBM in setting up 10,000 to 15,000 TPD of waste–to–electricity plants in the bigger cities of India; partnership to look at the requirement of digital innovations, start-ups, technologies, innovations, and conduct social impact assessments.

Following the the keynote address, **Ms Manjyot,** the moderator for the session, introduced the speakers of the panel by taking up questions with each speaker. The first question was put forth for the sub-national speakers from Delhi and City of Ekurhuleni, South Africa.

Ms Vandana Rao, Deputy Commissioner of Municipal Corporation of Delhi, discussed a few facts with respect to the Municipal Corporation of Delhi that deals with 95% of the Delhi population. She reported the amounts of Municipal Solid Waste (MSW) (nearly 11000 MT) and Construction and Demolition (C&D) (6000 tons) waste generated in the city daily, along with the presence of waste processing facilities, Waste-to-Energy (WtE) plants (of 7000TPD capacity), Material Recovery Facilities (MRFs) and transportation of waste being handled by waste concessioners, composting plants and decentralized composting facilities. She touched upon the amount of legacy waste present in the city's major landfills which was around 203 lakh metric tons and how they have engineered landfills coming up. She also mentioned the biogas plants in the city and their capacity enhancement that was being done as well.

She then discussed the efforts being put in for reduction of waste – direction of flattening and remediating the landfill sites had been one of the top solutions. Bio-mining was another process taken up that involved segregating inert and RDF from old waste in the landfill sites and that MCD would be tackling its remediation for the 3 landfill sites (Ghazipur, Bhalaswa and Okhla) by the end of March 2024. She further discussed the inert waste generated being reused in roads, filling and RDF being fed to WtE plants and cement plants. Furthermore, along with community composting, she mentioned the integration of the rag-pickers in the system for waste collection, by waste concessioners working with MCD. While discussing the bulk waste generators, along with working with them through the concept of zero-waste colonies, she specified the 'Sah-bhagita' scheme laid out for them for improving efficiency and compliance in tax collection. She also enlisted other initiatives being taken up by MCD such as: for SUPs, through 100-day challenges, it was targeting the weekly markets by increasing the plastic bag composition limit, sensitizing the population and supplying cloth bags; for E-waste, MCD was collaborating with NGOs for scientific disposal of waste; to tackle increased incidents of biomass burning in the city, MCD had mapped these areas by sensitizing the resident welfare associations (RWAs) nearby, and taking steps to increase surveillance in the area.

Furthermore, some of the challenges discussed by her were the large sizes of the landfills in the city. While bio-mining was being carried out on the sites, with there being no new space for waste, the fresh waste was again being dumped in the same areas, slowing down the progress of bio-mining. Secondly, she specified how the behavioural change that was expected from people for waste segregation has been an impediment in the progress. Finally, with the increasing quantity of C&D waste, she pointed out the difficulty in managing it as recycled C&D waste was not being reused effectively, due to the informal economy of the over-burnt bricks in the country.

Mr Is'haaq Akoon, Senior Manager, Climate Change, City of Ekurhuleni, South Africa, talked about the need to better innovate and manage waste from cities as the waste has consumed large spaces of land over the years and has become sterilized finding no more use anymore. Giving a short profile of the city of Ekurhuleni, he discussed

the large chunks of land in the city which were landfill sites and how they had closed about 11 of their legacy landfill sites that were not properly lined, by opening their lining and checking them for leachate seepage and contamination of ground water. While talking about the interventions their city was taking up, he discussed the various studies and barriers they came across in their implementation: 1. **Transforming the city for waste management:** He discussed they were looking at a study around city's waste composition, waste characterization, and mass flow analysis. He pointed the insufficient availability of data around waste and technical in-depth analysis of the city's waste budget as a barrier, which was essential to understand the situation of the city. He discussed the use of a Sustainable Waste Systems model that would integrate circular economy in their business, for which they were identifying and developing key projects. 2. **Waste integration into the green economy**: While discussing just transition, he mentioned how the city was working to stimulate business and economic opportunities in the waste sector by looking at waste exchange programs and models, especially around food and organic waste. 3. **Intervention around community-based models**: He then mentioned their work with rag-pickers by building around cooperatives for them to get better access to household waste and providing them with additional resources for them to upscale and also working on a plastic recycling plant that is co-owned by the city and the cooperatives who have been assisting them in carrying out the plan in the last 10 years.

He further discussed the garden disposal centres they started in the communities for the management of organic waste within the area. He finally touched upon the importance of logistics in waste management, as to how it is expensive, causes congestion on roads and GHG emissions. He discussed ways on how they should augment some of the trucks, and involve electric vehicles within the space. In conclusion, he stated the importance of behavioural change and work that should be put in to get communities excited about recycling and adequate management of waste.

Mr Tom Frankiewicz, Principal, Climate-Aligned Industries, RMI discussed the report they had published on the key strategies for mitigating methane from the waste sector, which defined their approach for improving waste management by reducing emissions and improving public health in the environment. He then presented the approach their organization was taking, to be based on the waste hierarchy which contained the basic 3 R's principle at its foundation. While discussing the inverted pyramid, he explained that there are opportunities for avoiding waste emissions at each stage of waste management but it is still preferred to divert the organics from the landfill to avoid the methane instead of trying to capture the landfill gas after already generating it. Further, in relation to the food loss and waste, he indicated how it is essential to focus on routing food to families and livestock instead of focusing on composting it after it has been wasted. He then explored the policy interventions, resources and help that are already available, such as: the USEPA-developed SWM estimation tool (SWEET), GMI's practice guide for landfill gas energy projects like the Climate Clean Air Coalition (CCAC), which has a lot of resources on waste management – and the strong network they built around national actors, aid agencies, NGOs and multilateral development banks that have both waste management expertise and also project implementers, the UN Habitat's Waste Wise Cities Tool (WaCT) that has best practices on waste data collection and characterization to help cities get a better sense of the amount of waste they are generating. He later explained that one of the main concerns he observed was that when a city had a project and the problem statement often identified, they had no clear sense of how much waste there was, how it was being collected, and where it was going.

Following this, he also explained that with waste projects often being carried out by web multilateral development banks, NGOs, etc., there are multiple groups working in one place or even at odds with each other. Discussing this, he then talked about methane assessment platform or a 'waste map' they were working on, that was an open access platform to provide decision-makers with global information on the waste sector to determine the best target interventions, prepare a strategic playbook, a decision support tool, and case studies as put forward by RMI, TERI, CCA, etc. He concluded by presenting the two-pronged approach they used that creates a feedback loop for better data and direct engagements with countries to assess their waste management systems to develop and implement a strategic playbook to eventually lessen the environmental and climate impact from waste.

Ms Ruchika Singh, Director, Sustainable Landscapes and Restoration, WRI India, talked about how food loss and food waste have a huge implication when looked at from the climate, livelihood, and nutritional perspective,

and appreciated the work being done by the Delhi government and progress through the Swachh Bharat Mission. She then touched upon the topic of the supply chain of the agricultural waste – talking about figures from the NAPCON's latest report on food loss (18.5 billion USD annually) from 54 crops, and GHG emissions (51.26 million tons CO_2eq. annually). She discussed how from a livelihood and nutritional security perspective, food is not wasted and there are many benefits that arise. Following this, she discussed the work being done in WRI, how they are looking at issues around food loss and waste from a systemic perspective. She talked about their paper titled: "Food Loss and Waste: The Knowns and Unknowns in India." She further discussed there being a lot of unknowns existing like the fragmented nature of action and actors, data on quantities of food waste/loss and capacity skills and behavioural issues prevalent across various supply chain actors. These require more research and have to be looked at more systematically. She then discussed WRI's initiative of creating a network of champions called the 'Friends of Champions 12.3' based on SDG 12.3 of food loss reduction – which is a group of like-minded partners and actors jointly working on realizing strategies, and action to tackle food loss and waste. She talked about how this initiative was helping mobilize action through partner networks while looking at existing policy incentives.

Furthermore, she discussed the research they were undertaking in Madhya Pradesh on tomato supply chain, where they conducted both quantity and quality measurements to investigate the situation at the wholesale and retailer level to measure the kind of losses occurring in the supply chain, along with studying the solutions emerging, behavioural change issues along the different supply chain actors, innovation and technology measures, and policy and other incentives. She concluded by mentioning their adoption of tools to control food loss and coming up with waste-related protocols, and doing a household survey to identify the waste context in different towns, as different kinds of waste profiles are present in the three tiers (I, II, III) of the cities.

Dr Suneel Pandey, Senior Fellow and Director, Environment & Waste Management Division, TERI, concluded the session with a summary – he started off by pointing out that waste is a resource and the need that exists for some finances to make that happen, which cities across the world have shown how that can be done. Following this, he discussed the point that, due to our past heavy dependence on mixed waste disposal due to centralized disposal, there is a lot of land value locked under these disposal facilities and waste processing sites, and bio-mining and landfill mining are efforts for freeing these land spaces – and redevelopment of these spaces can be made into green lungs for the city that can help address the air pollution issues as well. Further, if wet and dry waste can be managed together at properly designed MRFs in cities, the livelihood options for many workers and women SHGs can be addressed. Cities should work towards reviving their learnings that they have from the different technologies as practised in the past – that learning can be used and good practices from one city too can be used as a South-South learning, and not only as a lesson from developed economies.

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“	With the rising GDP and population, waste-related emissions are expected to increase by 13 megatons per year over the next decade with most emissions coming from South Asia and Sub-Saharan Africa. Therefore, to reduce emissions by 2030, and to be net-zero in line with 1.5°C, tackling emissions from the waste sector is crucial for emerging economies, such as India and Africa. **Ms Manjyot Kaur Ahluwalia** ***Regional Lead-Asia, Global Methane Hub***
“	India is seeing a paradigm of change by introducing decentralized waste management approaches, such as Material Recovery Facility (MRF), biomethanation plants, and community-based models, at cities and panchayats. To keep decentralized waste management approaches going, changes at the community level, scientific approaches, and remediation of existing dump sites are required. **Ms Roopa Mishra** ***Joint Secretary and Mission Director of SBM (U), Ministry of Housing and Urban Affairs***
“	The “zero waste colonies” is a new concept introduced in Delhi that covers several schemes such as Sahbhagita scheme, which is an essential step for introducing sustainable waste management practice in Delhi. **Ms Vandana Rao** ***Deputy Commissioner, Municipal Corporation of Delhi***
“	Some of the aspects that developing countries like South Africa and India need to comprehend are the areas where there is a lack of data and resources such as the waste characterization data, technical in-depth analysis, and identifying best case studies that showcase sustainable waste management practices that could also be adapted to a specific region. **Mr Is'haaq Akoon** ***Sr Manager, Climate Change, City of Ekurhuleni, South Africa***
“	Food loss and food waste are major concerns in the waste sector, and a contributor to GHG emissions. Several aspects such as the quantity of food waste in India are understudied. Initiatives must be introduced to reduce food loss and waste for greater food security and environmental sustainability. **Ms Ruchika Singh** ***Director, Sustainable Landscapes and Restoration, WRI-India***
“	Most countries heavily rely on landfill and dumpsites to manage waste with lower emphasis at the top of the waste management hierarchy. Hence, the two-pronged strategy is required which includes open-source platform, decision support tools, on-the-ground support, and information sharing. **Mr Tom Frankiewicz** ***Principal, Climate-Aligned Industries, RMI***
“	Due to our past dependence on mixed waste disposal, there is a lot of land value locked under these disposal facilities and waste processing sites. Therefore, bio-mining and landfill mining are efforts for freeing these land spaces – and the redevelopment of these spaces can create green lungs for the city that can further address the issue of air pollution. **Dr. Suneel Pandey** ***Sr Fellow and Director, Environment & Waste Management Division, TERI***