



SWaCH
Composting

SWaCH's at-source wet waste management initiative

A model by waste pickers, for the environment

SWaCH's inclusive in-situ wet waste model

This initiative aims to set up a **city-scale demonstration of in-situ organic waste management** as a model for a just transition for waste pickers within waste management.

Decentralized systems are not only preferable for more effective management of waste and better environmental outcomes, they have more than 30 times the employment generation potential of centralized waste processing systems.



Problem Analysis

- Organic waste is 76% of the waste produced by households in Pune, and this remains consist across income groups (What We Waste, 2022).
 - All of this waste can be treated at source: eliminating unnecessary GHG emissions, increasing employment and reducing the municipality's waste management burden.
- A strong policy framework is in place:
 - Bulk Waste Generators (BWGs) i.e. any residential or commercial complexes generating more than an average of 100kg waste per day, are mandated to manage their wet waste at source, as far as possible (SWM Rules, 2016).
 - In Pune, BWGs are to be monitored for compliances, and will be subject to incentives and or penalties based on the compliance status (PMC SWM Bye-laws, 2017).
- Most citizens have a "Not in My Back Yard" approach for organic waste:
 - This is due to misconceptions about foul smell and non-desirability of at-source solutions.
 - Technology and capital-intensive solutions like OWC machines, overnight composters, etc. often fail due to high operational and technological complexity, further reducing confidence in at-source solutions.
 - Despite a strong policy framework, many BWGs do not have adequate allocated space for at-source organic waste management. Upfront costs are a major hurdle for societies to switch from out-sourced to at-source waste management.

Initiative Design: Shifting to In-situ Wet Waste Management

- **Decentralized infrastructure:**
 - Low-tech and modular solutions for composting and biomethanation, which are easy to operate and maintain, sustainable in the long term.
 - Minimal use of synthetic and chemical cultures to the process.
 - Synergistic solutions for leaf litter and garden waste management.
 - Customized solutions based on requirements and space constraints -
 - Modular biomethanation for institutions with canteens
 - Pit, weld mesh, tray composting based on space available. Shredders added to optimize limited space.
- **Creative IEC :**
 - First-mover societies promoted as “model” zero waste communities, and serve as vocal advocates for sustainable waste management practices. Visits to operational sites and interaction with other citizens is a critical tipping point factor for uptake of in-situ organic waste solutions.
- **Partial support for capital costs against a commitment from citizens for long term continuation of zero waste systems:**
 - Commitment for 100% at-source segregation by residents,
 - 3-year commitment for managing composting pits, including user fees,
 - Commitment for participating in RRR drives, special collection for thermocol, multi-layered plastics, etc
- **Upskilling and employment for informal waste pickers:**
 - Training and on-the-job handholding support
 - Waste picker gain secure work as service providers with user fees from citizens for managing organic waste
- **Monitoring system:**
 - Baseline of residential BWGs in the city, shared with municipality
 - Monitoring system for organic waste compliance piloted: Routine spot-checks by monitoring team to track compliance, link to reward and penalty system for better enforcement of existing policy



Pit Composting



OWC + Tray System



Biogas

SWaCH: Wet Waste Management Impacts



- Upskilled and generated a new form of employment for **170+ waste pickers**, **impacting their families – over 290 individuals from marginalized communities**
- **250+ sites for in-situ composting**
- **4 sites for institutional biogas** including the Divisional Commissioner Office in Pune
- Increased the earnings of waste pickers by an average of **Rs. 3,800 per month**
- Waste pickers manage **19,000+ kg of organic waste in-situ every day**
- Municipality saves INR 1,3000,000+ in transportation and processing costs annually
- Established **30 model communities** that will act as amplifiers in the long run
- Developed a system **for registering and monitoring the organic waste compliance** status of Bulk Waste Generators



Policy Recommendations

At scale, in-situ organics waste management will reduce waste coming out of residential areas by 76%, cut down municipal waste management costs, eliminate unnecessary emissions and create large-scale employment for waste pickers. For every tonne of waste processed, 3 minimum wage-equivalent livelihoods can be generated.



Biogas at Divisional Commissioner Office



Pit composting method

To strengthen the enforcement of the BWG policy, municipalities can:

1. Establish a **wet waste cooperative** (agency) to undertake in-situ wet waste management by integrating enumerated waste pickers, providing training to operate wet waste technologies, who get paid a user fee by citizens for their service. Alternatively, multiple agencies providing such services can be reviewed and empanelled by the city.
2. Strictly **cease municipal wet waste collection** from all BWGs, and levy fines on non compliant BWGs to ensure the switch to in-situ wet waste management.
3. Levy fine or additional charge on BWGs that opt for off-site solutions.
4. Provide an **incentive** (covering partial costs of capex) to set up the in-situ wet waste management system. This diverts expenditure from operating wet waste transport and processing towards a one-time shift towards at-source processing.
5. Create **lighthouses to change perspectives** about wet waste management - RWAs, BWGs to be selected as model sites to host visits, establish a wet waste exhibit in the city to demonstrate in-situ technologies and serve as awareness and training centers.
6. Issue **guidelines for selection of appropriate technology** :
 - Based on matrix of capex, opex, space requirements, etc.
 - Low-tech composting solutions (pit, weld-mesh, drum, etc) with shredder, leaf litter mesh, etc as needed and minimal use of chemical cultures and additives – selected based on matrix.
 - Modular biogas for premises with canteens
 - Modular biogas (2kg onwards) for slum households
 - Community composters for slum communities.
 - Discourage use of unproven technologies (capital intensive 24*7 composters, overnight composters, etc).
7. Include mandatory requirement in **building regulations** - **2sq.ft per kg of wet waste** in all new constructions allocated for in-situ wet waste processing.
8. Expand the BWG definition to include all generators **above 30kg per day** in the municipal bye-laws.
9. Add a **minimum number of properties** to the definition of BWGs to streamline on-ground identification.
10. Modification of tipping fee-based collection contracts to **disincentive** mixed waste and pick-up of organic waste.
11. Periodic on-field **monitoring** of BWG sites through an independent empaneled monitoring agency, based on which penalties are enforced by the municipality.

Testimonials



Pallavi Kadam,
(Waste picker)

Pallavi Kadam is now an organic waste service provider. Pallavi says, “So far, I was only working with dry waste. This year, I have learned to work with wet waste too. This has been an economic benefit to me, as I have been able to increase my work. I am also contributing to environmental protection – the work I do reduces pollution and emissions and I am proud of the contribution I am making to the city. It is also a joy to learn new things!”

Arvinda Naik, Spring Hills society committee member, credits Santosh Salunkhe (project team member) for reviving in-situ composting. “I myself have advocated to the society committee to move to in-situ wet waste management. We rebuilt our composting pits, and it is working well. We had a function and felicitated our workers as well.” Residents now segregate waste, and non-compliance results in action.



Arvinda Naik,
(Society Committee member)

Through the dedication of waste pickers like Pallavi and communities like Spring Hills, vehicular transportation emissions of wet waste have been eliminated. This reduces pollution, CO₂, CO, and mitigates methane emissions.