



SEPARATION AT SOURCE (S@S)

12 Real-World
Zero Waste Practices
That Work



SEPTEMBER 2026

Executive Summary

Establishing waste separation at source (S@S) is the foundation of zero waste systems. It means separating different types of waste—such as organic, recyclable, and residual materials—at the point where waste is generated, keeping materials clean and preventing contamination. Without it, recyclable and compostable materials mix with other waste, lowering recovery rates. Crucially, however, promoting source separation without differentiated collection frustrates residents and undermines trust. Therefore, source separation, supported by differentiated collection, is a fundamental step to keep materials clean while reducing emissions and generating social benefits through job creation, community awareness, engagement, and participation.

This publication presents 12 diverse successful cases from five regions: Africa (Tanzania), Asia (India, The Philippines), Europe (Greece, Slovenia, Italy), North America (USA), and Latin America (Costa Rica). The communities featured range in scale, from Tilos Island with a permanent population of 700 residents, to megacities such as Bengaluru, where the zero waste systems reach approximately 2 million people. Across these jurisdictions, source separation rates vary according to local mandates and frameworks, ranging from 30–33% organic waste diversion in Portland to outstanding rates of 80–95% in places such as Varkala, San Fernando, and Dar es Salaam, and reaching 100% in Tilos Island.

One of the keys to achieving high waste separation rates is through the implementation of a decentralized infrastructure and door-to-door collection, rather than relying on public drop-off stations. The latter often lack social oversight, resulting in higher levels of waste contamination. The most effective systems rely on localized Material Recovery Facilities (MRFs) to receive, store, weigh, and process recyclables and compostables close to where they are generated. This reduces transportation costs and emissions while creating spaces for community participation, education, and engagement.

Efficient logistical systems, combined with strong economic incentives, can significantly improve waste separation and waste prevention. These include Pay-as-You-Throw (PAYT) schemes, reductions in municipal waste tariff, property tax discounts, and clear municipal by-laws, supported by enforcement mechanisms such as fines or non-collection of improperly separated or mixed waste. Together, these measures create financial incentives to separate their waste correctly, while also encouraging them to reduce the amount of waste they generate.

To ensure long-term sustainability, impactful systems invest in community-led education, including local ambassadors and volunteer networks that provide peer-to-peer guidance, formally integrating waste pickers and other marginalized groups into municipal labor systems.

This publication is a call to action for municipal officials, advocates, and policymakers to move away from disposal-focused approaches and embrace proven, community-led systems that protect both the climate and local communities. **Prioritizing source separation can help drive the transition toward healthier cities where resources are conserved, and people breathe cleaner air.**

High-performing source separation systems are highly replicable across diverse economic and cultural contexts. These models demonstrate that zero waste is not a distant or idealized utopia, but an achievable, practical, and justice-centered reality.

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Introduction

Effective recycling and composting systems depend on the separation of waste at source (S@S) and on collection systems that keep different waste streams separate. Ineffective source separation is often one of the root causes of low recovery rates in cities, and remains a common challenge worldwide. When recyclable and compostable materials are collected together with other waste, contamination increases and the quality and quantity of materials available for recovery can decline.

Source separation works best when it is supported by a corresponding separate collection system. Asking households to separate without providing convenient and reliable collection can lead to frustration and undermine trust in the system. In some cases, Mechanical Biological Treatment (MBT) - a process that mechanically sorts and biologically treats mixed waste - has been introduced as a way to recover materials from unsorted waste. However, because the incoming waste is already mixed and contaminated, the quality and quantity of materials that can ultimately be recovered are often limited. As a result, recovery rates can remain very low, with recyclables accounting for as little as 5% of recovered materials in some cases.¹

Establishing source separation from the point where waste is generated helps prevent contamination and reduces the loss of valuable materials throughout the waste management chain. It ensures cleaner recyclables, reduces greenhouse gas (GHG) emissions, and waste disposal in landfills, and contributes to cleaner cities. Well-designed systems can also deliver important social benefits, including job creation, community awareness, engagement, and participation, and ultimately contributing to improved public health and well-being.

With the aim of equipping a diverse audience - including municipal officials, planners, policy makers, local organizations, waste pickers, and funders - with the practical tools for implementing efficient zero waste systems, this publication showcases 12 real-world experiences to examine the operational approaches behind their success and identifies strategies that can help replicate and scale these impacts in other contexts.

Cities with source separation rates of at least 70% were selected for this publication through data from GAIA's Zero Waste Cities database and desktop research to identify jurisdictions meeting the high-performance criteria. This criterion was not applied to the U.S. because source separation rate is not commonly used as an indicator in the country, and comparable rates are generally lower. Nevertheless, U.S. cities were included to ensure geographic representation across all territories covered.

To gather more detailed information, municipal officials, implementing organizations, and representatives responsible for waste management programs in each city were contacted directly. The information they provided was reviewed, consolidated, and incorporated into the case studies presented in this publication. The case studies are organized according to the population size of each city, allowing readers to explore approaches across different scales.

¹ Edo-Alcón, N., Gallardo, A., Colomer-Mendoza, F. J., & Lobo, A. (2024) <https://pmc.ncbi.nlm.nih.gov/articles/PMC10884472/>

Glossary

BSF

Black Soldier Fly

CENRO

City Environment and Natural Resources Office

HORECA

Hotels, Restaurants, and Cafés

IEC

Information, Education, and Communication

KAYT

Know As You Throw

MBT

Mechanical-Biological Treatment

MRF

Materials Recovery Facility

NGO

Non-Government Organization

PAYT

Pay As You Throw

RFID

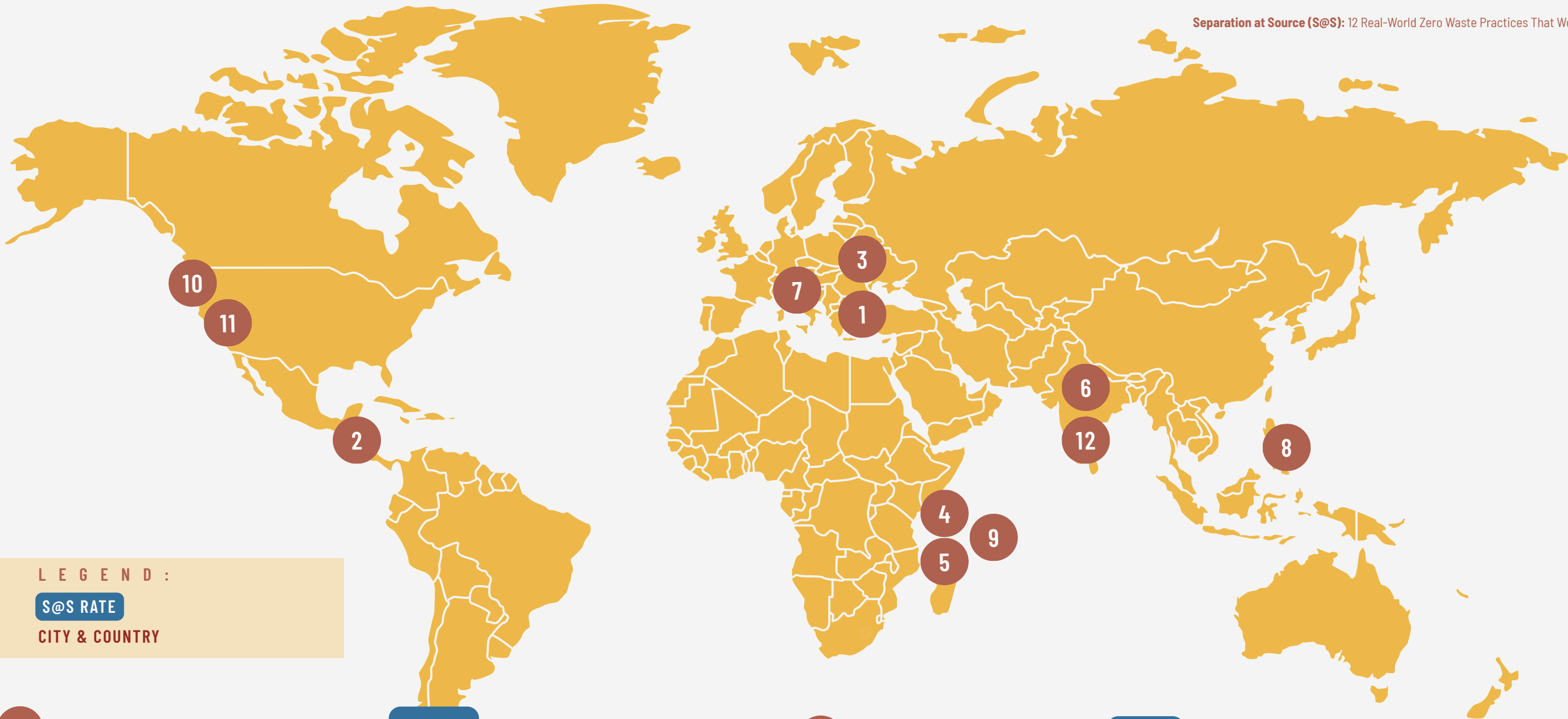
Radio-Frequency Identification

S@S

Separation at Source

ZW

Zero Waste



LEGEND :

S@S RATE

CITY & COUNTRY

- 1 TILOS ISLAND, GREECE 100%
- 2 LEÓN CORTÉS, COSTA RICA 100%²
- 3 VRHNIKA, SLOVENIA 82%
- 4 KIJITOUPELE AND CHUMBUNI, UNGUJA ZANZIBAR, TANZANIA 85%
- 5 ILALA, KINONDONI AND UBUNGO MUNICIPALITIES, DAR ES SALAAM, TANZANIA 95%
- 6 VARKALA, INDIA 95%

- 7 CAGLIARI, ITALY 76%
- 8 SAN FERNANDO, PAMPANGA, THE PHILIPPINES 90%
- 9 CHUMBAGENI WARD, TANGA, TANZANIA 85%
- 10 PORTLAND, OREGON, USA 30-33% ORGANICS
- 11 SAN FRANCISCO, USA 99%
- 12 BENGALURU, INDIA 55-97%³

² The separate collection service covers 100% of the city's area. While separation is practiced in nearly all households in some communities, the overall estimated rate is approximately 48-52%.

³ Bengaluru's city-wide waste source segregation rate is approximately 55%, according to data from [Bengaluru Solid Waste Management Limited \(BSWML\)](#). However, certain neighborhoods and model constituencies have demonstrated significantly higher segregation levels, reaching approximately 95%-97%.

		CITY	INHABITANTS	COLLECTION SYSTEM AND LOGISTICS	
1		Tilos Island, Greece	700	- Door-to-door collection - Three separate waste streams - Secondary sorting center - No public wastebins	
2		León Cortés, Costa Rica	13,533	- Door-to-door collection - Three separate waste streams - Regional secondary sorting center	
3		Vrhnika, Slovenia	18,210	- Door-to-door collection - Five separate waste streams - Infrequent collection for mixed waste - Drop-off centre for other materials - Strategic oversight by a Zero Waste Advisory Board	
4		Kijitoupele and Chumbuni, Unguja - Zanzibar, Tanzania	22,800	- Door-to-door collection - Weekly collection of organic waste in bins - Material Recovery Facilities (MRFs) for sorting, weighing and composting "No segregation, no collection" policy	
5		Ilala, Kinondoni and Ubungu Municipalities, Dar es Salaam, Tanzania	25,216	- Door-to-door collection - Four waste streams: organic, recyclable, domestic hazardous, and residual - Waste data collected on site	
6		Varkala, India	40,048	- Door-to-door collection - Weekly collection of residual waste - Daily collection of meat and organic waste from HORECA	
7		Cagliari, Italy	150,000	- Door-to-door collection - Organic waste collected a week - Residual waste and recyclables collected once a week - Households equipped with RFID tags	
8		San Fernando, Pampanga, The Philippines	354,666	- Door-to-door collection - Four waste streams: biodegradable, recyclable, residual, and special/hazardous waste - Twice-weekly collection using pushcarts and tricycles - Strict "no segregation, no collection" policy	
9		Chumbageni Ward, Tanga, Tanzania	393,429	- Door-to-door collection - Collection routes aligned with local administrative boundaries	
10		Portland, Oregon, USA	635,109	- Door-to-door collection - Weekly organics collection in green bins - Biweekly collection of residual waste - Visual inspections and "Oops" tags for non-compliance with waste separation	
11		San Francisco, USA	812,530	- Door-to-door collection "Fantastic Three" system: residual waste, recyclables, and compostables	
12		Bengaluru, India	2.3 million	- Door-to-door collection "2 Bins, 1 Bag": green for organics, red for residual waste, and white/blue for recyclables - Mixed waste is rejected	

	CITY	ECONOMIC INCENTIVES, FEES, AND PENALTIES 
1	Tilos Island, Greece	• Exploring PAYT, subject to jurisdictional approval • Penalties for non-compliance with waste separation requirements
2	León Cortés, Costa Rica	• 35% tariff reduction for participants who pass inspections • Fee-based agreements to process recyclables
3	Vrhnika, Slovenia	• “Cheaper with Koko”: bonus system to reduce waste bills
4	Kijitoupele and Chumbuni, Unguja - Zanzibar, Tanzania	• Monthly flat-rate fee • Polluter Pay Principle to hold polluters responsible for environmental damage, compensation, and recovery costs
5	Ilala, Kinondoni and Ubungo Municipalities, Dar es Salaam, Tanzania	• Fines enforced through municipal or city by-laws for illegal dumping, failure to participate in an approved waste collection service, and improper waste storage.
6	Varkala, India	• Monthly waste service fee • Tax-based system with fines for non-payment • Dumping and littering subject to penalties 90% subsidies for household compost bins and biogas systems
7	Cagliari, Italy	• Pay-As-You-Throw (PAYT) system • Regional incentive and penalty scheme rewarding municipalities that achieve high capture and quality rates in organic waste collection
8	San Fernando, Pampanga, The Philippines	• Funds provided to each neighborhood for Material Recovery Facility (MRF) construction • Compost is sold or donated to farmers • Revenue from penalties and compost sales goes into the city's General Fund
9	Chumbageni Ward, Tanga, Tanzania	• Households and businesses pay a monthly fee • Revenue from the sale of recyclables
10	Portland, Oregon, USA	• US\$15-20 fee for contaminated bins Pay-As-You-Throw (PAYT) system • Landlords pay the waste fee on behalf of their tenants
11	San Francisco, USA	• Pay-As-You-Throw (PAYT) system • Businesses can reduce their waste bills by up to 75% through proper waste separation • Fines of up to US\$100 per day for small businesses and US\$1,000 for larger businesses
12	Bengaluru, India	• Monetary penalties with fines for illegal dumping of construction waste, failure to separate waste at home, or non-compliance with waste management requirements

	CITY	COMMUNITY ENGAGEMENT STRATEGIES 
1	Tilos Island, Greece	• Consistent, hands-on contact with the community led by the municipality • Accessible information point for residents and tourists
2	León Cortés, Costa Rica	• “Oveja Verde” ongoing community education campaign (“Green Sheep”) • Door-to-door education and outreach
3	Vrhnika, Slovenia	• Steady, low-key communication and outreach • Residents can exchange their municipal organic waste bin for a free home composter
4	Kijitoupele and Chumbuni, Unguja - Zanzibar, Tanzania	• Door-to-door campaigns, beach clean-ups, youth activities, and religious gatherings • Use Material Recovery Facilities (MRFs) as community education spaces
5	Ilala, Kinondoni and Ubungo Municipalities, Dar es Salaam, Tanzania	• Door-to-door educational visits • Public gatherings, clean-ups, and Information, Education, and Communication (IEC) materials
6	Varkala, India	• Door-to-door education • Large-scale community campaigns through meetings, street theatre, and social media • Periodic awareness campaigns in schools and ward-level workshops
7	Cagliari, Italy	• Targeted awareness campaigns when delivering new collection kits to residents • Warning stickers on bins with improperly sorted materials
8	San Fernando, Pampanga, The Philippines	• Partnership with local NGO Mother Earth Foundation for Information, Education, and Communication (IEC) campaigns and Zero Waste Academies
9	Chumbageni Ward, Tanga, Tanzania	• Door-to-door education • Distribution of zero waste calendars with key information
10	Portland, Oregon, USA	• Master Recycler Volunteer Network, with capacity building provided in exchange for volunteer hours
11	San Francisco, USA	• Mailing fact sheets and educational materials in multiple languages • Presentations at community meetings • Businesses outreach visits
12	Bengaluru, India	• Volunteers, students, and Resident Welfare Associations conduct campaigns using sample waste segregation kits and informational materials

	CITY	EMPLOYMENT OPPORTUNITIES
1	Tilos Island, Greece	16 new local jobs created - Key roles include a program coordinator, community awareness ambassadors, and dedicated handlers for each waste stream
2	León Cortés, Costa Rica	5 municipal workers, plus 2 additional workers hired by a neighboring municipality
3	Vrhnika, Slovenia	The reuse center generates income to cover wages through upcycling and resale activities
4	Kijitoupele and Chumbuni, Unguja - Zanzibar, Tanzania	55 direct employment opportunities - Formalizes informal economy waste pickers, youth, and women-led initiatives as recognized environmental service providers through cooperatives
5	Ilala, Kinondoni and Ubungu Municipalities, Dar es Salaam, Tanzania	61 waste collectors sustain the program 3 waste groups manage collection
6	Varkala, India	- Jobs for over 260 women - Haritha Karma Sena empowers women from marginalized backgrounds - Regular wages - Safety equipment and skills training - Income generated through the sale of recyclables
7	Cagliari, Italy	30-50% increase in green jobs - Additional employment through social cooperatives
8	San Fernando, Pampanga, The Philippines	- Formalization of 160 waste workers, providing monthly salaries and additional income from the sale of recyclables - The City Environment and Natural Resources Office (CENRO) employs 135 dedicated garbage collection personnel
9	Chumbageni Ward, Tanga, Tanzania	16 trained waste pickers organized into 8 teams
10	Portland, Oregon, USA	- Private haulers manage waste collection instead of municipal trucks - Trained community volunteers
11	San Francisco, USA	- Hiring a Zero Waste Facilitator to address contamination issues "Environment Now" green jobs training program
12	Bengaluru, India	Waste pickers receive formal recognition and access to government schemes



CITY

KEY RECOMMENDATIONS FOR MUNICIPAL OFFICIALS, ADVOCATES, AND POLICYMAKERS



1	Tilos Island, Greece	• Provide daily guidance on source separation and ensure households have the necessary equipment. • Prioritize simple systems that minimize training and municipal workload. • Promote safe local drinking water and refill alternatives to reduce bottled water use.
2	León Cortés, Costa Rica	• Build strategic alliances with local stakeholders to address challenges together. • Avoid large-scale compost-bin giveaways without adequate funding and capacity to monitor their use and impact. • Move beyond isolated efforts, such as one-off events and sporadic recycling campaigns.
3	Vrhnika, Slovenia	• Organize zero waste workshops to train and certify local organizers • Use reuse centers as major community education hubs. • Avoid collecting mixed waste at communal eco-islands, which are a major source of contamination.
4	Kijitoupele and Chumbuni, Unguja - Zanzibar, Tanzania	• Integrate youth and informal economy waste pickers into the zero waste system. • Link zero waste efforts to climate, tourism, and public health. • Combine awareness campaigns with sorting infrastructure and regular collection services.
5	Ilala, Kinondoni and Ubungo Municipalities, Dar es Salaam, Tanzania	• Provide continuous door-to-door engagement. • Formally integrate informal economy waste pickers into municipal labor systems. • Establish strong partnerships with municipal authorities. • Work with influencers and media to expand outreach.
6	Varkala, India	• Dedicate collection days or months for specific low-waste materials (e.g. old clothes, e-waste) to increase source separation. • Enforce a strict ban on single-use plastics. • Place community composting sites and MRFs in highly visible public spaces.
7	Cagliari, Italy	• Secure strong regional government support to establish clear parameters for separate collection and enable waste-tax incentives. • Set waste fees transparently and clearly communicate how revenues are used, managing residents' expectations around savings and related public services such as street cleaning.
8	San Fernando, Pampanga, The Philippines	• Enable local barangays to establish and operate their own MRFs, rather than centralizing waste management functions. • Provide free collection equipment. • Build cross-party support and institutionalize the program through policies, dedicated budgets, and long-term implementation plans to safeguard it from political turnover.
9	Chumbageni Ward, Tanga, Tanzania	• Implement daily community awareness programs. • Formalize and recognize waste pickers as part of the zero waste system. • Complement voluntary participation with clear by-laws, monitoring systems, and proportionate penalties to ensure consistent compliance.
10	Portland, Oregon, USA	• Provide free resources to support waste diversion. • Establish regulations that promote zero waste. • Provide businesses with accessible technical assistance. • Implement outreach and education programs for residents.
11	San Francisco, USA	• Provide ongoing community education.
12	Bengaluru, India	• Share simple and consistent messages. • Provide decentralized waste management facilities • Maintain consistent source separation through ongoing coordination among residents, collection teams, and local authorities. • Keep separately collected waste segregated during transport and communicate this clearly to residents to maintain trust and participation. • Ensure complete collection coverage to avoid "back spots" in neighborhoods.

Key Learnings

Source separation is a proven and highly replicable approach across different urban scales and contexts, from small communities to megacities. The experiences featured in this publication highlight several key strategies for making source separation work effectively and sustainably.

1 Door-to-door collection can deliver stronger results than centralized drop-off containers.

Public collection points often lack social oversight, which can lead to contamination and undermine confidence in source separation. Door-to-door collection makes participation easier for households and businesses, enables more consistent monitoring, and helps maintain cleaner material streams. To support participation, households and businesses should have access to free sorting equipment and receive door-to-door education and guidance.

2 Decentralized models based on Material Recovery Facilities (MRFs) can improve efficiency and community engagement

Localized MRFs, particularly those operated at the neighborhood level, can reduce transportation costs and improve material tracking. MRFs can also serve as spaces for community composting and environmental education, while strengthening the legitimacy of zero waste systems. When residents can see where recovered materials go and understand how they are managed, they can better connect their daily practices to tangible local outcomes.

3 Regulations are essential for sustained compliance.

Municipal policies should establish clear requirements for households and large waste generators, reflecting their different volumes, capacities, and responsibilities. Effective measures include mandatory source separation, “no segregation, no collection” policies, and inspections, tags, or notices for non-compliant containers, supported by enforceable by-laws and fines. These regulations should be clearly communicated, consistently monitored, and applied fairly over time.

4 Economic incentives and penalties can reinforce participation and waste prevention

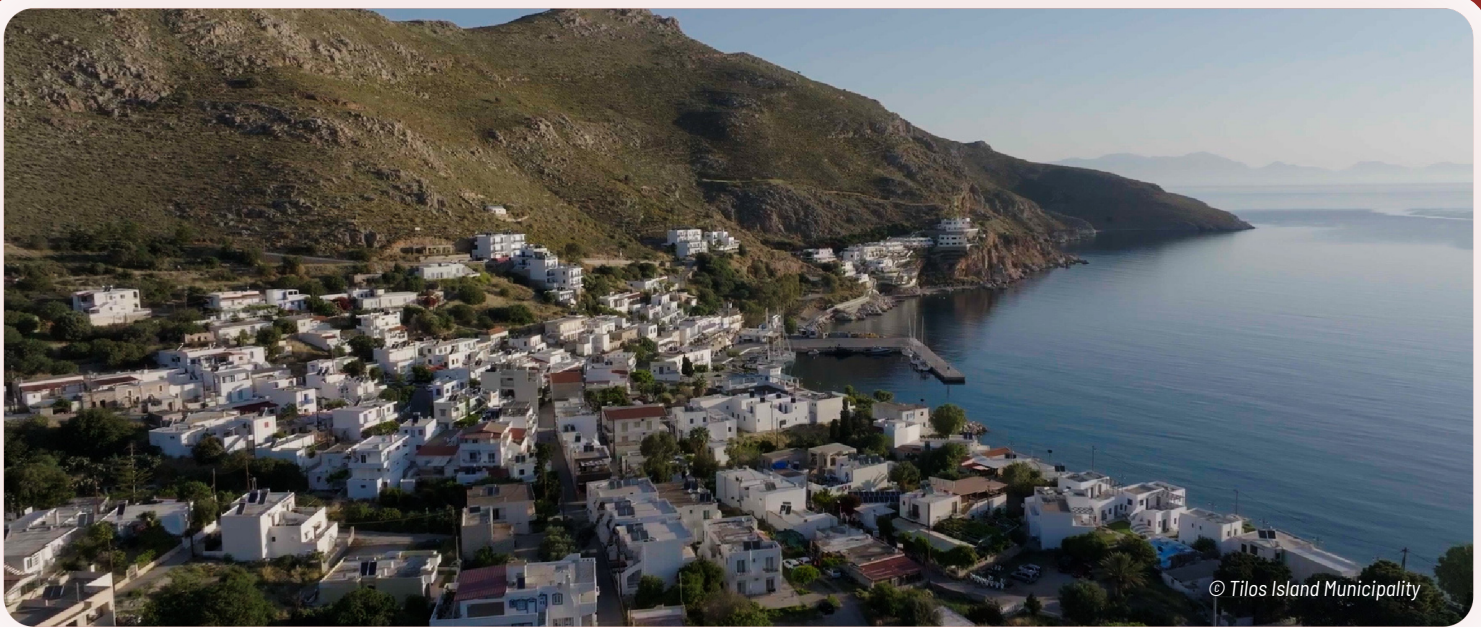
Tariff reductions and Pay-As-You-Throw (PAYT) systems – which link waste collection costs to the volume of waste generated – can successfully motivate households and businesses to maximize sorting and even reduce the amount of waste generated in the first place. Financial penalties for persistent noncompliance can further strengthen accountability when paired with accessible collection, equipment, and education.

5 Communication and community engagement are essential for building lasting participation.

Simple, consistent messages need to be backed by reliable municipal services and delivered through accessible Information, Education and Communication (IEC) materials and multiple channels, including door-to-door outreach, local media, social media, influencer engagement, and community platforms. Dedicated IEC staff and partnerships with community-based organizations can further strengthen outreach. Rather than relying on one-off campaigns or expensive equipment giveaways, successful systems invest in sustained engagement that builds confidence, knowledge, and lasting habits. Source separation is ultimately a process of cultural change that requires consistent reinforcement over time.



12 LEADING ZERO WASTE PRACTICES



1

Tilos Island, Greece

Tilos is a small island municipality with approximately 700 residents, but its population increases significantly during the tourism season, creating additional challenges for waste management. Before the implementation of its zero waste program, the island relied heavily on imported packaged goods and bottled water due to the lack of drinkable tap water. Despite these challenges, a public-private collaboration between the Municipality and the company Polygreen through the “Just Go Zero Tilos” project, enabled the city to close its landfill and become the world’s first certified zero waste island. From 2021 to 2024, the program was self-funded by Polygreen; since 2025, it has been funded by the Solid Waste Management Agency of South Aegean, the regional public authority.

A key step in the transition was the removal of all public waste bins from the island, and the introduction of a daily door-to-door collection system in the first year reaching 88%. Residents and businesses are required to separate their waste into three primary streams: organic, recyclable, and residual waste. Household collection is carried out three times per week, and collection from businesses, which account for the largest share of the collected quantities, is carried out daily. Following collection, materials are transported to a local Circular Innovation Center for secondary sorting, weighing, and preparation for recycling, reuse, and composting.

The system has created 16 dedicated local jobs, including a program coordinator, waste stream-specific handlers for organics and recyclables, and a community ambassador. The ambassador provides day-to-day guidance to local residents and businesses, supporting long-term participation and helping to build lasting waste separation habits.

Currently, the municipality does not provide economic incentives given to residents but is exploring a PAYT system, subject to jurisdictional approval. Penalties are in place for non-compliance; however, only one fine has been issued since the program began. This reflects the strong emphasis placed on education, community ownership, and ongoing awareness raising. Activities have included social media challenges and engagement with residents, businesses, schools, the HORECA⁴ sector, and visitors, as well as a physical “Zero Info Point” providing information and practical support.

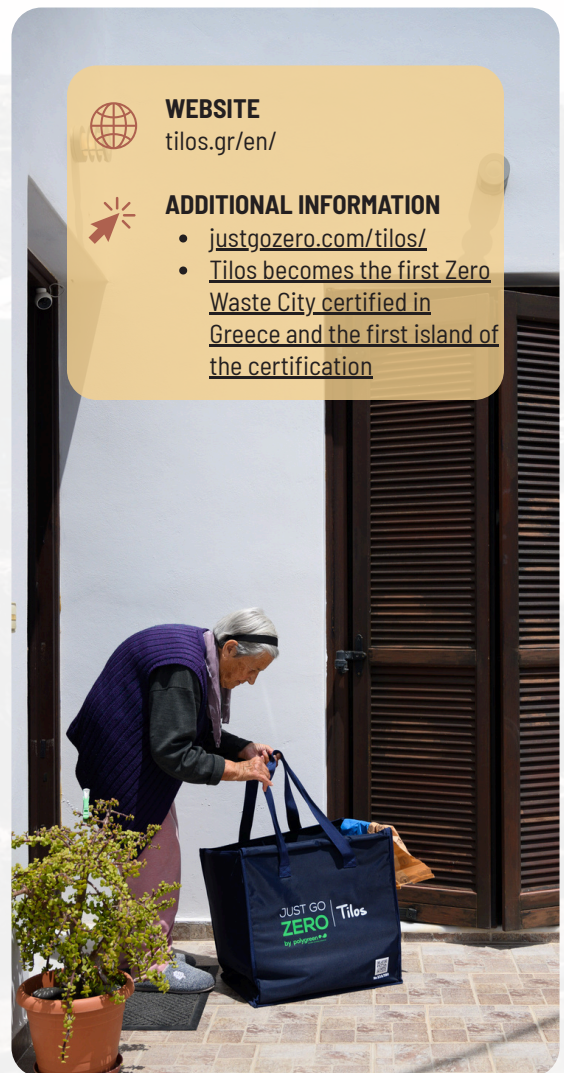
⁴Hotels, Restaurants and Cafés

Based on its experience, local officials recommend moving towards incentive-based approaches, such as reducing fees for households and businesses that generate less waste, rather than relying primarily on fines.

The program initially distributed home dehydrators⁵ to households to manage organic waste. However, the equipment created additional handling requirements and made participation more difficult for residents, leading the municipality to discontinue this approach. The experience highlighted the importance of balancing operational efficiency with simplicity and convenience for users, and of adapting systems based on practical experience. The program also faced challenges in collecting waste data separately for households, tourism, and business activities, limiting its ability to identify the main sources of residual waste. Strengthening data collection and monitoring systems is therefore an important area for further development.

The primary lesson from the Tilos experience is the importance of perseverance and continuous adaptation.

Transitioning to a zero waste system requires ongoing monitoring and refinement. Operational challenges and initial setbacks can provide valuable insights for improving the system rather than serving as reasons to abandon it.



⁵Small appliance that uses heating to circulate warm around food, removing its moisture content.



2 León Cortés, Costa Rica

León Cortés is a rural municipality located in Costa Rica's San José Province, located within the globally recognized coffee-producing *Zona de los Santos*. The municipality covers 120.2 km² and has a total population of approximately 13,533, according to the 2022 census.

Initiated in 2018, León Cortés' Solid Waste Management Program transformed a basic municipal service into a comprehensive separate collection system designed to comply with national legislation ([Law 8839](#)) and the municipal waste management plan.

The program operates through weekly, canton-wide collection routes. Residents separate their waste into recyclables and non-recyclable materials and place them in bags or containers outside their homes for collection. Organic waste is also collected weekly in the central district through a bin-exchange system and is subsequently composted in partnership with the Coffee Production [Coopetarrazu R.L. alliance](#). Materials are processed at a regional waste recovery center staffed by five permanent municipal workers and two additional workers from a neighboring municipality. The team manually sorts, compacts, and prepares recyclables from León Cortés, Dota, and Tarrazú. Collection routes for both recyclable and non-recyclable waste already cover 100% of the canton. The organic waste pilot currently serves 150 families, five businesses, and three institutions, with new families joining each week. Once a suitable collection vehicle is secured, and Coopetarrazú R.L. formalizes its authorization as a biodegradable waste manager, the program could establish a full organic waste collection route in León Cortés' central district, reaching approximately 5,000 residents, with potential expansion beginning in 2027.

A major driver of the program's success is its economic incentive structure, known as *Hogares Verdes* (Green Homes) and *Comercios Verdes* (Green Businesses). The schemes offer a 35% reduction in municipal waste tariffs to households and businesses that pass waste separation inspections, with participating properties receiving an identification sticker.

The initiative is complemented by *Oveja Verde* (Green Sheep), a community engagement campaign that reimagines the traditional "black sheep" cliché to celebrate those who stand out through environmental stewardship. Building on a distinctive graphic identity and mascot, the campaign has helped strengthen citizen participation.

The municipality also provided training, logistical support, and spaces for the Environmental Promoters Project. Led by the Association of Defenders of the Los Santos Natural Monument, a group of women conducted door-to-door visits to educate local families and support participation in source separation.

The municipality's experience highlights that lasting behavioral change requires comprehensive collection coverage and strong regional alliances, rather than relying on isolated clean-up efforts, sporadic recycling campaigns, or expensive household compost-bin giveaways that are difficult to scale.



WEBSITE

munileco.go.cr/



SOCIAL MEDIA

Facebook: [Municipalidad de León Cortés](#)



ADDITIONAL INFORMATION

- [Caso León Cortés, Costa Rica](#)





3 Vrhnika, Slovenia

With a population of 18,210 residents as of 2024⁶, the Slovenian municipality of Vrhnika generates approximately 359 kg of municipal solid waste per capita annually. Since launching its first source separation program in 1991, the city has reached an impressive 82.31% source separation rate in 2025, significantly above the Slovenian national average of 74.6% in 2024. As the first Slovenian municipality to join the European Zero Waste Cities Programme—now the Zero Waste Cities Certification—Vrhnika has established a Zero Waste Advisory Board that meets at least once a year to report on progress and results.

Under the current system, door-to-door collection for mixed municipal waste occurs just once every four weeks. Organic waste is collected 45 times per year, transitioning to bi-weekly during the winter, and residents can also trade their organic waste for a free home composter. In contrast, bulky waste is collected four times per year. Paper, cardboard, glass, and textiles must be dropped-off at public communal stations (eco-islands), where they are collected up to five times a week. Special campaigns are organized to collect hazardous waste in spring and autumn. However, because eco-islands have become a major source of contamination and improper waste disposal, the municipality recommends transitioning as many waste streams as possible to door-to-door collection rather than relying solely on communal drop-off points.

Residents of Vrhnika share a collection center with the neighboring municipalities Borovnica and Log-Dragomer. Residents can use the center to separately drop off a wide range of sorted materials, including metals, wood, hazardous waste, recyclables, clothing, used car tires, and construction waste. To encourage greater participation, the “Cheaper with Koko” bonus system rewards residents who bring sorted recyclables, such as packaging and paper, with credits that reduce their waste management bill, provided they meet the campaign’s conditions.

⁶ <https://www.stat.si/obcine/en/Municip/Index/200> accessed on 3-08-2026

One successful local initiative is “Healthy Bottoms”, launched by Zero Waste Europe member organization Ecologists without Borders and the Municipality of Vrhnika. The project replaced disposable nappies in a local kindergarten with reusable cloth nappies made by a local company. This initiative received 70% parental support before its rollout and has since avoided approximately 25,000 disposable nappies per year, reducing the kindergarten’s mixed waste by 50% (around 70 tonnes/year). An initial investment of €16,000 (approx US\$18,969) was quickly recouped and the initiative now saves the municipality approximately €5,000 (US\$5,842) annually compared with the previous system.

Vrhnika’s success is driven by continuous awareness-raising, which serves as a backbone of its zero waste system.

Rather than relying on large, one-off campaigns, the municipality uses steady, low-key communication channels, including newsletters, regular social media engagement, lectures for different age groups, and waste bill reduction incentives. According to the municipality, this multi-channel approach has helped make waste separation “second nature” for local residents over the past two decades.

The municipality also operates the Depo Reuse Center, which serves as both a reuse facility and an education hub. The center exclusively employs unemployed individuals and generates income through its activities to help fund their wages. In addition, an annual zero waste workshop for local event organizers provides training on reducing waste, avoiding single-use packaging, and improving waste separation. Organizers that commit to zero waste practices can receive a star-rated “Event on the Path to Zero Waste” label based on their level of achievement.



WEBSITE
vrhnika.si/



SOCIAL MEDIA
Instagram: [@obcina.vrhnika](https://www.instagram.com/obcina.vrhnika)



ADDITIONAL INFORMATION
• [THE STORY OF VRHNIKA #3 CASE STUDY](#)



© Ecology without Borders Association



4

Kijitoupele and Chumbuni Neighborhoods, Unguja, Zanzibar, Tanzania

Unguja is the main island in the Zanzibar Archipelago, in Tanzania. With about 900,000 residents, the first of a kind Urban Municipal Council Solid Waste Management Regulation was established in 2019, grounded in the polluter-pays principle and designed to drive decentralized, source-separated waste management across the island. A parallel, voluntary effort has also emerged from the tourism sector through the 2023 Zanzibar Declaration for Sustainable Tourism, which encourages hotels and operators to reduce waste through as a voluntary commitment.

The Zero Waste program is implemented in partnership with Nipe Fagio, in Kijitoupele and Chumbuni Neighborhoods. With a community of 22,800 inhabitants, the program aims to combat improper waste disposal, plastic pollution, and greenhouse gas emissions, shifting waste management from a traditional “collect and dump” system towards a zero waste model that promotes household-level separation of waste into four categories: organic waste, recyclables, domestic hazardous waste, and residual waste.

With a monthly flat rate fee of 3,000 TZS (approx US\$1.13) and a strict “no segregation, no collection” policy, waste is collected and weighed door-to-door once a week using local carts, bins for organics, and sack bags for the other categories, with supervisors on site manually tabulating waste volumes to track community participation and impact. The operational backbone of this system relies on decentralized MRF within the communities, which serve as localized hubs for sorting, weighing, and preparing waste for composting or recycling, while also functioning as environmental education spaces.

The initiative is rooted in meaningful community engagement, particularly through door-to-door outreach. This work is occasionally complemented by beach cleanups and engagement at faith-based gatherings. It also leverages social media, arts, music, and storytelling to engage youth. The success of the zero waste program is largely attributed to its strong educational outreach, waste picker integration, and the alignment of zero waste with broader goals like climate action, tourism, and health.

Economically, the program supports livelihoods by creating 55 direct employment opportunities across both shehia (neighborhoods). This includes 35 waste collectors in Kijitoupele and 20 in Chumbuni. Over the January to June 2026 reporting period, the program collectively managed 219.14 tonnes of waste from 2,111 households across 10 zones, diverting 150.02 tonnes away from Kibele landfill in Zanzibar including 138.89 tonnes of organic waste composted at the MRFs and 11.128 tonnes of recyclable materials sold to recycling partners while preventing the release of an estimated 2.35 tonnes of methane (CH₄), equivalent to 65.8 tCO₂e of greenhouse gas emissions. The compost generated in the system is frequently used for urban agriculture and gardens and the recyclables are sent to recycling partners generating approximately US\$100 per tonne for the cooperatives.

Implementing the zero waste model demonstrates how source separation reduces environmental pollution, improves neighborhood cleanliness, curbs waste burning and illegal dumping, and minimizes methane (CH₄) emissions from organic waste. Driven by decentralized MRF operations and community participation, this model drives climate action, advances public health, and fosters a resilient zero waste system for Zanzibar.

The success of the zero waste program is largely attributed to its strong educational outreach, waste picker integration, and the alignment of zero waste with broader goals like climate action, tourism, and health.



WEBSITE

nipefagio.co.tz/zanzibar-on-the-path-to-become-the-first-zero-waste-archipelago-in-the-world/



SOCIAL MEDIA

Instagram: [@nipefagio](https://www.instagram.com/nipefagio)



ADDITIONAL INFORMATION

- [Zanzibar Environmental Management Act, 2015 \(Act No. 3 of 2015\)](#)





5

Ilala, Kinondoni and Ubungo Municipalities, Dar es Salaam, Tanzania

Dar es Salaam, Tanzania's largest and most rapidly urbanizing city, faces challenges related to low waste collection efficiency and rising methane emissions from organic waste decomposing at the Pugu Kinyamwezi dumpsite. In response, local and national authorities have established a policy and regulatory framework that includes the National Environmental Policy 2021, the Environmental Management Act of 2024, Solid Waste Management Regulations of 2009, and the National Waste Management Strategy 2025-2040. These legal instruments support source separation, recognize waste pickers as key stakeholders, strengthen MRFs, and establish fines for illegal dumping and improper waste storage.

The zero waste model implemented by Nipe Fagio uses a community-based approach and currently serves 6,266 households, and over 744 institutions and businesses, in Bonyokwa (Ilala Municipality) and Mbweni (Kinondoni Municipality) alongside the Simu 2000 (Mawasiliano) market in Ubungo Municipality. This system requires source separation into four distinct waste streams: organic, recyclable, domestic hazardous, and residual waste. In residential areas, segregated waste is collected twice a week using one bin and three sack bags, while local MRFs receive and process the materials daily.

The program is implemented through partnerships among municipal councils, waste collection cooperatives, waste pickers, community groups, households, markets, and private sector stakeholders. Since 2021, this collaborative model has created 61 green jobs and diverted more than 3,522 tonnes of waste from disposal, including over 2,812 tonnes of organic waste recovered for composting and Black Soldier Fly production. Waste is weighed and recorded at the point of collection using data sheets, enabling the program to track diversion and recycling rates. The model estimates that it has avoided 112.48 tonnes of methane (CH₄), equivalent to 3,059.46 tonnes of CO₂e.

Several components have contributed to the program's success, including door-to-door engagement, the formal integration of waste pickers into municipal labor systems, strong partnerships with municipal authorities, and training and workshops for 61 waste collectors and approximately 120 government officials.

Community meetings and exhibitions, alongside radio, television, magazine, and social media campaigns involving local influencers, have further expanded outreach. Door-to-door distribution of IEC materials distribution in both Swahili and English provides residents with practical guidance on source separation.

The program has also used high-profile public engagement to build awareness and strengthen institutional support. A zero waste exhibition was organized in collaboration with the National Environment Management Council and government authorities responsible for environmental management, attracting approximately 350 participants.



WEBSITE
nipefagio.co.tz/



ADDITIONAL INFORMATION
• [Zero Waste Model : Dar Es Salaam Case Study.](#)



6

Varkala, India

Located in Kerala, India, the coastal city of Varkala has a population of approximately 40,048 and generates around 6,096 tonnes of waste annually. Backed by a 100% household source separation rate, decentralized composting, and restrictions on single-use plastics, the city operates a door-to-door collection system through Haritha Karma Sena, a municipality-accredited women-led waste management enterprise.

Source separation is mandatory, with households required to separate organic and non-biodegradable waste. Meat and organic waste from commercial establishments are collected daily and processed at rendering plants for conversion into animal feed. Plastics, paper, cardboard, and metals are collected once a week. A separate calendar-based collection system is used for low value non-biodegradable materials, such as e-waste, glass, and old clothes, which are collected during designated months, and kept separate from the regular waste collection system.

Waste collection is financed through a monthly fee. If households fail to pay, municipal services can be suspended, and outstanding balances added to property tax together with applicable penalties. Illegal dumping and littering are also punishable offenses, with fines ranging from Rs.500 to 5000 (approxUS\$5 to 52), depending on the severity of the violation. To encourage compliance, the municipality provides subsidies of up to 90% for household compost bins and biogas plants, and is considering property tax discounts for residents who manage their organic waste at source. For commercial establishments, having municipality-approved organic waste management facilities or arrangements is a prerequisite for obtaining a business license.

The city also invests in ongoing awareness and community engagement. Periodic campaigns involve students from local educational institutions, while clean-up drives address litter in public spaces, beaches, and tourist areas. At the same time, Haritha Karma Sena workers provide source separation guidance during door-to-door collection and conduct secondary sorting to maximize material recovery.

According to local waste management workers, three factors have been particularly important to Varkala's success: the calendar-based collection system, a mandatory green protocol restricting single-use plastics at public and private events, and decentralized organic waste recovery. Locating composting facilities within public spaces and infrastructure, including bus stops, roadsides, and markets, has helped optimize logistics and reduce municipal transportation costs.

Together, these measures have enabled Varkala to maintain a high level of source separation and gain recognition as one of the cities included in the UN Zero Waste Leader Cities list in 2026.



WEBSITE

varkalamunicipality.lsgkerala.gov.in/



SOCIAL MEDIA

Instagram: [@varkalamunicipality](https://www.instagram.com/varkalamunicipality)





7

Cagliari, Sardinia, Italy

Cagliari, the capital of the semi-autonomous Italian island-region of Sardinia, has a population of approximately 150,000, but experiences a significant increase in tourism during the peak summer months, when waste generation can double. (Zero Waste Europe, 2026).

The city currently achieves a 75% separate collection rate across the municipality through a door-to-door collection system combined with a PAYT scheme to incentivize residual waste reduction. The transition to kerbside collection began in 2018, followed by the introduction of PAYT in 2021. The system covers 82,999 households and 13,000 businesses and requires waste to be separated into distinct streams: organic waste, collected three times a week, and residual waste, paper and cardboard, glass, cans, and plastics, collected once a week.

To track and incentivize waste reduction, each household is provided with a 45-liter residual waste bin equipped with a radio-frequency identification tag (RFID)⁷, including residents of multi-storey buildings (condominiums). In these buildings, residents use collective containers kept indoors or on balconies, which are placed outside for collection on designated days by external social cleaning cooperatives.

The program was supported by extensive awareness campaigns during the distribution of the new collection kits. Ongoing compliance is reinforced through continuous communication and sensitization, including the use of warning stickers on bins found to contain contaminated materials.

The PAYT system allows each household 26 standard residual waste set-outs per year, meaning the number of times a full residual waste bin can be placed out for collection. Each additional set-out costs €1.90 (approx US\$2.22). This initiative is further supported by a Sardinia regional policy framework that has operated an incentive and penalty scheme since 2004. The scheme rewards municipalities that achieve high capture and quality rates in organic waste collection through tax discounts, while municipalities that fail to meet the targets pay an additional charge. The additional revenue helps support municipalities that achieve the required performance.

⁷ A radio-frequency identification (RFID) tag is a small tracking device consisting of a microchip and an antenna, attached to waste containers to identify their origin and record collection data. Combined with visual checks, weighing systems, or contamination monitoring, they can help municipalities identify mixed waste, provide feedback to households, and improve compliance with separation requirements.

However, the economic savings associated with reducing residual waste set-outs have been relatively limited because Cagliari's baseline waste tax is already high compared to other Italian cities. This has contributed to high expectations among residents for additional municipal services, such as street cleaning. As a result, the city recommends placing greater emphasis on individual feedback (KAYT – Know As You Throw) approaches, rather than relying solely on economic savings as an incentive.

The introduction of door-to-door collection has significantly improved waste separation while also generating new green jobs. The contracted collection company expanded its workforce, while additional employment opportunities were created through the social cooperatives responsible for managing waste containers.

The program's success is attributed to several factors, including strong institutional support at the regional level, convenient collection arrangements, a strong environmental awareness and collective action among Sardinian residents. The use of indoor collective bins in residential buildings has also helped improve source separation by making correct sorting more convenient for residents.



WEBSITE

comune.cagliari.it/portale/en/homepage.page



SOCIAL MEDIA

Instagram: [@comunecagliariufficiale](https://www.instagram.com/comunecagliariufficiale)



ADDITIONAL INFORMATION

- [How Sardinia uses economics to underpin its collection success](#)





8

San Fernando, Pampanga, The Philippines

The City of San Fernando serves as both the provincial capital of Pampanga and the regional administrative center of Central Luzon in the Philippines. With a population of 306,659, the city has achieved a 93% source separation rate across all 35 barangays⁸. Each barangay is required to operate its own MRF, led by grassroots-level community leaders. To support this decentralized system, the city provided PHP 150,000 (approx US\$2,500) to each barangay for MRF construction and equipment, including composting areas, as well as a minimum of two tricycles and pushcarts to support collection.

The city has also established a City Environment and Natural Resources Office (CENRO) with an enforcement unit responsible for monitoring compliance across neighborhoods.

Household waste is collected in four streams: biodegradable, recyclable, residual, and special/hazardous waste. The system is decentralized, with each of the 35 barangays responsible for organizing collection routes at least twice a week using tricycles, pushcarts, and garbage trucks. Barangay collection covers biodegradable, recyclable, and residual waste generated by households, which is then brought to the respective barangay MRFs. The residual waste is subsequently transported by barangay trucks to the City Central MRF. In parallel, city-operated garbage trucks provide collection along major thoroughfares at least twice a day. Organic waste at the city's two public markets is diverted to the City Composting Center, where it is processed into compost that is either sold or donated to local farmers.

⁸ Barangay means village in Filipino.

To ensure compliance, the city enforces a strict “no segregation, no collection” policy at the MRF level. Barangay Monitoring Teams oversee compliance with the Ecological Solid Waste Management Act (RA 9903). The city also issues City Ordinance Violation Tickets to residents who do not comply, with revenue from fines and compost sales channeled into the City’s General Fund.

The city partnered with the local non-governmental organization (NGO) Mother Earth Foundation (MEF) to conduct IEC campaigns, train local officials, engage residents, and strengthen understanding of the links between source segregation and a clean environment. MEF also trained residents in household waste management and organic waste processing, helping strengthen monitoring and reporting systems.

Public competitions recognize the best-performing barangays, help build civic pride around source separation. The city also partnered with a local television station to launch a live program, “Win-Win for all”, in which hosts conducted surprise households inspections and awarded cash prizes to residents found to be separating their waste correctly. These initiatives helped make source separation a visible, engaging, and locally celebrated practice.⁹



WEBSITE

cityofsanfernando.gov.ph
motherearthphil.org



ADDITIONAL INFORMATION

Picking up the Baton, Political Will Key to Zero Waste



⁹ Picking up the Baton, Political Will Key to Zero Waste, GAIA, 2019.



9

Chumbageni Ward, Tanga City, Tanzania

Tanga is one of the largest cities in northern Tanzania, with a population of approximately 400,000. Its name means “sail” in Swahili, reflecting the city’s identity and history as a port city.

The source separation program, officially referred to as the Community-Based Solid Waste Management System, builds on the proven zero waste model implemented by Nipe Fagio in Dar es Salaam and Zanzibar. The system is currently being implemented by Nipe Fagio, with the aim of transferring responsibility to the city government and establishing a long-term operational model in Chumbageni Ward. The program serves 700 households and 225 businesses and institutions, has achieved a 75% source separation compliance rate, and aims to reach 85%.

To support this model, a zoned collection system has been established, with 16 trained waste pickers organized into eight teams and collection routes aligned with local administrative boundaries. In the Kwaminchi zone, a two-person team serves approximately 30 households and 10 businesses per day. The program promotes separation into four waste streams: organic, recyclable, residual, and domestic hazardous waste. Collection services operate from Monday to Friday. Households receive door-to-door collection once a week according to the designed collection schedule, while businesses and institutions generating larger quantities of waste receive collection twice a week, on Tuesdays and Fridays. Each MRF is designed to process approximately 212 tonnes of segregated waste per operational cycle.

Households pay 3,000 TZS (approx US\$1.13) per month for collection services, whereas businesses between 5,000 and 20,000 TZS (approx US\$2-7.5), depending on the service required. Community-based waste management groups also generate additional income through the sale of recovered recyclables.

The program is supported by a regulatory framework that includes administrative fines and other enforcement measures for violations of municipal solid waste management by-laws, including illegal dumping, littering, unauthorized disposal, and the open burning of waste. These measures help deter non-compliance and reinforce proper source separation, waste handling, and disposal practices.



WEBSITE

nipefagio.co.tz/



SOCIAL MEDIA

Instagram: [@nipefagio](https://www.instagram.com/nipefagio)

Daily community awareness activities reach more than 900 people through face-to-face engagement, supported by a zero waste calendar that reinforces key messages on source separation. **Nipe Fagio emphasizes that the long-term success of the program depends on consistent, government-led monitoring, and effective enforcement of penalties to deter illegal dumping and non-compliance.**





10

Portland, Oregon, USA

Portland, known as the “City of Roses”, is the largest city in the state of Oregon, with a population of approximately 600,000. The city achieves an organic waste diversion rate of 30–33% through two complementary mandates: weekly organics collection for single-family homes through fourplexes, and a commercial requirement targeting “back-of-house”¹⁰ operations through a “food-only” standard that prohibits the mixing of food waste with yard debris or bioplastics.

Under Metro Regional Code Chapter 5.15 and Portland City Code Chapter 17.102, covered businesses that generate one 60-gallon roll cart (approx 113 kg) or more of organic waste per week are legally required to separate food scraps from garbage. Organics collected in green bins include food scraps, food-soiled paper, and yard debris. Any bags must be clearly marked as BPI¹¹-certified compostable. Residual waste is collected every two weeks, helping encourage waste reduction and separation.

Collection is carried out by private haulers operating within designated geographic zones. Haulers conduct visual inspections to identify contamination and, when contamination is found, drivers leave an “Oops” tag on the container. The waste is not collected, requiring residents to remove the contamination or pay a US\$15–20 “go-back fee” for the hauler to return.

Portland uses a PAYT system in which utility bills are determined by garbage bin size. Households that place organic waste in the residual stream risk filling their garbage bins more quickly and incurring additional service fees. Landlords and property owners are legally required to provide adequate compost, recycling, and garbage collection services for their tenants. Where landlords fail to comply, the City of Portland Bureau of Development Services can intervene through nuisance citations, monetary assessments, and property liens.

Community engagement is supported by the Master Recycler Volunteer Network, which provides residents with an intensive eight-week course covering waste prevention and soil microbiology in exchange for 30 hours of public volunteer outreach.

¹⁰Processes where food is cooked, assembled, processed, served, or sold. It does not apply to food waste discarded by the public or customers.

¹¹Biodegradable Products Institute <https://bpiworld.org/>

Participants serve as neighborhood ambassadors, running workshops and providing peer-to-peer guidance on food waste separation. The programme also distributes two-gallon (7.57 liters) kitchen pails, calendar guides, and magnets to support participation.

By diverting large quantities of food and yard waste from landfills to regional commercial processing streams, Portland's organics program has generated direct and indirect employment across multiple sectors, including logistics, route coordination, facility operations, customer service, facility management, and laboratory services.

According to Eben Pol, Solid Waste & Recycling Manager of the City of Portland Bureau of Planning and Sustainability, **key factors contributing to the programme's success include providing free resources to support waste diversion, establishing regulations that enable implementation, offering technical assistance to businesses and residents, investing in sustained outreach and education, and creating opportunities for networking and knowledge exchange.**

**WEBSITE**

portland.gov/bps/garbage-recycling

© Portland Bureau of Planning and Sustainability





11

San Francisco, California, USA

With a population of approximately 800,000, San Francisco, famously known as the “Golden City”, has enforced a Mandatory Recycling and Composting Ordinance (NO. 100-09), since 2009. The ordinance requires all residential and commercial properties to separate recyclables, compostables, and residual waste at source. In 2009, the mandate was strengthened through the Refuse Separation Compliance Ordinance, which introduced strict bin auditing for large waste generators to ensure proper separation.

The city achieved an average monthly organics and recyclables diversion rate of 53% between July 2025 and March 2026 through its “Fantastic Three” system: a black bin for residual waste, a blue bin for recyclables, and a green bin for compostables. Collection is managed by the city’s Department of Environment and operated by a private company called Recology, which reports the monthly collection volumes. Where a property fails an audit because materials are improperly mixed, the owner is required to hire a “Zero Waste Facilitator” to oversee improvements in waste separation. The ordinance also prohibits plastic bag liners in blue recycling bins and requires recyclables to be clean and dry.

A key tool for waste reduction is the PAYT system, which links the cost of garbage collection directly to the volume of waste generated. Businesses that maximize diversion into recycling and composting can reduce their refuse bills by up to 75%, while residents can lower their monthly bills by switching from a 32-gallon to a 20-gallon garbage bin. Fines can reach up to US\$100 per day for small businesses and single-family homes, and up to US\$1,000 per day for large commercial or multi-unit buildings .

Community education is supported by the city’s “Environment Now” green job training program, which employs 20 environmental advocates to reach diverse communities and provide multilingual education. The city also provides free tools, including kitchen compost pails, color-coded bin labels, instructional posters, and on-site waste assessment.

The city uses multiple outreach channels to reinforce proper source separation, including mailing multilingual fact sheets and educational materials, presenting at community meetings, and conducting visits to businesses.

A decade after the ordinance was adopted, more than 99% of properties complied with the mandatory composting and recycling requirements. However, city audits have found that more than half of the residual waste being sent to the landfill still contains recoverable materials, demonstrating that while participation is high, there is still room to further improve the quality of source separation.



WEBSITE

sfenvironment.org/SB-1383



ADDITIONAL INFORMATION

- [City and County of San Francisco Annual Rate Assessment For Rate Year 2024-25](#)





12

Bengaluru, India

Bengaluru is a massive urban center with a population of nearly 15 million, generating approximately 6,500 tonnes of waste every day. Nearly 30% of the population lives in apartment complexes¹², making effective source separation particularly important in a densely populated and rapidly growing city.

To address residential waste, a citizen-led movement introduced the “2Bin1Bag” system, supported by a 2015 Karnataka High Court Order that made source separation mandatory for all waste generators. The Solid Waste Management Rules (2016) further require all waste generators to separate waste at source and mandate local authorities to provide for separate collection, transportation, processing, recycling, and scientific disposal. The city’s Solid Waste Management By-Laws (2020) also established monetary penalties, ranging from 100 INR (approximately US\$1) for households failing to separate waste at source to 5000 INR (approximately \$50) for the illegal dumping of construction waste.

The 2Bin1Bag program provides every household with a uniform, color-coded segregation kit for door-to-door collection: green bins for organic wet waste, red bins for sanitary and reject waste, and white or blue reusable bags for dry recyclables. The system aims to establish a universal culture of source separation by making sorting simple for residents while eliminating the need for single-use plastic garbage bags.

Sanitation workers collect wet and sanitary/reject waste daily, while vehicles from Dry Waste Collection Centres collect recyclables once or twice a week. At the centres, specialized workers sort materials into distinct categories before sending them to authorized recyclers. Beyond collection, the program promotes home and community composting and campaigns to reduce single-use plastics in favor of reusable cloth bags and bottles. To maintain high sorting standards, the program enforces a strict 'no segregation, no collection' policy, with mixed waste left uncollected.

The program has been adopted by approximately 575,746 households, covered by the program through Dry Waste Collection Centers (DWCCs) working in collaboration with Hasiru Dala, diverting over 180 tonnes of waste from landfills every day.

¹² BeST – Bengaluru Science and Technology Cluster (2026). Can Bengaluru Really Become a Zero-Waste City?

These results have been supported by a large network of volunteers and Resident Welfare Associations, which conduct door-to-door awareness campaigns, organize green forums to share best practices, distribute educational materials, and run social media campaigns. They also developed “Suchimitra reports” to monitor compliance and coordinate directly with municipal officials.

Partnerships with waste pickers have further strengthened material recovery, with workers sorting dry waste into up to 176 distinct categories to maximise recovery and value. Organizations such as Hasiru Dala have played a vital role as implementation and outreach partners, supporting the initiative through advocacy, information, education and communication, community engagement, and awareness activities. A key component of this collaboration has been the issuance of occupational identity cards to the waste workers, helping to formalize and recognise their role within the waste management system. This approach has improved resource recovery, reduced landfill dependency, and recognized waste pickers as an integral part of the city’s waste-management ecosystem.

Hasiru Dala highlights the importance of avoiding an “optics problem” and segregation fatigue, which can occur when residents see collection workers mixing waste they have carefully separated. The programme also faces challenges related to residents’ willingness to pay even modest monthly fees for daily collection services, as well as delays in payments to sanitation workers and field staff and frequent changes in government officials, which have affected

workforce motivation and programme continuity. These challenges highlight the importance of regular awareness and follow-up campaigns to sustain source separation, reinforce behavioural change, and maintain community engagement.

**WEBSITE**

2bin1bag.in/video-reel

**ADDITIONAL INFORMATION**

- [#RefuseDisposables #MyChoice CAMPAIGN](#)



Conclusion

Far more than an operational measure, source separation is the cornerstone of a successful zero waste system. Separating materials where they are generated keeps organic waste, recyclables, hazardous materials, and residuals in distinct streams, making it possible to collect, process, and recover each material efficiently while minimizing contamination and loss. The quality of what is separated at source ultimately determines the quality of what can be recovered downstream.

This is particularly important when compared with systems that rely on recovering materials after they have been mixed, such as MBT. Once different waste streams are combined, organic matter can contaminate recyclables, hazardous materials can compromise worker safety, and valuable materials become more difficult and costly to recover. Mixed-waste treatment therefore requires more complex infrastructure and processes, while still producing lower-quality materials and significant residual waste. Source separation prevents these problems upstream rather than attempting to solve them after contamination has already occurred.

For this reason, source separation must be planned and funded as essential public infrastructure, rather than treated as an add-on to conventional waste collection. The experiences presented in this report show that successful systems combine several mutually reinforcing elements: convenient and reliable door-to-door collection; decentralized composting, MRFs, and other recovery infrastructure; appropriate collection and sorting equipment; clear regulations and enforcement; fair and effective economic incentives; robust logistics and data systems; and continuous education and community engagement. No single intervention is sufficient on its own. Residents are far more likely to separate correctly when the system makes participation easy, provides clear and consistent information, and demonstrates that separately collected materials remain separate throughout collection, transport, and processing.

The case studies also demonstrate that source separation can be a powerful engine for local employment and environmental justice. When waste pickers, women-led enterprises, community organizations, and youth are formally integrated into zero waste systems, municipalities can build on existing knowledge and livelihoods rather than displacing them. Formalization can provide stable contracts, regular wages, access to social protection and safety equipment, training, and opportunities to generate income from recovered materials. These workers are not simply providing a collection service: they are essential actors in recovering resources, reducing pollution, and making zero waste systems function.

Successful source separation systems also require long-term political and institutional commitment. Behavioral change does not happen through one-off awareness campaigns. The strongest examples combine ongoing communication with reliable services, monitoring, feedback, incentives, and proportionate enforcement. They also demonstrate the importance of adapting systems over time: testing different collection models, responding to contamination, improving data collection, and adjusting incentives and infrastructure as local conditions change. In this sense, successful zero waste systems are not static models but continuously improving public services.

Taken together, the experiences of cities and communities around the world demonstrate that high-performing source separation systems are both achievable and replicable across very different contexts—from small island municipalities and rural communities to rapidly growing megacities. They show that source separation can deliver high recovery rates while conserving resources, reducing waste-related climate emissions and pollution, creating local employment, strengthening community participation, and improving public services.

The lesson is clear: zero waste begins where waste is generated. When cities invest in the systems, people, infrastructure, and policies needed to separate materials at source, they can move beyond a waste management model based on disposal and towards one that treats materials as resources, supports workers and communities, and prevents waste and pollution in the first place.

A just zero waste future is therefore not a distant ideal—it is already being demonstrated in communities around the world, and its lessons can be adapted and scaled to build the systems of tomorrow.

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About GAIA

GAIA is a network of grassroots groups as well as national and regional alliances representing more than 1000 organizations from 101 countries. With our work we aim to catalyze a global shift towards environmental justice by strengthening grassroots social movements that advance solutions to waste and pollution. We envision a just, Zero Waste world built on respect for ecological limits and community rights, where people are free from the burden of toxic pollution, and resources are sustainably conserved, not burned or dumped.

www.no-burn.org



SEPARATION AT SOURCE (S@S)

12 Real-World Zero Waste Practices That Work

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