

Table of Contents

- **3** Executive Summary
- 4 A Youth-led Zero Waste System Gaining Traction in Municipal Assemblies
- 7 Economic Analysis
- 15 Greenhouse Gas Emissions Reduction Potential
- 17 Recommendations
- 18 Conclusion
- 19 Acknowledgements

Executive Summary

Accra is paving a path toward climate resilience and social equity through community-led zero waste initiatives. The Green Africa Youth Organization (GAYO) has pioneered a decentralized waste management model that demonstrates how organic waste diversion can create green jobs, reduce methane emissions, and strengthen local governance.

Launched in partnership with the LaDade-Kotopon Municipal Assembly (LaDMA) in 2021, GAYO's program has expanded to five municipal assemblies across Greater Accra, serving between 8,000–10,000 residents. At the core of the initiative is a Materials Recovery Facility (MRF) that processes 40–45 tonnes of waste per month, sorting plastics, metals, paper, and glass for recycling, and transforming organic waste into nutrient-rich compost.

The facility supports 25–30 green jobs, including waste pickers who have transitioned from the informal sector into recognized, formal employment. By integrating waste sorting, composting, and local partnerships, GAYO's project showcases an inclusive approach to waste management that complements municipal services.

The project's economic model combines philanthropic funding, in-kind community contributions, and municipal support—including free use of government land and partial salary funding for key staff. The initiative generates measurable economic and environmental value. It diverts 144 tonnes of organics per year, saving up to US\$2,280 annually in avoided landfill costs.

According to greenhouse gas (GHG) modeling using the Combined CH₄ & CO₂ Emissions from Waste Calculator developed by Eunomia, if Accra advanced towards a Zero Waste Scenario it could cut annual emissions by 103 percent by 2050 compared to a Business-as-Usual scenario where disposal predominates. Expanding composting to cover 80 percent of organic waste generated in the city by 2050 would reduce methane emissions by more than nine times, underscoring the significant mitigation potential of scaling up zero waste systems.

To achieve citywide impact, Accra needs greater municipal investment, land allocation, and policy integration. Embedding zero waste strategies into official waste management contracts and budgets will ensure sustainability, enhance resource recovery, and foster a just transition that empowers communities, creates dignified livelihoods, and drives long-term methane mitigation.

A Youth-led Zero Waste System Gaining Traction in Municipal Assemblies

The Green Africa Youth Organization (GAYO)¹ is a group of youth leaders who have fostered zero waste initiatives in Ghana with great success. The zero waste program in Accra began in 2021 with the signing of a Memorandum of Understanding with the LaDade-Kotopon Municipal Assembly (LaDMA), one of the districts located within Greater Accra. Since then, the organization has expanded partnerships with other districts and is now working with five municipal assemblies in the region. Notably, **GAYO won the 2024 Earthshot Prize for its zero waste model in Ghana that prevents waste from ending up in landfills** by diverting organic, plastic, and electronic waste, significantly reducing air pollution, GHG emissions, and microplastic leakage while empowering communities and the informal sector through inclusive waste management solutions.²

The waste sector is the largest source of GHG emissions in Accra³, hence, preventing waste and improving waste management is imperative. Reducing organic waste disposal is particularly relevant, as organic waste accounts for almost 66 percent of the municipal solid waste generated in Greater Accra⁴. This context provides an idea of the importance and urgency to implement and expand zero waste systems such as GAYO's, that don't just manage waste but actually prevent waste, recover resources, and reduce disposal.



¹ https://greenafricayouth.com/

² Clean Air Fund. (2024, November 6). Green Africa Youth Organization wins Earthshot Prize 2024. https://www.cleanairfund.org/news-item/gayo-earthshot-prize/ (Accessed: October 29, 2025)

³ Accra Climate Action Plan 2020-2025.

 $[\]frac{\text{https://cdn.locomotive.works/sites/5ab410c8a2f42204838f797e/content_entry5ab410faa2f42204838f7990/5ab5605ea2f4220acf4}{5cfa6/files/Accra_Climate_Action_Plan.pdf?1603293785}$

⁴ Miezah, K.; Obiri-Danso, K.; Kádár, Z. Fei-Baffoe, B. (2015). Municipal solid waste characterization and quantification as a measure towards effective waste management in Ghana. Waste Management 46(1) September 2015.



GAYO operates a materials recovery facility (MRF) that serves as a central hub for community material recovery. The MRF is located in a site where a crematorium used to operate, which was later abandoned and donated to the zero waste project in 2021. Operating since 2022, the facility currently processes about 40 to 45 tonnes every month of recyclables, e-waste, and organic waste collected from households, stores, and 10 schools from five municipal assemblies, serving an estimated 8,000 to 10,000 people. The facility's operations, equipped with sorting sheds, baling machines, and composting units, are designed to maximize resource recovery. Waste is sorted into different streams, including plastics, paper, metals, glass, and organics. Plastics are baled for recycling, while metals and glass are prepared for resale. The organic fraction is processed into nutrient-rich compost.

The zero waste project is a significant employer in the community, currently providing jobs for about 25-30 people, and has the potential to create more green job opportunities as the MRF processing capacity increases. Roles range from waste sorters and machine operators to community engagement officers and administrative staff, and have formalized waste pickers into the system, proving it is also a means for just transition. The initiative also fosters indirect employment for waste transporters and recycling partners, further bolstering the local economy.

By integrating with existing waste management systems, the GAYO MRF complements organic waste composting efforts with separate collection of recyclables, and compost use with urban farming, thereby creating a more holistic and effective waste management system that yields many other environmental and social benefits.

GAYO envisions a future where zero waste is the norm—empowering workers, local communities, and governments to build the skills and systems needed for long-term sustainability. This requires not only building capacity but also the establishment of economic frameworks and institutional structures to sustain and oversee zero waste programs, such as ecological waste management committees within the municipal assemblies. While Ghana is still in the early stages of its zero waste journey, **GAYO's campaign** has demonstrated that momentum is growing through municipal and youth-led initiatives. Youth engagement in projects that work for the common good builds civic muscle and improves democratic quality, and helps develop a sense of ownership for local initiatives. By building upon local knowledge and community engagement, enhancing inclusion and protecting waste pickers' livelihoods, GAYO's project creates environmentally just waste solutions.⁵

Organic waste management unit

Accra





Jobs Jobs

5 full-time equivalent2 waste pickers

Funding

Philantropy
Public funding (local)
Community in-kinds

⊘ Organics

144 tonnes/year organics diverted

СН₄ Methane

7.76 tonnes/year methane emissions avoided

⁵ For more information, read Environmental Justice Principle for Fast Action on Waste and Methane. https://www.no-burn.org/environmentaljustice-methane/

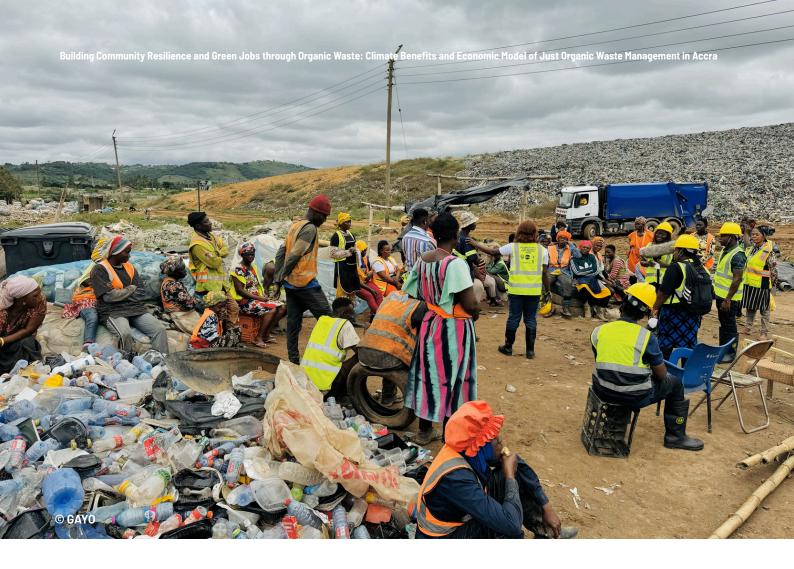
Economic Analysis⁶

Funding Sources

The organic waste management project has so far been funded mainly by philanthropic organizations, as well as some small community donations, and local partnerships. Much of the project is funded internally by GAYO utilizing the funding received by philanthropic sources. GAYO's funds mainly cover staff time to organize and coordinate project activities, facilitate stakeholder engagements, conduct education campaigns, build political alignment, and provide the operational backbone needed to ensure smooth implementation. These activities are critical for the uptake, sustainability, and replication of the model. In addition, they often bridge small funding gaps, such as logistics, communication, and follow-up activities that are essential for sustaining the momentum of the project. Additionally, there were some donations from the local community (i.e. in-kind tools, bins, and labor contributions), while the project received technical support from the Global Alliance for Incinerator Alternatives (GAIA), and logistical and outreach support through local partnerships with government and consulting firms. In turn, the local municipality contributes towards the salary of one tricycle rider and one composting associate.



⁶ This chapter is based on an economic analysis developed by Lumec (Pty) Ltd, an economic development research organisation based in South Africa.



Capital and Operational Costs

For the Accra zero waste model operated by GAYO, land and buildings account for 97 percent of total capital costs, underscoring how fixed assets dominate investment needs. This mirrors patterns in other zero waste models across the global south, where land and infrastructure are both the main drivers and barriers to capital investment—representing up to 89 percent of total asset value in Indonesia and 58 percent in Brazil. This creates high barriers to entry for industrial or large-scale operators but less so for decentralized or community-based systems where land is publicly provided like GAYO's zero waste model. In the case of this zero waste program in Accra, LaDMA provided the land to GAYO at no cost, significantly reducing barriers for establishing the MRF operation from the capital costs view point. While the zero waste project has been allocated 50 percent of this land, 20 percent (1,400 m²) is designated specifically for the organic waste management component. The site has compost chambers and a maturation area, and is mostly run manually, with some machinery and equipment such as scales, hand lifts, and tricycles, which are shared with collection and processing of other waste streams.

⁷ Yusuf, B.; Bimo, R.; Gembira, H.; Nurfitriani, F. and Purnomo, I. (2025) Enabling Conditions for Scaling Up Solid Waste Management Financing: Case Studies in Indonesia and Brazil. Climate Policy Initiative. https://www.climatepolicyinitiative.org/publication/enabling-conditions-for-scaling-up-solid-waste-management-financing-case-studies-in-indonesia-and-brazil/

In Accra's GAYO-operated model, salary constitutes the bulk of operational expenses (66 percent of the total operational costs), reflecting the labor-intensive nature of this program and its potential to create green jobs. This pattern is consistent with findings across the global south community-based zero waste models, where labor constitutes between up to 98 percent of total operating expenses in Indonesia and up to 90 percent in Brazil.⁸ Such cost structures highlight the employment potential of zero waste systems while emphasizing the need for stable funding to sustain labor-driven operations. Ten workers are engaged in the organic waste management system and urban farming, but most of them share activities with other waste streams. The organics program operates with the equivalent of five full-time staff.⁹ The roles in the system include a tricycle rider, composting associate, facility supervisor, urban farming officer, zero waste ambassador, project coordinator, and project manager. Of these, only the composting associate and the urban farming officer are full-time.

Figure 1. Project Cost Breakdown (in percentage)



⁸ Ibidem

⁹ Full-time equivalent is a measure that adds up the hours of all workers -including full time, part-time, or other types- and then calculates the equivalent number of full-time workers.

Green Jobs

Two of the workers are waste pickers. One of the tricycle riders handles waste collection and transportation, and the composting associate supports composting activities and site operations. These formerly informal workers are now registered under the municipal assembly, hold certificates, and receive regular pay for their work. **This illustrates a pathway toward recognizing waste pickers' contributions and building a just transition within the waste sector.**

Production

Each month, around **12 tonnes of feedstock**—mainly grass clippings, food waste, and smaller amounts of chicken manure—are processed, with mature compost added to enhance the mix. This yields approximately 5 tonnes of compost monthly.

Revenues

The compost is given to local community food gardens, farmers, and government institutions for free. While the project currently does not generate any direct commercial revenues, there is a potential for sale of compost that could be expanded with policies that incentivize the use of compost over synthetic agrochemicals, offtake guarantees for compost sales, etc. The Accra market value of compost is US\$20 per tonne, so a modest amount of commercial revenues could be derived from compost sales. Other potential sources of revenues and savings are explored below.



Barriers and Opportunities to Scaling

Scaling Requirements

Increased compost production capacity

increased compost production capacity	
Barriers to Scaling	Opportunities
 Insufficient land for scaling Insufficient finances to purchase land 	 Request increased land use at the current location. Make appropriate land available as part of the government waste management practices and low-carbon economy goals. Allocate or lease public land to overcome the high entry barrier of land costs. Support land-access mechanisms (e.g., through local ordinances, urban land use planning, or public-community partnerships) to facilitate siting of decentralized organic waste facilities. Encourage multi-use or co-located sites (e.g., waste treatment + urban farming) to optimize limited urban land. Identify idle or vacant municipal land to establish decentralized composting sites — repurposing underutilized spaces within neighborhoods to reduce hauling distances and improve community participation.
 Additional buildings, equipment, and machinery are needed 	 Full costing of capital investment costs required for scaling. Seeking support and funding from government agencies for buildings, and equipment - this could include viability gap funding, and infrastructure and technical development funds.
• Insufficient staff time	 Tapping the government to fund staff as part of waste management practices (extending current human resources financing support).

Scaling Requirements

Increase the supply of compost inputs

increase the supply of compost inputs	
Barriers to Scaling	Opportunities
 The current facility constraining geographic reach 	 Replicate in a decentralized manner in proximity to communities and other waste generators. Investing in collection routes, systems, and vehicles where there are no plots of lands available to replicate the MRF.
 Limited partnerships with organic waste- generating businesses. 	 Sign supply agreements with food waste producers and bulk generators (e.g. restaurants, fresh markets, etc.) — starting with low-hanging entities under local government's work jurisdiction (e.g. municipal-owned markets). Mandate food waste producers and bulk generators to handle their own organic waste and implement source separation of organic waste to foster enabling conditions for establishing agreement with waste treatment operators or facilities. Integrate composting into educational spaces, particularly public schools and universities, linking it to urban farming and food security, or establish organic waste management service agreements with composting facilities.
 No access to the waste collected by formal waste collection businesses. 	Policy review and municipal approval to allow zero waste projects to access waste directly from appointed collectors.
 Insufficient number of collectors for scaling 	Employ more collectors and integrate informal workers into formal contracts.

Scaling Requirements Increase the site's income Barriers to Scaling Opportunities No income from • Sales of compost to commercial farms, nurseries, and other the sale of users. National and subnational governments can support the development of compost markets by connecting with farmers compost No other revenue and promoting compost use to improve soil quality. sources Establish compost offtake guarantee, procuring compost for their public landscape maintenance. · Compost price regulation, setting minimum sales price to set market certainty and revenue predictability. · Look to establish a collection fee and/or gate fee for waste processing. The government can support regulating the system, as part of the public service provision, and include communitybased and workers-based operators. • Explore public funding sources connected to other areas of the program, such as health, agriculture, and labor promotion. Introduce cost-saving reinvestment mechanisms from avoided cost of landfilling and transportation.

Upscaling Considerations

The analysis shows that the capital requirements for scaling the project from its current 50 percent capacity to 100 percent is US\$190,000, a one-time investment that would extend for decades in the most part, given that the highest investment needed is for buildings. Existing land can be leveraged, but significant investment is required to develop a warehouse storage facility, with some investment for a new forklift, crusher, and tricycles.

As the system currently does not generate commercial revenues from sales, collection fees or other, operational costs would need to be covered as part of the public waste management system, in addition to exploring some revenues from sale of compost that could help cover part of the costs. The project's current operation is limited by feedstock availability and transport reach, as it is a long-distance away from waste generation points. **Decentralized replication of projects closer to communities and waste generators would strengthen collection while expanding impact.**

Nearly all waste contracts in Accra are franchised to formal service providers. Yet, despite contractual obligations to reduce waste and recycle, none of the five franchisees has reported activities related to waste diversion or recycling. Hence, GAYO's pilots fill gaps in underserved areas not due to provider cost but due to structural and policy design shortcomings This gap presents an opportunity for the government to require providers to support zero waste initiatives by supplying organic feedstock and potentially offering financial contributions toward recycling targets. A gate fee could be charged to the franchised collectors at a rate lower than the current US\$8-15 per tonne paid at the landfill facilities. Similarly, contacts can be entered into with organic waste generators for the collection and disposal of their organic waste.

Currently, the project diverts approximately 144 tonnes of organics per annum, resulting in savings of between US\$1,152-US\$2,880 per annum¹⁰. These savings are an asset that could be invested in the project.



¹⁰ Estimation made by LUMEC based on waste management costs from Accra provided by GAYO.

Greenhouse Gas Emissions Reduction Potential

Using the Combined CH₄ & CO₂ Emissions from Waste Calculator developed by Eunomia¹¹, emissions from Accra's waste system were analyzed under both a baseline and an alternative zero waste scenario. In the Business-as-Usual (BAU) case for 2025, the city diverts only about 7 percent of waste, with merely 1.8 percent of organics composted. Most residual waste is landfilled (80 percent), while smaller portions are dumped openly (14 percent), burned in the open (6 percent), or incinerated (1 percent). Under the zero waste scenario case, the city attains substantial diversion rates—approximately 80 percent for most materials including organics, 25 percent for plastics, 50 percent for textiles, and 20 percent for other waste streams¹².

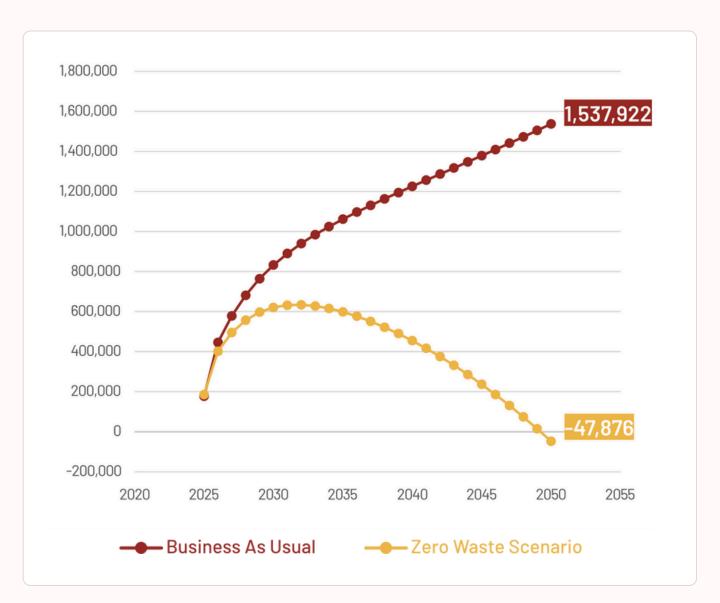
By strengthening zero waste approaches, the city can reduce annual GHG emissions by 103 percent by 2050, in comparison with the Business-as-Usual scenario. This highlights the significant climate benefits effectively implemented zero waste system that expands progressively across the city. Even greater emission reductions could be achieved if the city can accelerate the scale-up of these initiatives beyond limited pilot projects.



¹¹ Eunomia Research & Consulting. (2025). Combined CH₄ & CO₂ Emissions from Waste Calculator. Global Alliance for Incinerator Alternatives

¹² These diversion rates were set based on existing aspirational cases seen in San Francisco, USA and Capannori, Italy, where 80 percent of waste diversion is achieved.

Figure 2. Annual GHG emissions (2025–2050), in metric tonnes of CO_2 equivalents



Organic waste diversion from landfills is key to lowering the climate footprint of Accra's waste system. Currently, GAYO's composting project alone diverts around 144 tonnes of organics annually, preventing approximately 7.76 tonnes of methane emissions each year. This corresponds to an avoidance of 209.52 tonnes of CO₂e. If composting were expanded to process 80 percent of the city's organic waste by 2050, the methane mitigation potential would rise from 7.76 tonnes to about 70.18 tonnes annually—more than nine times the current level.

Recommendations

To scale successfully, the project should prioritize securing land for expansion or replication, through dedicated municipal support recognizing such projects' contribution to recycling, improved waste management, and sustainable development. **Decentralizing operations into smaller community-based sites would expand access to feedstock,** while supply agreements with restaurants, markets, and other waste generators could provide a reliable input stream. Low-tech mechanization could be introduced to increase processing capacity and reduce costs.

Financial sustainability will depend on municipal policy support in **shifting budgets from landfill to zero** waste initiatives as cost savings partnerships. Diversifying revenue streams can also help cover a portion of operational costs. Selling compost to farms, nurseries, or institutions; introducing **gate fees for organic** waste processing; fees for collection from commercial clients and charging government institutions for compost, which is currently supplied free of charge, would all help reduce reliance on donor funding and ensure sustainability. This could also include further valorization of compost products such as production of bio-fertilizer or compost pellets.

Recognizing the role of informal collectors can create the enabling conditions needed for scaling. Given that the informal sector contributes significantly to waste collection, policy should be directed towards the outsourcing of these services to community projects, businesses, or cooperatives.

Ultimately, the project should emphasize its **substantial socio-economic benefits** — particularly job creation, food security, and soil restoration — to secure ongoing investment and political support for expansion.



Conclusion

GAYO's zero waste model, initially launched by a non-governmental organization with philanthropic support in partnership with a local municipality, is expanding and laying the groundwork to become a system operated by a workers' cooperative in collaboration with Accra's municipal assemblies.

The model has improved working conditions and a just transition for waste pickers, providing an additional source of income and diversifying expertise into organic waste management.

It is also contributing to advancing waste diversion targets that commercial service provides are not fulfilling. With more suitable land and better infrastructure and equipment, the system could benefit more from the technical know-how and the community engagement sustained by GAYO, the waste workers, and the municipality.

Programs such as GAYO's are a flagship and are urgently needed in a region where organic waste represents almost 66 percent of the total municipal solid waste, and waste is the largest source of GHG emissions.

Advancing a zero waste model will reduce methane emissions by 87 percent per year and overall GHG emissions by 103 percent by 2050.

This underscores the importance of **shifting climate finance to support zero waste systems-not only as a rapid mitigation strategy but also as a means to build long-lasting, low-carbon systems grounded in community ownership and green jobs**. It also highlights the need to increase waste management budgets to enable local governments, waste worker and picker organizations, and community groups to solidify the transition to zero waste.

Acknowledgments

Reviewers

Designer

Sonia G. Astudillo

Dan August S. Abril

Annika N. Hernandez

GAIA is grateful to GAYO for agreeing to be featured, and for sharing information and their photos for use in the publication.

This report has been made possible in part through funding support from the Global Methane Hub. The views expressed in this publication do not necessarily reflect that of the GMH and its funders. This report or its parts may be reproduced for non-commercial purposes provided the source is fully acknowledged. Reproduction for sale or commercial purposes is prohibited without written permission of the copyright holder.

The Editorial Team

Authors

Cecilia Allen Doun Moon

Contributors

LUMEC

Paul Jones Kelly Pearson Shannon Moffet

GAIA

Yobel Novian Putra Macarena Guajardo Neil Tangri

GAYO

Mabel Laryea Jacob Johnson Attakpah Fathia Selasi Charway-Glover Michael Kofi Assimah

About GAIA

GAIA is a network of grassroots groups as well as national and regional alliances representing more than 1000 organizations from over 100 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





Supported by



Building Community Resilience and Green Jobs through Organic Waste: Climate Benefits and Economic Model of Just Organic Waste Management in Accra

© November 2025 Global Alliance for Incinerator Alternatives 1958 University Avenue, Berkeley, CA, USA