DAR ES SALAAM CITY INCLUSIVE CLIMATE ACTION CITIES FUND PROJECT

A Systematic Community Mobilization Toolkit

This project is part of C40's Inclusive Climate Action Programme. More info: *https://www.c40.org/what-we-do/raising-climate-ambition/inclusive-thriving-cities/ica-cities-fund/*

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ACKNOWLEDGMENTS

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A Simplified Toolkit for Inclusive and Participatory Community Mobilization in Planning and Implementing
Modern Organic Waste Management Technologies in Dar es Salaam City, Tanzania.

List of Abbreviations

BSF   Black Soldier Fly

CBO   Community-Based Organization

CMT   Council Management Team

CSOs   Civil Society Organizations

C40   C40 Cities Leadership Group Inc

DCC   Dar es Salaam City Council

ICA   Inclusive Climate Action

LGAs   Local Government Authorities

MEAL   Monitoring, Evaluation, Accountability, and Learning

MP   Mazingira Plus

SMEs   Small and Medium Enterprises

SWM   Solid Waste Management

TACSS Tanzania Alliance for Climate and Sustainable Society

Executive Summary

Dar es Salaam faces waste management challenges, especially in informal settlements of the city. Most waste collection services are concentrated in formal residential and commercial areas, with informal settlements often neglected, leading to uncontrolled waste dumping and pollution due to waste burning. The city generates about 4600 tons of waste and existing operations transport this waste to the only available dumpsite in the city called Pugu Kinyamwezi; located 38 km away from the city center. The city and municipalities within the Dar es Salaam region utilize city-owned and hired trucks to collect and dump municipal waste at dumpsites. This approach only covers 51% of Dar es Salaam city, leaving the remaining areas uncovered with waste collection services, a challenge that festers indiscriminate dumping and waste burning in the parts of the city (Giavini, 2016).

Informal waste dealers constitute the waste service delivery gap in sub-wards of Dar es Salaam city, through collecting such waste and disposing it in dumpsites, or for re-use, or recycling activities. Studies indicate the important contribution of informal waste sector dealers in waste collection services in most developing cities, however, limited knowledge of systematic waste management processes and infrastructural capacities continues to slow down their participation. Additionally, local communities have not fully benefited from the economic opportunities along the waste management value chain. There exists a gap between collaborative approaches between informal waste dealers, private businesses, civil society, and the local government authorities.

Through this project, DCC, through the C40 ICA Fund project, worked with Tanzania Alliance for Climate and Sustainable Society (TACSS Tanzania) and Mazingira Plus to build capacities of Local Government Authorities (LGAs) technical officials in mobilizing communities for their participation to manage waste and reduce GHG emissions while improving their livelihoods.

The DCC and the partners undertook various inclusive and participatory approaches to planning and implementing tailor-made waste management activities including converting organic (food) waste to compost and producing animal feed through Black Soldier Flies (BSF) technology . In addition, DCC conducted a series of consultations with waste pickers, waste collectors, and aggregators to develop viable and effective waste transit mechanisms from inaccessible sub-wards of informal settlements in the Vingunguti ward. In collaboration with the DCC technical team, these groups of waste dealers designed bespoke pushcarts (two-wheeler pushcarts) that could easily access previously-inaccessible sub - wards for waste collection. This waste collected by the informal waste pickers and collectors now becomes available to be collected by municipal and private-owned trucks for being dumped at dumpsites and recycling facilities. Organic waste was taken to the BSF composting cage, which was built as part of the project, and was used to make compost and generate BSF Animal feed. BSF animal feed was then sold to poultry farms as an available local market through market linkages established through the project.

Through this project, the DCC and partners documented the key steps and approaches for mobilizing and integrating informal waste dealers in city waste management programs and policies. This toolkit presents guidelines for community awareness raising and capacity building, stakeholders' engagement, researching and selecting viable waste innovative solutions, initiative communication plan, risks, challenges, and mitigation plan, resource allocation, partnership, market linkages, networking, and knowledge management to ensure initiative scalability and sustainability.

The steps in this toolkit can be adapted by other cities to further advance integrated waste management policies and programs through community engagement while improving livelihoods, building local resilience, and reducing GHG emissions.

1. Introduction

1.1 Background of the Project

Dar es Salaam, the largest city in Tanzania faces significant challenges in Solid Waste Management (SWM) due to rapid economic growth and urbanization coupled with changes in lifestyle and consumption patterns. However, the rapid increase in the volumes of solid waste generated in the city has never been matched with the pace of economic growth necessary for supporting the required infrastructure for effective solid waste management service provision (Omar & Bullu, 2022). Additionally, increasing climate change impacts have continued to increase the complexity of waste management processes and activities.

Historically, Dar es Salaam's solid waste management system has been characterized by inefficiencies, including limited collection coverage, insufficient disposal facilities, informal waste picking, and inadequate recycling initiatives. Most waste collection services are concentrated in formal residential and commercial areas, with informal settlements often neglected, leading to uncontrolled dumping and pollution in these areas (Kaseva et al., 2002). According to the Dar es Salaam City Council (DCC), 4600 tons of waste are generated daily. The waste generated is made up of household waste, commercial waste, industrial waste, and construction debris. The household (organic) waste largely comprises food waste, garden leaves, and grasses. More than 50% of the generated waste is estimated to be dumped at the Pugu Kinyamwezi dumpsite located about 30 km from the city center.

The city's main landfill site, Pugu Kinyamwezi, has been operating beyond its capacity for years, resulting in environmental degradation and health hazards for nearby communities (DCC, 2023). Additionally, the lack of proper waste segregation and recycling facilities has contributed to the overall challenges in managing solid waste effectively.

In recent years, however, there have been efforts to improve solid waste management practices in Dar es Salaam. The city officials, in collaboration with various stakeholders and development partners, have initiated projects aimed at enhancing waste collection services, promoting waste segregation at source, establishing recycling facilities, and raising public awareness about the importance of proper waste disposal (Kaseva & Mbuligwe, 2005). These initiatives often involve community mobilization efforts, such as clean-up campaigns, waste separation workshops, and the promotion of sustainable waste management practices at the grassroots level.

Despite these efforts, significant gaps and challenges remain in Dar es Salaam's solid waste management system. These include the need for improved infrastructure, increased capacity building for waste management personnel, enhanced public participation, and sustainable financing mechanisms to support long-term waste management solutions. More importantly, there is still a need to capitalize on the existing informal waste collection service groups and individuals in increasing waste collection, diverting organic waste from households, commercial facilities, and Sub wards as a response to climate change mitigation, and city climate change resilience through improved waste management value chain.

For sustainable solid waste management in unplanned settlements, it is crucial to develop a community-based approach that involves the active participation of local government authorities, residents, and both formal and informal waste stakeholders.

This collaborative approach should prioritize capacity building and training for local government officials and waste management personnel. Additionally, it should include the establishment of formalized partnerships between the local government, residents, and waste stakeholders to create sustainable and inclusive waste management solutions.

By fostering a sense of shared responsibility and collaboration, the community-based approach can effectively address the unique challenges of solid waste management in unplanned settlements, leading to cleaner and healthier living environments for all stakeholders.

1.2 The need for a Systematic Community Mobilization Toolkit

While the community is aware of waste management challenges, their limited involvement poses challenges for sustainable community waste management solutions. Local government authorities including municipalities and city councils hold responsibility for such improvement, however, limited resources continue to hinder the efficient implementation of solutions (Kubanza, 2020). Despite government efforts to enhance social and economic standards of living, collaboration among communities and stakeholders is essential. Enhancing communication and coordination between the community and local authorities is crucial for boosting awareness and encouraging community participation in waste management activities (Abel, 2005).

This toolkit is designed to guide initial community engagement and identify key stakeholders involved in establishing inclusive waste management practices in Dar es Salaam. Within the project and the toolkit, the city of Dar es Salaam embraces inclusivity and participatory approaches to ensure co-designing waste segregation techniques, recycling efforts, and overall solid waste management while reducing illegal dumping and promoting sustainable waste practices. By adopting a systematic community mobilization for waste management, this toolkit aims to enhance community engagement for sustainable waste management in the city, create green jobs for informal settlement dwellers in the waste management value chain, and increase income for individuals and families, and overall, reduce greenhouse gas emissions

1.3 Toolkit Scope and Objective

This toolkit guides processes in community mobilization through step-by-step approaches for designing, planning, and implementing a waste technological solution aiming at increased waste collection services, waste sorting, recycling, reuse, and organic waste diversion from heading to dumpsites. More importantly, this toolkit highlights best practices across various developing cities, local governance systems, community engagement, and outreach practices in the waste management value chain.

The toolkit, therefore, describes tested pathways for attracting informal and formal waste management practitioners, guiding municipal and city officials to raise awareness, and ensuring continued community mobilization to engage and improve waste management. More importantly, this toolkit will be a guide to the city and municipalities within the city of Dar es Salaam, other cities, and waste management practitioners, entrepreneurs, and academics.

The toolkit creates bases and identification of innovative waste solutions to be implemented, stakeholder mapping and engagement process, awareness raising, validating selected waste management practice or solution, establishing a cost-benefit analysis along the selected waste management solution, partnership and networking, market linkages, operation procedures and formalization of practice and knowledge management.

1.4 Toolkit significance and impact

DCC envisions the application of this toolkit as key to improved waste management, particularly within the informal waste management value chain. An informed, inclusive, and participatory planning and implementation of waste technological solutions will benefit informal settlements in Dar es Salaam city, and other cities (Figure 1). Other envisaged benefits include:

i.   Reduced expenditure for running waste management facilities and overall operations
ii.   To effectively tap into knowledge and experiences from communities on waste management already being practiced in the area.
iii. Established ownership and buy-in of waste management solutions and practices due to effective community involvement in waste management.
iv.   Clear pathways and techniques established for achieving systematic community mobilization for engaging in waste management activities.
v.   Reduced greenhouse gas emissions, from the application of cost-effective and modern waste management practices.
vi.   Creating green jobs and therefore laying the ground for sustainable utilization of natural resources.
vii. Improved livelihoods of communities that earn from the waste management value chain.
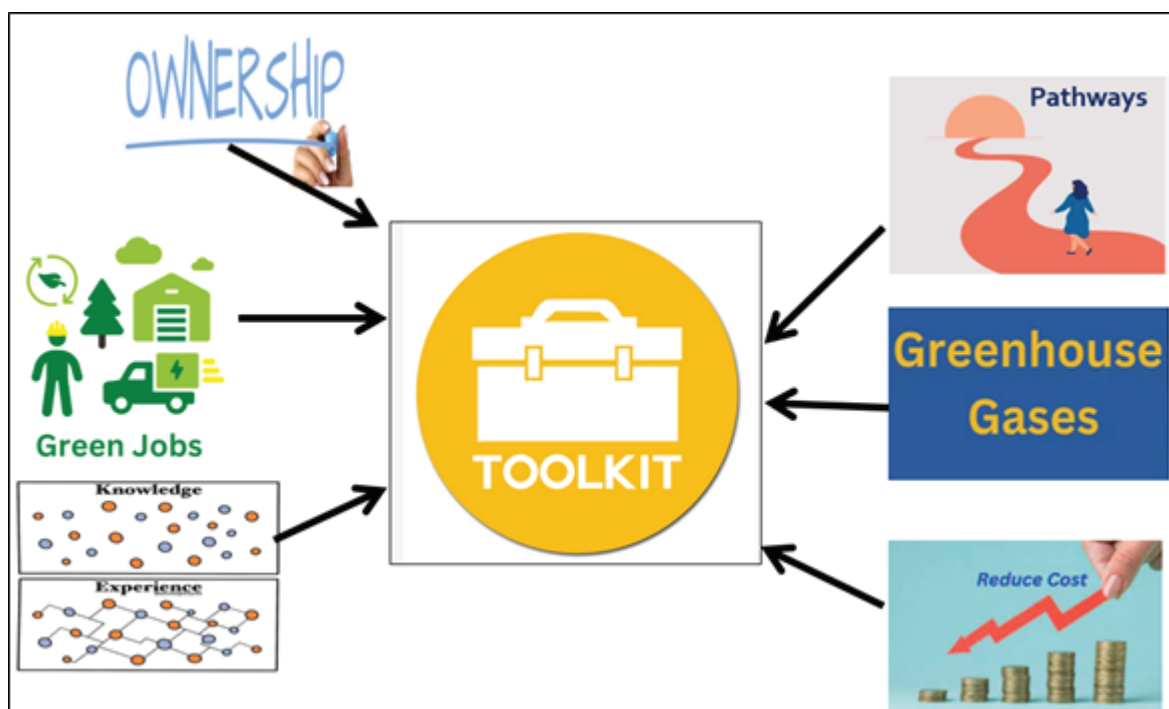
Figure 1: Infographic description of the toolkit's significance.

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2. Systematic community mobilization in waste management

Step I: Explore existing waste management gaps and opportunities.

Summary of Key Considerations

Required time	Actors	Requirement and Achievements
4-weeks	• *City/Municipal technical officers* • *Communities*	• *Reviewing recent studies, news on waste management gaps, and needs targeting the project area.* • *Conducting preliminary site visits for validating preliminary knowledge/ practice that needs to be scaled or introduced,* • *Identifying contextualized and priority waste management technological solutions* • *Establish resource requirements to realize the practice (existing opportuni ties and needs)*

Summary of sub-steps

(i) *City officials and other waste management practitioners conduct an intensive literature review on existing waste management solutions and practices.*

(ii) *Documented information and data will need to be validated by conducting a site visit, and consulting various waste management value chain stakeholders.*

(iii) *Validation of review and site visit data and information for cost-effective, inclusive, and participatory planning of the waste management solution.*

At this stage, there are limited resources to assess the existing waste solutions in place. It is therefore important that technical city teams or any other waste management practitioner working on waste management conduct a site visit to follow up on documented waste solution gaps, needs, and opportunities. Site visits will aid in validating all reviews and collected information before taking further steps on what stakeholders should be involved, initiative costs, and materials requirements

This is the preliminary phase where city or municipal officials and other waste management practitioners need to equip themselves with existing data and information on viable waste solutions in the area. City and municipal technical officials will gather recently conducted studies and information on the status quo of waste management within the area of jurisdiction.

The review will focus on exploring the gap and barriers to community involvement in waste management activities with a focus on waste collection rates and organic waste diversion from dumpsites or landfills. This review will establish existing waste management practices, and identify priority waste management solutions (ranging from waste generation to disposal). This step will also include costing requirements (financial and non-financial) for realizing the identified waste solutions and practices in the city.

Key revised waste management-related documents reviewed for this project include:

- Strategy on Organic Waste Management in Dar es Salaam, Tanzania for 2017 -2020, 2017.
- National Solid Waste Management Strategy for the United Republic of Tanzania, 2018.
- Gaps and Needs Assessment Report for the selected waste Priority high-impact action in the city of Dar es Salaam, 2023.
- Baseline Study for Enhancing Urban Migrant Resilience through Waste Management Value Chain, 2023.
- Promoting Green Urban Development in African Cities, Dar es Salaam Tanzania, 2016.

At this stage, the city and/or municipal officials will facilitate internal consultations and technical reviews of documents. The findings of this process will be documented to support subsequent stakeholder engagement and selected waste management practices implementation.

For example, the ICA Fund project implemented in Dar es Salaam city prioritized the consultation of waste sector practitioners and experts, to validate review and site visit findings of this stage on community mobilization to tapping the potential along waste management activities in Dar es Salaam, and other African cities.

To ensure buy-in and approval of the initiative and realization of the selected waste management practice, the LGA including senior leaders and political class must be provided with a summary of initiative objectives (Detailed city and municipal government authorities and political leader's engagement described under step II).

Step II: Communication and Engagement Plan

Summary of Key Considerations

Required time	Actors	Target Stakeholders
Throughout the project lifecycle.	• Ward and Sub ward extension officers • Municipal and City council officers • Like-minded groups (Civil Society Organizations (CSOs), businesses (micro, small and medium enterprises).	• Ward and Sub ward government • Local community members • Political class (mayors and councilors) • Private sector (Small and Medium Waste entrepreneurs) • Waste dealers (pickers, collectors, aggregators, re-users, and recyclers) • Research Institutions • Academia • Civil Society Organizations

Summary of sub-steps

(i)   Listing relevant stakeholders that need to be involved during an entire project implementation.

(ii)   Clearly describe the purpose of communication to identified stakeholders.

(iii) Establish key messages that cut across initiative design, planning, implementation, results, and learnings for scaling best practices.

(iv)   Briefly describe the communication methods and channels to be utilized.

(v)   Indicate timelines and responsibilities for each key message designed for engagement and communication.

Effective community mobilization to engage in any of the ecological and socio-economic development activities needs consistent communication and a streamlined engagement plan. This step involves pointing out to whom you need to communicate the progress of your waste action or policy, the purpose of communication with them, the communication method you will use, how often you will communicate, and who will communicate with the audiences identified.

The communication and engagement plan must consider:
- List of stakeholders identified at step 2 of this toolkit, the key people and groups who should be informed about the prioritized waste management solutions and the level of influence they have (Figure 4)
- Purpose of the communication for each of the groups identified, for example, to engage, sustain interest, or share outcomes and celebrate success.
- Identifying contents to be communicated (key messages). Key features may include: Why this particular waste management practice or solution is important, changes, results, lessons learned, and next steps.
- Identifying the best method of communicating with each of the groups identified.
- Point out the best timing and timelines of when each group will receive communication.
- Identify who in the team (maybe city officials or waste management practitioners) will carry out each piece of communication.
- To amplify the communication messages, city officials as part of the team initiatives need to contact the city communication department to align with city-wide communication plans and therefore establish collaboration.

With the city communication department, the Dar es Salaam C40 ICA Cities Fund implementation team worked together to develop a clear, brief, and streamlined communication and engagement plan to aid informal waste dealers' engagement and involvement in waste management solutions.

See Figure 2, an example of the simplified stakeholder communication and engagement plan that the Dar es Salaam C40 ICA Cities Fund implementation team relied on to establish stakeholder engagement activities under step 2 of this toolkit.

Initative Stakeholders Engagement and Communications Plan Template

Stakeholders - By name if known. (in the department, organisations, partner organisations, wider community, and service users?)	Purpose of engagement and communication (Engage, sustain interest, Celebrate and share? What do you want them to do?)	Key messagesto be communicated (to do this, what do they know? Which questions should be answered?)	Timing of communication (Stages of project, specific times, frequency)	How are you going to communicate? (e.g routine report, flyer, newsletter, poster, case study, social media, video, blog)	Who is responsible? (Who will do the communicating? What do they need to know?)

Figure 2: Stakeholders engagement and communication plan template

To ensure a resilient and tailor-made communication and engagement plan that works for the initiative and embraces quality improvement, it needs to ensure that it;

(i)   Builds will and conditions for change **(Creating Conditions),**

(ii) Understand the current system and opportunities for improvement along the waste management value chain **(Understanding Systems),**

(iii)Laying out aims along a developed theory of change in waste management practice in the area **(Developing Aims),**

(iv) Listing and laying out specific change ideas followed by testing them to evaluate their effectiveness, and offer improvement opportunities if any **(Testing Changes),**

(v) Implement selected waste management solution or practice and sustain upon testing results, and finally produce learning messages and best practices.

Figure 3: A quality improvement journey of effective stakeholder communication and engagement plan

It is important that to deliver systematic planning, testing and continuous improvement of waste management practices, the city or any other entity puts in place firm initiative champions **(Leadership and Teams)** (Figure 3), and that this team fosters all aspects of proper implementation of waste management practices **(Project Management and Communication),** and finally ensures harvesting outcomes (part of step 9) to spread the messages from learnings.

Step III: Stakeholder Engagement

Summary of Key Considerations

Required time	Waste management value chain stakeholders target
Throughout the project lifecycle.	*City/Municipal Officials including City/Municipal Executive Directors*
	Sub wards and Ward leaders (Government employees)
	Political leaders (Ward councilors sub ward chairpersons, and the Mayor)
	Community or traditional leaders
	Sector Practitioners (Independent consultants and researchers)

Throughout the project lifecycle.	Businesses, SMEs (Waste aggregators and Recycling companies)
	Waste collectors and pickers
	Underrepresented and marginalized groups (such as women, youth, persons with disabilities, and low-income groups)
	Waste generators (Households, kitchens/restaurants, factories, markets, etc.)

Summary of sub-steps

(i) City officials and other waste management practitioners map and identify key stakeholders along the identified waste management practice or solution.

(ii) Identified stakeholders become engaged at different stages of the initiative, and for the effective contribution of stakeholder groups, this needs to be inclusive and participatory at both the planning and implementation stages of the initiative.

(iii) A participatory and inclusive stakeholder engagement process, at both the planning and imple mentation phases will include a series of site visits, consultative meetings, and dialogues. These meetings and collaborative approaches further improve the initiative setup, costs, resources required, and proper stakeholders during an entire phase of the initiative realization.

This phase is divided into two steps including:
1. Identification and mapping of all key stakeholders including beneficiaries and the most impacted groups to be involved in the waste management value chain.
2. Involvement (Inclusive and participatory) of stakeholders at all stages of planning and implementa tion of prioritized waste management practice.

Stakeholder mapping and Identification: This project leaned on preliminarily identified stakeholders for the selected waste management practices. Identified stakeholders included waste generators, collectors, pickers, aggregators, recyclers, and both small and large-scale re-users. This stage focused on locating stakeholders of interest, their activities in the waste sector, the market of waste products, technology in use, challenges, and opportunities along the entire waste management value chain. The overall stakeholder selection for engagement and involvement needs to consider stakeholder influence, and impact on ensuring the success of the selected waste solution (Figure 4).

Figure 4: Simplified stakeholders mapping template

Apart from this group of stakeholders, it was found imperative to ensure that this process includes the mapping of enablers and obstructers in the waste management sector. Enablers in Dar es Salaam for innovative waste management solutions included the Mayor of Dar es Salaam City Council, City Director, Head of the Environment and Natural Resources Conservation, Head of the Waste Management Department, and Head of Health and City Medical Department. The initiative listed groups of waste pickers and individuals as obstructers who still pick or collect organic waste from dumpsites. This group remained to be worried about reduced organic waste to be collected, and could not easily support selected waste management solutions. It was important to develop a special awareness and training to unfold opportunities that this group could tap into for improving livelihoods, along with similar organic waste diversion initiatives. The identification and engagement of relevant city and municipal departments continued across various life cycles of the initiative implementation.

It is always important to work with the local government authority to harness their experiences and achieve full government support over the communities' buy-in and adoption.

More importantly, this process looks at the existing strengths and weaknesses of stakeholders, and opportunities existing along stakeholders' plans of expansion in waste management business or involvement. To realize this:

    i. City or municipal officials will prepare site visit survey tools including questionnaires, and group discussion questions, and conduct Key Informant Interviews (KII) see Appendix 1.

    ii. The data will be gathered by using prepared tools to collect data from private businesses, local communities at the household level generating waste, and waste dealers at generation and collection stations; these will involve waste pickers, collectors, and aggregators.

    iii. Rely on collected data to plan for further stakeholder (target communities) engagement in waste management activities. The city, municipal, or any other waste sector practitioner will utilize such information to reshape priority waste management practices, and or technologies to suit project implementation and scalability at a later stage.

Stakeholder engagement: This stage involves the engagement of target project beneficiaries in the planning and implementation of prioritized waste management solutions in the area.

    Inclusive and Participatory Planning: Under this phase, the Dar es Salaam city council, for instance, gathered all four municipal officials from Ubungo, Kinondoni, Kigamboni, and Temeke to revise existing and proposed waste technological solutions and practices in place (Figure 5). This engagement was delivered through a series of site visits and meetings where officials visited households, sub-wards, and ward leaders, informal waste pickers and collectors, waste aggregators, and waste entrepreneurs in the sector.

    A final consultative meeting was conducted to validate collected data and propose waste technological solutions in the area. City officials and practitioners rely on this final waste solution validation meeting as it brings together different actors including both municipal and city officials and waste dealers (waste pickers, collectors, aggregators, and recyclers) in the area. This meeting brings partners and collaborators such as civil society organizations (CSOs), small and medium enterprises (SMEs), waste businesses, research institutions, and academia. Information and data validation lean on various group discussions, innovative use of locally understandable language, and interpretation of technical terminologies to ensure full coverage of understanding and decision-making. It is an important sub-step of stakeholder engagement as it is the moment when the city government authority connects and links to local communities to implement modern waste management practices.

Figure 5: Inclusive and participatory consultative meeting for refining selected waste technological solutions

Collected data and information resulted in the selection of adopting a composting pit associated with the production of composts and black soldier flies' larvae (animal feed), as well as the purchase of tricycles and pushcarts as the transport means to increase waste collection services in the area.

Inclusive and Participatory Implementation:

Upon identifying the best and contextualized waste management solutions that align with existing waste management value chains, city and municipal officials effectively engage communities or project beneficiaries in developing, installing, and executing selected waste management technological solutions. In Error! Reference source not found., waste aggregators and integrated waste pickers group from the Butiama sub-ward in Vingunguti fully participated in ensuring the orientation and construction of the compost cage.

Figure 6: Construction of the compost cage and waste sorting collection station

Among the factors to consider is to include amount of waste to be generated in a specific area of concern, size of the technological waste solution to be installed, costs of operation, operational and management plan, proposing likely partners and networks for collaboration, as well as other relevant implementation requirements to realize selected waste solution.

This sub-stage will therefore emphasize an intensive consultation of waste collectors, aggregators, recyclers, private businesses, and users of re-use or recycling products, where an overview of the target waste management technology is explained and seeks inputs to improve or reshape the plan of design and implementation (Figure 7).

Figure 7: An inclusive and participatory co-creation meeting to validate viable and tailor-made waste management solutions.

More importantly, this stage calls for a diversified group of stakeholders including local authority leaders, politicians, and vulnerable groups within target communities. Among highly considered special groups to influence success, waste management solutions included youth, women, students, pupils, and elderly communities (Figure 8).

Figure 8: City officials and waste dealers representatives visiting Kibasila Secondary School Zero Waste Initiative

A Simplified Toolkit for Inclusive and Participatory Community Mobilization in Planning and Implementing Modern Organic Waste Management Technologies in Dar es Salaam City, Tanzania.

Private businesses play an important role in determining market availability and improvement of the waste management products from the selected waste solution value chain. The Dar es Salaam C40 ICA project team consulted small, and medium-scale waste dealers (SMEs), enterprises, and institutions such as schools to enrich the waste management value chains in the city of Dar es Salaam (Figure 8). City waste collectors and pickers were mobilized and met with waste dealers SMEs. SMEs were able to describe needed waste recyclables in the market while offering better prices as compared to experienced waste prices in the market.

Step IV: Community and Relevant Stakeholders Awareness Raising.
Summary of Key Considerations

Required time	Actors	Target Stakeholders
2 Months.	• Local community members • Ward and Sub ward extension officers • Municipal and City council officers • Political class (mayors and councilors) • Private sector (Small and Medium Waste entrepreneurs) • Research Institutions • Academia • Civil Society Organizations	• Ward and Sub ward government • City and municipal officers • Business owners • Waste dealers (pickers, collectors, aggregators, re-users, and recyclers)

Summary of sub-steps

(vi) Introducing the topic, in this case, prioritized waste solutions to be scaled by the city, and communities.

(vii) Customizing different messages to suit various groups engaged in capacity-building sessions. This process extends to long-term capacity building in such a way that waste dealers and communities are coached for a prolonged period during the waste solution implementation.

(viii) Providing highlights on the benefits, and making linkages on ecological, and socio-economic implications to the target communities.

(ix) Economic benefits associated with the prioritized waste technological solution. This promotes the value and attracts more community members to engage in waste management activities.

The first week of this phase will focus on developing training tools and presentations. The tools will be developed fit for purpose along with building awareness and capacity building for identified stakeholder groups throughout the entire initiative implementation. For example, a waste picker and collector will be trained on the use of Personal Protective Equipment (PPE) and segregation of waste at source while technical executive leaders, politicians, and senior city officials will be trained on delivering strategic capacity building and policy reforms in favor of waste management solutions in the area.

To deliver effective awareness raising, the city must consider the following:

i **Introduction of the topic:** It is vital to provide a wide and contextual understanding of selected waste management technologies. This should be focused on providing a basic understanding of the technology as linked to addressing the climate, ecological, and socio-economic challenges of the target communities (Figure 9). For the political class, executive officials, and leaders of the target communities, the focus should be on policy reforms and the contribution of the waste management initiatives towards improving city resident's services.

ii **Bespoke key messages to relevant community groups and leaders:** Preliminary surveys and field visits need to inform key messages and learnings delivered to target groups. The DCC, in collaboration with the TACSS Tanzania, developed training and awareness materials specifically for waste pickers, collectors, and aggregators. The content of these training and awareness materials differed from those targeting waste re-users, recyclers, and small and medium businesses trading waste byproducts.

Figure 9: Stakeholder engagement Workshop during the Initiative Launch

Additionally, city and municipal technical officials will develop training modules focusing on various topics of concern to realize the implementation of the selected waste management technological solutions. DCC developed modules on the proper use of PPEs and self-hygiene, waste segregation at source, techniques to increase waste collection from generation and collection points, community mobilization tips, and waste entrepreneurship. These will aid sustainable awareness and training to community members where waste technological solutions will be replicated and sustained.

Figure 10: Hon. Omary Said Kumbilamoto (in the middle), Mayor of Dar es Salaam City Council engaged for the project buy-in and support

To ensure effective training and awareness-raising programs, local leaders must become the center of preliminary engagement. Local leaders from sub-wards towards the city level earn significant influence and trust within the community. Taking an example of the Dar es Salaam C40 ICA fund project, the ward government and the Dar es Salaam city council mayor were engaged in increasing the understanding, buy-in, and support for upcoming project activities (Figure 10).

It is therefore of paramount importance to systematically engage the senior political class while linking community services to be rendered along waste management practice in an area.

iii. Unfolding climate, ecological, and socio-economic benefits for the selected waste technological solution.

An understanding of the benefits of sustainable waste management practices is important for all target groups for waste management initiatives in cities. Communities in the informal settlements of Dar es Salaam were attracted to earning an income from the reuse of waste and recycling activities, while the political class prioritized the job creation opportunities of such an initiative.

The CMT revealed high costs incurred in operating waste transportation and relevant mobility experienced at Pugu Kinyamwezi Dumpsite. Waste trucks wait prolonged periods queuing to empty at the dumpsite (Figure 11). This significantly reduces waste collection rates in the entire city of Dar es Salaam. It is for this reason the DCC continues to promote informal waste dealers in converting organic waste into compost, animal feed, and biogas. Less waste going to dumpsites, reduced trucks shuttling to dumpsites, and less cost of operation, and by doing so the DCC continued to demonstrate its contribution to reduced greenhouse gas emissions and therefore protecting the globe from catastrophic impacts of climate change.

Figure 11: Waste trucks cue at Pugu Kinyamwezi dumpsite, waiting for emptying.

The engagement of Local government authority and technical officials is key to policy and local strategy reforms. **Through the C40 Inclusive Climate Action Fund, Dar es Salaam City Council engaged senior leaders such as mayors and Vingunguti ward councilors for increased visibility and buy-in to operationalizing local strategies to support organic waste diversion from heading to Pugu Kinyamwezi dumpsite.**

iv. Raise ambition to implement selected waste technological solutions.

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City and municipal officials need to introduce working strategies and pathways to engage and integrate target groups such as involving women, youth, and low-income earners to support the equitable distribution of the project impacts.

Through site visits and consultations with household heads, waste pickers, and collectors, the Dar Salaam C40 ICA Fund project has demonstrated the process and benefits associated with installing Black Soldier Fly (BSF) composters and the use of cost-effective rented pushcarts and tricycles for improved waste management in the area.

While waste aggregators found value in harvesting compost and BSF for business purposes (sale for city gardening and animal feed), waste pickers and collectors were interested in cost-effective push carts and tricycles for increasing collection rates and earning higher daily rates. To realize this ambition, the Dar Salaam C40 ICA Fund project supported waste pickers and collectors' groups with tailor-made pushcarts, wheelbarrows, and relevant personal protective equipment (PPE) such as gloves, safety boots, and safety glass for efficient handling of collected waste and increased waste collection rates from streets.

Figure 12: Waste collection and handling tools and equipment donated to Vingunguti ward waste dealers

Based on the C40 ICA Fund project, this stage revealed that every 1 Kilogram of black soldier fly (BSF) larvae was sold at 2000 -2500 TZS (equivalent to 1 US dollar) and that one 25-kilogram sack of compost was sold at 50,000 TZS (Equivalent to 20 US dollars). Increased collection rate with the use of bespoke pushcarts increased their waste collection fee by 35%. This return on investment promises a continued engagement in waste entrepreneurship business in the Vingunguti ward and other informal settlements in Dar es Salaam.   These economic benefits became one of the key lessons the project documented for promoting modern waste management practices in developing countries.

More importantly, local leaders, including the sub-wards chairperson, councilors, and the mayor, demonstrated that the initiative is highly valued because of its job creation potential for city residents including informal workers. This has increased the interest and ambition of the city and municipal councils to invest in decentralized and community waste management systems in Dar es Salaam.

Step V: Final selection of viable and tailor-made waste management solutions.

Summary of Key Considerations

Required time	Actors	Requirement and Achievements
4-weeks.	• *City and or Municipal technical officers* • *Sub-wards and ward leaders* • *Practitioners*	• *Site visits for validating preliminary proposed knowledge/practice.* • *electing cost-effective and preferred waste solutions by target beneficiaries.* • *Economic benefits for the selected waste techno logical solution/practice.* • *Final resource requirements and allocation to realize the selected practice*

Summary of sub-steps

(i) At this stage city officials and waste management practitioners conduct more site visits while verifying information and data collected from stakeholder engagement and inputs while raising community awareness.

(ii) This step involves specifying technical specifications, and internal and external resource require ments for the prioritized waste solution.

(iii) Based on a clear understanding built, select the most prioritized, preferable, and viable waste management solution for implementation.

An initial review of existing waste management studies and practices, field visits, and several consultations inform the selection of the highly preferable and viable waste technological solution. **A well-informed selection will ensure cost-effective and efficient implementation on the ground, as well as community ownership of the project.**

Through the C40 ICA Fund project, effective community stakeholder engagement led to the discovery of already piloted cost-effective waste management solutions in the area. This includes:

(i) BSF organic waste composters who already process organic waste in the city
(ii) Private waste aggregators as an alternative waste collection point for community waste pickers
(iii) Use of electric-powered tricycles for the collection of waste from households, and sub-wards with limited pliable roads
(iv) Packaging of recyclable waste for in-country transportation and exportation.

The mobilized women and youth groups, waste pickers, waste collectors, waste aggregators, and SMEs prioritized scaling black soldier food waste composting pits as a cost-effective waste management practice in the city. The community members emphasized putting more effort into increasing waste collection rates from sub-wards for recovering recyclable waste. To increase such collection rate, it became necessary to assess the type of transportation required. This was determined to be pushcarts and electric tricycles.

● Verification of waste technological solutions and practice

This step focuses more on confirming the reliability of collected data and information to secure the viability implementation of prioritized waste technological solutions. The project, therefore, through site visits, key performance interviews, technical dialogues, group discussions, and consultations with community groups verified the cost-effectiveness and viability of BSF-based composting pits and increased waste collection rate by relying on electric tricycles. Community groups of waste pickers, collectors, and aggregators provided enough information in favor of selected technologies as the best waste solutions technologies to be relocated in Dar es Salaam municipal and city councils.

● Technology and practice implementation requirements

At this stage, final inclusive and participatory planning becomes the key to realizing organic waste management solutions. A series of consultations was set up with community groups on required financial, technical, and human resources. Waste pickers, collectors, and aggregators provided informed perspectives for sustainable and cost-effective waste transportation modalities and viable increased waste collection rate techniques.

Sub-wards and ward-level political and government leaders are key to initiating contact and overall community members' engagement in waste management. Sub-wards and ward governments proposed and guided appropriate community groups to be contacted, involved, and assisted to elevate individuals' and community groups' income.

This planning stage involves listing and costing key required composting pit realization, and electric tricycle purchase and maintenance. More importantly, this process involved assigning roles, responsibilities, and times for acquiring and initiating the implementation of selected waste technology and, or practice.

Step VI: Partnership, market linkages, networking, and collaboration.

Summary of Key Considerations

Required time	Actors	Key groups for Partnership and Networking
2 Months.	● *City and or Municipal technical officers* ● *Consultants* ● *Political leaders (Mayor)*	● *Mapping same interest groups (individuals and institutions)* ● *Financial Institutions* ● *Developmental partners* ● *Businesses (Waste aggregators, Small and Medium Enterprises)* ● *Non-Governmental Organisations (NGOs)* ● *Research Institutions* ● *Academia* ● *Media*

Summary of sub-steps

(i) Upon selecting waste management practice or solution, city officials rely on stakeholder engagement events at step 2, to identify potential groups, businesses, and partners for collaboration.

(ii) City officials and practitioners make contacts and visits to selected collaborators for amplified effort during the initiative implementation

Mobilized groups, businesses (especially small and medium enterprises), and individuals were linked to a diversified range of stakeholders for exploring opportunities and collaboration alignment to realize selected waste technological solutions. Efforts need to be directed toward value chain supply solutions working with like-minded individuals, businesses, and civil society organizations. This increases relevance and magnifies the impact of replication of selected waste management solutions in the area. Relying on like-minded partners' techniques, the DCC, together with four municipalities - Ubungo, Temeke, Kigamboni, and Kinondoni, seeks to acquire resources for upscaling selected waste technological solutions.

Through the C40 ICA Fund project, the DCC partnered with NGOs including TACSS Tanzania and Mazingira Plus in providing technical capacity building and longer term coaching towards a modern organic waste diversion from heading to Pugu Kinyamwezi dumpsite. This partnership included designing training modules and establishing a knowledge gap in organic waste diversion. Such partnership provided clear guidance and backstopping to the city and municipal officials in planning and implementing waste management projects.

The city of Dar es Salaam, through the C40 Climate Action Implementation (CAI) program is developing 3 organic waste diversion models that prioritize decentralized and community waste management practices. Developed models are an extension of decentralized waste management practices achieved through the Dar es Salaam C40 ICA Fund project.

At this stage, it is also crucial to involve academia and research-based institutions to enable informed and evidence-based waste management solution practices. The Dar es Salaam C40 ICA Fund project engaged Ardhi University and Elico Foundation as part of diversifying current research-based information. In addition, C40 Cities is a key knowledge partner supporting best practices and models and recommending a knowledge hub network for extracting waste-related information.

Formulation and dissemination of project outcomes require consultation and engagement with the media. The Dar es Salaam City Council through the C40 ICA Fund utilized the city FM radio, and social media including X, LinkedIn, and Instagram to communicate and amplify initiative outcomes (Figure 13). The use of such social media platforms increases public awareness of innovative waste solutions. Through social media, the C40 ICA Fund project attracted more partners, and like-minded stakeholders to join efforts in addressing waste management issues in the city of Dar es Salaam. Linked to that, the City Council continues to embrace awareness-raising and outreach campaigns through virtual webinars, and effective participation in workshops and dialogues. The city envisioned these platforms as an approach for increasing collaboration opportunities and seeking more resources to scale the initiative documented under this toolkit.

Partnership, network, and collaboration of this nature were key for the amplification of similar efforts conducted in municipal and city councils. Furthermore, networking broadens political groups and decision-making class involvement in accelerating internal and external financing toward modern waste management.

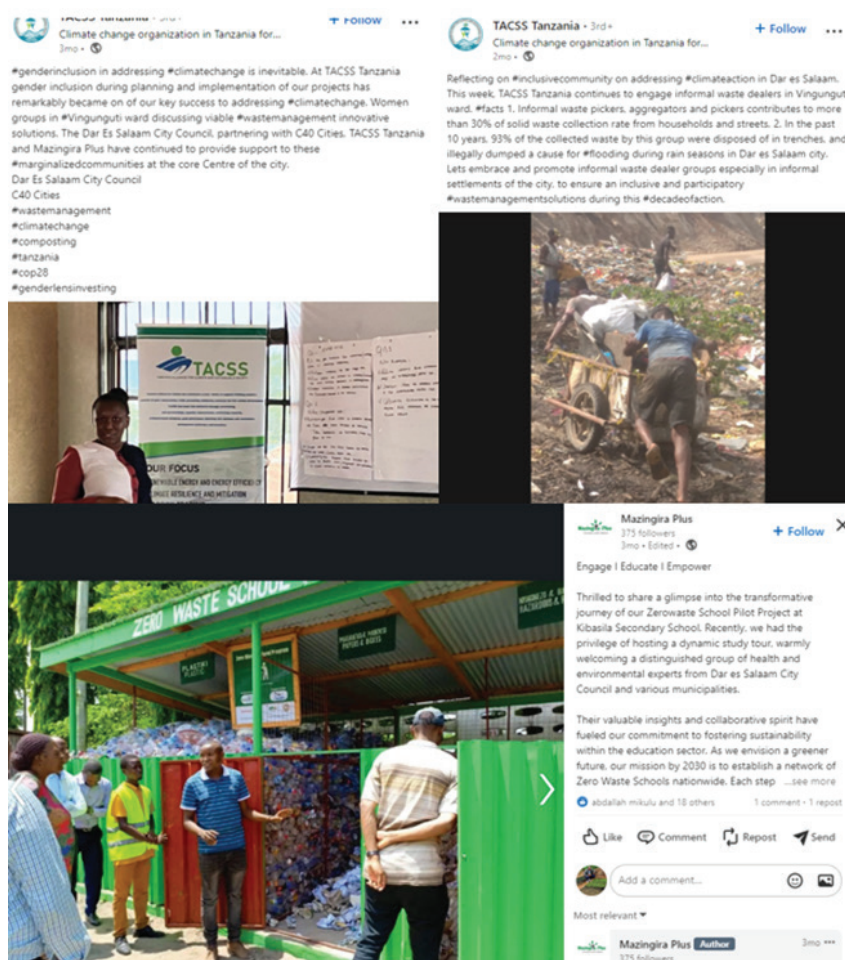*Figure 13: Community and Partners Sensitization social media posts*

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Step VII: Initiative formalization

Summary of Key Considerations

Required time	Actors	Preparation requirements
4-weeks	• City and or Municipal technical officers • Community groups and individuals	• Legalization of formulated groups • Established coordination and reporting frame work. • Government oversight for support and guidance

Summary of key steps

(i) Upon selection of waste management practice or solution, city officials rely on stakeholder engagement events at step 2, to identify potential groups, businesses, and partners for collaboration.

(ii) City officials and practitioners make contacts and visits to selected collaborators for amplified effort during the initiative implementation.

(iii) It is important that areas of collaboration and support categories from different partners are documented for a clear systematic initiative implementation.

As the best practice and ensuring continuity of decentralized waste management technological solution, the Dar es Salaam C40 ICA fund project ensured community mobilized groups were legally registered. Identified groups (Waste pickers and collectors), were supported to develop a memorandum of understanding (MoU) that was used to register these groups under the ward and city government. For instance, the BUTIAMA Group in the Vingunguti ward became a legal entity to engage in waste management activities. Formal registration of individuals (waste pickers and collectors), group members, and SMEs increased the window of opportunity to sell black soldier fly larvae, produced compost, and increased collection fees. Formalized groups are participating in the initial stages of engaging in competitive pricing, bidding, and waste collection from the LGAs.

The Dar es Salaam City Council project team further established an accountability and assurance program for beneficiary groups, with e-tricycles and/or pushcarts, BSF compost pits producing composts, and black soldier fly larvae (for animal feed production). As part of the formalization and operationalization structure, monthly and quarterly income and expenditure reports of the supported community groups were submitted to the ward government. The ward government includes group reports in periodic reports submitted to the city council providing feedback. Follow-ups from the city and ward government continue to monitor groups and pose improvement conditions for an ensured group's growth and scalability of selected waste management solutions.

Step VIII: Data, Monitoring, Evaluation, Accountability, and Learning Framework.

Summary of Key Considerations

Required time	Actors	Preparation requirements
Throughout the project life cycle.	• City and or Municipal technical officers	• Reviewing recent studies, and released news on waste management gaps, and needs targeting the project area. • Conducting preliminary site visits for validating preliminary knowledge/practice that needs to be scaled or introduced, • Identifying contextualized and top-priority waste management technological solutions • Establish resource requirements to realize the practice (existing opportunities and needs)

Summary of key steps

  i.   *Establishing relevant data and information to be collected during the initiative implementation.*
 ii.   *To formulate a data and information collection framework that aids initiative implementation, and transparency and provides the opportunity for learning from best practices.*
iii.   *Utilize data and information for evidence-based waste solutions and practices formulation and implementation.*

The Dar es Salaam C40 ICA Cities fund project lays a foundation for the need for consistent mentorship, coaching, and governance support of formulated groups working on innovative waste solutions and technologies. Periodic reporting across operation requirements, leadership and project management, and income and expenditure transparency remain key to ensuring sustainable waste management practices in cities. Collected data and information are utilized to maintain operational costs, necessary information for investment, opportunities for growth, and partnerships.

The establishment of initiatives or practice reporting to the DCC through Sub wards and ward governments increased monitoring and evaluation of established decentralized and community-based waste management in the city. The city and municipal councils continue with a close follow-up to all government-supported initiatives and ensure that reporting from community groups and members informs reporting to the ministry responsible for Environment and Climate change through the regional government authority.

The project intervention leaned on level 1 to 3 reporting to ensure the flow of information that amplifies learning and scalability of waste technological solutions from one LGA to the other (Figure 14). DCC envisions this flow of information as key to resource acquisition, partnership, and therefore amplification of Climate action within the city of Dar es Salaam.

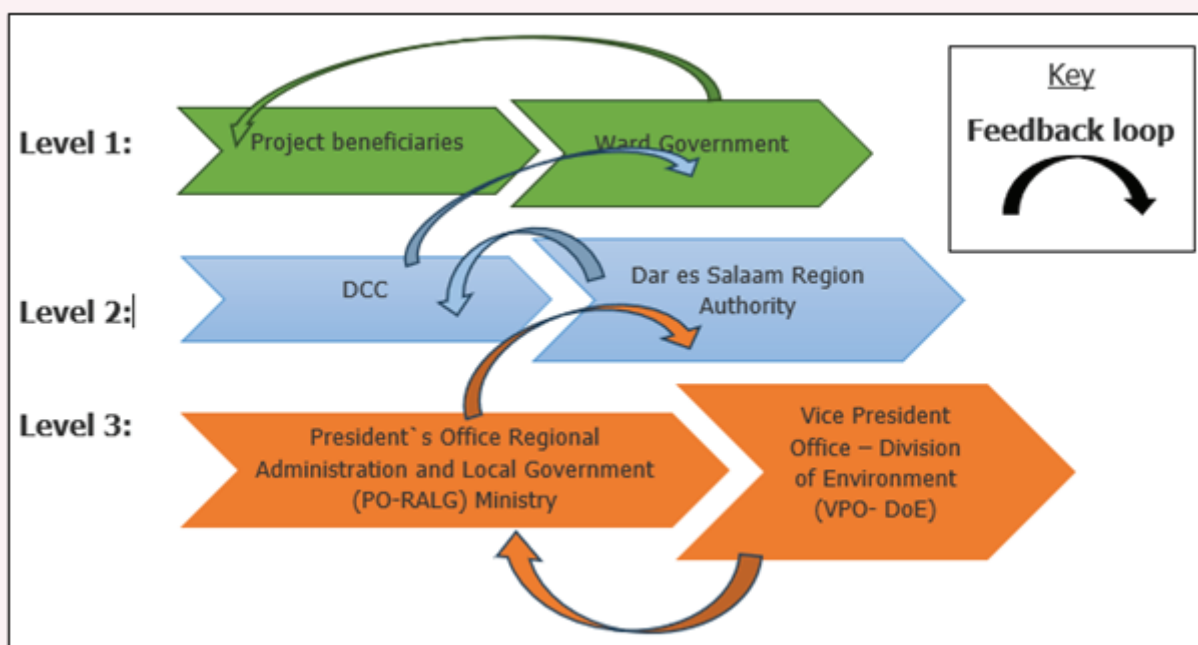*Figure 14: Waste initiative monitoring and reporting loop*

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Formulated community groups, waste picker, and collector groups develop monthly and quarterly reports that become a link to government visibility on existing efforts, challenges, and opportunities to continue serving the people. In addition, the national government collects data that informs the implementation of national waste management and climate change strategies. The Dar es Salaam city council and four municipalities of Dar es Salaam have remained a role model to several local government authorities demonstrating to the national government to implement action that contributes to the realization of the climate change strategy and Paris Agreement binding Nationally Determined Contribution (NDC).

Through this accountability, the ward government will continue to facilitate several groups and ensure decentralized community waste management and that community-based waste management becomes a solution to addressing waste in Dar es Salaam.

Step IX: Identification, Control, and Management of Challenges and Risks

A: Encountering project hindrances and practical resolutions

Mobilizing city residents inhabiting informal settlements to engage in waste management activities goes hand in hand with several challenges rooted in ecological, cultural, and socio-economic affiliations. Cities are characterized by numerous buildings and erected structures that lead to limited space for operating waste-handling activities. Dar es Salaam city project team was able to engage individual waste aggregators, private businesses, and the ward government to acquire land for compost and waste recovery cage construction. Due to raised ambition, the waste aggregators were able to provide land for compost making and waste recovery cage construction. Neighboring groups and individual waste dealers were able to utilize recovery cages for sorting waste, the sale of organic waste for composting, and the sale of recyclables. The lesson learned was that it is important to engage a range of stakeholders to support the project. Government-based entities take time to make decisions to be able to provide assets like land for supporting project activities. Waste aggregators quickly offered land, and that resulted in a quick win of the project implementation.

B: Risk identification, control, and management

Waste management in informal settlements poses various risks to public health, the environment, and overall community well-being. Mitigating these risks requires a multifaceted approach that involves stakeholders at different levels. Here are some common risks associated with waste emanating from informal residences in Dar es Salaam city and relevant mitigation measures:

B-I: Public Health Risks

While piloting an innovative waste solution model, improper waste disposal can lead to the spread of diseases like cholera, Schistosomiasis, and other waterborne illnesses. Contaminated food and water sources due to the mingling of waste with edible items pose a direct threat to public health.

Mitigation Measures

i. Proper Waste Segregation: Prioritized waste management solutions or practices need to emphasize segregating organic and inorganic waste at the source which aids in managing different types of waste appropriately.

ii. Covered Waste Bins: Using covered waste bins prevents the attraction of pests, minimizing the risk of disease transmission.

iii. Awareness Campaigns: Regular campaigns and awareness raising at step 4 of this toolkit will educate the public on the importance of disposing of waste properly to protect their health.

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B-II: Environmental Pollution

Continuous waste solution improvements may lead to incorrect waste disposal that contaminates the environment, leading to soil, air, and water pollution. This can have long-term impacts on ecosystems, biodiversity, and overall environmental health.

Mitigation Measures

(i) Recycling and Reuse: Promoting recycling and reuse reduces the amount of waste sent to land fills, lowering environmental impact.

(ii) Establish Recycling Centers: Convenient access to recycling facilities encourages people to dispose of recyclables properly.

(iii) Eco-friendly Packaging: Encouraging the use of environmentally friendly packaging materials helps reduce pollution from non-biodegradable substances.

B-III. Aesthetic and Nuisance Issues

The accumulation of improperly managed waste contributes to an unclean and visually unappealing environment, impacting the market's attractiveness and hygiene. While mobilizing community groups and individuals, city officials and waste management practitioners need to emphasize housekeeping, proper storage of waste in different sections, and if necessary labeling.

Mitigation Measures

(i) Regular Waste Collection: Timely and consistent waste collection schedules maintain cleanliness in the market area.

(ii) Proper Waste Bins Placement: Strategically placing waste bins with clear signage encourages people to dispose of their waste responsibly.

(iii) Community Cleanup Initiatives: Involving local communities and vendors in regular cleanup events fosters a sense of ownership and responsibility for the cleanliness of their surroundings.

B-IV. Fire Hazards

Combustible materials in waste piles can create conditions conducive to fires, posing a threat to the safety of market infrastructure and nearby areas.

Mitigation Measures

(i) Vendor Education and awareness raising: Educating market vendors about the dangers of improper waste disposal and the risk of fires encourages responsible waste handling.

(ii) Fire Safety Measures: Providing fire extinguishers and ensuring clear access to emergency services helps in preventing and managing fire incidents.

B-V. Economic Impacts

Poor waste management practices result in economic losses due to increased cleanup costs, healthcare expenses, and potential damage to the local tourism industry.

Mitigation Measures

(i) Collaboration with Businesses: Partnering with local businesses and waste management organizations to develop sustainable practices reduces economic burdens.

(ii) Incentive Programs: Offering economic incentives for businesses adopting eco-friendly waste disposal methods promotes responsible waste management.

B-VI. Regulatory Compliance

Failure to comply with waste disposal regulations can result in legal consequences, affecting both individual and community groups engaging in waste entrepreneurship.

Mitigation Measures

(i) Enforcement of Regulations: Ensuring that waste entrepreneurship activities comply with existing waste management regulations through regular inspections and penalties.

(ii) Collaboration with Authorities: Working closely with local authorities to monitor and enforce regulations effectively.

3. Conclusion

The Dar es Salaam city council through the C40 Cities ICA Fund project has demonstrated the importance of the effective inclusion and participation of diversified groups of stakeholders, especially informal workers, in improving the waste management value chain in the entire city of Dar es Salaam.

Community engagement, including field visits, consultations, dialogues, and workshops with at-risk and frontline communities, remains key to increasing awareness and building the capacity of communities and groups that are engaging in modern waste management practices. Systematic inclusion and participation of key stakeholders in both planning and implementation is a winning pathway. Technical, formal, and informal waste sector actors as well as political city leaders can contribute to promoting the financing and sustainability of waste management solutions.

This toolkit, therefore, remains a useful resource in promoting equitable climate action through the integration of diverse groups' ideas in formulating inclusive city programs and policies. This way, systematic waste technological solutions implementation will result in a demonstration of realizing equitable impacts resulting from urban climate actions. Considering frontline communities and low-income earners that represent the city's large population interests increases buy the inn and that resulted in impact benefits a large population of a respective city.

The Dar es Salaam city and municipal councils encourage partnership and collaboration from civil society organizations, academia, research institutions, think tanks, businesses, private sector, and development partners to ensure that more efforts through such accountable waste management modality are set and scaled throughout.

About the Project

The Dar es Salaam Inclusive Climate Action Cities Fund project was implemented to build city officials' capacity to establish a participatory and inclusive planning and implementation approach to organic waste entrepreneurship activities in informal habitats within urban areas.

This project was supported by C40 Cities through the Inclusive Climate Action (ICA) Cities Fund. The ICA Fund is intended to support local governments to ensure city-led climate actions or projects are just, fair, and inclusive and benefit all residents, especially frontline communities, whilst providing the potential for city practices, projects, and/or policies to be institutionalized, replicated and/or scaled in the future. Working with the Dar es Salaam City Council (DCC), the project intended to build the capacity of city staff to mobilize communities in informal settlements to engage in waste management activities and increase waste collection and processing rates, while building climate resilience in at-risk communities.

The project capitalized on existing city practices, knowledge sharing, and technological solutions. It focused on the gaps and needs required for diverting organic waste that emerged from city markets into compost (or biogas) processing. The project promoted the creation of an enabling environment for community-based waste management through the institutionalization of organic waste management recovery in unplanned and low-income wards of Dar es Salaam City Council, particularly the Vingunguti ward. Additionally, the project enhanced the technical capacity of city officials and key actors in the solid waste management value chain to effectively engage frontline communities through community mobilization and skills development.

The main project activities included:
   1. Enhancing capacities of city officials to mobilize informal waste actors (CBOs and Waste pickers) in the solid waste collection sector operating in low-income and unplanned wards of DCC (with a focus on organic waste). The city was able to develop various waste management training modules that city officials were trained on and utilized to mobilize the community to engage in waste management activities. These training modules included basic occupational health and safety; introduction to solid waste management; Community mobilization in waste management; leadership and group dynamics, and communication skills.

   2. Enhancing the capacities of informal settlement inhabitants in organic waste recovery and treatment through a black soldier fly (BSF) constructed organic waste composting cage, and tailor-made push carts for increased waste collection rates in informal residential habitats of the city.

   3. Formulation of the community mobilization field toolkit to aid the planning and implementation of waste management practices in informal settlements of the City of Dar es Salaam.

Through this project, the DCC has demonstrated how to mobilize informal settlement residents in designing and implementing various innovative waste management solutions. The project leaned on tailor-made practices to increase solid waste collection from sub-wards, divert organic waste from being disposed to dumpsites, and promote the processing of organic waste into compost and animal feed.
The project has set a benchmark to guide needed community-based waste management technologies in unplanned/informal neighborhoods in Dar es Salaam and other cities with a similar context across the globe

The Toolkit Essence

This toolkit has been developed in response to the enhancement of inclusive and participatory community mobilization in designing, planning, and implementing various tailor-made waste management solutions in Dar es Salaam city. It can be used in various urban areas, municipalities, and cities in sub-Saharan Africa and elsewhere across the globe.

The toolkit presents a simplified step-by-step approach for designing and implementing a climate-resilient project that prioritizes the participation of diverse community groups, sustainable technical capacities, and local government support to achieve diverse community benefits and ensure sustainable development. This toolkit is hinged on the Dar es Salaam City Council's desire to engage local communities in climate action-related processes, and support city residents to improve livelihoods through engagement in the waste management value chain and to safeguard already existing informal waste sector jobs.

Climate action lies within local communities' day-to-day activities to satisfy living requirements. Effective engagement of communities and frontline groups provides an opportunity to employ various cost-effective, viable, and sustainable waste management solutions and climate actions. Cities, municipalities, and institutions struggle to design tailor-made solutions to effectively address persistent waste management challenges. Recent studies indicate that improper waste management contributes to an increase in greenhouse gas (GHG) emissions. thus, Dar es Salaam City considers this toolkit as an opportunity to implement innovative waste management solutions with communities while building city climate resilience.

This toolkit is a result of the successful execution of the inclusive and participatory waste management project in the Vingunguti ward, part of the Dar es Salaam city council. This toolkit will aid city and municipal officials, practitioners, and project officers in mobilizing and integrating communities into city waste management solutions and building climate resilience. More importantly, this toolkit will provide an opportunity to scale up waste management activities, with a focus on waste diversion from landfills and enhanced organic waste composting.

The toolkit draws experiences of local waste pickers, collectors, aggregators, and small waste businesses in the area through their collaboration with the city to design, plan, and implement waste management activities in the city.

Authors' Profiles

Dativa Byarufu

Ms. Dativa is a seasoned environmental scientist with a wealth of knowledge and expertise in various facets of environmental management. Her passion for the environment is evident in her dedication to bridging the gap between research and practical application, making her an asset in the field of environmental science, climate change, education, and awareness programs. Currently serving as the operations manager for TACSS Tanzania, Ms. Dativa plays a pivotal role in orchestrating the organization's environmental endeavors. Her leadership ensures that projects are executed efficiently and effectively, contributing to positive environmental outcomes.
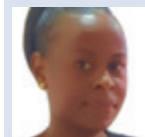
Irene Mwesiga

Ms. Irene's expertise dives into Environmental Management Systems (EMS), Environmental Impact Assessments (EIAs) and Audits (EAs), and Project Management. Irene's expertise also extends toward the inclusion and mobilization of communities to engage in environmental conservation and management. Over the recent years, Ms. Irene has contributed to climate-inclusive action for youth, women, and low-income earners to drive the climate action agenda. Presently, she holds the role of National Coordinator at TACSS Tanzania, actively engaged in project design, executing, overseeing, and assessing projects, all aimed to continuously enhance practices and achieve tangible results

Shabani Hamisi

Mr. Shabani has served as Programme Lead Support at the Tanzania Alliance for Climate and Sustainable Society (TACSS Tanzania) with a robust background in community mobilization and climate-resilient actions since 2021. In this role, he provides strategic leadership and technical support for climate adaptation activities, including mainstreaming climate change into programs, promoting climate-resilient livelihoods, and advocating for policy changes aligned with national climate strategies. He coordinates project activities, manages budgets, and facilitates stakeholder communication.
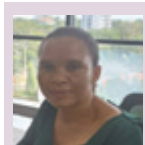
Anna S. Nyangi

A professional, dedicated, and ambitious expert in mobilizing climate-vulnerable groups in addressing socio-economic challenges in low-income earning communities. Her expertise has been key to developing tailor-made solutions for the inclusivity of women, youth, elders, and low-income earners in addressing health, climate change, and livelihood challenges. From time to time, Ms. Anna has been fundamental to community inclusion and participation-based project design, planning, and implementation at TACSS Tanzania. Her contribution has been hinged on ensuring that rural and city residents become part of the solution to problems facing their livelihood and improvement to better wellbeing.

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Appendices
Appendix 1: Sample of Stakeholders' Survey and Assessment Tools
Waste Pickers Survey tool

S/N	Information Required
1	Name of Interviewer
2	Date of the interview
3	Name of the Waste Picker
4	Service area
5	What is your gender?
6	How old are you?
7	What is your educational level?
8	Are you part of any waste picker associations or groups?
9	How long have you been working as a waste picker?
10	What types of waste do you typically collect?
11	Where do you collect waste from?
15	How often do you collect waste?
16	What methods do you use to collect waste?
17	What do you do with the waste you collect?
25	Do you have access to proper tools and equipment for waste picking?
26	Are there any resources (such as gloves, masks, etc.) that you lack in your work? if yes, list them.
27	How satisfied are you with your income from waste picking?
28	How much do you earn from waste picking per day/week/month?
29	What are your main expenses?
30	Do you have any savings?
31	Are there alternative livelihood options you would be interested in exploring? if yes, list them.
32	What are the main challenges you face as a waste picker?
33	What opportunities do you see for waste picking?
34	Are you aware of the different types of waste and their potential hazards?
35	Do you know how to properly handle and dispose of hazardous waste?
36	Are you aware of the environmental and health risks associated with waste picking?
37	Have you received any training on waste picking or waste management?
38	If yes, please specify the type of training and duration.
39	Do you have knowledge of safety practices while collecting waste?
40	Have you experienced any health issues related to your work as a waste picker?
41	If yes, Describe the issue
42	Are you aware of the potential hazards associated with certain types of waste?
43	Are there specific areas of waste management that you feel you need more knowledge about?

S/No	Information Required
44	If yes, Describe the Area of Waste management you need more knowledge about
45	What format of training do you prefer?
46	Are there specific topics you would like to be covered in training programs? if yes Describe
47	Do you feel socially recognized for your contribution to waste management?
48	Do you have access to any support services for waste pickers?
49	If yes, Describe the support you can access
50	What kind of support would be most helpful to you as a waste picker?
51	What are your plans for the future?
52	Do you want to continue working as a waste picker?
53	If not, what are your other options?

Community-based organization/wantrepreneur Assessment tool

S/No	Information Required
1	Interviewer
2	Date of interview
3	Name of organization
4	Date of Establishment (Registration)
5	Type of Organization
6	General services/role of the Organisation
7	Name
8	Phone
9	Position
10	Total
11	Number of Males
12	Number of females
13	Is your organization a member of an umbrella organization
14	Name of the Umbrella organization
15	Do you have a collection point / Workshop?
16	If yes, to whom does it belong?
17	If yes, where is it located? (street, ward)
18	What are the main activities at your site?
19	How big is the collection point area (Squire meter)?
20	Does it satisfy the need?
21	Are you aware of the different types of waste and their potential hazards?
22	Do you know how to properly handle and dispose of hazardous waste?
23	Have you received any training on waste management?
24	If yes, please specify the type of training and duration
25	Do you have knowledge of safety practices while managing waste?
26	Have any of the workers experienced any health issues related to your work in waste management?
27	Are your workers aware of the potential hazards associated with certain types of waste?

28	Are there specific areas of waste management that you feel you need more knowledge about?
29	What format of training do you prefer for your organization?
30	Are there specific topics you would like to be covered in training programs? if yes list them
31	Which area does the organization concentrate on?
32	Number of staff working at present
33	Average monthly salary (cash, kind)
34	Are you serving more than one Ward/street?
35	Service area (street, Ward), if yes list them all
36	Do you have multiple waste sources in your area?
37	If yes, List the waste sources in your area
38	Total number of households
39	Number of households served
40	How many businesses are served
41	Types of businesses served
42	How many households/business units pay the fee regularly?
43	Do the number of households that pay change?
44	If yes, how was the trend and why?
45	Type and capacity of vehicle/cart/machine you use to operate?
46	Are there any innovative technologies or methods employed by your organization in waste management?
47	If yes, describe
48	Amount of waste collected and brought to the collection point per day (kg /tons, volume)
49	Organic waste (food remains, fruits, vegetables ......)
50	Grass and leaves
51	Newspaper
52	Cardboard, boxes
53	Wood and wood waste
54	Glass bottles
55	Other types of glass
56	Plastic bottles (PET)
57	Metal (tins, rods, wire, other...)
58	Aluminum
59	Other
60	Is there any sorting at the source?
61	If yes, which types are sorted?
62	Contact person's name
63	Phone
64	Does your organization provide training or capacity-building programs for your staff in waste management techniques?
65	How is the LGA official's involvement in SWM at the Moment?
66	How does your organization engage with the local community to promote waste management awareness?
67	What challenges do you normally face in waste collection?