



GARID
GREATER ACCRA RESILIENT AND
INTEGRATED DEVELOPMENT



**GREATER ACCRA RESILIENT AND INTEGRATED
DEVELOPMENT (GARID) PROJECT**

MINISTRY OF SANITATION AND WATER RESOURCES



FINAL REPORT
SOLID WASTE MANAGEMENT IMPROVEMENT PLAN

JUNE 2021



EXECUTIVE SUMMARY

The Component Two of the Greater Accra Resilient and Integrated Development (GARID) Project focuses on Solid Waste Management capacity improvements in the 17 municipalities of the Odaw River Catchment. Specifically, Component Two has been designed to reduce the amount of solid waste flowing into the primary Odaw River or Drain. Prime emphasis has been laid on the reduction of the municipal solid waste that ends up in the ocean, thus, reducing the level of marine litter and the overall environmental protection of the Odaw Basin.

The scope of interventions that was contemplated under Component Two of the GARID Project includes:

- Community-based Solid Waste Management (SWM) interventions in targeted low-income communities
- Implementation of a major outreach program to sensitize and improve public behaviour on SWM and, litter management
- Provision of SWM infrastructure including construction of waste transfer stations, capping of old dumpsites, and improvements at final waste disposal sites.

Specifically, the scope of this assignment encompassed processes towards the development of a Solid Waste Management Improvement Plan (SWMIP) which will form the basis for service improvements in the Odaw Catchment, especially in low-income communities. Geographically, the assignment covers 17 Metropolitan and Municipal Assemblies (MMAs) in the Greater Accra Metropolitan Assembly (GAMA).

As part of the process for developing the Solid Waste Management Improvement Plan, a comprehensive assessment was conducted on the Municipal Solid Waste Management System within the Odaw Catchment. The assessments include: Waste Characterisation, Refuse Mapping, Hydrological and Drainage systems, Recycling Systems and Community Surveys (User Satisfaction and Willingness to Pay for Improvements, Knowledge, Attitudes and Practices and Anti-Littering). Summaries of the findings of these assessments have been presented in this report.

In addition to the above, a situational analysis of the Municipal Solid Waste Management (MSWM) system of the 17 municipalities within the Odaw River Catchment was conducted. The assessment was done using the Integrated Sustainable Waste Management (ISWM) analytical framework, that is the WasteAware Benchmark Indicator tool. The ISWM indicator set examines both the physical components (collection, disposal, treatment, and recycling) and the governance aspects (inclusivity, financial sustainability, national policy framework, and local institutions) required to deliver a self-correcting and sustainable MSWM.

Based on the assessment of the entire MSWM system, the key issues and needs along the Solid Waste Management value chain was analysed. This formed the basis of the proposals made in the Solid Waste Management Improvement Plan. The keys issues and needs identified in the analysis have been succinctly presented as follows:

- **Mixed waste at point of generation:** The Odaw Catchment has an estimated total household of 832,478 with waste generation rate of 0.70 kg/cap/day. The daily and annual tonnage of waste generated within the catchment stands at 2,914.39 and 1,063,753.30, respectively. Waste composition consists of Organics (food and green wastes) 51.59%, Paper 3.62%, Plastic 16.69%, and Metals 1.55 %, with a density of mixed loose solid waste of 320.70 kg/m³, and a Moisture content of 50%. Most households mix all their waste during storage. Mixed waste reduces value of recyclables generated at the household level. Households rarely practice source separation. This is perhaps because of inadequate access to standard waste containers for households to practice source separation.
- **Inadequate services by Formal Service Providers (FSPs) especially in Low-Income Communities (LICs):** In all the 17 municipalities, communities have been zoned and assigned to Formal Service Providers (FSPs) to collect solid waste. The frequency of collection by FSPs is inadequate and a major cause to accumulation of waste and littering in the communities. Also, the frequency of MSW collection does not meet the expectations of users within the catchment.
- **Potential of Informal Service Providers to support MSW Collection in Low-Income Areas:** Formal service providers have been inefficient especially in low-income communities; creating opportunities for the informal service providers to fill in these gaps. The ISPs though not organized and integrated within the system still provides personalized and reliable MSW collection services to their clients. Currently they collect more than 50% of all MSW collected in the 17 MMAs within the Odaw River Catchment and have the potential to improve collection services within the LICs, if supported.
- **High incidence of littering:** The absence of oversight on the activities of the ISPs contribute to a high incidence of illegal refuse points within MMAs. Also, poor servicing of communal containers and litter bins result in overflowing of communal containers leading to littering in drains. About 75% of communal container sites are characterised by high incidence of littering, mostly as a result of low frequency of collection of litter bins placed at terminals, markets, and other public places.
- **Inadequate data on Solid Waste Collection:** MMAs do not have a management information system for MSWM, neither do they have the capacity and the required resources to collect reliable data for effective planning.
- **Service user inclusivity in Solid Waste Planning and Monitoring:** Service user engagement, participatory decision making, monitoring and feedback is not widespread in most MMAs. Thus, the limited user inclusive initiatives partly contribute to littering, illegal dumping, and refusal to pay user charges. Users are not considered active participants in the municipal solid waste management system.
- **High informal recycling sector:** The recycling sector is dominated by informal service providers. The actors can increase their capacity and employ more workers, but they are restricted by working space and financial resources. Also, they are in competition with most foreign formal recycling companies. Sixty-two (62) recyclers and two (2) innovators identified within the catchment covert materials reclaimed by informal waste pickers into pellets and flakes (IWPs).
- **Informal Waste Pickers (IWP) can support delivery of recyclables to Bring-Back Centres:** IWP are the main drivers of MSW recycling within the catchment. IWPs

contribute to an estimated MSW recycling rate of 18% generating more than US\$ 22 million annually through their recovery and recycling operations. However, they are mostly unorganized, working as free riders with poor oversight control of their activities. Together, the informal waste pickers (IWPs), the itinerant waste pickers and the informal service providers (ISPs) recover 22.5% of all MSW disposed annually within the Greater Accra Metropolitan Area (GAMA).

- ***Inadequate number of Composting and Anaerobic Digestion Plants:*** The assessment revealed that more than 50% of MSW is organic waste. However, there is currently limited potential market for source separated materials, especially biodegradables. Also, the inadequate number of treatment plants limits the potential sustenance of waste segregation at source. There are only 4 privately owned composting and anaerobic digestion plants within GAMA.
- ***Lack of fully controlled disposal facility for solid waste:*** About 95% of all MSW collected is sent to landfill sites. Landfill sites are poorly managed, and currently there is no evidence of environmental monitoring and verification at the landfill sites. For instance, Gas collection systems at the Kpone landfill are underutilised or not in use. Land requirements and the use of landfills in disposal for the MSW in the catchment is unavailable, expensive and contributes to a high collection and transportation cost.

The (SIP) has been formulated based on the findings from the comprehensive assessment of the MSWM system and the situational analysis of the prevailing waste culture of residents within the 17 MMAs within the Odaw River Catchment. The SIP has been modeled not only to improve the physical components, but most importantly the governance aspects in a holistic manner; and, to support both service providers and service users with incentives to motivate them towards system sustainability.

The overarching goal of the SIP is to support the implementation of a results-based solid waste collection service delivery within the Odaw River Catchment. The SIP has been developed for a 10-year period – all things being equal, the various interventions proposed within this plan is targeted to yield marked improvements in MSW collection, recycling, treatment, disposal, litter prevention, monitoring, and data management in a 10-year period. The commencement of implementation of the plan in 2021.

The proposed strategies and interventions towards the improvement of the MSWM across the 17 municipalities have been captured under five main themes. Each of the themes have sub-themes which further organizes the various strategies and interventions proposed under the Solid Waste Management Improvement Plan. These themes are as follows:

Thematic Focus One: Improve Solid Waste Service Delivery

Generation and Storage:

- Design a three-stream source segregation model for adoption in the selected communities and markets
- Update the data on all selected low-income communities (*households, institutions, transport terminals and markets*) with geo-referenced data
- Procure and distribute receptacles for the segregation of household solid waste at source.

- Engage service providers and municipal representatives to collaborate with institutions to determine their required quantities and volumes of receptacles and monitor the acquisition of same by all institutions.

Collection and Transport:

- Engage FSPs and ISPs on the Implementation Action Plan within the 4 No. communities
- Conduct a catchment-wide cleaning and removal of all existing refuse dump sites
- Collect stored recyclable MSW once every week, but twice a week for biodegradable MSW and others from households in the catchment
- Clean markets, collect and handle segregated waste and pay for the discharge and transportation
- Transport all recyclables to sell to bring-back centres for further segregation into streams
- Provide incentives to households, institutions who segregate MSW through service fee reduction

Reuse, Recycling and Disposal

- Mobilize relevant stakeholders towards the formation of the foundation; Develop operational mandate for the running of the foundation; Create a seed fund for the foundation.
- Provide office space for recycling foundation
- Enumerate and profile the IRs within the Catchment; Register all interested IRs; Facilitate the formation of 4 No. cooperatives of IRs; Train and equip IRS cooperatives
- Identify market opportunities and stakeholders
- Sensitize farmers and communities on compost product usage; Establish a demand and supply agreement between stakeholders for the purchase of compost products; Monitor and learn
- Collaborate with private sector for the construction of a new composting and anaerobic treatment plant
- Procure 5 No. Recycling Extruders, 5 No. Pelletizers, 5 No. Crushers and Washers for use by high chain IRs

Thematic Focus Two: Create efficient mechanisms for Litter Management

Sensitization and Education on Anti-Littering:

- Engage musical artists to compose Anti-littering songs in at least three dominant local languages for education and awareness creation
- Engage FM and TV Stations with wide transmissivity and relatively high number of listeners to systematically play Anti-Littering Songs.
- Erect large billboards with simple but clear Anti-littering messages at the main corridors/entry points to the GAMA.
- Engage experts as panellists on FM and TV Stations to discuss the effect of littering, the proposed plans for litter prevention
- Engage religious institutions to dedicate some time every week (continuously for at least 6 months) to allow for designated experts to promote litter prevention
- Develop anti-littering communication plan and educational materials
- Mass production of communication and educational materials.

Innovations for handling litter in Public and communal spaces:

- Procure, distribute and install 200 Litter Bins within 4 selected communities; Develop a plan to empty litter bins; Engage ISPs or MMAs to empty bins; Identify public spaces for the installation of 5 bulletin billboards
- Design and Install 5 Bulletin Billboards to create awareness on litter prevention
- Liaise with the management of landfills to improve uptake of MSW
- Mandate cooperatives to start the collection of MSW within selected communities
- Mandate cooperatives or MMAs to empty Litter bins

Community-led advocacy and reward systems for Litter Management:

- Organize stakeholder validation workshop on the final RBF and Implementation Action Plan.
- Engage MCEs and MCDs on the final MSWSIP, RBF and Implementation Action Plan
- Sensitize the selected communities to empower and create ownership of action plan
- Profile the 4 No. selected communities and markets for project implementation; Identify community structures, gatekeepers & community champions; Develop a structure to support waste collection intervention and litter prevention
- Facilitate the establishment of the committees
- Train committees for waste collection
- Engage community leaders, market queens, transport terminal leaders, and leaders of informal settlements to assume responsibility for litter prevention and cleanliness
- Appoint and support key influencers in slum settlements, as MSWM representatives/ attendants to see to the day-to-day management of litter and MSW

Thematic Focus Three: Strengthen municipal governance for SWM:

Enhanced Institutional and Stakeholder Capacity for MSWM:

- Training Programme for Selected Metropolitan/ Municipal Officers
- Training Programme for Selected Informal Sector Players
- Training Programme for Selected Formal Waste Management Companies
- Assess the human resource requirements of the EHSU & WMD in beneficiary MMAs
- Facilitate the recruitment of the required number of staff for the EHSU and WMDs in beneficiary MMAs
- Support Engagement Activities towards the amendment of the Local Government Act to enable the establishment of Waste Management Departments in Municipalities.

Planning and regulatory arrangements for MSWM.

- Review the Solid Waste Management Component of the MESSAPs
- Review and Update Structure Plans for the 17 Municipalities
- Support Physical Planning and Works Departments of MAs to conduct development control activities within the Basin
- Review and update fines for Solid Waste and Littering related Offences (to be more punitive and enforceable)
- Support the operation of sanitation courts or “sanitation court days”
- Enforce Littering and Solid Waste Management Related Byelaws
- Enforce Byelaws related to Environmental Sanitation within Catchment Areas (e.g., Toilet Ownership)

Thematic Focus Four: Ensure effective monitoring, evaluation, and learning

Development of MEL Framework:

- Assess the existing MEL framework and procedures at the national and MMA levels

- Define appropriate indicators to measure progress and achievement of each thematic area
- Establish procedure for the conduct of MEL at all levels that aligns with existing structures
- Set-up the National, Inter-Jurisdictional, Metro/Municipal, and Community MEL Teams
- Assess the capacity needs of the respective MEL Teams and train them on the MEL Framework

Conduct of Monitoring, Evaluation and Learning:

- Conduct of routine monitoring by the respective MEL Teams
- Preparation of Monthly Reports on activities by MEL Teams
- Preparation of Quarterly Monitoring Reports on strategy implementation
- Set-up and run of a Remote Sensing Monitoring System
- Develop Cleanliness Verification Protocol and Train municipal level actors
- Institute a half-yearly competitive Cleanliness Assessment among the 17 municipalities
- Organise Annual Review Meetings on implementation progress
- Conduct two Mid-Term Evaluations and End-of-Project Evaluation
- Institute and Support Monthly Metro/ Municipal Level Learning Alliance
- Organise Quarterly Inter-Jurisdictional Learning Alliances
- Produce, publish, and disseminate Quarterly Briefs on strategy implementation
- Conduct Annual Policy Dialogue of on Low-Income Community MSWM,
- Produce Factsheets (10) based on lessons from the implementation of the strategy
- Produce Policy Briefs (3) on Low-Income Community SWM.
- Open multi-media Platforms for dissemination of project information

The summarized Action Plan with Cost Estimates and Schedules for the implementation of the MSW improvement strategy within the Odaw river catchment attached as an annex.

Summary of Cost Estimates

Thematic Area	Cost Estimates				
	Recurrent Expenditure (\$)	Capital Investment (\$)	Total Budget (\$)	Total Budget (GHC)	% of Total Budget
Solid Waste Service Delivery	1,880,200.00	4,525,000.00	6,405,200.00	37,150,160.00	10.7
Litter Management	1,927,600.00	542,000.00	2,469,600.00	14,323,680.00	4.1
Governance (Including Enforcement)	3,644,000	0	3,644,000.00	21,135,200.00	6.1
Monitoring Evaluation & Learning	2,566,200.00	0	2,566,200.00	14,883,960.00	4.3
Equipment & Infrastructure	0	43,946,085.00	43,946,085.00	254,887,293.00	73.4
Project Coordination	850,000.00	0	850,000.00	4,930,000.00	1.4
	10,868,000.00	49,013,085.00	59,881,085.00	347,310,293.00	100.0

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LIST OF ABBREVIATIONS

ACARP	-	Accra Composting and Recycling Plant
ADMA	-	Adentan Municipal Assembly
AEMA	-	Ayawaso East Municipal Assembly
AfDB	-	African Development Bank
AMA	-	Accra Metropolitan Assembly
AMOS	-	Analysis of Moment Structure
ANMA	-	Ayawaso North Municipal Assembly
AWMA	-	Ayawaso West Municipal Assembly
CFA	-	Confirmatory Analysis
COVID-19	-	Corona Virus Disease 2019
EHO	-	Environmental Health Officer
EPA	-	Environmental Protection Agency
FSPs	-	Formal Service Providers
GAMA	-	Greater Accra Metropolitan Area
GARID	-	Greater Accra Resilient and Integrated Development
GCMA	-	Ga Central Municipal Assembly
GEMA	-	Ga East Municipal Assembly
GNMA	-	Ga North Municipal Assembly
GPS	-	Global Positioning System
GWMA	-	Ga West Municipal Assembly
HDPE	-	High-density Polyethylene
IRC	-	Informal Recyclable Collector
IRECAP	-	Integrated Recycling and Compost plant
IRECOP	-	Integrated Recycling and Composting Plant
ISPs	-	Informal Service Providers
ISWM	-	Integrated Sustainable Waste Management
IWM	-	Integrated Waste Management
IWS	-	Informal Waste Sector
KAP	-	Knowledge, Attitude and Practice
KoKMA	-	Korle Klottey Municipal Assembly
LaDMA	-	La Dadekotopon Municipal Assembly
LaNMMA	-	La Nkwantanang-Madina Municipal Assembly
LDPE	-	Low-density Polyethylene
LICs	-	Low Income Communities
MA	-	Municipal Assembly
MBT	-	Biological Mechanical Treatment Plant
MCD	-	Municipal Coordinating Director
MCE	-	Municipal Chief Executive
MEHO	-	Municipal Health and Sanitation Officer
MESTI	-	Ministry of Science, Technology, and Innovation
MLGRD	-	Ministry of Local Government and Rural Development

MMA	-	Metropolitan and Municipal Assembly
MPO	-	Municipal Planning Officer
MSW	-	Municipal Solid Waste
MSWM	-	Municipal Solid Waste Management
MSWR	-	Ministry of Sanitation and Water Resources
MWH	-	Ministry of Works and Housing
NGO	-	Non-Governmental Organisation
NIMBY	-	Not In My Backyard syndrome
NPAP	-	Ghana National Plastic Action Plan
PAR	-	Participatory Action Research
PET	-	Polyethylene Terephthalate
PMU	-	Project Management Unit
PP	-	Polypropylene
PPE	-	Personal Protective Equipment
RBF	-	Result Based Financing
RORO	-	Roll-on-Roll-off
SDGs	-	Sustainable Development Goals
SEM	-	Structure Equation Modelling
SIP	-	Service Improvement Plan
SPSS	-	Statistical Package for Social Science
SW	-	Solid Waste
SWM	-	Solid Waste Management
ToR	-	Terms of Reference
TREND	-	Training, Research and Networking for Development

1. INTRODUCTION

1.1 Overview of the GARID Project

The Greater Accra Resilient and Integrated Development (GARID) Project is a World Bank-sponsored project being implemented by the Ministry of Works and Housing (MWH), the Ministry of Sanitation and Water Resources (MSWR) and the Ministry of Local Government and Rural Development (MLGRD). The Project is being implemented across 17 Metropolitan and Municipal Assemblies (MMAs) in the Greater Accra Metropolitan Area (GAMA) which falls within the Odaw River Catchment. The Project is expected to be implemented within a six-year duration (2019 – 2025).

The development objective of the Project is to improve flood risk management and Solid Waste Management (SWM) within the Odaw River Catchment of the Greater Accra Region; and to improve access to basic infrastructure and services in selected communities within the Odaw River Basin. To effectively achieve the objective, the Project will adopt a result-based community incentive mechanism to improve the management of Municipal Solid Waste (MSW) in communities within the Odaw River Catchment.

The GARID Project has four (4) main components, as shown below:

<i>Component 1:</i>	<i>Component 2:</i>	<i>Component 3:</i>	<i>Component 4:</i>
<i>•Climate Resilient Drainage and Flood Mitigation Activities</i>	<i>•Solid Waste Management Capacity Improvements</i>	<i>•Participatory Upgrading of Targeted Flood Prone LICs & Local Government Support</i>	<i>•Project Coordination and Management</i>

Figure 1: Components of GARID Project

The Component Two of the GARID Project is hosted by the Ministry of Sanitation and Water Resources (MWSR). In 2020, the Project Management Unit (PMU) of the GARID Project and the Ministry engaged a Consortium; Training, Research and Networking for Development (TREND) and URBA Consulting to provide technical support to the implementation of Component Two of the Project.

1.2 Objectives of the GARID Project – Component 2

This assignment falls under the Component Two of the GARID Project which focuses on Solid Waste Management capacity improvements in the 17 municipalities of the Odaw River Catchment. Specifically, Component two has been designed to reduce the amount of solid waste flowing into the primary Odaw River or Drain. Prime emphasis has been laid on the reduction of the municipal solid waste that ends up in the ocean, thus, reducing the level of marine litter and the overall environmental protection of the Odaw Basin. The scope of interventions under Component Two (as stated in the Project Appraisal Document) include:

- *Community-based SWM interventions in targeted low-income communities*
- *Implementation of a major outreach program to sensitize and improve public behaviour on SWM and, litter management*
- *Provision of SWM infrastructure including construction of waste transfer stations, capping of old dumpsites, and improvements at final waste disposal sites.*

1.3 Scope of Services

The scope of the services to be provided under the Assignment is in two parts: – the content of services and geographical facets. In terms of the content, the scope is expected to result in the development of a Solid Waste Management Improvement Plan (SWMIP) which will form the basis for service improvements in low-income communities within the Odaw Catchment. The main tasks relating to the assignment based on the Terms of Reference (ToR) are summarized in Box 1.

Box 1: Main Tasks of the Assignment

a. Assessment of the Solid Waste Management Services:

Task 1.1 Literature Review: Review of all available scholar works on SWM in Ghana and similar developing country context to provide a theoretical and conceptual foundation.

Task 1.2 Waste Characterization: Systematic collection and analyses of the MSW to ascertain the waste quantities and compositions, and the mapping of all refuse points.

Task 1.3 Litter Management: Description of the existing infrastructure and hydrological system within the Catchment, including the analysis of the problem of waste.

Task 1.4 Community Surveys: Surveys on peoples' behaviour in waste storage, discharge, and preferences; Demand and Willingness to Pay; Knowledge, Attitude and Practice of segregation at source; Analysis of the reasons for litter in the Basin; and Litter enforcement.

Task 1.5 Equipment and Facility Inventory: Capturing all the equipment and facilities available and used for solid waste management activities in the 17 MMAs.

Task 1.6 Recycling Systems: Existing recycling activities within the Solid Waste sector analysed to provide understanding about the flow of materials within GAMA.

Task 1.7: Sustainable Financing Mechanisms: Analysis of the financing mechanisms for municipal solid waste management and alternative financing arrangements within the sector.

b. Option Analysis:

Based on a detailed assessment of the Municipal Solid Waste Management System, options analysis to identify and evaluate the practical options available for addressing each aspect of sustainable solid waste management towards the development of the Improvement Plan, and the Litter Management Strategy.

c. Results-based Community Incentive Mechanism:

Again, based on the assessment of the MSWMS in the Odaw Catchment a results-based financing (RBF) mechanism will be modelled to ensure cost recovery, and the introduction of incentive mechanisms to support solid waste management improvements in the Odaw River Catchment.

Geographically, the assignment covers 17 Metropolitan and Municipal Assemblies (MMAs) in the GAMA. The focus of the study is on low-income communities within these MMAs which fall within the catchment of the Odaw Basin. The boundary of the Odaw catchment is shown in Figure 2. The Consortium is expected to collaborate with Consultants and Non-Governmental Organisations working on Components One and Three of the GARID Project especially in relation to community engagement activities. The 17 beneficiary MMAs have been listed in Box 2.

Box 2: Beneficiary MMAs under the GARID Project

Names of Metropolitan and Municipal Areas	
1. Accra Metropolitan Assembly (AMA)	10. Adentan Municipal Assembly (AdMA)
2. Ablekuma Central Municipal Assembly (AbCMA)	11. Ga Central Municipal Assembly (GCMA)
3. Ablekuma North Municipal Assembly (AbNMA)	12. Ga East Municipal Assembly (GEMA)
4. Ablekuma West Municipal Assembly (AbWMA)	13. Ga North Municipal Assembly (GNMA)
5. Ayawaso Central Municipal Assembly (ACMA)	14. Ga West Municipal Assembly (GWMA)
6. Ayawaso East Municipal Assembly (AEMA)	15. La Dadekotopon Municipal Assembly (LaDMA)
7. Ayawaso North Municipal Assembly (ANMA)	16. La Nkwantanang-Madina Municipal Assembly (LaNMMA)
8. Ayawaso West Municipal Assembly (AWMA)	17. Okaikwei North Municipal Assembly (ONMA)
9. Korle Klottey Municipal Assembly (KoKMA)	

1.4 Context of the Report

This Solid Waste Management Improvement Plan Report captures a summary of the Assessment of the Municipal Solid Waste Management Systems in the 17 MMAs under the GARID Project and the Proposed Solid Waste Management Improvement Plan.

1.5 Structure of the Report

This Report been structured in seven (7) main sections as follows:

- The Section One (1) provides an overview of the GARID Project, the objectives and scope of the assignment, context to the report and report outline.
- Section Two (2) provide summaries of the Municipal Solid Waste Management Assessment Reports
- The Section Three (3) presents the synthesis of the Municipal Solid Waste System Assessment in all 17 MMAs and the analysis of Issues and Needs relating to Solid Waste Management in the Odaw River Catchment
- Section Four (4) presents the Solid Waste Management Improvement Plan Report.
- Section Five (5) presents the Success and Failure factors of implementing the SIP
- Section Six (6) details out the Environmental and Social Safeguards
- Section Seven (7) provides the Cost Estimates for the Implementation of Solid Waste Management Improvement Plan

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

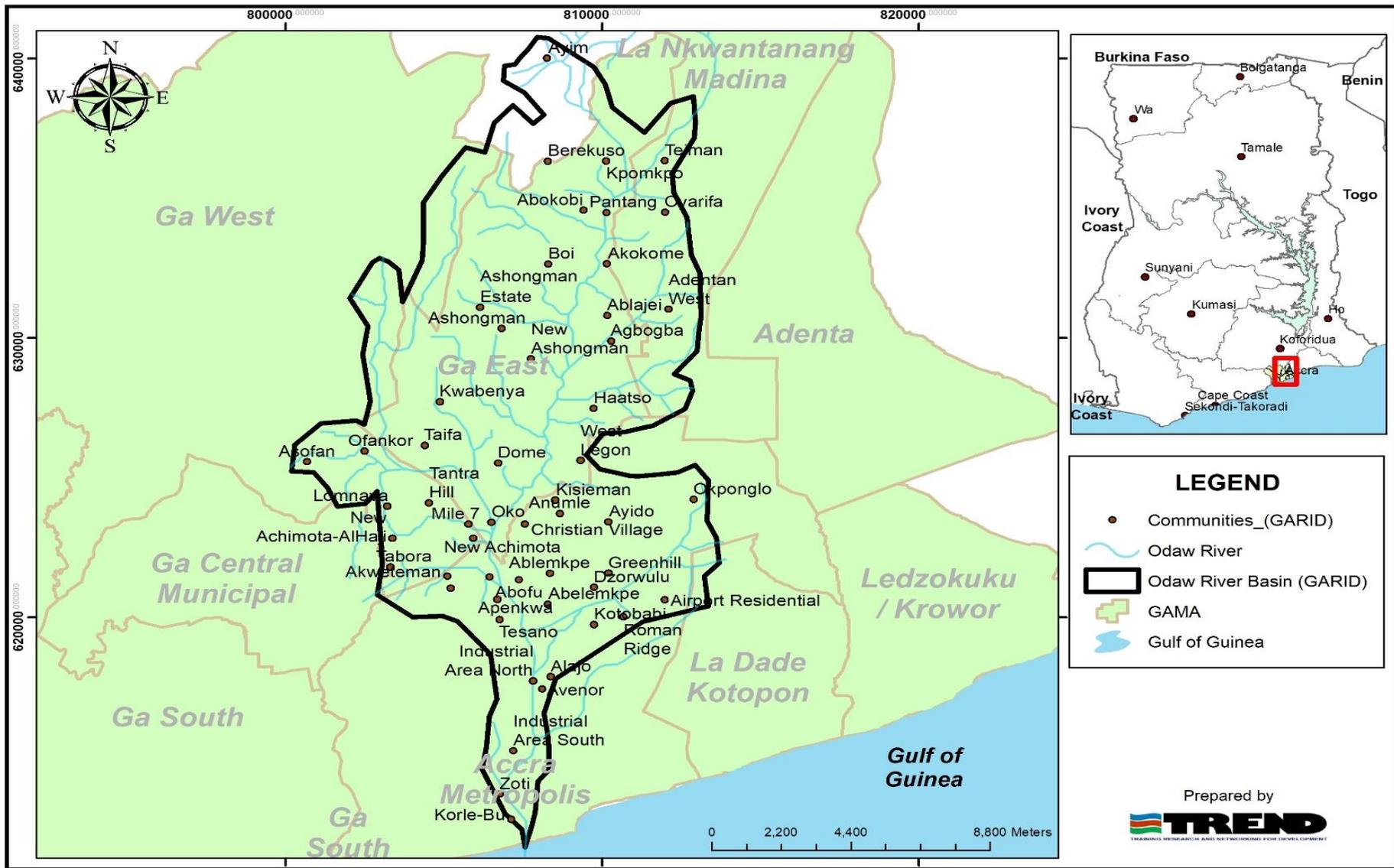


Figure 2: Map of Project Area Source, TREND-URBA Consortium, 2020

2. ASSESSMENT OF THE MUNICIPAL SOLID WASTE MANAGEMENT WITHIN THE ODAW CATCHMENT

2.1 Introduction

This section of the report presents the summary of all the different assessments carried out under this assignment. Prior to commencement, literature relating to the sub-themes under this assignment were reviewed to provide the foundation for the design of the other assessments. It is worthy to note that the full report of all these assessments discussed under this section have been submitted in previous reports under this assignment. The assessments include: Waste Characterisation, Refuse Mapping, Hydrological and Drainage systems, Recycling Systems and Community Surveys (User Satisfaction and Willingness to Pay for Improvements, Knowledge, Attitudes and Practices and Anti-Littering). The summaries of the findings from the various assessments have been presented below.

2.2 Summary Literature Review

In line with the requirements of the ToR, the Consortium, comprehensively reviewed relevant literature (local reports and scholarly literature on Municipal Solid Waste Management) based on the themes and sub-themes of the Project namely:

- Municipal Solid Waste Characterization
- Municipal Solid Waste Collection, Disposal and Recycling
- Assessments of Municipal Solid Waste Management Systems
- Solid Waste Recycling Behaviour
- Municipal Solid Waste Management Financing, Institutions and Policies
- Stakeholder Participation and Inclusivity
- Litter Management
- Results-based Financing
- Solid Waste Improvement Plans and Strategy

The available literature was identified and reviewed towards the realization of the objectives of the Project. These sets of scholarly literature and reports were carefully selected to provide relevant data and information on the physical components, governance, and behavioural aspects of the municipal solid waste management (MSWM) system of Ghana and similar developing country cities. In addition, literature on the linkages with land-use patterns and solid-waste related flooding was also reviewed. The Consortium also reviewed several reports, plans, Acts, and franchise agreements within the municipalities. This provided a working definition of Municipal Solid Waste (MSW) in the context of this Project and further described two major Solid Waste Management (SWM) frameworks: the Integrated Waste Management (IWM) and the Integrated Sustainable Waste Management (ISWM) upon which real and sustained improvements in service delivery can be achieved. The aim of the review was to bring the Consortium to speed on the available information and existing MSWM practices within developing economies and especially in the municipalities within the catchment area of the Project.

2.3 Summary of Waste Characterizations and Waste Projections

The waste characterisation exercise comprised field determination of solid waste generation rates, field composition analysis, and the projection of waste quantities in the municipalities within the Odaw Basin. The Municipal Solid Waste (MSW) for the exercise was collected randomly from households within 12 out of 17 MMAs, from traders within the three largest markets within the catchment and from 19 institutions. Twenty households were randomly selected in each of the 12 municipalities (grouped into three income divides) for the analysis. A total of 3750 samples of different weights and sizes (2600 samples from households, 700 from markets and 450 from institutions) were analysed for 10 days in August 2020.

The analysis in the GAMA points to an average MSW generation rate of 0.70kg per capita per day and 0.78 kg per capita per day for households and institutions, respectively. Markets recorded an average of 1.31kg per shop per day. The result for households is closer to the averages (0.72 kg) and (0.71 kg) respectively in earlier solid waste characterization studies for metropolitan cities of Ghana (Miezah et al., 2015; Oduro-Appiah et al., 2017), but above the average 0.54 kg estimate for developing countries (Kaza et al., 2018). Whilst average per capita generation rates within low-income areas is 0.51 kg, that of their high-income counterparts is 0.91 kg; confirming already known trends in which the affluent in society is reported to generate more MSW than their urban poor counterparts (Worrell and Vesilind, 2011). Using the World Bank's regression model, the average MSW generation rate for the year 2030 has been projected as 0.88 kg per capita per day

The three most significant components within households MSW are organics (51.59%), plastics (16.69%) and inert (14.90%). A planned diversion of these components from disposal has the potential to reduce the GHG emission burden of the current MSWM system.

2.4 Summary of Thematic Refuse Mapping

This presents the incidence of refuse within the Odaw River Catchment and its implications for Cleaning Campaigns, Litter Prevention and Solid Waste Collection improvement towards the attainment of cleaner municipalities. The objectives of the refuse mapping were to:

- Locate, quantity and map both temporal and permanent refuse sites within the catchment.
- Understand the origins, sources, and reasons for the incidence of refuse within the catchment.
- Recommend practical actions for the systematic removal of all refuse points and the prevention of new ones within the Catchment.

The thematic refuse map and descriptions provided within the report cover the incidence of MSW within communities, markets, public spaces, and vacant lots the Odaw Catchment. Weeds and the occurrence of MSW in tertiary and secondary drains within the catchment were not included in the mapping processes.

The mapping process involved the traversing of each municipality to locate, take coordinates, dimensions and pictures of all refuse and communal container sites. Questionnaires were

administered to nearby residents to solicit information about the origins and history of the site. All data and information collected were synchronized and monitored by a team of GIS experts in real time. The data obtained were analyzed with Microsoft Excel and ArcGIS after random field triangulation and verification of some selected refuse sites.

The findings from the refuse mapping revealed that a total of 91 refuse sites were identified within the Odaw River Catchment. Forty-eight (48) of these sites were classified as temporal with the rest (43) being permanent. The largest concentration of refuse points occurs within the downstream end of the Odaw River/Drain from Ofankor to the outfall at Korle lagoon. Significant number of refuse points also exist along secondary drains constructed along major roads.

In total, 35 container sites were identified within the Odaw basin. Approximately 75% of all communal container sites within the municipalities are characterised by extremely high incidence of littering (overflowing MSW), some of which leak into drains partly by means of windblown litter and rainwater. This can be attributed to the poor management of these refuse containers coupled with inefficiencies in the prevailing MSW collection system.

The spatial distribution of the refuse sites and locations of refuse containers within the Odaw Catchment is shown in the Figures 3 and 4. Also, the volumes of waste mapped the various refuse sites are shown in Figure 5.

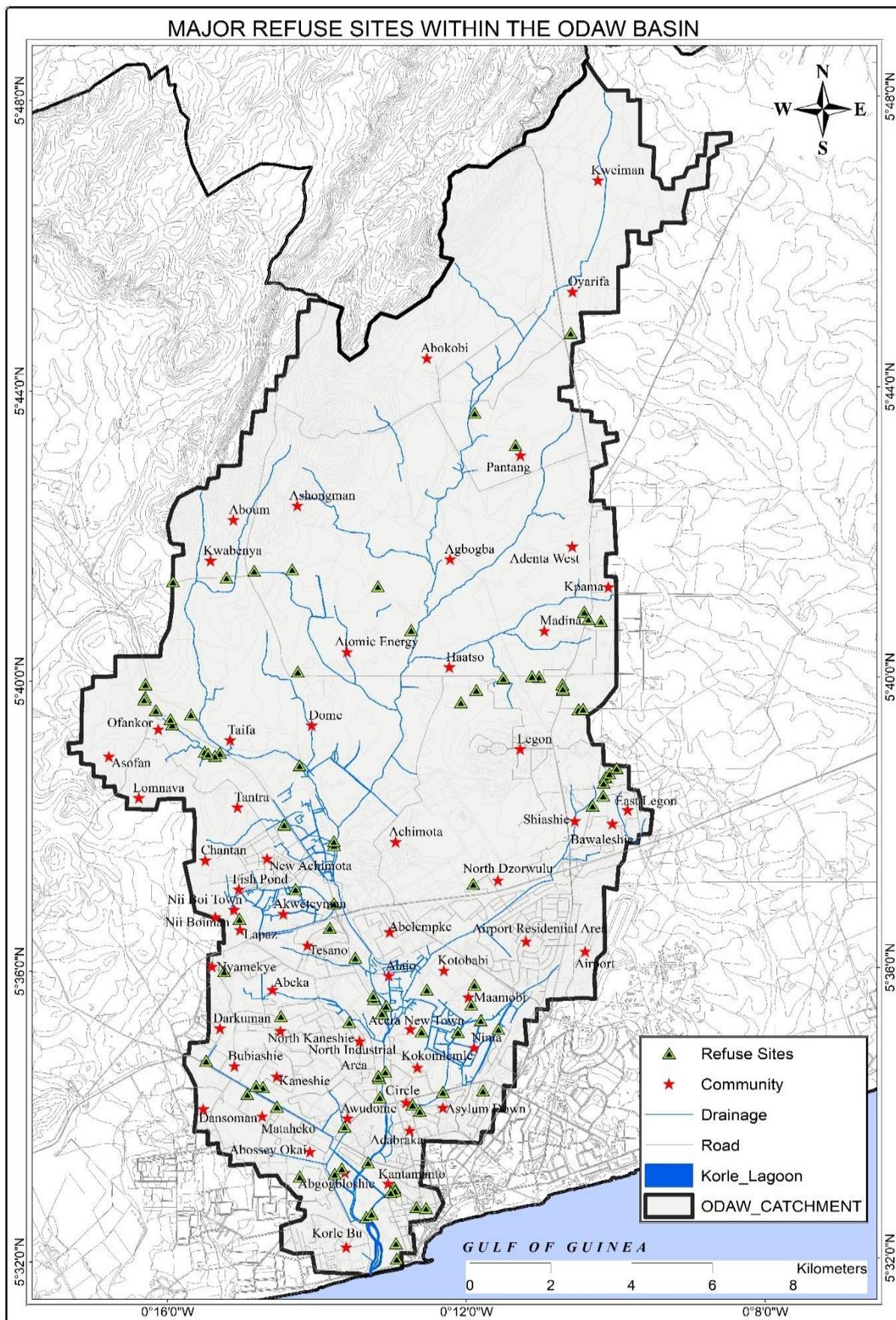


Figure 3: The distribution of major refuse sites within the Odaw River Catchment

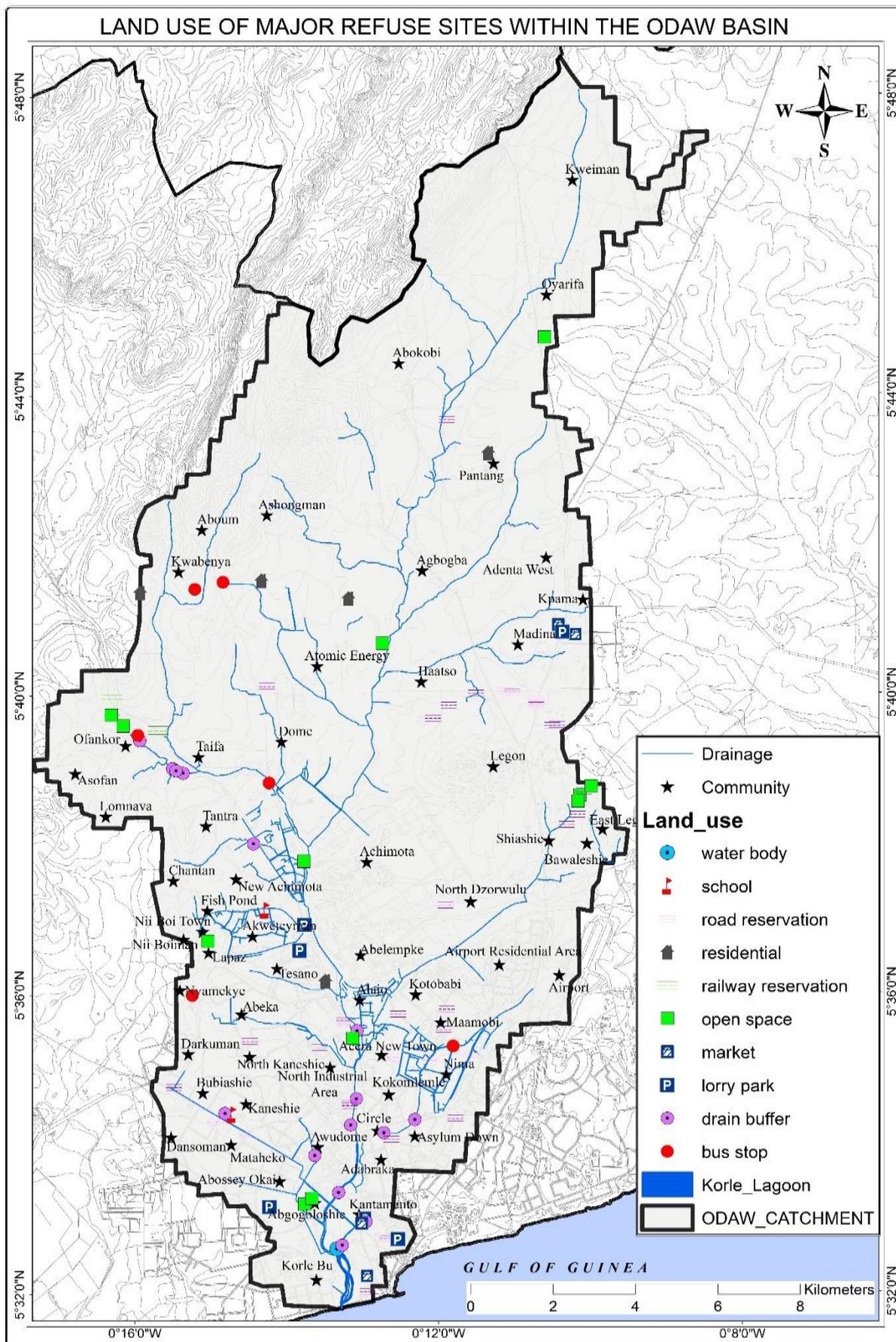


Figure 4: Land Use of major refuse sites within the Odaw River Basin

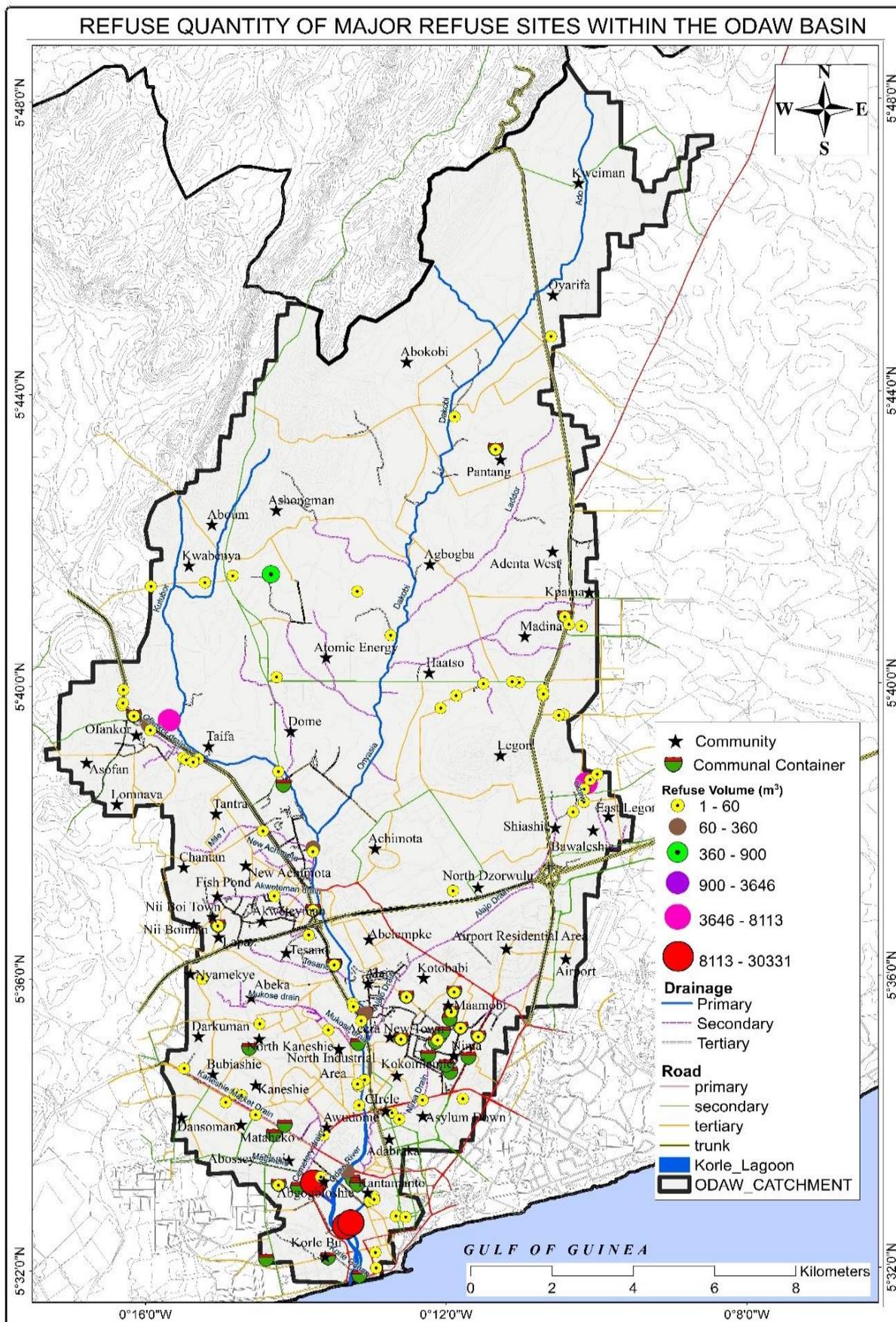


Figure 5: Estimated volumes of MSW at major refuse sites and the distribution of communal container within the Odaw River Catchment

2.5 Summary of Hydrological and Drainage Systems Report

The Odaw River has its origins from Berekuso within the Akuapim South Municipality of the Eastern Region and runs through the Greater Accra Metropolitan Area, flowing through 17 municipalities. The Odaw River finally discharges into the Atlantic Ocean via the Korle Lagoon. The Odaw River receives stormwater and wastewater from two main streams: the stream running from Aburi Mountains through Berekuso (both in the Akuapim South Municipality of the Eastern Region) down to Kwabenya in the Ga East Municipality, and the stream running through Danfa to Kweiman in the Greater Accra Region. The major streams that drain into the Odaw River are the Kutubor, Ado, Dakobi, and Onyasia.

There is also the existence of a network of small drains (gutters), along major road networks which serve as conduits to stormwater and greywater. The entire stretch of the Odaw River (from Danfa to the outfall weir near Korle Lagoon), in addition to all secondary and tertiary drains discharging stormwater, greywater and MSW to the Odaw River was traversed. The hydrological and drainage systems information was developed from field observations and review of relevant literature on the Odaw River. The Odaw river is faced with the incidence of MSW along its stretch, especially from Ofankor to the outfall weir close to the Korle Lagoon.

The municipal solid waste in the Odaw river/drain are because of the following:

- the daily human practices of the densely populated settlements along the Odaw drain, especially from Ofankor to the outfall at Korle Lagoon, who dump waste into the river/drain
- the daily disposal of MSW by the inhabitants of the densely populated settlements and small-scale businesses along various primary and secondary drains that feed the Odaw river.
- the relatively low collection coverage within low-income communities in the catchment and incidence of refuse sites and littering leading to overflow of waste into drains.
- the seemingly and wanton anti-environmental behaviour of littering which allows litter to be blown or washed into uncovered drains connecting to the Odaw river.
- the deliberate discharge of collected MSW by most informal solid waste collectors along the banks of the river, especially within Agboghoshie and Konkomba markets

Approximately, 410 tonnes of MSW are discharged daily through the aforementioned sources into the Odaw River. About 95% of this discharge occurs between the Alogboshie and Agboghoshie stretch of the river. The rest comes from the upstream end of the river between Teiman and Ofankor.

The Elevation map (Figure 6) shows the elevations/heights of the various communities within the Catchment. Figure 7 and Figure 8 is the Land Cover and Hydrological and Drainage Systems Map of the Odaw Catchment.

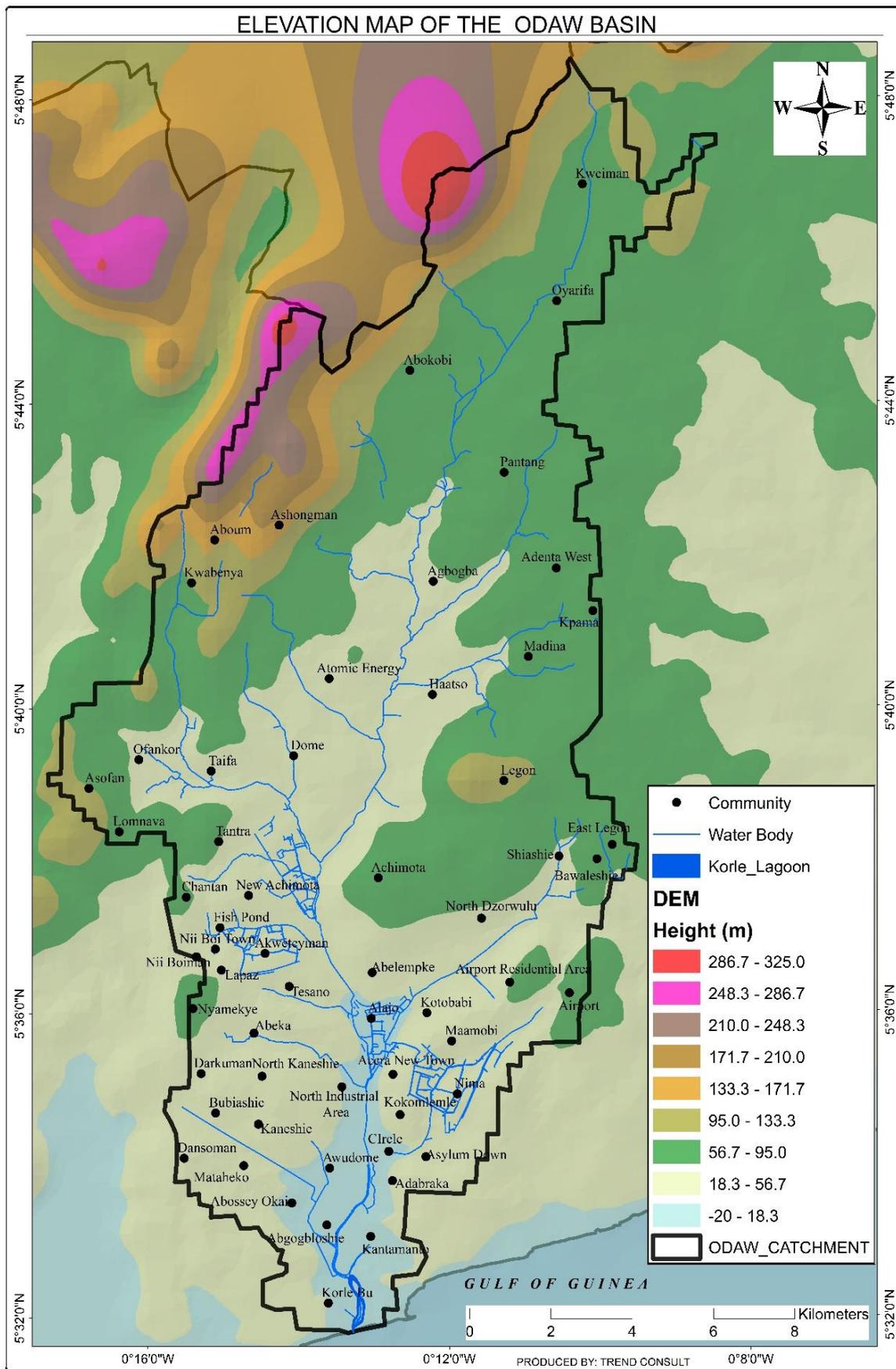


Figure 6: The elevation map of the Odaw River

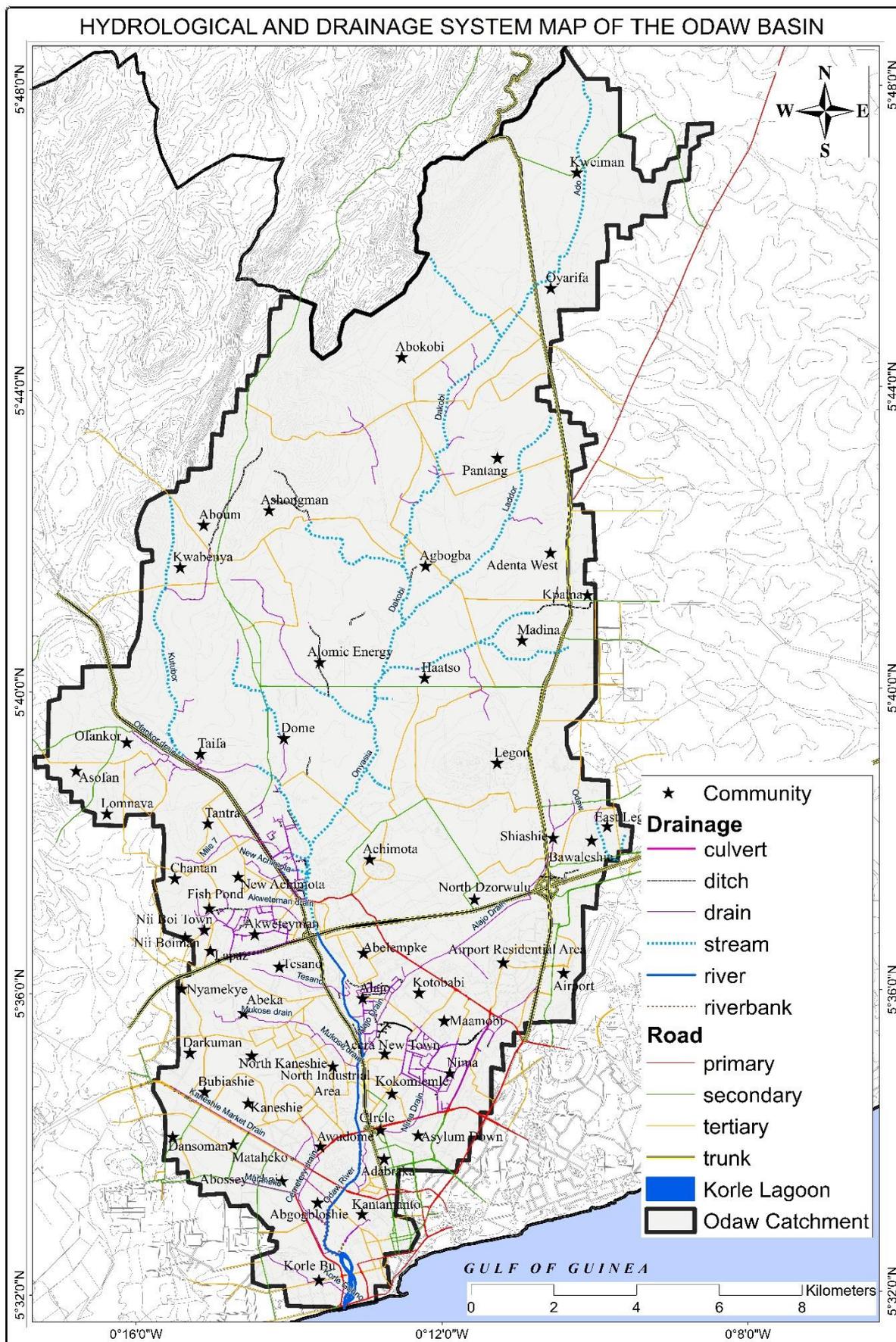


Figure 7: The drainage system map of the Odaw River Catchment

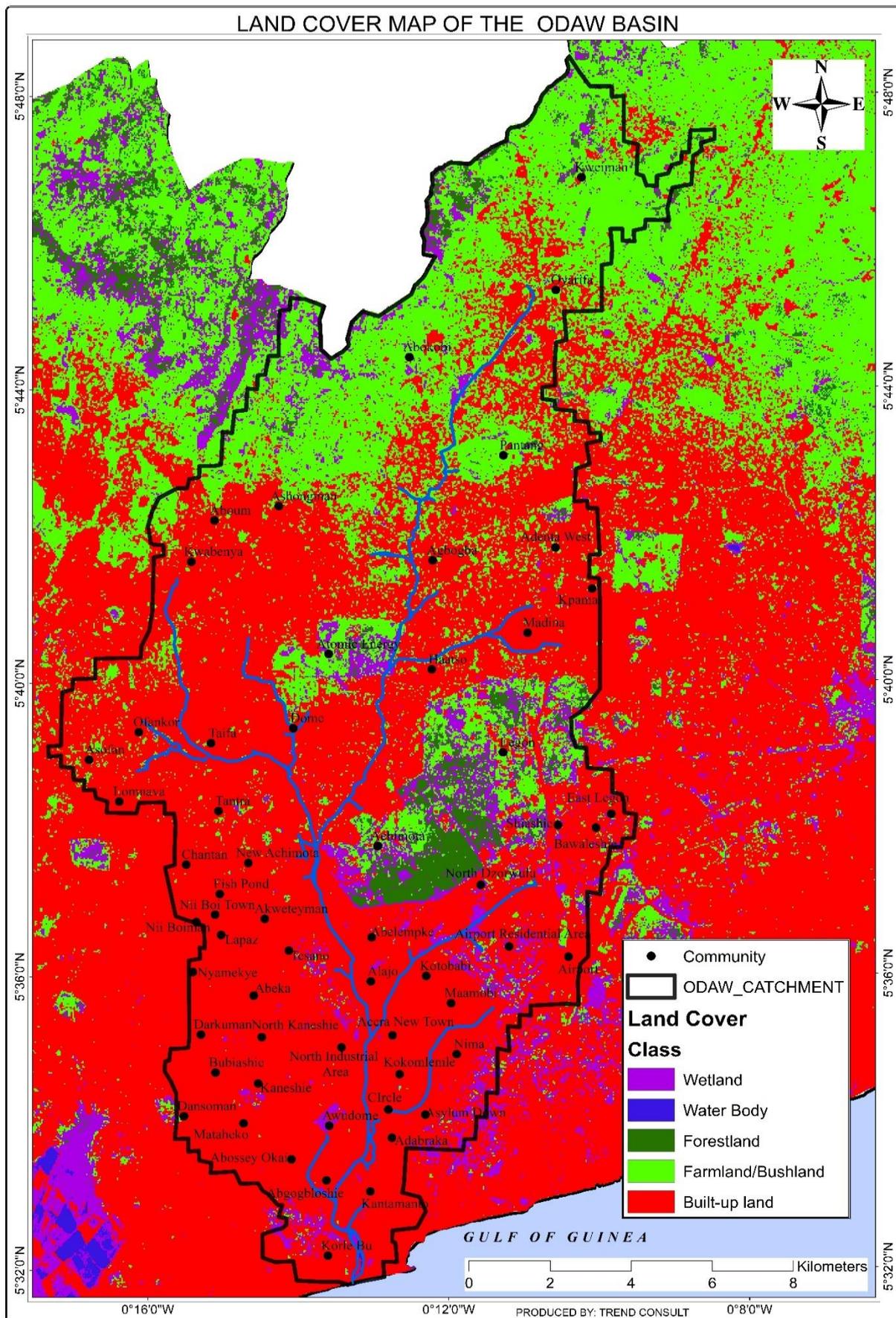


Figure 8: The land cover map of the Odaw River Catchment

2.6 Summary of Recycling System Report

The analysis of the recycling situation within the Odaw River Catchment was conducted through interviews, focus group discussions, field visits, material flow mapping and stakeholder workshops. The objective of the recycling system analysis was to:

- determine the roles and contribution of the Informal Waste Sector in the value chain
- determine the hierarchy of significant materials of market value within the value chain
- estimate the Municipal Solid Waste (MSW) recovery and recycling rates
- understand the recycling value chain hierarchy and market mechanism
- assess the extent of support required to enhance recycling within the Catchment.

The analysis of the MSW recycling value chain system under this Project focused on the Greater Accra Metropolitan Area (“the GAMA”) other than the 17 municipalities within the Catchment. This is due to the peculiar nature of the recycling system of the region, especially in its origins and interconnectedness with disposal of MSW; where materials recovered for recycling originates from disposal sites that receive the waste of the GAMA. Many of these disposal sites are outside the confines of the 17 MMAs within the Catchment.

The waste generated is collected by both formal and informal service providers and mostly sent to the various disposal sites (landfills/ dumpsites). Waste pickers on the disposal sites recover materials of value and sell to intermediate buyers who further sell to recyclers (who process them into flakes and pellets), innovators, recycling industries and or export outside the country. Itinerant buyers collect and purchase recyclables from within neighbourhoods to also sell to intermediate buyers or directly to the recyclers. Informal service providers mostly sort the waste collected to recover recyclable materials for sale. This is shown in Figure 9.

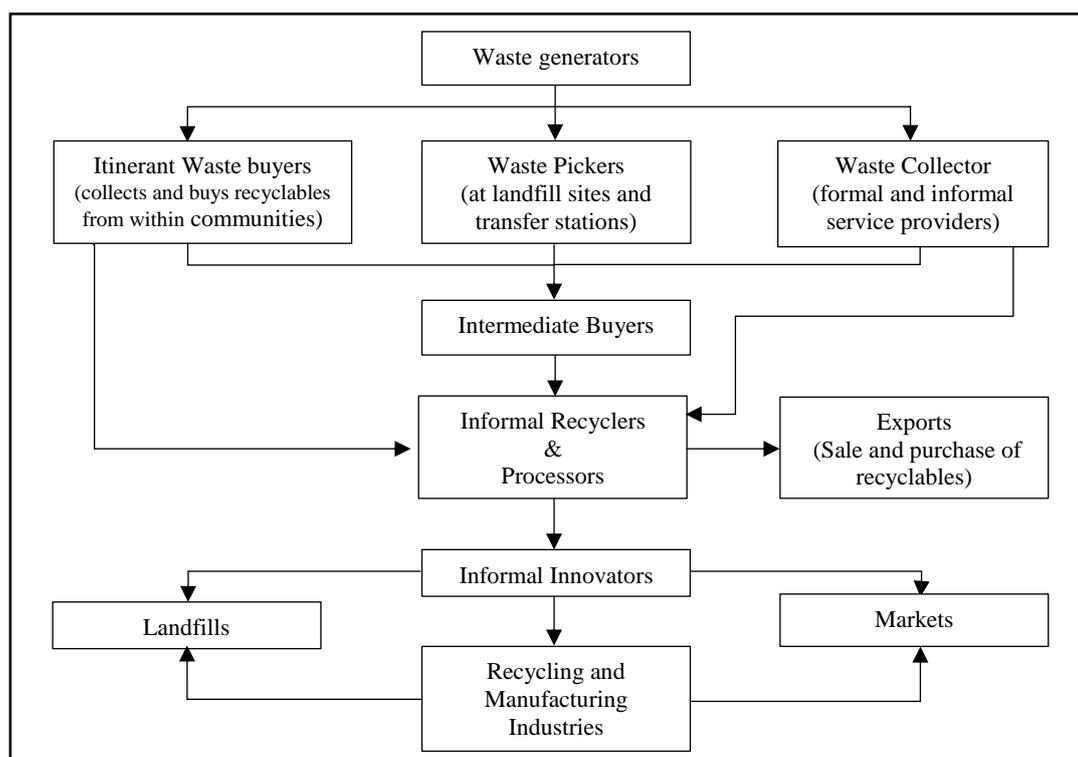


Figure 9: Generic flow of recyclables through the recycling system of the GAMA

The recycling value chain is significantly an informal venture (80%) with about 20% formality (mostly being the end-user recycling industries and an exceptionally low level of participation from the formal service providers). Formal (FSPs) and their informal Service Providers (ISPs) transport approximately 478848 and 473864 tons of mixed waste respectively to the various dumpsites and landfills within the GAMA annually. Approximately 1200 waste pickers (800 active at every moment in time) at the bottom of the pyramid recover 236080 tonnes of materials from the various disposal sites and sells through the intermediate buyers and/or directly to the higher value chain recyclers.

Informal Service Providers recover an estimated 17784 tons of recyclables through the sorting of valuable materials from the MSW they collect from households, institutions, and commercial centres. Through the actions of the MSW value chain actors, an average of 328744 tons (22.49%) of the MSW generated within the GAMA are recovered by waste pickers, ISPs, and itinerant buyers. The contribution of the MMAs and FSPs is minimal at 492 and 728 ton per year, respectively. The total recoverable materials earmarked for recycling amounts to 344524 (23.57%) of the total waste generated. Estimates put losses in recycling to 25% especially with unclean (non-source-separated recyclables) leaving recycled outputs to 258393 tons per year. Based on this analysis, the recycling rate of the GAMA is computed to be approximately 18% of the total waste generated. This does not include composted organics.

The analysis of the recycling system shows that, the value chain actors have the potential to support solid waste recycling improvements within the Odaw Catchment and the entire GAMA. The assessment shows that their activities limit the burden on landfills, supports the attainment of the sustainable development goals and circular economy initiatives. Socio-economically, the IWS actors are known to save the municipalities of the GAMA US\$20 million annually in waste collection and recovery. Despite, they are not officially recognized but tolerated in the MSWMS, do not have the capacity to organize themselves, face complex occupational health and safety issues, and an increasing threat of being denied access to the solid waste materials that sustains their livelihoods.

The results of the assessment are depicted in the process flow diagrams of Figure 10 and Figure 11. The flow diagrams are intended to assist the client and other stakeholders to appreciate the linkages between formal and informal activities within the collection and disposal service chains on the one hand, and the valorization and recycling value chains on the other hand. Developing the process flow diagrams for the catchment alone proved difficult because of the interrelatedness of the service- and value-chains to disposal. The consultant has therefore resorted to provide the flow diagrams to depict the situation within all the 25 municipalities other than the 17 municipalities. However, and where necessary, peculiar information pertaining to the assessment of the MSW system of the 17 municipalities of the catchment based on the WasteAware ISWM indicators has been provided to assist the client to make informed decisions.

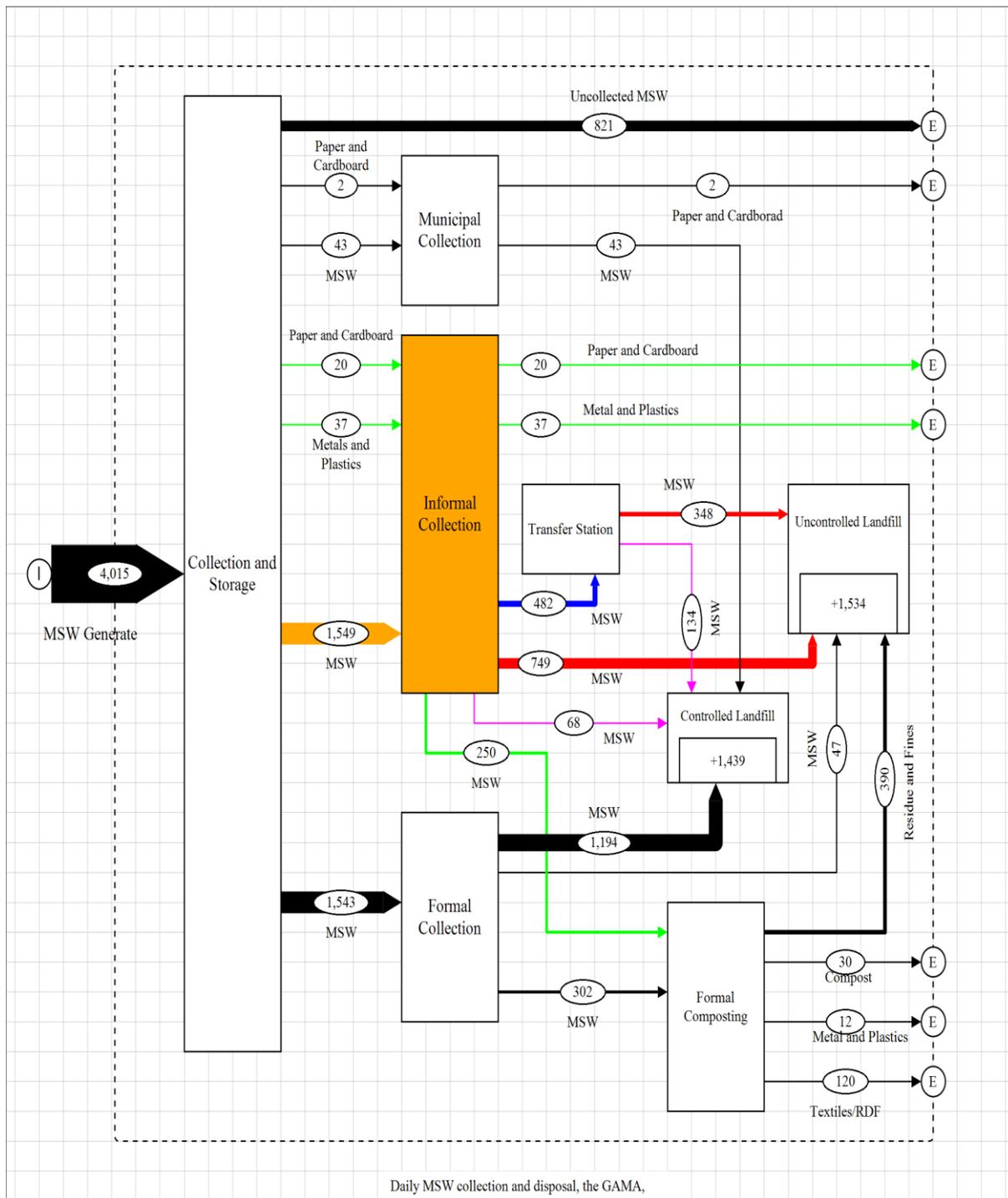


Figure 10: Sankey-type material flow diagram for MSW collection, valorization, and disposal within GAMA
 Source: TREND, 2020

The thickness of the flow corresponds to the weight of the waste (tons per day)

Legend: MSW: Municipal Solid Waste; RDF: Refused Derived Fuels

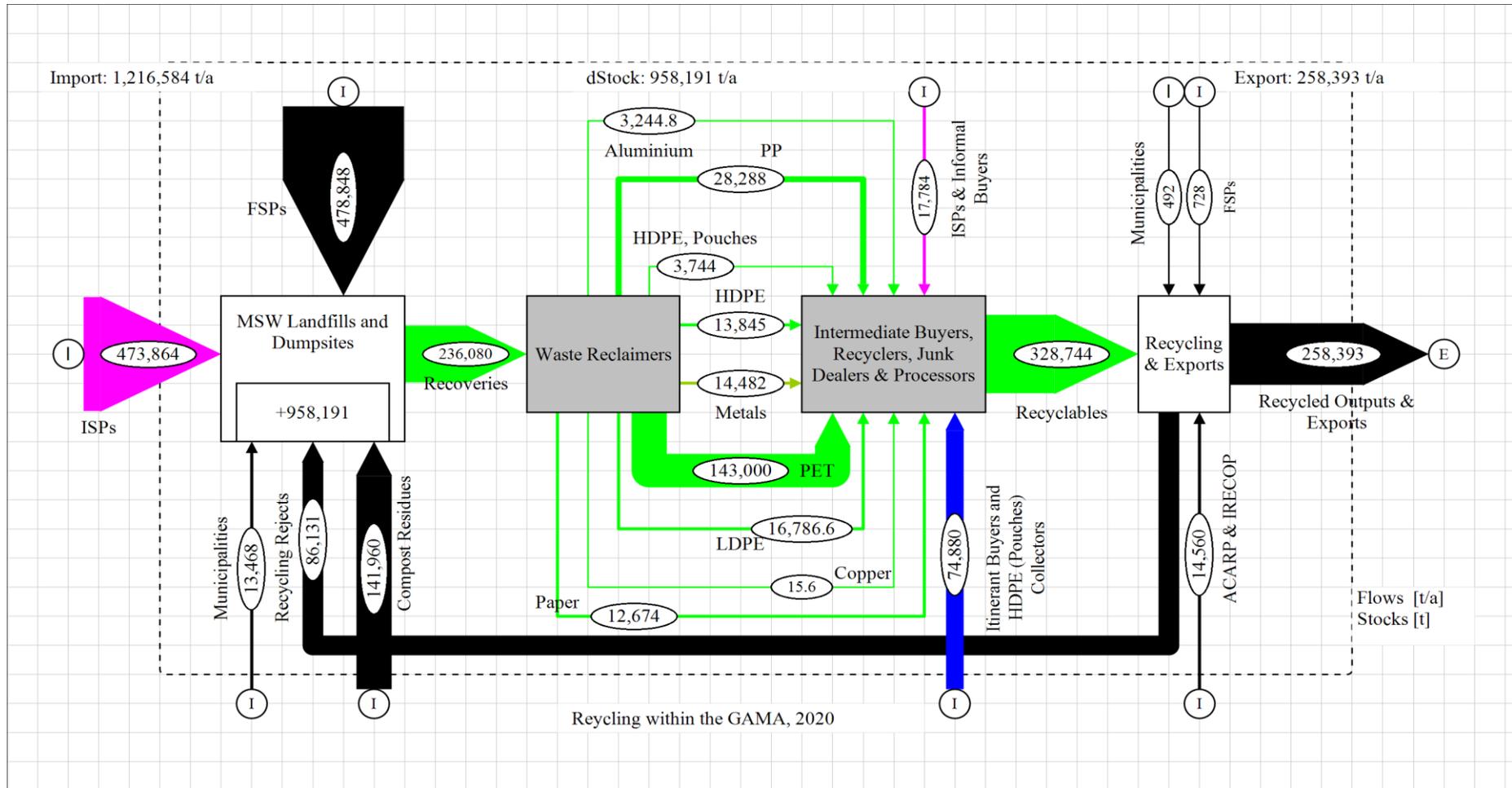


Figure 11: Sankey-type material flow diagram for MSW recycling within the GAMA, Source: TREND, 2020

The thickness of the flow corresponds to the weight of the waste (tons per year)

Legend: ACARP: Accra Composting and Recycling Plant; FSPs: Formal Service Providers; HDPE: High-density Polyethylene; IRECOP: Integrated Recycling and Composting Plant; ISPs: Informal Service Providers; LDPE: Low-density Polyethylene; MSW: Municipal Solid Waste; PET: Polyethylene T terephthalate; PP: Polypropylene

2.7 Summary of Community Surveys

2.7.1 Beneficiary Satisfaction and Willingness to Pay Survey Report

This survey focused on the analysis of the service user (households ‘and institutions’) satisfaction and willingness to pay for MSW service improvements. The objectives of the survey were to find out the level of satisfaction of users of the existing MSW collection service delivery; challenges of the existing MSW collection service delivery through the lenses of service users; the existing payment regime and the willingness of service users to pay for improvements in service delivery.

The survey involved 697 households and institutional heads in charge of MSW. The hypothesis was that households and institutions will willingly pay for MSW collection services if they were satisfied with the service delivery. Here, households were deemed to be satisfied with service delivery if they enjoyed regular services, had an effective complaint and feedback mechanism, had a good impression of the crew and/or service attendants, and willingly paid for rendered services.

Out of the 697 respondents, 499 were from residences and 198 from institutions. 57.9% of residential respondents were from multi-family dwellings (locally referred to as “compound houses”) while 47.5% of institutional respondents were from the hospitality industry. The study reported that 80% and 41% of users from institutions and households respectively, used 240 and 110 litre standard bins respectively for primary storage of MSW. Also, approximately 41% of respondents from residences use boxes, polyethylene bags and sacks as storage receptacles.

The survey revealed that, 81% and 68% of residential and institutional respondents purchased their primary storage receptacles, respectively. Respondents from households and institutions reported that it takes a week for their bins to be filled up. The findings from the survey confirm two predominant MSW collection service delivery within the municipalities in the Odaw River Basin: services carried out by the Formal Service Providers (FSPs) and the Informal Service Providers (ISPs). Municipalities have concessions with the FSPs as the sole franchisees to collect MSW from the communities within the Odaw Drainage Basin.

A total of 62.5% of the household respondents subscribe to the services of Informal Service Providers (ISPs) compared to 32.9% serviced by the Formal Service Providers (FSP). On the other hand, 56.6% of the respondents from institutions subscribe to the services of the FSPs compared to 41.9% serviced by the ISPs. Each group of subscribers are satisfied with the services they receive. It must be emphasized, however, that the increasing number of subscribers to the services of the ISPs is partly due to a failure of the formal concession holders (the FSPs) in service delivery in relatively low-income areas.

A significant number of service beneficiaries have the ability and are willingly to pay for the services. Service satisfaction based on the regularity of service and feedback mechanisms, payment of services and perception of the code of conduct of service provision attendants, regularity and feedback mechanism is the significant determinant of total satisfaction, which highly correlates also with payment for the services. Respondents were split with the potential of paying for improved services.

2.7.2 Knowledge, Attitudes and Practices Survey Report

The knowledge, attitudes and practices survey analysed households within the communities and municipalities located in the Odaw Catchment, towards the separation of waste at source (at the point of generation). The objective was to find out households' knowledge of the process and the benefits of source separation; households' knowledge on the different components of waste; the mix of latent constructs (attitudes, perceived norms, perceived behavioural) and moral obligations that predicts the intention of respondents to practice source separation; and their actual behavioural practice.

The KAP survey was conducted among 644 households in 12 communities within the 17 municipalities of Odaw River Basin. The survey revealed that 70% of the households knew the different components of waste. Again, more than 80% of the respondents had knowledge of the various benefits that is associated with MSW separation, including: clean cities, employment, earning income. These are positive signals of support for a future MSW separation process within communities in the Odaw River Basin.

The KAP survey showed that 34% of households practice some form of waste separation. The main component of separation was found to be plastics. This means that households have some level of know-how and may further support the interventions that may be put in place towards a MSW separation process. Also, most households would prefer a two-stream or a three-stream separation of MSW as a starting point.

The findings to the survey show that households have a fair understanding and a reasonably significant know-how of the benefits of MSW separation. This reinforces positive attitudes towards such a pro-environmental behaviour in the future. Respondents reported of an appreciable practice in MSW separation (which we are unable to confirm). Nonetheless, the Consultant recommends a comprehensive education for all households within the Odaw Catchment towards any future MSW separation at source process.

2.7.3 Anti-littering Survey Report

The anti-litter survey conducted for households and selected management representatives of markets and transport terminals within the 17 municipalities of the Odaw River Catchment. The objective of the anti-littering survey and targeted interviews was to find out the:

- mix of latent constructs (attitudes, perceived norms, perceived behavioural) and moral obligations/personal norms that predicts well the behavioural intention of respondents towards anti-littering practices
- types of intrinsic motivators that has the highest potential to motivate residents to stop littering the environment and the Odaw channel
- forms of control systems required to facilitate and prevent littering within the Odaw catchment
- the commitment and perception of management representatives of markets and transport terminals towards anti-littering within their spheres of influence.

The findings of the survey show that participants understand the effects of littering on drains, water bodies, public health, and the environment, which is encouraging to reinforce positive attitudes towards such a pro-environmental behaviour of anti-littering in the near future. The

use of the TPB and an extended form of the TPB in which moral and personal norms have been added to the default TPB constructs show that personal norms and/or moral obligations, perceived behavioural control, followed by attitudes have a significant potential to predict participants intentions towards a future anti-littering program for the communities and municipalities in the Odaw Catchment area.

Educational interventions that promote knowledge, self-value, moral and religious correctness have the highest potential to influence citizens to stop littering their surroundings. This can be followed by incentive-based solid waste collection schemes and the advertising of the benefits of anti-littering both through the print and electronic media will improve intentions to stop littering. As part of the Litter Management Strategy, there is the need to develop and implement interventions like the provision of receptacles, separation of solid waste at source, incentives to citizens for preventing littering, in addition to ensuring that service providers are regular in their collection service delivery.

It is crucial to ensure stakeholder participation by involving religious and cultural leaders to reinforce the moral obligation in keeping a clean environment towards an anti-littering behaviour. Managers, queens and representatives of markets and lorry terminals have a sense of awareness of the extent of littering within their premises and are committed to support efforts towards the prevention of such practices. Strengthening their capacities through periodic and targeted education, rewarding them with cleanliness-based incentives and supporting them with receptacles and educational materials should boost their moral to support anti-littering within their areas of influence.

3. SITUATIONAL ANALYSIS OF THE MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM IN MUNICIPALITIES WITHIN THE ODAW CATCHMENT

3.1 Introduction to the MSWM System Assessment

This section of the report presents the methodology and findings of the assessment of the Municipal Solid Waste Management (MSWM) system of the 17 municipalities within the Odaw River/ Drain Catchment. The assessment was conducted using the Integrated Sustainable Waste Management (ISWM) analytical framework, as further developed into the WasteAware Benchmark Indicator tool shown in (Figure 12). The ISWM indicator set has been selected for the assessment because it examines both the physical components (collection, disposal, treatment, and recycling) and the governance aspects (inclusivity, financial sustainability, national policy framework, and local institutions) required to deliver a self-correcting and sustainable MSWM system. The objective for the assessment has been to:

- evaluate the performance of the MSWM system in both the physical and governance components
- understand the nexus between system success and system failures
- develop interventions (as part of a SWM improvement plan) to strengthen what is working and fix what is failing within the MSWM system.

In line with the objectives outlined above, this section of the report will discuss the outlook of the MSWM situation in the 17 MMAs. This section will present a picture of how the 17 MMAs are performing across specific indicators under the WasteAware Benchmark Indicator tool. It is worthy to note that these indicators capture all the critical MSWM indicators within the ToR for this assignment. The outcome of this situational analysis provided further information towards the development of the MSWM Improvement Plan, which will be presented in subsequent sections of this report.

3.2 Methodology for the MSWM System Assessment

The methodology for the participatory assessment of the MSWM system of the municipalities is based on the WasteAware Benchmark Indicator sets of the ISWM framework. ISWM is a participatory planning framework that provides a lens for understanding municipal waste management as a combination of physical components and governance aspects (Figure 12). To facilitate ownership of the results from the assessments, and the implementation of interventions towards system improvement, a working group made up of relevant officials in each of the 17 municipalities were formed to assess the MSWM system. The approach involved the development of a checklist of datasets based on the indicators for the physical components and the governance aspects. The MMA level working groups worked together with an Expert Team to assess the performance of the MMAs in all relevant indicators using a Microsoft Excel scoring system. Where “reliable data” was not available, approximate estimations were made from existing literature and fed into the scoring system.

As part of the MSWM System assessment processes, interviews and focus group discussions were also organized with relevant stakeholders in the municipalities (informal waste pickers, waste collectors, recycling value chain actors and innovators, formal service providers, slum dwellers, trustees of transport terminals, Assembly members, market queens and representative, etc.) to verify data and to better understand the dynamics of the system. The assessment process was conducted over a period of four (4) months.

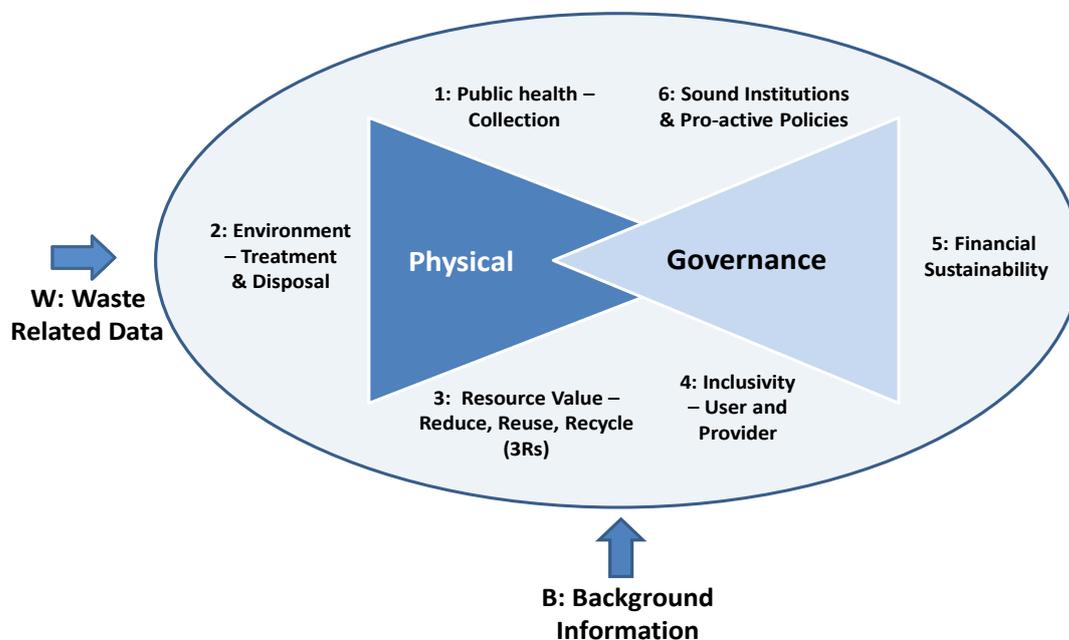


Figure 12: The simplified version of the Integrated Sustainable Waste Management (ISWM) Analytical Framework (Source: Wilson et al., 2015)

The WasteAware Benchmark Indicators – Framework for the MSW Assessment

The indicators allow for a comprehensive performance assessment and benchmarking of the system elements, the stakeholders, and the governance aspects required to deliver a well-functioning Municipal SWM and recycling system. Global ideals of good practice in MSWM such as universal collection coverage, controlled disposal, resource efficiency, activity-based budgeting, service provider and service user inclusivity, and sound institutions and proactive policies constitute the basis for the indicators. The indicators have proved useful as a unified, freely available, and real-time diagnostic tool for MSWM baseline study, in preparation of local and national MSWM strategies.

The indicators are utilized to assess SWM systems, identify strengths and weaknesses, and to make informed decisions for system improvement. Since the introduction of these indicators, more than 70 cities in the world have assessed their MSWM systems using the indicators. A unique quality of the indicators is its ability to not only assess the quantities of the physical components but also their quality, providing municipalities with a holistic overview of their performance. There are 12 composite indicators (Table 1) divided between the physical and governance aspects and weighted in a ratio of 7:5, respectively. Four benchmarks measure quantitative data, and the others reflect service quality. Each qualitative indicator is multi-attribute and composite in nature and defined by at least five sub-criteria (Table 2).

Table 1: The 12 Indicators of the ISWM framework used for MSWM System Assessment

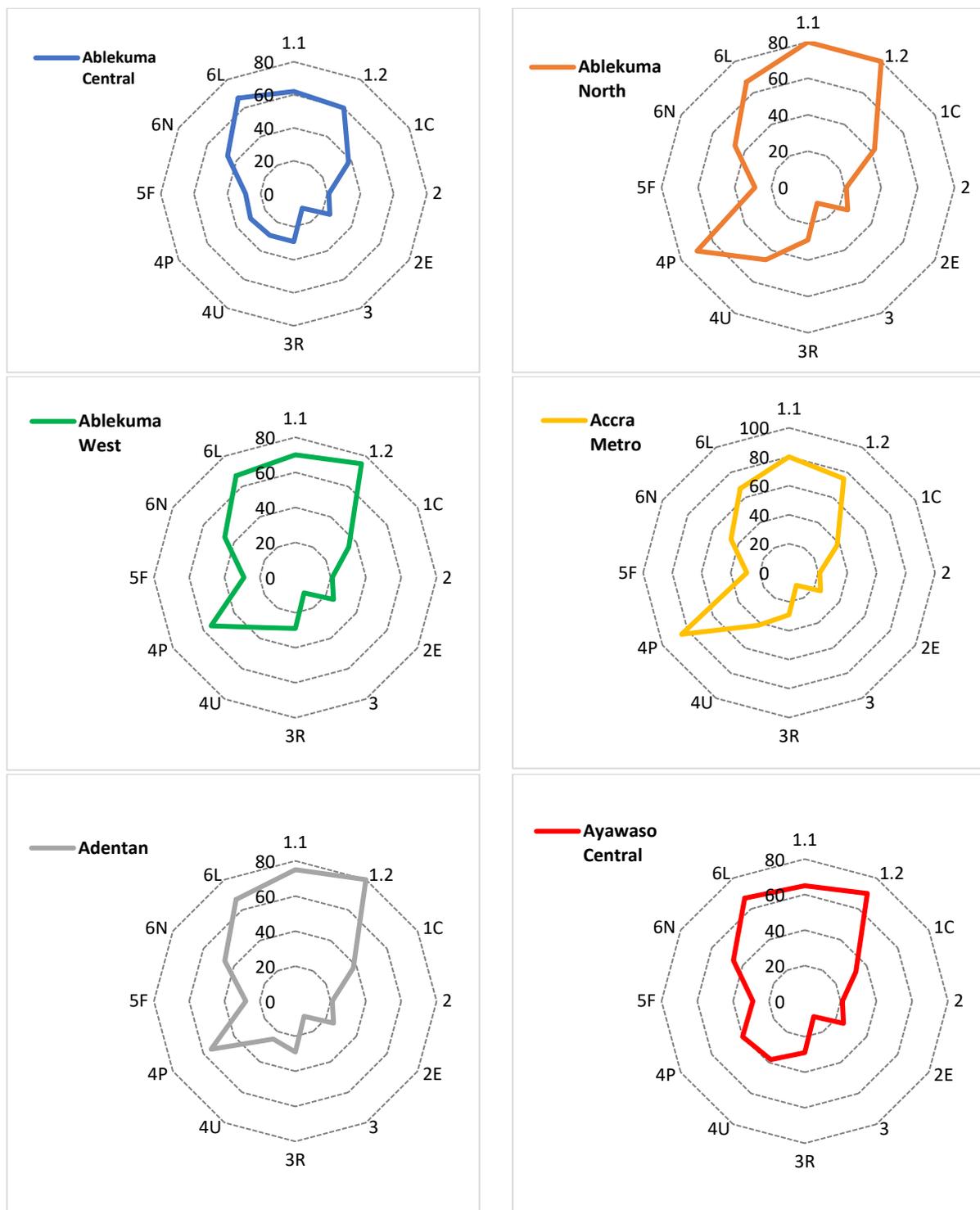
No.	Component	Subcategory	Indicator	Definition of indicator (unit of variable)	Representation
1	Physical	Public Health	Collection Coverage		1.1
2			Waste Capture		1.2
3			Quality of Waste Collection		1C
4		Environment	Controlled Treatment and disposal		2
5			Quality of Environmental protection of waste treatment or disposal		2E
6			Recycling Rate		3
7		Resource Value	Quality of Resource Management		3R
8	Governance	Inclusivity	User Inclusivity		4U
9			Provider Inclusivity		4P
10		Financial Sustainability	Financial Sustainability		5F
11		Sound Institutions and proactive policies	National SWM Framework		6N
12			Local Institutional Coherence		6L

Table 2: Detailed multi-attribute composite indicators for assessing the extent of the quality of the collection system (1C), and user inclusivity (4U) as defined by Wilson et al., 2015

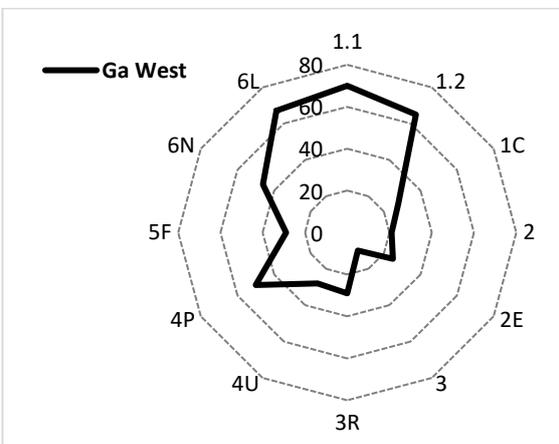
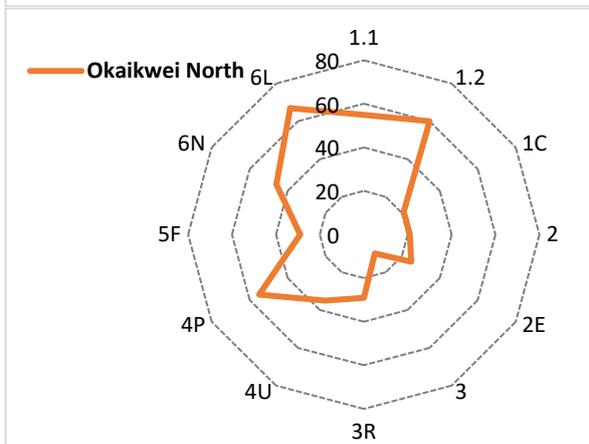
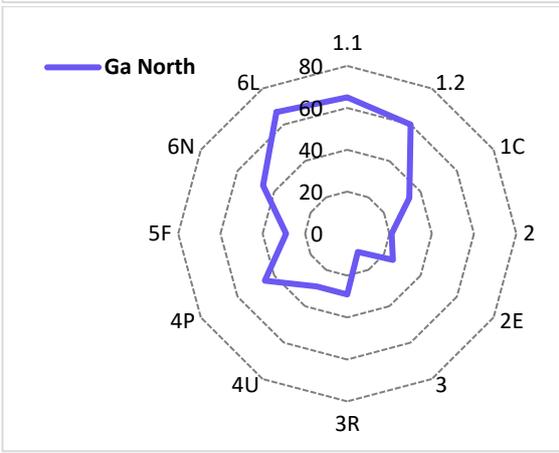
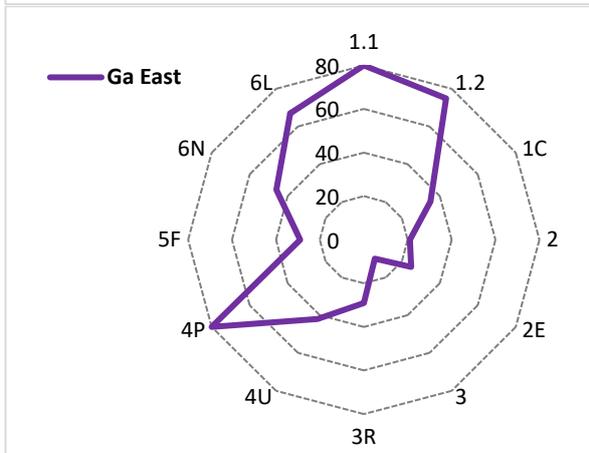
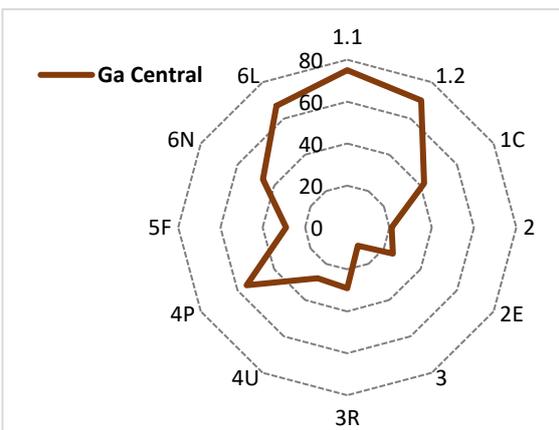
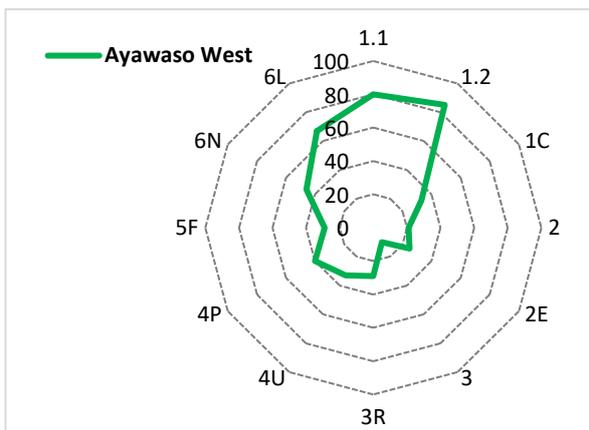
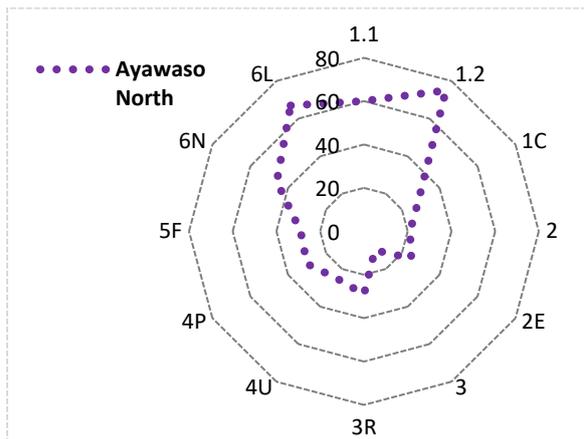
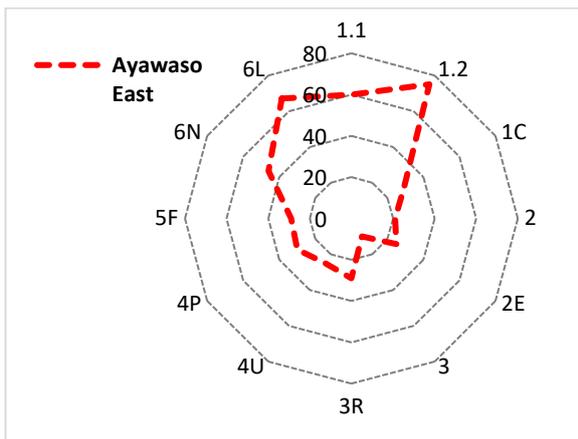
No.	Criterion	Description	Scoring range and Criteria
1C.1	Appearance of waste collection points	Presence of accumulated waste around collection points/containers	0,5,10,15,20 Degree of incidence
1C.2	Effectiveness of street cleaning	Presence of litter and/or overflowing litter bins across city centres and popular places	0,5,10,15,20 Degree of incidence
1C.3	Effectiveness of collection in low-income districts	Presence of accumulated waste/illegal dumps/open burning	0,5,10,15,20 Degree of incidence
1C.4	Efficiency and effectiveness of waste transport	Appropriate public health and environmental controls of waste transport to treatment and disposal sites	0,5,10,15,20 Level of compliance
1C.5	Appropriateness of service planning and monitoring	Appropriate service implementation, management, and supervision in place	0,5,10,15,20 Level of compliance
1C.6	Health and safety of collection workers	Use of appropriate personal protection equipment and supporting procedures	0,5,10,15,20 Level of compliance
4U.1	Equity of service provision	Extent to which all citizens receive good solid waste management service	0,5,10,15,20 Level of compliance
4U.2	The right to be heard	Evidence of the existence of a legal obligation that compels authorities to consult and involve citizens in decisions that directly affect them	0,5,10,15,20 Level of compliance
4U.3	Level of public involvement	Evidence of actual public involvement at appropriate stages of SWM decision-making, planning and implementation process	0,5,10,15,20 Level of compliance
4U.4	Public feedback mechanisms	Existence and use of public feedback mechanisms on SWM services	0,5,10,15,20 Level of compliance
4U.5	Public education and awareness	Implementation of comprehensive, culturally appropriate public education, and/or awareness programmes	0,5,10,15,20 Level of compliance
4U.6	Effectiveness in achieving behaviour change	Change in habits and behaviour of both the public and businesses regarding their waste management/handling practices	0,5,10,15,20 Level of compliance

3.3 Results of the Assessment of the Municipal Solid Waste Management System of the 17 Municipalities within the Odaw River/Drain Catchment

The performance of the MSW of the 17 municipalities has been summarized into radar diagrams for easy comprehension by the client (Figure 13). The various scores for each municipality in the indicators have been compared (Figure 14).



SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT



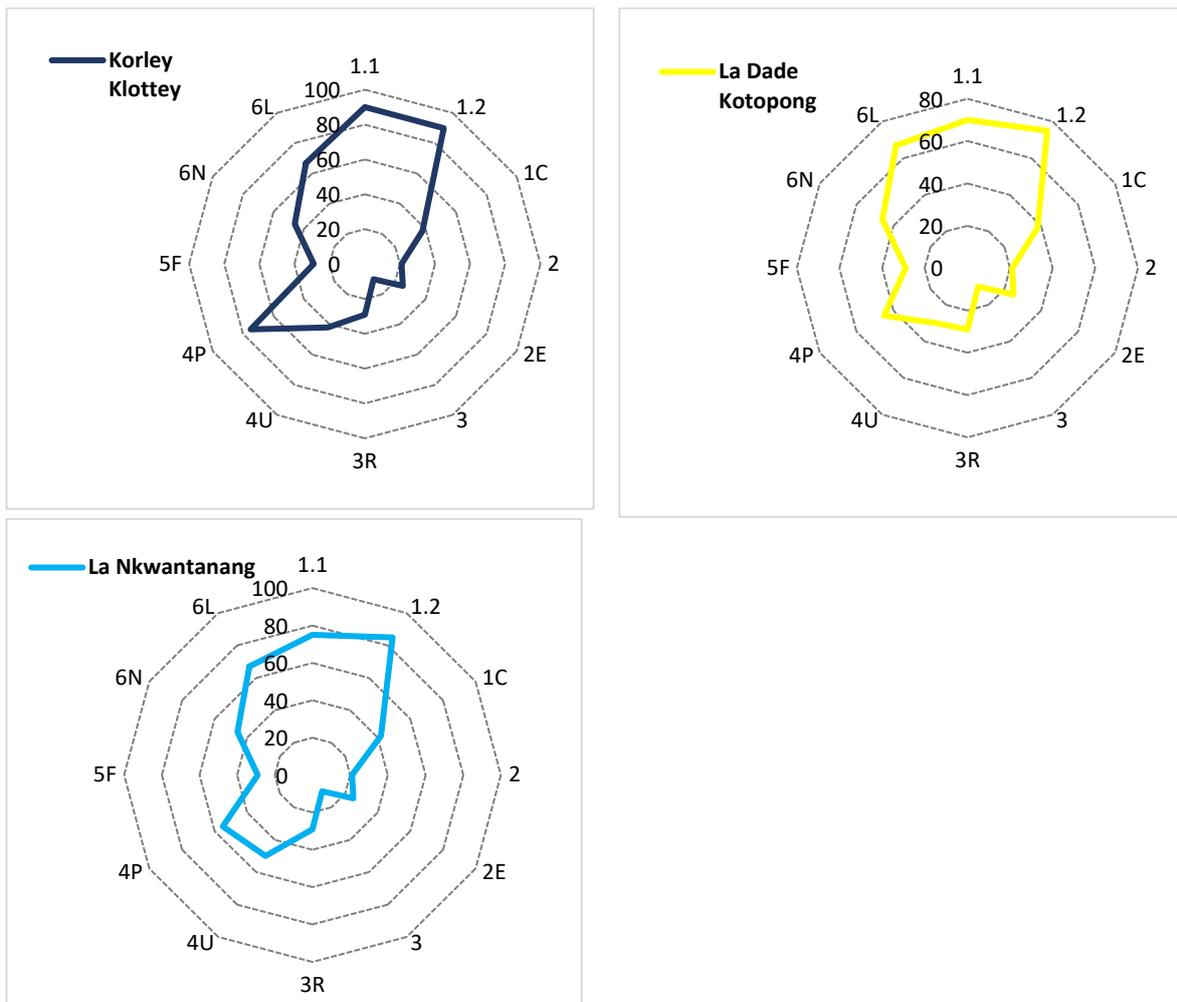


Figure 13: Radar diagrams summarizing the performance of the 17 municipalities (in MSWM) in the 12 WasteAware ISWM benchmark indicators, Source: TREND, 2020

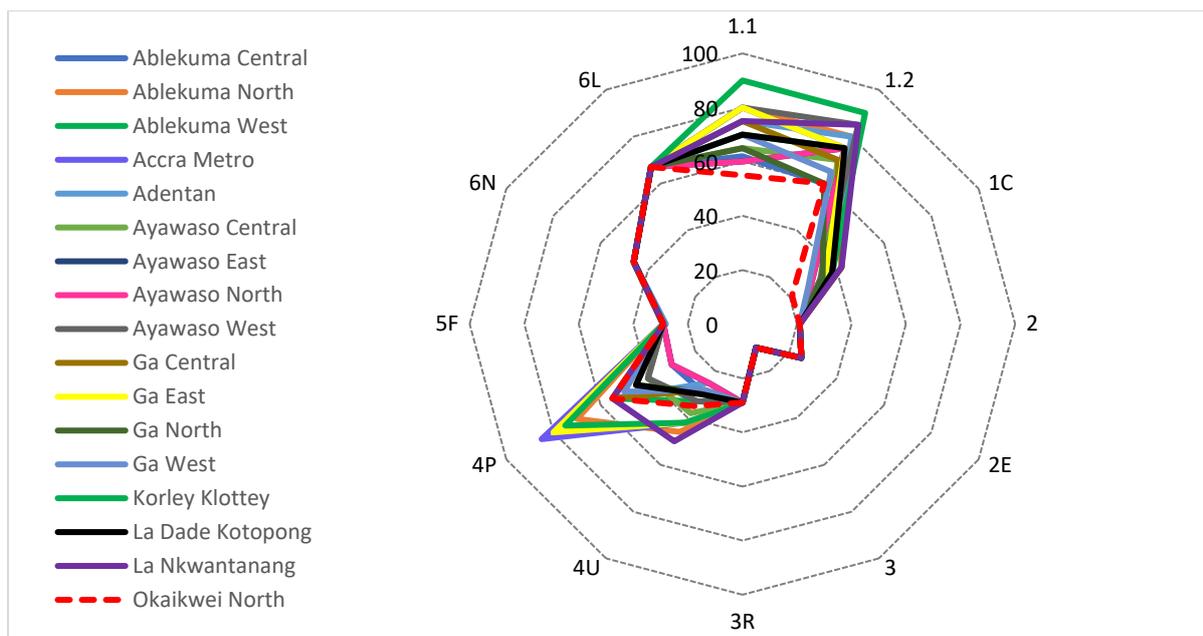


Figure 14: Comparative Radar diagram of the performance of the 17 municipalities (in MSWM) in the 12 WasteAware ISWM benchmark indicators, Source: TREND, 2020

3.4 Discussion of Results and Analysis of Issues from the MSWM Assessment

This section of the report provides background data to the assessment, and further explanation to the analysis of the scores for the radar diagrams using the six indicators of the ISWM framework. The performance of the 17 municipalities as shown in the radar diagrams above is explain in the following sub-sections.

3.4.1 Background information and Waste Generation

The 17 municipalities within the Odaw river basin have an estimated population of 3,163,418 with a transient population of 1,000,000 as at the year 2020. The study area has an estimated total household of 832,478 with waste generation rate of 0.70 kg/cap/day. The daily and annual tonnage of waste generated within the catchment currently stands at 2,914.39 and 1,063,753.30, respectively. Waste composition in the catchment consist of Organics (food and green wastes) 51.59%, Paper 3.62%, Plastic 16.69%, and Metals 1.55 %, with a density of mixed loose solid waste of 320.70 kg/m³, and a Moisture content 50% (*refer to Section 2.3*).

3.4.2 The process flow diagram on collection, disposal and valorization

The total population of the GAMA (5,736,155), and a presumed floating population of 1,000,000 was used in analysis the flow of waste collection, disposal, and valorization. The total waste generated is 4,015 tons per day at an average generation rate per capita of 0.7kg. Out of this, 3,194 tons is collected daily leaving approximately 11% uncollected. The uncollected MSW ends up on vacant plots, streets, beaches and in drains (including the Odaw). Some are also buried and/or burnt by residents. An important observation within the assessment is that informal service providers (ISPs), are not official recognized by the MMAs. Even though ISPs do not have the concession to collect MSW within the municipalities, they collect more than 50% of the MSW within the GAMA. Comparatively, the FSPs who hold the concession to collect MSW come second at 48%.

The contribution of MMAs towards collection accounts for 1.4%. Only 550 tons of the MSW collected per day are sent to two state-of-the-art composting plant (ACARP) and a Mechanical Biological Plant (IRECOP) for processing into compost; 71% of which is returned to landfills as rejects. A total of 95% of all the MSW collected within the GAMA ends up on semi-controlled landfills at Kpone, Nsumia, and Adepa, and on dumpsites at Adoquaye (Weija), and Awutu Senya in the Central Region of Ghana. About 30% of the waste collected by the ISPs pass through two transfer stations for eventual disposal on the landfills.

3.4.3 MSW Collection Coverage, Capture and Quality of Collection (1.1, 1.2 and 1C)

The waste collection coverage assesses the percentage of households with access to a reliable collection service, while the waste collection capture assesses the proportion of the total MSW generated that is captured by the municipal waste management system. The qualitative indicator (1C) determines the quality of collection based on the six multi-attribute composite criteria. Two main collection system exist within the catchment, door-to-door (primary) collection using compactor collection vehicles and motorized tricycles, and secondary collection using skip and Roll-on-Roll-off (RORO) collection vehicles in especially low-income communities, markets, and transport terminals.

There are also two main collection service providers, the formal and informal service providers. The formal service providers are recognized by the Municipalities through franchise arrangements to collect MSW. The informal service providers have evolved to fill gaps created as a result of ineffective service delivery by the formal providers to mostly low-income communities, and they are yet to be officially integrated. The assessment identified a total 2,638 informal service providers, 75% of them who are always active and an estimated 90 formal service providers (Table 3). The collection system runs on the polluter pays principle, where users pay for the services rendered.

Monthly services charges for the formal service provision (4 times a month for a 240-litre bin of MSW) is cross subsidized at GH¢150, GH¢100, GH¢60 and GH¢30 for institutions, high-income areas, middle-income areas, and low-income areas, respectively. However, there are variations in the payment of MSW services across municipalities as a result of the different fee-fixing resolution established at the various MMAs. Collection of user charges is monthly with exceptions in few municipalities. The user fee for the ISPs is always a negotiated amount. It is mostly paid at the point of collection of the MSW and based partly on the quantity of the MSW to be collected, and the rapport between the provider and the service user.

Table 3: Data on population, Formal and Informal Service Providers, and MSW facilities within the GAMA

No.	Municipalities	Area (Km ²)	Population	No. of ISPs	No. of FSPs	MSWM facilities
1	Accra Metropolis	23.50	555,767	150	5	Integrated Recycling and Composting Plant, Gamashie Compost Plant
2	Ablekuma West	12.47	75,254	200	2	
3	Ablekuma North	10.77	232,877	300	1	
4	Ablekuma Central	9.10	294,022	270	2	
5	Ayawaso East	3.71	105,546	60	3	
6	Ayawaso North	2.13	125,789	30	1	
7	Ayawaso West	35.19	89,225	50	1	
8	Ayawaso Central	6.04	179,422	33+22	1	Kokomlemle Mini Transfer Station
9	Okaikwei North	20.86	287,820	60	2	Zoom Pak Transfer Station, Achimota
10	Korle Klottey	11.88	153,452	20+280	3	
11	Ga Central	41.33	147,820	80	13	
12	Ga East	82.89	186,342	155	18	
13	Ga West	247.40	127,841	50	13	Accra Compost and Recycling Plant (ACARP)
14	Ga North	58.29	131,129	50	11	City Waste Recycling
15	Ga South	22.55	295,344	45	N/A	
16	Weija-Gbawe	43.46	241,629	45	N/A	Weija Dumpsite

						Tidy-Up Mini Transfer Station
17	Ledzokuku	37.05	158,659	33	N/A	Zoom Pak Transfer Station, Teshie
18	Krowor	18.38	128,675	40	N/A	
19	La Dade-Kotopon	35.97	231,306	40	4	
20	La Nkwantanang Madina	67.80	141,124	135	10	
21	Adentan	82.24	98,682	55	9	LynAmps Enterprise (Recycling Plant)
22	Tema Metropolis	42.31	212,926	30	N/A	Safi Sana Anaerobic Digestion Plant
23	Tema West	51.63	156,134	45	N/A	
24	Ashaiman	20.29	240,841	320	N/A	
25	Kpone Katamanso	226.27	138,529	30	N/A	Kpone Landfill Blowplast Recycling Ltd.
	Total	1453.51	4,736,155	2,638	90	

Source of Table: TREND, 2020, Source of population data: Ghana Statistical Service, 2020
 Legend: N/A: Non-Applicable; U: Unknown Yet

The average collection coverage and capture within the Odaw river basin are 71% and 73% respectively. However, collection coverage and capture for certain municipalities are generally low. Collection coverage and capture are encouraging in municipalities such as: Korley Klottey (90%, 90%), Ga-East (80% 75%), Ayawaso West (80%, 85%) and Ablekuma North (80%, 80%), (Figure 13). However, collection coverage and capture are very low in municipalities such as Okaikwei North (55%, 60%) and Ablekuma Central (62%, 60%). Innovative approaches adopted by very few FSPs in addition to personalized services from the ISPs are the reasons for the relatively higher collection coverage in some municipalities.

A best practice worth learning is that of the formal service provider within the Korley Klottey municipality, who employs a unique approach to waste collection, where a combination of compaction vehicles and tricycles (Borla taxis) are used to collect MSW from both high- and low-income communities, respectively. The user fees for the service in low-income areas of the municipality is also collected on a flexible basis through revenue collectors, a system which seem to suit low-income dwellers compared to the monthly payments by high-income neighbourhoods and institutions.

The Ga East and the Ablekuma North municipalities have recognized and registered the informal service providers to provide primary collection services, a reason for the relatively high collection coverage and waste capture. On the other hand, Okaikwei North has low collection coverage and capture because of the presence of many low-income communities such as Alogboshie, Abofu, Abeka Zongo, Kiss/Abotre, Akweteyman Zongo, Korpevi, Ayigbe Town and slums along the railway line of the Odaw River/Drain that do not receive collection service from the formal service providers with the franchise. Generally, the quality of collection service within the Odaw river basin is low-to-medium at 38%.

3.4.4 MSW Treatment and Disposal (2 and 2E)

Landfilling and open dumping remains the largest and inevitably MSW disposal methods within the catchment and in the GAMA. Approximately half of the 95% of all collected MSW is disposed on two semi-controlled landfills at Kpone and Nsumia. The rest are sent to uncontrolled sites at Adepa after Nsawam in the Eastern Region, Bosomabena and beyond in the Awutu-Senya Municipality of the Central Region and at Adoquaye dumpsite within the Weija Gbawe Municipality. Annually, 958,191 tons of MSW is disposed of directly on landfills and dumpsites. The Kpone landfill was constructed as a sanitary landfill site to receive MSW from three municipalities (Tema, Kpone and Ashaiman). However, it has been receiving waste from almost all the MMAs in GAMA and can currently be classified as a semi-controlled facility.

Although the Kpone landfill has gas collection systems in place, there are no records of landfill gas emission measurements to support the development of a climate change action plan for the catchment; nor are there any future post-closure energy recovery plans. The buildup of gas is suspected to have facilitated the outbreak of fire on the Kpone landfill in 2019, forcing municipalities to dispose of waste in an adjacent landfill site that has been closed for some time. The other disposal sites are not completely fenced, and waste are not checked before tipping. These sites have no evidence of environmental monitoring and verification by the Environmental Protection Agency (EPA) of Ghana. Site condition is generally bad and vehicular access to tipping areas is poor; a reason for the low to moderate environmental control score for the 17 municipalities of the catchment.

Currently, most landfills and dumpsites sites have exceeded their design capacities, leaving the catchment in a precarious situation with regards to disposal of MSW. The MSWR intends to construct a new engineered landfill at Ayidan but the reality is that the catchment is facing an arduous challenge to MSW disposal. This has led to some municipalities like the AMA resorting to illegal dumping, especially at night, in some parts of Ablekuma Central, along the Abossey Okai to Gamashie stretch. Perhaps these challenges are necessary to drive system handlers to consider the option of source separation and support the expansion of recycling and organic valorization processes towards the diversion of biodegradable and recyclable MSW from landfills.

The management of the semi-controlled landfills receiving MSW from within the catchment has been privatized to a company, Waste landfills. Senior management have the technical competence to operate the disposal site. However, most of the field staff/frontline staff seem not to have adequate knowledge for the work.

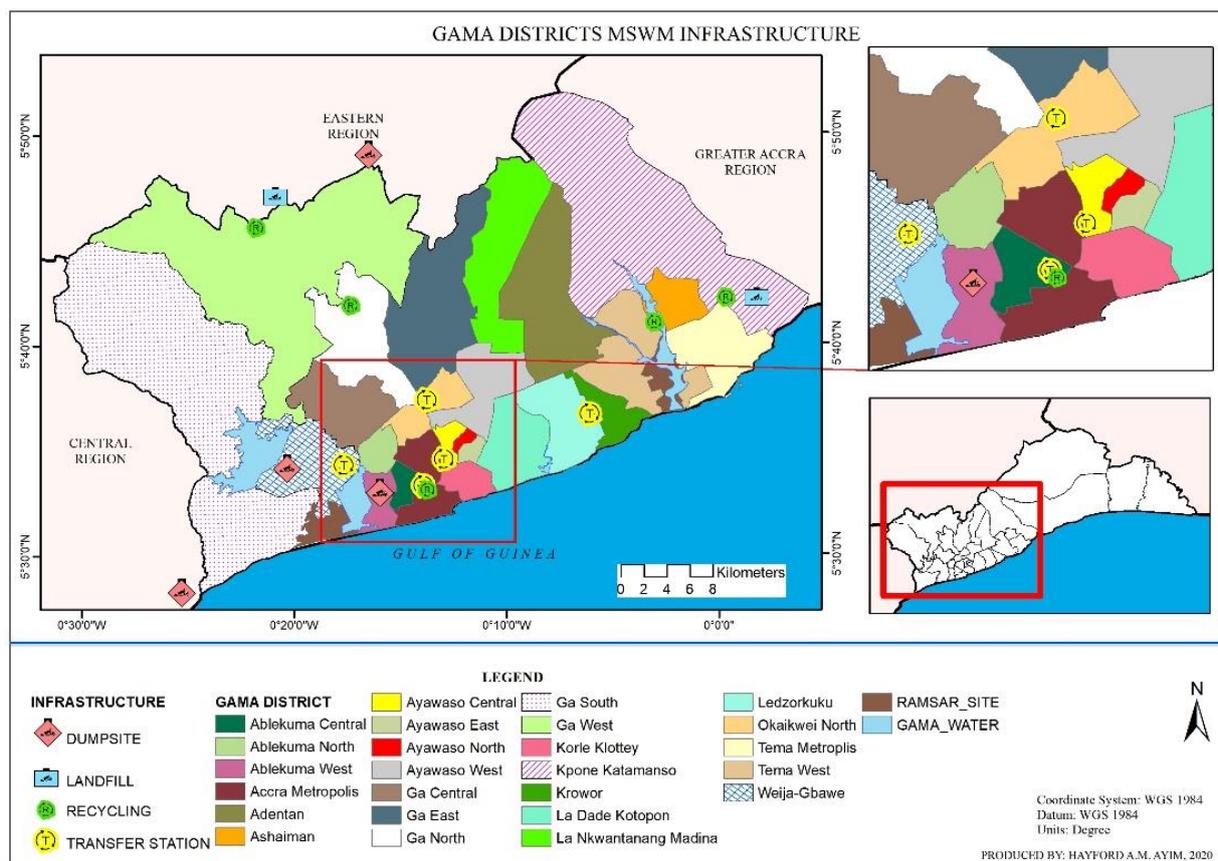


Figure 15: Infrastructure for the treatment and disposal of MSW of the GAMA

3.4.5 MSW Recycling Rate and Quality (3 and 3R), Resource Management

The recycling benchmark assesses the rate of recycling and the quality of the 3Rs (reduce, reuse, and recycle). This section has been thoroughly discussed under section 2.6 of this report.

3.4.6 Service User Inclusivity (4U)

The user inclusivity indicator assesses the degree to which service users can influence the municipality’s decision-making processes and operations in MSWM. It is an important indicator because literature and experience has shown that “successful waste management strategies in developing countries require meaningful involvement of the concerned stakeholders”. The households and businesses whose MSW are removed for disposal - are seldom involved in the planning or implementation of MSWM decisions and programs within the Odaw catchment. There are no established MSW stakeholder platforms to support inclusive governance, further denying system users of transparency and improved MSWM governance.

There is little equity in service provision. Service users in most low-income communities have lower quality level of service and are seldom listened to. The MSW collection franchise agreements require the establishment of a complaints desk within the municipalities. Also, most users within the municipalities pay a fee (directly to the service provider) for solid waste collection services, and are not normally consulted, nor invited to participate in determining, either the level of service or the price for the service level in their area. Although sanctioned by law, public review of MSWM budgets is seldom implemented in the municipalities, earning them a low score on user inclusivity.

There is an Assembly member for each electoral area and a representative (chairperson) of a Social Services Committee at town hall and stakeholder validation meetings, but the political dynamics does not make their representation of the citizens (especially towards effective and efficient MSWM service delivery) enough to drive citizen participation. The residents seem to have lost trust in their elected representatives at the local level, a situation that has stalled the flow of information and interventions towards sustained MSWM. Awareness campaigns and education of the citizenry on best MSWM practices is inadequate in some municipalities.

The assessment revealed that the type of citizen engagement, participatory decision making, and feedback mechanism that will serve to actively involve and empower the service users to stimulate their feeling of ownership of MSWM interventions and lead them to comply with norms and other forms of good solid waste behaviour is nonexistent. Perhaps the lack thereof of such user inclusive initiatives may be part of the reasons why littering, illegal dumping, resistance to pay user charges and the prevalence of the Not In My Backyard (NIMBY) syndrome (towards the construction of waste treatment and disposal facilities, and even the siting of communal collection containers) within the catchment are recurrent issues.

3.4.7 Service Provider Inclusivity (4P)

The provider inclusivity indicator assesses the degree to which service providers from both municipal and non-municipal (including the formal private, community or informal sectors) are included in the planning and implementation of solid waste and recycling services. Formal service providers are known to be moderately involved in MSW decision-making, but this mild commitment to participation (provider inclusivity) does not apply to any of the informal waste and recycling service providers. Still, formal service providers do have a platform that relates to all MSW tendering processes, with clear guidelines and franchise agreements provided to support them in their service delivery.

The municipalities within the Odaw River Basin had an average score of medium (55%) in provider inclusivity. However, Accra Metro (85%) and Ga East (80%) had an encouraging score of medium to high. Service provision within the municipalities is based on a 5-year Fee and Performance-Based Franchise Agreement between the FSPs and various municipalities. The bidding process is to a large extent transparent and based on laid down rules of engagement. The AMA and Ablekuma North Municipalities have moved their engagement and recognition of the ISPs a little bit further by providing their leadership with an office and partially involving them in most MSWM activities. Additionally, the Ga-East Municipality has recognized and registered almost all ISPs within the municipality to improve service provision.

3.4.8 Financial Sustainability

This indicator assessed through six multi-attribute composite criteria measures the degree to which the catchments' MSWM system is financially sustainable. The municipalities of the catchment perform poorly on this benchmark. Solid waste financing remains a major challenge to the municipalities within the catchment. Loans and grants from development partners and international institutions constitute the major source of capital funding, and user pay are not fully developed to cover the total cost of MSWM operations. Government subventions and tax revenues from municipalities supplemented by user fees, ideally should cover budgeted

operation and maintenance costs for collection services. However, this does not “reach” incidental or irregular expenses such as clearing away illegal dumpsites, even when such activities are technically part of the collection service.

The operation and maintenance of landfills are heavily subsidized, and such financing modalities are politically popular, but it tends to hide the true cost of the service from users. Consequently, there is no incentive to divert recyclables from disposal, nor any perceived financial advantage for waste prevention. There seems to be the hesitation to charge the full cost for disposal in the light of remaining politically correct in the handling of the waste sector. Also, there is a lack of activity-based budgeting at the various municipalities, meaning that the total cost of MSWM within the catchment is not well known. Cost recovery mechanisms are underdeveloped and, in most cases, non-existent with MSW reclaiming and recycling being a purely informal activity.

Again, there is a phenomenon where major cost component of managing the MSW in the 17 MMAs are budgeted for and paid to service providers contracted at the national level. This situation indirectly affects effective supervision and monitoring of such aspects of the solid waste service delivery at the level of the municipalities. Similarly, the fee-fixing resolution on one hand have not be able to effectively direct access to SWM services to all socio-economic groups in the municipalities. The cross-subsidy mechanism within the fee-fixing resolutions established by the 17 municipalities does not seem to be attractive to formal service providers and as such most low-income communities are unserved by their concessional FSPs, and thus depend on ISPs. Perhaps the modalities for paying for services in low-income communities must be re-imagined to be flexible and appropriate fit for such low-income localities.

3.4.9 National Solid Waste Management and Local Institutional Framework

The assessment of the National and Local level institutional Framework for MSWM focuses on assesses the: adequacy of the national solid waste management framework regulating the implementation of legislations and policies on MSW and human resource; and organizational strength and coherence of the institutions managing the MSW system. Generally, the assessment score for this component was medium (46%). The MSWR holds the responsibility for the development of strategies for MSWM within the catchment and the country, although there exist overlaps with the Ministry of Science, Technology, and Innovation (MESTI) and the Ministry of Local Government and Rural Development (MLGRD) in some respects. For example, MESTI provided the leadership for the development of a framework on Plastics, under an ongoing Ghana National Plastic Action Plan (NPAP).

Again, at the national level, there is a policy on environmental sanitation with supporting strategic and investment plans, but the absence of a comprehensive legislative framework and a sustained funding source for its implementation has hampered its operational usefulness to the MSWM system. The MSWR recently (in June 2020) and for the first time ever released a National Solid Waste Management Strategy to guide MSWM in the country. A master plan for SWM is also almost complete.

Also, the municipalities, who are tasked with the implementation of the policies for waste management, are under-resourced. These municipalities have limited budgetary authority and too little trained staff (compared to the task they are expected to address). By law municipal assemblies are not required to have waste management departments. The MSWM activities are coordinated by Environmental Health and Sanitation Units of the municipal assemblies. However, given the complexities of SWM in GAMA, it is imperative for municipalities to have autonomous waste management departments. While this position is shared by the National Environmental Sanitation Policy, the Local Government Act does not recognize this as a gap. This should be considered as a long-term measure. In the interim an interjurisdictional or zonal approach should be considered where the Waste Management Department of AMA should be mandated and capacitated to support the other municipalities.

Continuous and perhaps deliberate private sector monopoly in service delivery, occasioned in part by the failure of the municipalities to improve and sustain MSWM, is gradually turning them into system observers. Overlap in activities and a lack of willingness to streamline operations between the waste management and public health departments, in addition to interference from superior officers has belittled enforcement of bylaws and implementation of MSWM guidelines.

The MSWR and the relevant stakeholders must critically evaluate the role and responsibilities of the institutional framework of the municipalities towards sustained MSWM service delivery. There is no doubt that sound policies translated into strong legislative and regulatory frameworks and coupled with pro-active institutions form the backbone of effective SWM systems. Creating an independent waste management department or agency from the control of the municipalities will provide the requisite autonomy and enabling environment to support system handlers to take politically difficult but economically and environmentally sustainable decisions for MSWM system improvement. This will also provide the opportunity for tailored-made training and capacity building to address system challenges.

3.5 Analysis of Key Issues and Needs towards SWM Improvement Plan

This section of the report presents the summary of key issues from the situational analysis of the municipal solid waste management systems in the 17 municipalities within the Odaw River Catchment. The analysis of keys issues and needs presented in this section forms the basis of the proposals in the SWM Improvement Plan. The analysis has been organized based on the thematic focus areas in the MSW value chain.

Thematic Area: Source separation and storage			
Key Issue	Description of Issue	Baseline Situation	Critical Needs/ Requirements
<i>Mixed waste at point of generation</i>	<ul style="list-style-type: none"> All waste is mixed during storage Mixed waste reduces value of recyclables generated at the household level 	<ul style="list-style-type: none"> 41% and 80% of households and institutions use standard waste bins respectively Households rarely practice source separation 	<ul style="list-style-type: none"> Provision of standardized bins to support source separation
Thematic Area: Solid waste collection			
<i>Inadequate services by Formal Service Providers (FSPs) especially in LICs</i>	<ul style="list-style-type: none"> Communities have been zoned and FSPs assigned to collect solid waste. Frequency of collection by FSPs is inadequate and lead to accumulation of waste and littering 	<ul style="list-style-type: none"> Frequency of MSW collection does not meet the expectations of users 	<ul style="list-style-type: none"> Contract renewals should be performance-based Reimagine service levels for different types of communities
<i>Potential of Informal Service Providers to support MSW Collection in Low-Income Areas</i>	<ul style="list-style-type: none"> ISPs are recognised but not formally integrated into the MSWM System ISPs do not have concessions in the MMAs 	<ul style="list-style-type: none"> ISPs collect more than 50% of all MSW collected in the 17 MMAs within the Odaw River Catchment. 	<ul style="list-style-type: none"> Engage and support ISPs to improve MSW service delivery especially in low-income communities and unserved areas.
<i>High incidence of littering</i>	<ul style="list-style-type: none"> Overflowing communal containers leading to littering in drains Absence of oversight on the activities of the ISPs contribute to a high incidence of illegal refuse points within MMAs 	<ul style="list-style-type: none"> Communal container sites (about 75%) are characterised by high incidence of littering Low frequency of collection of litter bins placed at bus terminals, markets, and other public places 	<ul style="list-style-type: none"> Improve waste capture, collection coverage, and reduce (eliminate) the usage of communal containers Anti-littering campaigns and enforcement of byelaws
<i>Inadequate data on Solid Waste Collection</i>	<ul style="list-style-type: none"> Absence of reliable data for effective planning makes it difficult for MMAs to monitor and modernise waste collection 	<ul style="list-style-type: none"> MMAs do not have a Management Information System for MSWM 	<ul style="list-style-type: none"> Create a repository for MSW data across projects to support planning

<i>Service user inclusivity in Solid Waste Planning and Monitoring</i>	<ul style="list-style-type: none"> Limited user inclusive initiatives contribute to littering, illegal dumping, and refusal to pay user charges 	<ul style="list-style-type: none"> User engagement, participatory decision making, monitoring and feedback is not widespread in most MMAs 	<ul style="list-style-type: none"> Engage key community leaders and stakeholders to form MSW teams that will support MSW planning and monitoring
Thematic Area: Solid waste recovery and diversion from landfills			
<i>Informal Waste Pickers (IWP) can support delivery of recyclables to Bring-Back Centres</i>	<ul style="list-style-type: none"> IWP are the main drivers of MSW recycling within the catchment. Contribute to an estimated MSW recycling rate of 18% generating more than US\$ 22m IWPs are highly unorganized 	<ul style="list-style-type: none"> 1200 IWPs, with 800 always active on landfills/ dumpsites 600 itinerant waste pickers IWPs and ISPs reclaim 22.5% of all MSW disposed annually 	<ul style="list-style-type: none"> Engage and support IWPs with space and equipment to improve and sustain their services
Thematic Area: Solid waste treatment and recycling			
<i>High informal recycling sector</i>	<ul style="list-style-type: none"> The recycling sector is dominated by informal service providers The sector can increase their capacity and employ more workers, but they are constrained with space and finances They are in competition with most foreign formal recycling companies 	<ul style="list-style-type: none"> An estimated 64 intermediate buyers, recyclers, processors, and innovators purchase most of the reclaimed material from IWPs The informal service providers in the recycling sector contribute to 18% recycling rate 	<ul style="list-style-type: none"> Support recycling sector with a permanent space, and creating an environment for private sector to support/invest infrastructure and equipment
<i>Inadequate number of Composting and Anaerobic Digestion Plants</i>	<ul style="list-style-type: none"> Limited market for source separated materials especially biodegradables Inadequate number of treatment plants limits the potential sustenance of waste segregation at source 	<ul style="list-style-type: none"> More than 50% of MSW is organic waste. There are only 4 privately owned composting and anaerobic digestion plants within GAMA 	<ul style="list-style-type: none"> Engage existing companies to discuss the viability of receiving separated materials to expand and sustain waste segregation
Thematic Area: Final disposal			
<i>Lack of fully controlled disposal facility for solid waste</i>	<ul style="list-style-type: none"> About 95% of all MSW collected is sent to landfill sites Gas collection systems at the Kpone landfill are underutilised or not in use Landfill sites are poorly managed No evidence of environmental monitoring and verification 	<ul style="list-style-type: none"> Land requirements and the use of landfills in disposal for the MSW in the catchment is unavailable, expensive and contributes to a high collection and transportation cost 	<ul style="list-style-type: none"> Ensure that environment standard requirements are fully adhered to Increase investment in intermediary processes in the value-chain aimed at reducing the amount of waste that ends up at the landfills and dumpsites

4. MUNICIPAL SOLID WASTE MANAGEMENT IMPROVEMENT PLAN FOR SERVICE DELIVERY WITHIN THE ODAW RIVER CATCHMENT

4.1 Overview of the Service Improvement Plan

This section presents the strategies proposed towards the improvement of the Municipal Solid Waste (MSW) Service Delivery in the low-income communities, markets, and institutions of the 17 municipalities of the Odaw River Catchment. The focus of improvement is on both the physical components (Storage, Collection, Transportation, Recycling and Disposal) and the governance aspects (Inclusiveness, Financial Sustainability, Policies, and Institutions) of the Municipal Solid Waste Management (MSWM) System. The SWM Improvement Plan has been formulated based on the findings from the comprehensive assessment of the MSWM system and the situational analysis of the prevailing waste culture of residents within the 17 municipalities within the Odaw River Catchment. The SIP has been modeled not only to improve the physical components (i.e. promote community-based MSW separation at source, improve collection coverage, disposal, treatment and recycling), but most importantly the governance aspects (build capacity of system handlers, improve inclusive service provision and decision-making, improve system financing and cost recovery, improve MSW legislation, guidelines and monitoring systems) in a holistic manner; and also to support both service providers and service users with incentives to motivate them towards system sustainability.

4.2 Strategic Focus of the Solid Waste Management Improvement Plan

4.2.1 Goal of the Solid Waste Management Improvement Plan

The overarching goal of the integrated and incentive-based SWM Improvement Plan is to support the implementation of a sustainable and cost-effective SWM and recycling system within the Odaw River/Drain Catchment. This is premised on the implementation of an incentive based MSW model which integrates multiple stakeholders (government, formal and informal sector actors within the solid waste services value chains, Universities, NGOs etc.) to support each other towards the sustainability of the system. This SIP has been developed for a 10-year period – all things being equal, the various interventions proposed within this plan is targeted to yield marked improvements in MSW collection, recycling, treatment, disposal, litter prevention, monitoring, and data collection, hosting, and management in a 10-year period. This target assumes the commencement of implementation of the plan in 2021. The summarized Action Plan with Cost Estimates and Schedules for the implementation of the MSW improvement strategy within the Odaw river catchment attached as an Annex.

4.2.2 Strategic Objectives of the Solid Waste Management Improvement Plan

The strategic objectives of the Service Improvement Plan include the following:

- To improve the storage of MSW at the household, institutional and commercial levels and promote segregation of MSW at source.
- To increase MSW collection coverage within the Odaw River Catchment and

- To reduce the total amount of MSW sent to landfills through an integrated and incentive-based diversion and recycling scheme.
- To enhance capacities of the relevant actors (service providers, municipal staff, and recycling value chain actors) to facilitate the implementation and monitoring of the strategy.
- To support relevant stakeholders with the organization, and provision of equipment and the necessary infrastructure for the implementation of the strategy.
- To develop the financial, institutional, and regulatory mechanisms for the sustainable implementation of the strategy.

4.2.3 Thematic Focus Areas of the Solid Waste Management Improvement Plan

The thematic focus of the SWM Improvement Plan is derived from the situational analysis of the MSWM system of the 17 municipalities within the Odaw River Catchment and the strategic goal and objectives of the plan. The proposed strategies and interventions towards the improvement of the MSWM across the 17 municipalities have been captured under five main themes. Each of the themes have sub-themes which further organizes the various strategies and interventions proposed under the SWM Improvement Plan. These themes are as follows:

I. Improve Solid Waste Service Delivery

- a. Generation and Storage
 - b. Collection and Transport
 - c. Disposal, Reuse and Recycling
- } Sub-themes

II. Create efficient mechanisms for Litter Management

- a. Sensitization and Education on Anti-Littering
 - b. Innovations for handling litter in Public and communal spaces
 - c. Community-led advocacy and reward systems for Litter Management
- } Sub-themes

III. Strengthen municipal governance for SWM

- a. Enhanced Institutional and Stakeholder Capacity for MSWM
 - b. Planning and regulatory arrangements for MSWM
- } Sub-themes

IV. Ensure effective monitoring, evaluation, and learning (MEL)

- a. Development of MEL Framework
 - b. Conduct of Monitoring, Evaluation and Learning
- } Sub-themes

V. Develop sustainable financing and cost recovery mechanisms

4.2.4 The Guiding Framework for the Solid Waste Management Improvement Plan

The Solid Waste Management Improvement Plan is anchored on the Integrated Sustainable Waste Management (ISWM) framework. ISWM is a participatory planning framework which provides a lens for understanding urban waste management and envisions a city's MSWM system as the combination of the two overlapping parts – the physical components and the governance aspects. Perhaps the most significant element of ISWM is that it uses a system lens,

and the core assumption is that there is always a system and any intervention to improve the system need to begin with finding and articulating how that system works.

Interventions need to begin by actively seeking to identify what is working, what is valuable, and what should be preserved in the system, and what is incomplete, broken, insufficient, unfair, and/or failing, from the point of view of the main system stakeholders. In waste management (as in other urban services) the main stakeholders are the users or potential users of the system, and the providers of the services. In recycling and recovery, the main stakeholders are the waste pickers, the collectors, traders, recyclers, and processors and in some cases the producers or users of the items that are recovered.

Successful interventions framed using the ISWM approach begin with an inventory of what is happening, and especially what is working, because for any intervention to be sustainable, it must build on and reinforce the functionalities, when it purports to correct the inadequacies. The implicit claim of the ISWM framework is that any sustainable, self-correcting, and well-functioning MSW system can only succeed when it is secured in the two overlapping triangles.

Thus, this strategy does not follow strictly the conventional models of MSW improvement as often borrowed from developed and highly industrialized countries but formulated along locally appropriate themes. The ultimate and long-term focus is to increase the level of service provider and user inclusion in MSW service delivery and decision-making through participation. The collection and recycling plan seeks to move towards circularity by supporting the service- and value-chain actors at all stages to increase their capacities, improve upon their working conditions and environments, and create livelihoods through community-based management approaches.

4.3 Comprehensive Overview of the Service Improvement Plan

This section provides further implementation insights, anticipated project activities, indicative timelines for proposed activities, the roles, and responsibilities for various actors within the SW Sector for each of the outlined interventions, and the costing and financing plan geared towards Solid waste improvements, litter prevention and the promotion of cleanliness within the Catchment. The detailed interventions have been proposed to systematically address and improve upon the MSW service delivery within the Catchment. These interventions are intended to be implemented in an integrated manner and never as stand-alone. The comprehensive description of each of these major interventions have been provided in the subsequent sections of the report.

4.3.1 Thematic Focus One – Improve Solid Waste Service Delivery

Sub-theme: 1a. Generation and Storage

The liberty to choose and the absence of regulation on the type of MSW storage materials within most low-income communities partly facilitates the occurrence and incidence of littering. Most inhabitants are not able to afford the use of “standard” receptacles, resorting to the usage of all forms of receptacles for the storage of MSW. The objective of this intervention is to make readily available and provide “standardized” (locally appropriate) receptacles and liners to low-income communities for purposes of uniformity and litter prevention in the

storage of MSW. A second objective is to use such provision as an incentive tool to gain societal support and cooperation towards the implementation of the components of the SIP, especially in MSW separation at source and litter prevention interventions.

Sub-theme: 1a. Generation and Storage			
Municipal solid waste storage at point of generation			
Project Activities	Timeline (2021 - 2030)	Role	
		Lead Agency	Collaborating Agency
Design a three-stream source segregation model for adoption in the selected communities and markets	2023	MSWR	MMAAs
• Update the registration database of all selected low-income communities (households, institutions, transport terminals and markets) within the municipalities using geo-referenced data.	2021	MMAAs	Service Providers
Procure and distribute receptacles for the segregation of household solid waste at source	2023-2024	MSWR/ PMU	MMAAs
• Engage service providers and municipal representatives to collaborate with institutions to determine their required quantities and volumes of receptacles and monitor the acquisition of same by all institutions	2022	MMAAs	Service Providers, Institutions
• Support middle- to high-income households, restaurants/eateries, and road-side food vendors/traders to purchase standard receptacles outright or on credit towards planned payment within a 6-month period	2022	MSWR/ PMU	MMAAs
• Procure and distribute manufactured receptacles to selected, markets, transport terminals for storage of separated MSW	2024	MSWR	MMA, Service Providers

Sub-theme: 1b. Collection and Transport

The evidence of the MSWM assessment within the catchment shows that, informal service providers are collecting more MSW than their formal counterparts, and especially in low-income communities. Their personalised and reliable services, in addition to their flexible user charge collection has won them trust from most service users. The real-life practice is that ISPs are performing reasonably well and remain a viable solution to MSW collection challenges in low-income communities, markets, and transport terminals. They need to be engaged and strengthened to harness their full potential towards MSW collection improvement within the catchment. The focus is to engage and support the informal service providers to render service in most low-income areas of the Catchment.

Sub-theme: 1b. Collection and Transport			
Innovations for improving MSW collection and transportation in the Odaw Catchment			
Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
• Engage FSPs and ISPs on the Implementation Action Plan within the 4 No. communities	2021	MSWR	MMAAs, FSPs, ISPs
Undertake reconnaissance survey to confirm refuse points on refuse maps; Identify disposal sites to receive evacuated refuse;	2021	MSWR	MMAAs

Package refuse points into three (3) No. contract lots; Procure contractor (s) for refuse evacuation			
Evacuate waste	2022	MSWR	MMA
Supervise refuse evacuation	2022	MSWR	MMA
• Collect stored recyclable MSW at least once every week, and twice a week for biodegradable MSW and others from households	2024	Service Providers	MMA, MSWR
• Clean markets, collect and handle segregated waste from markets, and pay for the discharge and transport of same	2024	MMA	FSPs, ISPs
• Transport all collected biodegradable MSW directly to composting and biogas plants (ISPs should travel within 15km away from treatment sites)	2024	Service Providers	MMA
• Transport all recyclables to sell to bring-back centres for further segregation into streams	2024	Service Providers	MMA, Bring-back Centres
• Introduce tracking device on all solid waste collection vehicles (including tricycles and bulk transport trailers) to monitor services	2022	MSWR	Service Providers, MMA, ESPA
• Provide incentives to households, institutions who segregate MSW through service fee reduction	2024	MSWR	MMA, ESPA, FSPs, ISPs, Institutions

Sub-theme: 1b. Collection and Transport

ISP-led MSW waste collection and transportation in low-income communities

Project Activities	Timeline (2021 - 2030)	Roles	
		Lead Agency	Collaborating Agency
• Engage service providers to take-up responsibility for MSW collection modernization in low-income communities	2022	MMA	Service Providers
Develop management & financial models for tricycles, trucks & composting machines	2021	MMA	PIU
• Enumerate and profile the MSW ISPs within the 4 No. Communities and Markets. Register all interested ISPs Facilitate the formation of 4 No. cooperatives of ISPs Train and equip cooperatives	2021	MSWR	MMA, PIU
Support cooperatives to identify office space	2021	MSWR	MMA
• Engage the low-income communities on the proposed plan for MSW collection improvements and introduce ISPs cooperatives	2021	MMA	Informal Service Providers. Communities
• Procure a management consultant to manage tricycles trucks & composting machines Supervise management Monitor, learn and scale up	2021	MSWR	MMA
• Review existing MSW collection franchise documents within the 4 No. selected communities Delineate and assign franchise zones to ISPs within the 4 municipalities for MSW collection • Collect MSW collection coverage data to establish baselines and set targets for improvement	2022	MSWR	MMA
Mandate cooperatives to start the collection of MSW within selected communities	2021-2026	MSWR	MMA

Sub-theme: 1c. Reuse, Recycling and Disposal

The aim is to promote and regulate the processes of organic valorisation, increase recovery of clean sourced recyclables in addition to improving the rate and market dynamics of recyclable MSW.

Sub-theme: 1c. Reuse, Recycling and Disposal			
Recycling, treatment, and disposal of MSW within the Catchment			
Project Activities	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
Mobilize relevant stakeholders towards the formation of the foundation Develop operational mandate for the running of the foundation • Create a seed fund for the foundation	2023	MSWR	PIU
Provide office space for recycling foundation	2023-2024	MSWR	MESTI, Associations of Plastic producers and importers
• Enumerate and profile the IRs within the Catchment Register all interested IRs Facilitate the formation of 4 No. cooperatives of IRs • Train and equip IRS cooperatives	2024	MSWR	
• Identify market opportunities and stakeholders	2021	MSWR	MMA
Sensitize farmers and communities on compost product usage; Establish a demand and supply agreement between stakeholders for the purchase of compost products Monitor and learn	2024	MSWR	MMA
• Collaborate with private sector for the construction of a new composting and anaerobic treatment plant	2021-2024	MSWR	Private Sector
• Procure 5 No. Recycling Extruders, 5 No. Pelletizers, 5 No. Crushers and Washers for use by high chain IRs	2023 - 2024	MSWR	MMA
• Procure land for IRs operations	2023 - 2024	MSWR	MMA
• Sign MoU with the IRs and mandate them to operate the buy-back centres	2024	MSWR	PIU
• Monitor and Learn the operations of the buy-back centres.	2024	MSWR	MMA

4.3.2 Thematic Focus Two – Create efficient mechanisms for Litter Management Strategy

The Litter Management Strategy presents innovative strategic solutions to address littering challenges that were identified in situational analysis of markets, transport terminals and key public spaces and places within communities across the 17 MMAs. The aim of the Litter Management Strategy is to outline a system of interventions that has the highest potential to reduce the incidence of littering within the municipalities of the Odaw Drainage Catchment and consequently within the Odaw Channel.

Sub-theme: 2a. Sensitization and Education on Anti-Littering

The goal is to sensitize, educate and create continuous awareness on Litter prevention. Strategic interventions designed under this theme focus on promotion and provision of comprehensive and significant education on anti-littering, including the consequences and legislative sanctions

of littering within the municipalities. In addition, this sub-theme seeks to educate and promote waste segregation at source in basic schools through a collaborative effort among the Ministries of Education (MoE), Local Government and Rural Development (MLGRD), and Sanitation and Water Resources (MSWR).

Sub-theme: 2a. Sensitization and Education on Anti-Littering			
Roll out a comprehensive Anti-Littering Education and Awareness Campaign Strategy within Municipalities			
Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Engage musical artistes to compose Anti-littering songs in at least three local languages (Ga, Twi, Ewe, Hausa, Dagbani) for purposes of education and awareness creation 	2022	MSWR	MMA, MUSIGA, Creative Arts Council
<ul style="list-style-type: none"> Engage popular celebrities within the creative arts industry to roll adverts (jingles) and conversations geared towards anti-littering 	2021 – 2023	MSWR	MMA, MUSIGA, Creative Arts Council
<ul style="list-style-type: none"> Engage FM and TV Stations with wide transmissivity and relatively high number of listeners to systematically play Anti-Littering Songs 	2022 -2024	MSWR	Media Houses
<ul style="list-style-type: none"> Engage experts as panellists on FM and TV Stations to discuss in different languages the effect and cost of littering, including the plans in place for litter prevention 	2021- 2025	MSWR	Media Houses
<ul style="list-style-type: none"> Engage religious institutions to dedicate time for designated experts to promote litter prevention (for at least 6 months) 	2021 – 2022	MMA	Religious Bodies
<ul style="list-style-type: none"> Develop anti-littering communication plan and educational materials Mass production of communication and educational materials 	2021	MSWR	MMA

Sub-theme: 2a. Sensitization and Education on Anti-Littering			
Education and Promotion of Anti-Littering and MSW Separation as a Practice in Basic Schools			
Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Engage experts to develop simple educational materials geared towards MSW Separation in basic schools. 	2022 – 2023	MSWR	MoE. GES, SHEP
<ul style="list-style-type: none"> Train SHEPs and selected School-based health coordinators on waste segregation 	2022-2024	MSWR	GES
<ul style="list-style-type: none"> Support selected basic schools to acquire bins for a three-stream separation (Food and Plant-based Waste, Paper, and Plastics) of MSW 	2022 – 2023	MMA	MoE. GES, SHEP

Sub-theme: 2b. Innovations for handling litter in Public and communal spaces

The objective of this sub-theme is to adopt innovative approaches to improve the storage, collection, and transportation of MSW in markets, transport terminals and public places and spaces within the 17 MMAs. The interventions focus on the provision of litter bins to improve the storage, collection and transportation and complement waste segregation sensitization and education campaigns within the Odaw Catchment.

Sub-theme: 2b. Innovations for handling litter in Public and communal spaces			
Installation of Litter Bins in Public Spaces			
Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Procure, distribute and install 200 Litter Bins within 4 selected communities; Develop a plan to empty litter bins; Engage ISPs or MMAs to empty bins; Identify public spaces for the installation of 5 bulletin billboards Design and Install 5 Bulletin Billboards to create awareness on litter prevention 	2021	MSWR	MMA
<ul style="list-style-type: none"> Liaise with the management of landfills to improve uptake of MSW 	2021 – 2022	MSWR	MMAs, Landfill Operators
<ul style="list-style-type: none"> Mandate cooperatives to start the collection of MSW within selected communities 	2021-2026	MSWR	MMA/Service Providers
<ul style="list-style-type: none"> Mandate cooperatives or MMAs to empty Litter bins 	2021 – 2026	MSWR	MMA, Service Providers

Sub-theme: 2b. Innovations for handling litter in Public and communal spaces			
Improve Litter Collection and Transportation in Public Areas			
Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Engage service providers and management of markets/ terminals on new Litter Management improvement plan with focus on daily (frequency of) collections 	2022	MMAs	FSPs, ISPs Managers of Markets/ Terminals
<ul style="list-style-type: none"> Engage MAs and management of markets/ terminals to separate SWM levy component from rent and develop separate SW payment arrangement for markets/ terminals 	2022	MMAs	Managers of Markets, Terminals
<ul style="list-style-type: none"> Procure 90 No. receptacles within selected market and institutional recyclable waste streams 	2023 - 2024	MSWR	MMA
<ul style="list-style-type: none"> Assign attendants to monitor and ensure adherence to appropriate separation and disposal to avoid incidence of littering around the skips 	2022	MMAs	Managers of Markets, Terminals
<ul style="list-style-type: none"> Form Community Support Team to support litter management and ensure general enforcement 	2022	MMAs	Managers of Markets/Termin als
<ul style="list-style-type: none"> Transport all recyclables collected to bring-back centres for further segregation into waste streams. 	2024	MSWR	Service Providers

<ul style="list-style-type: none"> • Transport all collected biodegradable waste from market and terminals to treatment sites (composting/ biogas plants) 	2024	MSWR	FSPs, ISPs
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Sub-theme: 2c. Community-led advocacy and reward systems for Litter Management

This sub-theme seeks to advance community-led advocacy, assessment, and rewards as an approach to achieving and sustaining litter-free municipalities. The complexity and dynamics of the prevailing littering practices (based on findings from anti-littering management survey) within the Odaw Catchment calls for a decentralized and an all-inclusive community-based leadership strategy. Interventions under this sub-theme centre on engaging community leaders and stakeholders, markets, and transport terminals leaderships to lead and promote anti-littering activities and issues. In addition to this, there is an intervention designed to support the efforts of municipalities (transport terminals, markets, and communities) that work systematically towards the attainment of clean communities by assessing and rewarding clean communities.

Sub-theme: 2c. Community-led advocacy and reward systems for Litter Management			
Establish and Strengthen Community-Level Leaders/Influencers as the Face of Anti-littering within the Catchment			
Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> • Organize stakeholder validation workshop on the final RBF and Implementation Action Plan. 	2021	MSWR	MMA
<ul style="list-style-type: none"> • Engage MCEs and MCDs on the final MSWSIP, RBF and Implementation Action Plan 	2021	MSWR	PIU
<ul style="list-style-type: none"> • Sensitize the selected communities to empower and create ownership of action plan 	2021	MSWR	MMA
<ul style="list-style-type: none"> • Profile the 4 No. selected communities and markets for project implementation; Identify community structures, gatekeepers & community champions; Develop a structure to support waste collection intervention and litter prevention • Facilitate the establishment of the committees • Train committees for waste collection 	2021	MSWR	Assembly Mem, Community
<ul style="list-style-type: none"> • Engage community leaders, market queens, transport terminal leaders, and leaders of informal settlements to assume responsibility for litter prevention and cleanliness 	2021 -2022	MMAs	Assembly Mem, Community
<ul style="list-style-type: none"> • Appoint and support key influencers in slum settlements, as MSWM representatives/ attendants to see to the day-to-day management of litter and MSW 	2021 -2023	MMAs	Assembly Mem
<ul style="list-style-type: none"> • Appoint (in a participatory manner) transport terminal and market sanitation officers/queens/representatives to assume MSW oversight and coordination responsibilities within markets and transport terminals. 	2021 -2030	MMAs	GPRTU, Market Unions
<ul style="list-style-type: none"> • Support the leaders to form a three (3)-to-five (5) person Community Support Team, watchdogs and/or MSW teams in communities, transport terminals and markets. 	2021 -2022	MMAs	Assembly Mem, Community
<ul style="list-style-type: none"> • Recognise and introduce Community Support Teams to their localities (communities/ markets and terminals). 	2021 -2022	MMAs	Assembly Mem, Community

<ul style="list-style-type: none"> Assess the capacity needs of the Litter prevention taskforce and/teams and provide training and management support 	2021 -2023	MMA's	Assembly Mem,
<ul style="list-style-type: none"> Provide anti-littering teams with incentives based on verified outputs (reduction in the incidence of littering and improved MSW collection). 	2021 -2030	MMA's	GPRTU, Market Unions

Sub-theme: 2c. Community-led advocacy and reward systems for Litter Management

Mobilising Communities for a Sustained Municipal Solid Waste Management

	Timeline	Role	
Project Activities	(2021 -2030)	Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Support Municipalities to Engage with traditional, religious, and political Leaders in selected Communities on the objectives SWMIP 	2021	MSWR	MMA's
<ul style="list-style-type: none"> Support MAs to Organize Community Durbars (Entry Conferences) in selected Communities 	2021 - 2022	MSWR	MMA's
<ul style="list-style-type: none"> Support MAs and Sub-metros to form Basin Related Task Force in Communities and Commercial Areas 	2021 - 2022	MSWR	MMA's

Sub-theme: 2c. Community-led advocacy and reward systems for Litter Management

Develop a mechanism to Assess and Reward Clean Communities

	Timeline	Role	
Project Activities	(2021 -2030)	Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Engage designated municipal officers in the mapping of refuse areas within their municipalities to serve as a baseline for the assessment. 	2024	MSWR	MMA's
<ul style="list-style-type: none"> Engage professionals and municipality representatives to develop (in a participatory manner) a scheme and/or a challenge to reward clean communities. 	2024	MSWR	MMA's
<ul style="list-style-type: none"> Publicize the assessment results of municipalities through all the available media 	2024	MSWR	Media Houses

4.3.3 Thematic Focus Three – Strengthen Municipal Governance for SWM

Sub-theme: 3a. Enhanced Institutional and Stakeholder Capacity for MSWM

The Solid Waste Management Improvement Plan will be governed by the existing legislation and institutional arrangements for Environmental Sanitation, Local Government Administration, and Water Resources Management, among others. However, the institutional arrangement prescribed in the Project Appraisal Document will be used in implementing the proposed project activities for the first 3 years, starting 2021. Thus, to effectively implement the plan, the identified capacity of key implementing institutions and stakeholders must be strengthened. The objective of this sub-theme is to ensure the availability and deployment of appropriate, well-trained, and motivated human resource for plan implementation.

Sub-theme: 3a. Enhanced Institutional and Stakeholder Capacity for MSWM			
Training and Certification Programme for Key Stakeholders			
Project Activities	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
Training for Metropolitan/Municipal Officers: <ul style="list-style-type: none"> • Data Collection and Management • Sustainable Solid Waste Management (Circular Economy) • Inclusivity (Involvement of Women, Marginalised) 	2022 - 2026	MSWR/PIU	MLGRD
Training Programme for Informal Sector Players: <ul style="list-style-type: none"> • Sustainable Livelihoods • Occupational Health and Safety • Organizational Development – (Periodic Training & Management Support for Cooperatives) • Gender Mainstreaming in Solid Waste Management • Child Labour and Solid Waste Management • Community champions and gatekeepers 	2022 - 2026	MSWR/PIU	MLGRD
Training Programme for Selected Formal Waste Management Companies <ul style="list-style-type: none"> • Occupational Health and Safety • Inclusivity and Gender Mainstreaming 	2022 - 2026	MSWR/PIU	MLGRD

Sub-theme: 3a. Enhanced Institutional and Stakeholder Capacity for MSWM			
Adequate Staffing (in EHSD & WMDs) for Plan Implementation			
Project Activities	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
• Assess the human resource requirements of the EHSD & WMD in beneficiary MMAs	2021	MSWR	MMA
• Facilitate the recruitment of the required number of staff for the EHSU and WMDs in beneficiary MMAs	2022 - 2025	MSWR	MMA

Sub-theme: 3a. Enhanced Institutional and Stakeholder Capacity for MSWM			
Institutional arrangement for Plan Implementation			
Project Activities	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
• Form and inaugurate the Inter-Jurisdictional Coordination Management Committee	2021	MLGRD	MSWR
• Support the activities of the Inter-Jurisdictional Coordination Management Committee	2022 - 2025	MLGRD	MSWR
• Facilitate the engagements and activities Leading to the Declaration of the Joint Development Planning Area (JDPA)	2022 - 2025	MLGRD	NDPC
• Establish the Joint Development Planning Board (JDPB)	2022 - 2025	MLGRD	NDPC
• Support transitional activities between the ICMC and the Joint Development Planning Board	2022 - 2025	MLGRD	MSWR

• Support and Fund the initial Planning and Operational Activities of the JDPA and JDPB	2022 - 2023	MLGRD	MSWR
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Sub-theme: 3b. Planning and regulatory arrangements for MSWM

The strategy recognises planning as a critical component of delivering effective Solid Waste Management Improvement. The strategy would therefore focus on evidenced-based development and spatial planning activities. The strategy and action plan have a goal of creating an enabling legislative environment, which will support the strategy or plan implementation. This will be done through strategic actions such as: address the deficiencies in the existing legal and policy environments and support the enforcement of sanitation related byelaws. Again, a major change in the regulatory arrangement for waste management in municipalities in Ghana is the nature of contracts under which the waste management companies are delivering their services. MMAs, under these current contracts, have little or no control over the awarding of contracts, hence, are almost incapacitated in their bid to ensure the delivery of quality services. In addition, the current contracts do not recognize the informal sector that play a critical role in delivering solid waste management services. The Consultant therefore proposes the strategies below to improve contracting for MSWM.

Sub-theme: 3b. Planning and regulatory arrangements for MSWM			
Planning for Effective Municipal Solid Waste Management			
Project Activities	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
• Review the Solid Waste Management Component of the MESSAPs	2021	MLGRD	MSWR, MMAs
• Review and Update Structure Plans for the 17 Municipalities	2021 - 2022	MLGRD	MSWR, MMAs, LUSPA
• Support Urban Upgrading Programmes in selected Communities	2022 - 2030	MSWR/ PMU	MMAs & Community
• Support Physical Planning and Works Departments of MMAs to conduct development control activities	2021 - 2030	MMAs	MLGRD, LUSPA

Sub-theme: 3b. Planning and regulatory arrangements for MSWM			
Appropriate Legislative Framework for Project Implementation and Enforcement of SWM Related Byelaws			
Project Activities	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
• Review and update of byelaws related to solid waste management	2021	MMAs/MSWR	MLGRD
• Review fines for Solid Waste and Littering related Offences (to be more punitive)	2021	MMAs/MSWR	MLGRD
• Support the operation of sanitation courts or “sanitation court days”	2021 - 2030	MJAG/MSWR	MLGRD

• Enforce Littering and Solid Waste Management Related byelaws	2021 - 2030	MMAAs	MLGD/MSWR
• Enforce byelaws related to Environmental Sanitation within Catchment Areas (e.g., Toilet Ownership)	2021 - 2030	MMAAs	MLGD/MSWR
• Collaborate with WRC/EPA to enforce River Basin Related Legislations	2021 - 2030	MSWR	MMAAs/WRC/EPA

Sub-theme: 3b. Planning and regulatory arrangements for MSWM

Contracting

Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
• Review Existing Franchise Agreements to create opportunities for informal sector players	2021 - 2030	MSWR	MLGRD
• Develop a Performance Based-Contracting System for Informal Players	2021 - 2030	MSWR	MLGRD

4.3.4 Thematic Focus Four – Ensure effective monitoring, evaluation, and learning (MEL)

Sub-theme: 4a. Development of MEL Framework

This involves the development of appropriate indicators to measure the success or otherwise of the implementation of the SIP. It also involves the definition of the procedures to be followed in the conduct of MEL. The MEL Framework should be aligned with existing structures and procedures at the national and MMA levels to avoid duplications. The framework should be developed at the on-set of the project implementation. Following the definition of the MEL framework, the roles of, and the interrelationship among key stakeholders in the MEL process should be defined. This will include national level MEL Team, Municipal/Metro Level MEL Team, and community level structures for MEL. Given that some interventions will be basin-wide, Inter-Municipal/Metro MEL Team is proposed. The MEL Teams can be same as the Project Support Units (or members from the units).

Sub-theme: 4a. Development of MEL Framework

Set-up Monitoring, Evaluation and Learning (MEL) Framework for Implementation

Project Activities	Timeline (2021 - 2030)	Role	
		Lead Agency	Collaborating Agency
• Assess the existing MEL framework and procedures at the national and MMA levels	2021	MSWR	MMAAs
• Define appropriate indicators to measure progress and achievement of each thematic area	2021	MSWR	MMAAs
• Establish procedure for the conduct of MEL at all levels that aligns with existing structures	2021	MSWR	MMAAs
• Define the composition and the interrelationships of the MEL Teams at the various levels	2021	MSWR	MMAAs

• Set-up the National, Inter-Jurisdictional, Municipal/Metro, and Community MEL Teams	2021	MSWR	MMAAs, Assembly Mem.
• Assess the capacity needs of the respective MEL Teams	2021	MSWR	MMA
• Train the MEL Teams on MEL Framework and Procedure	2021	MSWR	MMAAs
• Procure and supply required resources to MEL Teams for the conduct of MEL	2021	MSWR	MMAAs

Sub-theme: 4b. Conduct of Monitoring, Evaluation and Learning

Under this sub-theme, the objective of conducting monitoring, is to serve as a steering mechanism to ensure that implementation of the strategy is responsive to the proposed plans. It will consist of ongoing actions intentionally planned and executed to ensure that all actors and resources are adequate and on schedule, and that any shortcoming is identified timely and rectified appropriately for the achievement of the goal of the SWMSIP.

Also, the evaluation component under this sub-theme will constitute the periodic activities to be used to appraise and inform the implementation progress. The main objective is to assess the successes and failures during or at the end of implementation, identify the keys factors for these successes and failures, and use the findings to review the implementation strategy for the achievement of the intended goal or inform future interventions.

The emphasis on learning under this sub-theme is deemed crucial given that the SWMSIP constitutes a bold step towards dealing with the solid waste management challenges within the Odaw River Catchment. The learning objective is therefore targeted at providing opportunities to document the implementation process to capture lessons to influence policy and co-creating a platform for participatory learning and sharing among stakeholders.

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning			
Monitoring			
Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
• Conduct of routine monitoring by the respective MEL Teams	2021 - 2030	MSWR	MMAAs & Community
• Preparation of Reports on monitoring activities by MEL Teams	2021 - 2030	MSWR	MMAAs
• Preparation of Quarterly Monitoring Reports on strategy implementation	2021 - 2030	MSWR	MMAAs
• Set-up and run of a Remote Sensing Monitoring System (Camera’s and Satellite Images)	2021 - 2030	MSWR	MMAAs

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning

Evaluation

Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Develop training and monitoring tools for clean communities Train MMAs on Indicators for cleanliness and refuse mapping; Develop a clean community plan; Develop an award scheme Assess MMA based on scheme 	2021 -2022	MSWR	MMAs,
<ul style="list-style-type: none"> Institute a half-yearly competitive Cleanliness Assessment among the 17 municipalities based on the Cleanliness Verification Protocol 	2024 - 2030	MSWR	MMAs & Community
<ul style="list-style-type: none"> Organise Annual Review Meetings on implementation progress 	2021 - 2030	MSWR	MMAs, Assembly Members,
<ul style="list-style-type: none"> Conduct two Mid-Term Evaluations of The Strategy/Plan (end of 3rd Year and 6th Year) 	2024/ 2027	MSWR	MMAs
<ul style="list-style-type: none"> Conduct End-of-Project Evaluation (10th Year) 	2030	MSWR	MMAs

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning

Evaluation

Project Activities	Timeline (2021 -2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Verify and certify assessment results on cleaner communities 	2021 -2025	MSWR	MMAs,
<ul style="list-style-type: none"> Award the cleanest communities 	2021 - 2025	MSWR	MMAs
<ul style="list-style-type: none"> Provide periodic training for community champions and gatekeepers 	2022 - 2026	MSWR	MMAs & Community

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning

Learning

Project Activities	Timeline (2021 - 2030)	Role	
		Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Institute and Support Monthly Municipal/Metro Level Learning Alliance 	2021 - 2030	MSWR	MMAs
<ul style="list-style-type: none"> Organise Quarterly Inter-Jurisdictional Learning Alliances 	2021 - 2030	MSWR	MMAs
<ul style="list-style-type: none"> Produce, publish, and disseminate Quarterly Briefs on strategy implementation 	2021 - 2030	MSWR	MMAs
<ul style="list-style-type: none"> Conduct Annual Policy Dialogue of on Low-Income Community MSWM, 	2021 - 2030	MSWR	MMAs
<ul style="list-style-type: none"> Produce Factsheets (10) based on lessons from the implementation of the strategy 	2021 - 2030	MSWR	MMAs
<ul style="list-style-type: none"> Produce Policy Briefs (3) on Community SWM 	2021 - 2030	MSWR	MMAs

• Open multi-media Platforms for dissemination of project information	2021 - 2030	MSWR	MMAAs
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4.4 Proposed Equipment and Infrastructure

Proposed Equipment and Infrastructure			
Equipment and Facility Tools for Improved MSWM			
	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
Equipment			
• Procure and distribute 12 No. Compactor Collection Vehicles to MMAAs and ISPs	2022	PMU	MSWR, MMAAs
• Procure 90 No. tricycles	2021	MSWR	MMAAs
• Procure 8 No. compact compost machine	2021	MSWR	MMAAs
• Procure 17 Roll-on-Roll-off trucks to be distributed among selected Municipalities	2022	PMU	MSWR, MMAAs
• Procure 85 Motorcycles to be distributed to all Municipalities (5 each)	2022		
Maintenance/Repair Tools			
• Procure basic repair toolbox (containing basic repair tools) for all 17 Municipalities	2022	PMU	MSWR, MMAAs
Disinfection & Fumigation Tools			
• Procure basic fumigation and disinfection machine for all 17 Municipalities	2022	PMU	MSWR, MMAAs

Proposed Equipment and Infrastructure			
Proposed Infrastructure for Improved MSWM			
	Timeline	Role	
	(2021 -2030)	Lead Agency	Collaborating Agency
Infrastructure			
• Construction of a new composting and anaerobic treatment plant	2022	PMU	MSWR, MMAAs
• Construction supervision of 17 No. buy-back centres	2023	MSWR	MMAAs
• Construct 17 No. buy-back centres	2023 - 2024	MSWR	MMAAs
• Design and construction supervision of 2 No. transfer stations	2021 - 2022	MSWR	PIU
• Construct 2 No. transfer stations	2022 - 2023	MSWR	PIU
• Design and construction supervision of 1 No. landfill	2021 - 2023	MSWR	PIU
• Construct 1 No. landfill	2023 - 2024	MSWR	PIU

4.5 Coordination and Management

The objective for the Strategy Implementation Coordination and Management arrangement is to define the institutional arrangement for the oversight at the different levels of strategy implementation. Four main levels are proposed for the implementation of this strategy and these are partially in line with existing arrangements.

- National Level Coordination Team: Two main bodies are proposed at the national level. These structures are already existing.
 - Project Implementation Unit (PIU) to be set-up within the Ministry to provide oversight and general coordination of implementation of the strategy.
 - Project Management Unit (PMU) which is constituted as a technical body to support the Ministry in the implementation of the strategy. The PMU should be composed of the complement of the required skills to support the project, including expertise in planning, engineering, MEL, ICT/GIS, and project management.
- Inter-Municipal/Metro Project Support Team – this is conceived as new body to be set-up slightly above the municipal/metro level to oversee implementation activities at the basin level. This is proposed to consist of one representation from each municipality/metropolis and selected representation from community groups.
- Municipal/Metro Project Support Unit (PSU)- PSU is to set-up in each municipality/metropolis to oversee implementation activities at the respective municipal/metro level. The PSU already exist at the municipal/metro level.
- Community Liaison Teams – constitution of community level groups in pilot communities to support implementation activities through the facilitation of community engagements and facilitation. This is to be composed to give representation to the different interest groups in the community.

Generally, the coordination is to ensure that, Planning, coordination and reporting for the strategy implementation are adequately executed at the respective levels. The coordination arrangements are to be set-up as part of inception activities. The following specific activities are proposed for setting-up the coordination arrangements:

- ✓ Define the roles of the Project Coordination Teams and the relationship between,
- ✓ Set-up/confirm the Project Coordination Teams at the respective levels of operation,
- ✓ Train the Project Coordination Teams on their roles and project implementation framework

Procure and supply the resources needs of the Coordination Teams

Coordination and Management			
	Timeline	Role	
Project Activities	(2021 -2030)	Lead Agency	Collaborating Agency
<ul style="list-style-type: none"> Define the roles of the Project Coordination Teams (i.e., PMU, PIU, ICMC, PSU, CLT) and the relationship between them 	2021	MSWR	MMA's
<ul style="list-style-type: none"> Set-up/confirm the Project Coordination Teams (i.e., PMU, PIU, ICMC, PSU, CLT) at the respective levels of operation 	2021	MSWR	MMA's
<ul style="list-style-type: none"> Train the Project Coordination Teams (i.e., PMU, PIU, ICMC, PSU, CLT) on their roles and project implementation framework 	2021	MSWR	MMA's
<ul style="list-style-type: none"> Procure and supply the resources needs of the Coordination Teams 	2021	MSWR	MMA's

5. SUCCESS AND FAILURE FACTORS IN THE IMPLEMENTATION OF SOLID WASTE MANAGEMENT STRATEGIC IMPROVEMENT PLAN

5.1 Introduction

This section presents the perceived and anticipated factors that may facilitate the successful implementation of the MSWM Improvement Plan or impede it. The outlined factors are based on observations and evidence from the assessment of the MSWM system within the Odaw Catchment, the waste culture of citizens, the performance of the service and value chain actors (both formal and informal), experiences from similar donor projects, and supported by a review of the scholarship on MSWM in Ghanaian Cities and similar developing country cities. Generally, issues relating to governance and financing arrangements for the implementation of the plans have been a common feature in this process.

5.2 General Success and Failure factors in the Implementation of SIP Litter Prevention Strategy

The Solid Waste Management Component of the GARID Project is aimed at reducing the amount of solid waste flowing into the primary Odaw channel. The proposed interventions in the Strategy were aimed at achieving this goal and the numerous expectations of key stakeholders (including low-income communities within the Basin). Based on experiences from other donor-sponsored projects and the results of stakeholder engagements at the national and sub-national levels, the Strategy identified the following success and failure factors for plan implementation:

- ***Continuous Engagement of Key Stakeholders:*** The PMU and PIU must continuously identify and engage key stakeholders to ensure their active participation and commitment. Key stakeholders such as the MMDAs, service providers, and communities (especially low-income communities) must be continuously engaged and involved in the plan implementation. The absence of this will lead to implementation difficulties, which might affect the project budget and outcomes.
- ***Effective Communication:*** To effectively execute a community-focused project like the Solid Waste Management Improvement Strategy/Plan, the PMU and MSRW-PIU must ensure clear and regular communication of project objectives, results, and challenges. It is expected that the project management or any consultant on the project must routinely organize project review and progress meetings with key stakeholders. This will ultimately ensure that the proposed interventions get the buy-in and support of key stakeholders. The absence of a communication strategy or a poorly coordinated communication strategy may lead to misinformation about project objectives and the proposed interventions thereby jeopardizing implementation and project outcomes.

- **Recruitment of Competent Consultant and Contractors:** The PMU and MSWR-PIU would have to ensure that service providers (i.e., the contractors and consultants) to be engaged to provide goods and services under the proposed interventions in the SWMI Strategy or Plan must be experienced, competent, and technology savvy. The PMU and the MSWR-PIU must therefore use quality-based recruitment and competitive procurement processes in engaging all consultants and contractors on the project.
- **Political Commitment:** Political support is essential for project success. Political leaders at the national and subnational levels should be engaged and their support courted for effective project implementation. It must be stated that the success or failure of the interventions relating to law enforcement and development control within the Basin depends on the level of involvement and support of the political leadership at the National and MMA levels.
- **Overall Project Coordination:** GARID is an integrated project, hence interventions under the various components should be scheduled and coordinated such that they reinforce each other. To achieve the overall project goal, and the specific project goal of the solid waste component of the project, the PMU, and the various PIUs must continuously review the overall implementation plan and schedule. A failure to do this would lead to a disjointed implementation process, which could ultimately affect project outcomes.

6. ENVIRONMENTAL AND SOCIAL SAFEGUARD ISSUES

6.1 Overview of Policy, Regulatory and Institutional Framework

The policy and regulatory framework relevant to the proposed SWMIP for the Odaw Basin are those that related to sanitation, waste management, and water pollution sectors. Broadly, the framework for the MSWMIP includes the following:

Box 3: List of Relevant Policies, Regulations & Institutional Requirements

List of Relevant Policies, Regulations, and Institutional Requirements

The policy and regulatory areas applicable include:

- National environmental policy and requirements.
- Water, sanitation, and hygiene sector policy and requirements.
- Framework for national planning and development.
- Requirements on land for development.
- Aviation Sector Requirements
- World Bank Group's requirements

National Environmental Policy and related Requirements

The policy and regulatory areas applicable include:

- Ghana's National Environmental Policy, 2012.
- Environmental Protection Agency Act, 1994, Act 490.
- Environmental Assessment Regulations, 1999 (LI 1652); and
- Ghana National Climate Change Policy, 2013.

Water, Sanitation and Hygiene Sector Policy and Requirements

The relevant legislation, rules, and other requirements in the water and sanitation sector include:

- National Environmental Sanitation Policy, 2010.
- National Water Policy, 2007.
- National Environmental Sanitation Strategy and Action Plan, 2010.
- District Environmental Sanitation Strategy and Action Plan, 2010.
- Water Resources Commission Act, 1996 (Act 522); and
- Wetland Management (Ramsar Sites) Regulations 1999, L.I. 1659.

National Planning and Development Requirements

The national policy requirements for planning and development include:

- Land Use and Spatial Planning Act, 2016 (Act 925).
- Local Governance Act 2016 (Act 936):
- New Ghana Building Code, 2018 (GhBC; GS 1207, 2018); and
- Ghana Shared Growth and Development Agenda, 2014 – 2017.

Requirements on Land for Development

The relevant policy, legislation, and institution on land for development include:

- The National Land Policy, 1999.
- The Lands (Statutory Wayleaves) Act, 1963 (Act 186); and
- Lands Commission Act, 1994 (Act 483).

Aviation Sector Requirement

Ghana Civil Aviation Authority Act, 2004 (Act 678)

World Bank Group's Requirements

The application requirements during the implementation of the proposed interventions include:

- **Environmental and Social Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.**
- **Environmental and Social Standard 2: Labour and Working Conditions.**
- **Environmental and Social Standard 3: Resource Efficiency and Pollution Prevention and Management.**
- **Environmental and Social Standard 4: Community Health and Safety.**
- **Environmental and Social Standard 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.**
- **Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure.**

6.2 Climate, Environmental and Social Risks in Implementing the Proposed Interventions

The proposed SWMIP intervention involves 3 key objectives – are presented in Table 36.

The implementation of the proposed SWMIP– as listed above could lead to significant impacts and risks. Some activities/interventions with potential environmental and social risks include the following:

- *Construction Works (e.g., Transfer Stations, Bring Back Centres, Composting Plants, and Recycling Hubs)*
- *Procurement and Distribution of SWM Equipment to 17 MMAs (e.g., Compactors, RO-ROs, Tricycles, etc.)*
- *Anti-littering and Waste Segregation related campaigns*
- *Enforcement and Development Control Activities*
- *Evacuation and Capping Activities*
- *Monitoring Activities (Using Drones), etc*

The initial environmental and social risks and mitigations associated with the SWMI and its associated RBF interventions are provided in Table 37.

The proposed interventions will trigger World Bank Group Environmental and Social Standards during the implementation stages. Therefore, the applicable Environmental and Social Safeguards tools (e.g., ESIA, RAP) will be prepared to ensure the sustainability of the interventions.

The identified environmental and social risks as well as the proposed mitigation measures are provided in the table below:

Table 4: Potential Environmental and Social Impacts of the Proposed SWMI Plan and Mitigations

S/N	Impact	Source (s)	Effects	Mitigations
A. Construction Works				
1.	Potential socio-economic and livelihoods impacts	<ul style="list-style-type: none"> Land acquisition 	<ul style="list-style-type: none"> Loss of land Loss of place of abode Displacement of economic activities Denial of access to public services/infrastructure 	<ul style="list-style-type: none"> Preparation of Resettlement Action Plan
2.	Public and occupational and safety risks	<ul style="list-style-type: none"> Accidents related to slips, trips, and falls and piercing of workers Movement of construction vehicles and equipment at the construction sites Reckless driving Breakdown of haulage trucks in transit Use of old or poorly maintained trucks Haulage at peak periods 	<ul style="list-style-type: none"> Injuries and fatalities Deterioration of traffic conditions on roads creating inconveniences to other roads users 	<ul style="list-style-type: none"> Provision and use of personal protective equipment (PPE) The setting of speed limits for construction vehicles Fixing of reverse alarms on movable construction equipment Provision of a contact number on trucks for reporting reckless driving Installation of tracking systems on trucks Scheduled maintenance of trucks Trucks deployed less than 5 years old Haulage during off-peak periods
		<ul style="list-style-type: none"> Exhaust fumes from the burning of fossil fuel by construction vehicles and equipment Dust from the movement of construction vehicles on untarred roads and fly-offs from the transportation of fine aggregate materials 	<ul style="list-style-type: none"> Deterioration of air quality with resultant impacts on respiratory organs Gritty eye conditions 	<ul style="list-style-type: none"> Adherence to speed limits Adherence to scheduled maintenance Covering of trucks in transit with tarpaulins

S/N	Impact	Source (s)	Effects	Mitigations
3.	Potential human rights abuse	<ul style="list-style-type: none"> • Discrimination based on ethnicity, gender, religion, age, disability, and HIV status during recruitment processes • Sexual abuse and harassment • Recruitment of minors 	<ul style="list-style-type: none"> • Human rights abuse 	<ul style="list-style-type: none"> • Ensuring equal opportunities for all segments of the population based on competencies • Include workers' code of conduct in their employment contract • Filing of all cases of human rights abuses • Inspection of birth certificates before recruiting
4.	Waste disposal impacts	<ul style="list-style-type: none"> • Indiscriminate disposal of wastes generated by workers • Indiscriminate defecation and disposal of greywater • Indiscriminate disposal of construction waste (e.g., broken concrete, empty, etc.) • Inappropriate handling and disposal of oily waste from equipment maintenance 	<ul style="list-style-type: none"> • Breeding of mosquitoes and other disease-causing vermin • Blocking of drainage channels leading to flooding • Deterioration of groundwater quality 	<ul style="list-style-type: none"> • Provision of waste bins at the construction sites • Provision of mobile toilets at the construction sites • Collection of waste oils in containers and storing the collected waste oil in bonded locations • Contracting registered waste management companies to collect and dispose of waste generated at the construction sites
B. Procurement and Distribution of SWM Equipment to 17 MMAs (e.g., Compactors, RO-ROs, Tricycles, etc.)				
1.	Noise and vibration impacts	<ul style="list-style-type: none"> • Poor servicing of SWM Equipment 	<ul style="list-style-type: none"> • Potential health risks (hearing impairments, musculoskeletal to SWM equipment operators and the public) 	<ul style="list-style-type: none"> • Regular servicing of SWM equipment • Provision of PPE to operators
2.	Air quality impacts	<ul style="list-style-type: none"> • Poor servicing of SWM Equipment 	<ul style="list-style-type: none"> • Potential health risks (respiratory disorders) • Emission of greenhouse gases (which is responsible for climate change) 	<ul style="list-style-type: none"> • Regular servicing of SWM equipment
3.	Public and occupational health and safety risks	<ul style="list-style-type: none"> • Over speeding 	<ul style="list-style-type: none"> • Injuries and fatalities 	<ul style="list-style-type: none"> • The setting of speed limits for construction vehicles • Fixing of reverse alarms on movable construction equipment

S/N	Impact	Source (s)	Effects	Mitigations
				<ul style="list-style-type: none"> • Provision of a contact number on trucks for reporting reckless driving • Installation of tracking systems on trucks
4.	Waste disposal impacts	<ul style="list-style-type: none"> • Indiscriminate disposal of waste oil and lubricants 	<ul style="list-style-type: none"> • Pollution of surface and groundwater resources 	<ul style="list-style-type: none"> • Proper storage of waste oil and lubricants in bonded locations • Returning waste oil and lubricants to suppliers • Sending waste oil and lubricants to EPA accredited companies
C. Anti-littering and Waste Segregation Related Activities				
1	Waste disposal impacts	<ul style="list-style-type: none"> • Delay in evacuating segregated waste 	<ul style="list-style-type: none"> • Breeding of vermin and other disease-causing pathogens along the drainage corridor 	<ul style="list-style-type: none"> • Timely evacuation of segregated waste
D. Enforcement and Development Control Activities				
1.	Socio-economic and livelihoods impacts	<ul style="list-style-type: none"> • Creation of buffer zones along the Odaw drain 	<ul style="list-style-type: none"> • Disruption of businesses and housing settlements close to the drain 	<ul style="list-style-type: none"> • Payment of compensation to affected Project Affected Persons (PAPs) by preparing a Resettlement Action Plans (RAP)
E. Evacuation and Capping Activities				
1.	Waste disposal impacts	<ul style="list-style-type: none"> • Improper disposal of collected MSW at unapproved locations, such as drainage channels, depressions by waste collection service providers 	<ul style="list-style-type: none"> • Exacerbation of floods along the drainage channels in GAMA • Breeding of vermin and other disease-causing pathogens along the drainage corridor 	<ul style="list-style-type: none"> • Disposal of collected MSW into only approved final waste disposal sites by waste collection service providers • Auditing the operations of the waste management company evacuating the MSW
2	Risk of explosion from gas build-up	<ul style="list-style-type: none"> • Accumulation of methane gas within the capped dump • Poor installation of gas pipe arrangement 	<ul style="list-style-type: none"> • Explosion and fire outbreak leading to injuries, fatalities, and loss of properties adjoining the capped dump 	<ul style="list-style-type: none"> • Installation of gas wells with collection pipes spread averagely on surfaces of dumps

S/N	Impact	Source (s)	Effects	Mitigations
<i>F. Monitoring Activities (Using Drones)</i>				
1.	Interference of drone activities with the operations of manned aircraft	<ul style="list-style-type: none"> Operating drones above the approved altitude (i.e., 120m) by GCCA Operating of drones at restricted zones designated by GCAA 	<ul style="list-style-type: none"> Potential aircraft accidents resulting in injuries, fatalities, and destruction of properties 	<ul style="list-style-type: none"> Registration of drone operations with GCCA Operation of drones in only GCCA approved zones
2.	<ul style="list-style-type: none"> Invasion of privacy 	<ul style="list-style-type: none"> Operating of drones in inhabited locations along the Odaw River channel 	<ul style="list-style-type: none"> Invasion of privacy 	<ul style="list-style-type: none"> Sensitising of communities along the drainage of the operations of the drones Flying of drones in non-residential areas along the Odaw River channel

6.3 Proposed Future Analysis of Climate, Environmental and Social Impact (CES) Issues

The process towards the development of this MSWIP involved a preliminary assessment and analysis of the degree to which the proposed project will manage and mitigate the climate, environmental and social impacts (CES) of the program.

In this process, the task team was guided by the general policy and regulatory framework within Ghana objectives and general principles in the Integrated Safeguards System (2013) and its related Climate Safeguards System (CSS).

The team took cognizance of the fact that the nature of the SWMIP, which is results focused, will entail tailored due diligence procedures and requirements which go beyond the tools applicable to ordinary investment projects.

Future analysis of CES during the Project preparation process should be guided by the principles of equivalence and acceptability to determine requirements for management and mitigation of the impacts of the program and/or identify areas for improvement. CES analysis will take a risk management approach adapted to the context of the envisaged proposed SWMIP. The process will assess at each level for each of the SWMIP components - what is required to achieve required climate, environmental and social (CES) objectives against the range of environmental and social impacts that will be associated with the SWMIP.

(a) ***Technical assessment and application of selectivity on Disbursement-Linked Indicators (DLIs).***

The team will examine the programme's potential safeguard impacts through screening, categorisation and scoping of results and assessment of relevant operational policy triggers to determine the modalities of using strategic environmental assessment tools.

(b) ***Safeguard Systems Assessment.***

The task team will carry out detail assessment that will evaluate existing policies, regulations and institutions in the management and mitigation of the impacts of the program; and identify areas for improvement.

(c) ***Capacity development planning.***

The assessments will be the basis for identifying measures to improve the safeguard systems and to build capacity in the program, if needed. The analysis will lead to agreement on required support measures to strengthen the safeguard systems through SWMIP and include these in an action plan and will monitor the implementation of the program and the agreed actions.

(d) ***Preparation of Environmental and Social Impacts Assessments and Resettlement Action Plans***

The various sub-projects under the SWMI and its associated RBF interventions will trigger the World Bank Group's ESS. There will therefore be the need to prepare the appropriate environmental assessment tools to meet the Bank's environmental and social safeguard requirements and Ghana Environmental Assessment Regulations (LI 1652).

7. COST ESTIMATES FOR THE IMPLEMENTATION OF SOLID WASTE MANAGEMENT STRATEGIC IMPROVEMENT PLAN

This section presents a detail breakdown of the cost estimates of the improvement plan based on each thematic area. The cost of equipment, infrastructure and programme coordination are also presented here.

Solid Waste Service Delivery

Sub-theme: 1a. Generation and Storage				
Municipal solid waste storage at point of generation				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Design a three-stream source segregation model for adoption in the selected communities and markets	–	10,000	10,000	58000
• Update/Create the registration database of all selected low-income communities (households, institutions, transport terminals and markets) within the municipalities using geo-referenced data.	510000	–	510000	2958000
• Procure and distribute receptacles for the segregation of household solid waste at source		250000	250000	1450000
• Engage service providers and municipal representatives to collaborate with institutions to determine their required quantities and volumes of receptacles and monitor the acquisition of same by all institutions	34000	–	34000	197200
• Support middle- to high-income households, restaurants/eateries, and road-side food vendors/traders to purchase standard receptacles outright or on credit towards planned payment within a 6-month period	34000	–	34000	197200
Total	578,000.00	260,000.00	838,000.00	4,860,400

Sub-theme: 1b. Collection and Transport				
Innovations for improving MSW collection and transportation in the Odaw Catchment				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Engage FSPs and ISPs on the Implementation Action Plan within the 4 No. communities	-	10000	10,000	58000
Undertake reconnaissance survey to confirm refuse points on refuse maps	-	2,000,000	2,000,000	11600000
Identify disposal sites to receive evacuated refuse				
Package refuse points into three (3) No. contract lots				
Procure contractor (s) for refuse evacuation				
Reporting and Closure				
Evacuate waste				
Supervise refuse evacuation	-	5000	5000	29000
• Collect stored recyclable MSW at least once every week, and twice a week for biodegradable MSW and others from households	-	-	-	-
• Clean markets, collect and handle segregated waste from markets, and pay for the discharge and transport of same	-	-	-	-
• Transport all collected biodegradable MSW directly to composting and biogas plants (ISPs should travel within 15km away from treatment sites)	-	-	-	-
• Transport all recyclables to sell to bring-back centres for further segregation into streams	-	-	-	-
• Introduce tracking device on all solid waste collection vehicles (including tricycles and bulk transport trailers) to monitor services	112200	-	112200	650760
• Provide incentives to households, institutions who segregate MSW through service fee reduction	-	-	-	-
Total	112,200.00	2,015,000.00	2,127,200.00	12,337,760.00

Sub-theme: 1b. Collection and Transport				
ISP-led MSW waste collection and transportation in low-income communities				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Engage service providers to take-up responsibility for MSW collection modernization in low-income communities	85000	-	85000	493000
Develop management & financial models for tricycles, trucks & composting machines	-	50,000	50,000	290000
• Enumerate and profile the MSW ISPs within the 4 No. Communities and Markets.	-	50,000	50,000	290000
Register all interested ISPs				
Facilitate the formation of 4 No. cooperatives of ISPs				
Train and equip cooperatives				
Support cooperatives to identify office space	-	10,000	10,000	58000
• Engage the low-income communities on the proposed plan for MSW collection improvements and introduce ISPs cooperatives	85000	-	85000	493000
• Procure a management consultant to manage tricycles trucks & composting machines	-	1,000,000	1,000,000	5800000
Supervise management				
Monitor, learn and scale up				
• Review existing MSW collection franchise documents within the 4 No. selected communities	-	80,000	80,000	464000
Delineate and assign franchise zones to ISPs within the 4 municipalities for MSW collection				
• Collect MSW collection coverage data to establish baselines and set targets for improvement				
Mandate cooperatives to start the collection of MSW within selected communities	-	-	-	-
Total	170,000.00	1,190,000.00	1,360,000.00	7,888,000.00

Sub-theme: 1c. Reuse, Recycling and Disposal				
Recycling, treatment, and disposal of MSW within the Catchment				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
Mobilize relevant stakeholders towards the formation of the foundation	-	-	-	0
Develop operational mandate for the running of the foundation				
Create a seed fund for the foundation				
Provide office space for recycling foundation	-	-	-	
• Enumerate and profile the IRs within the Catchment	-	50,000	50,000	290000
Register all interested IRs				
Facilitate the formation of 4 No. cooperatives of IRs				
Train and equip IRS cooperatives				
Support cooperatives to identify office space	-	10,000	10,000	58000
• Identify market opportunities and stakeholders	-	-	-	-
Sensitize farmers and communities on compost product usage	-	-	-	-
Establish a demand and supply agreement between stakeholders for the purchase of compost products				
Monitor and learn				
Procure 5 No. Recycling Extruders, 5 No. Pelletizers, 5 No. Crushers and Washers for use by high chain IRs	1000000	-	1,000,000	5800000
Procure land for IRs operations	-	1000000	1000000	5800000
Sign MoU with the IRs and mandate them to operate the buy-back centres	-	-	0	0
Monitor and Learn the operations of the buy-back centres.	-	-	0	0
• Mobilize leadership of Informal Recyclers (IRS) for discussions towards diversion of MSW from landfills	20,000	-	20,000	116000
Total	1,020,000.00	1,060,000.00	2,080,000.00	12,064,000.00

Litter Management

Sub-theme: 2a. Sensitization and Education on Anti-Littering				
Roll out a comprehensive Anti-Littering Education and Awareness Campaign Strategy within Municipalities				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
· Engage musical artistes to compose Anti-littering songs in at least three local languages (Ga, Twi, Ewe, Hausa, Dagbani) for purposes of education and awareness creation	30000	-	30000	174000
· Engage popular celebrities within the creative arts industry to roll adverts (jingles) and conversations geared towards anti-littering	25000	-	25000	145000
· Engage FM and TV Stations with wide transmissivity and relatively high number of listeners to systematically play Anti-Littering Songs	75000	-	75000	435000
· Engage experts as panelists on FM and TV Stations to discuss in different languages the effect and cost of littering, including the proposed plans in place for litter prevention	25000	-	25000	145000
· Engage religious institutions to dedicate time for designated experts to promote litter prevention (for at least 6 months)	25500	-	25500	147900
Develop anti-littering communication plan and educational materials	500,000	-	500,000	2900000
Mass production of communication and educational materials				
Total	680,500.00	0	680,500.00	3,946,900.00

Sub-theme: 2a. Sensitization and Education on Anti-Littering				
Education and Promotion of Anti-Littering and MSW Separation as a Practice in Basic Schools				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
· Engage experts to develop simple educational materials geared towards MSW Separation in basic schools	5000	-	5000	29000
· Train SHEPs and selected School-based health coordinators on waste segregation	255000	-	255000	1479000
· Support selected basic schools to acquire bins for a three-stream separation (Food and Plant-based Waste, Paper, and Plastics) of MSW	33150	-	33150	192270
Total	293,150.00	0	293,150.00	1,700,270.00

Sub-theme: 2b. Innovations for handling litter in Public and communal spaces				
Installation of Litter Bins in Public Spaces				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHC)
· Supply litter bins for biodegradable waste, plastic bottles, and pouches, aluminum cans, and paper to be installed at selected public places within the municipalities	55250	-	55250	320450
Procure, distribute and install 200 Litter Bins within 4 selected communities	-	350,000	350,000	2030000
Develop a plan to empty litter bins				
Engage ISPs or MMAs to empty bins				
Identify public spaces for the installation of 5 bulletin billboards				
Design and Install 5 Bulletin Billboards to create awareness on litter prevention				
Liaise with the management of landfills to improve uptake of MSW	-	-	-	-

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

Mandate cooperatives to start the collection of MSW within selected communities	-	-	-	-
Mandate cooperatives or MMAs to empty Litter bins	-	-	-	-
Total	55250	350000	405,250.00	2,350,450.00

Sub-theme: 2b. Innovations for handling litter in Public and communal spaces

Improve Litter Collection and Transportation in Public Areas

Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
· Engage service providers and management of markets/ terminals on new Litter Management improvement plan with focus on daily (frequency of) collections	51000	-	51000	295800
· Engage MAs and management of markets/ terminals to separate SWM levy component from rent and develop separate SW payment arrangement for markets/ terminals	8500	-	8500	49300
Procure 90 No. receptacles within selected market and institutional recyclable waste streams	250,000	-	250,000	1450000
· Assign attendants to monitor and ensure adherence to appropriate separation and disposal to avoid incidence of littering around the skips	-	-	-	-
· Form Community Support Team to support litter management and ensure general enforcement	8500	-	8500	49300
· Transport all recyclables collected to bring-back centres for further segregation into waste streams.	-	-	-	-
· Transport all collected biodegradable waste from market and terminals to treatment sites (composting and biogas plants)	-	-	-	-
Total	318,000.00	0	318,000.00	1,844,400.00

Sub-theme: 2c. Community-led advocacy and reward systems for Litter Management

Establish and Strengthen Community-Level Leaders/Influencers as the Face of Anti-littering within the Catchment				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Organize stakeholder validation workshop on the final RBF and Implementation Action Plan.	-	30000	30,000	174000
• Engage MCEs and MCDs on the final MSWSIP, RBF and Implementation Action Plan	-	10000	10,000	58000
• Sensitize the selected communities to empower and create ownership of action plan	-	20000	20,000	116000
• Profile the 4 No. selected communities and markets for project implementation.	-	30000	30,000	174000
• Identify community structures, gatekeepers & community champions				
• Develop a structure to support waste collection intervention and litter prevention				
• Facilitate the establishment of the committees				
• Train committees for waste collection				
• Engage community leaders, market queens, transport terminal leaders, and leaders of informal settlements to assume responsibility for litter prevention and cleanliness	-	102000	102000	591600
• Appoint and support key influencers in slum settlements, as MSWM representatives/ attendants to see to the day-to-day management of litter and MSW	25500	-	25500	147900
• Appoint (in a participatory manner) transport terminal and market sanitation officers/queens/representatives to assume MSW oversight and coordination responsibilities within markets and transport terminals.	30600	-	30600	177480
• Support the leaders to form a three (3)-to-five (5) person litter prevention Community Support Team, watchdogs and/or MSW teams in communities, transport terminals and markets.	30600	-	30600	177480
• Recognise and introduce Litter prevention taskforce and/teams to their localities (communities/ markets and terminals).	30600	-	30600	177480

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• Assess the capacity needs of the Litter prevention taskforce and/teams and provide training and management support	20400	-	20400	118320
• Provide anti-littering teams with incentives based on verified outputs (reduction in the incidence of littering and improved MSW collection).	204000	-	204000	1183200
Total	341,700.00	192000	533,700.00	3,095,460.00

Sub-theme: 2c. Community-led advocacy and reward systems for Litter Management

Mobilising Communities for a Sustained Municipal Solid Waste Management

Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Support Municipalities to Engage with traditional, religious, and political Leaders in selected Communities on the objectives SWMIP	102000	-	102000	591600
• Support MAs to Organize Community Durbars (Entry Conferences) in selected Communities	85000	-	85000	493000
• Support MAs and Sub-metros to form Basin Related Task Force in Communities and Commercial Areas	17000	-	17000	98600
Total	204,000.00	0	204,000.00	1,183,200.00

Sub-theme: 2c. Community-led advocacy and reward systems for Litter Management				
Develop a mechanism to Assess and Reward Clean Communities				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
<ul style="list-style-type: none"> Engage designated municipal officers in the mapping of refuse areas within their municipalities to serve as a baseline for the assessment. 	10000	-	10000	58000
<ul style="list-style-type: none"> Engage professionals and municipality representatives to assess the state of cleanliness of municipalities at least once every six months. 	15,000	-	15000	87000
<ul style="list-style-type: none"> Publicize the assessment results of municipalities through all the available media 	10,000	-	10000	58000
Total	35,000.00	0	35,000.00	203,000.00

Governance

Sub-theme: 3a. Enhanced Institutional and Stakeholder Capacity for MSWM				
Training Programme for Key Stakeholders				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHC)
• Training Programme for Selected Metropolitan/Municipal/Municipal Officers- Circular Economy, Sustainable and Inclusivity	300,000	-	300,000	1,740,000
• Provide periodic training for community champions and gatekeepers	250,000		250,000	1,450,000
• Training Programme for Selected Informal Sector Players (Sustainable livelihoods, OHS, OD, Cooperatives, Gender & Child Labour	510000	-	510000	2958000
• Training Programme for Selected Formal Waste Management Companies (Training Programme)- OHS & Inclusivity	25000	-	25000	145000
Total	1,085,000.00	0	1,085,000.00	6,293,000.00

Sub-theme: 3a. Enhanced Institutional and Stakeholder Capacity for MSWM				
Adequate Staffing (in EHSD & WMDs) for Plan Implementation				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Assess the human resource requirements of the EHSD & WMD in beneficiary MMAs	50,000	-	50000	290000
• Facilitate the recruitment of the required number of staff for the EHSU and WMDs in beneficiary MMAs	5000	-	5000	29000
Total	55,000.00	0	55,000.00	319,000.00

Sub-theme: 3a. Enhanced Institutional and Stakeholder Capacity for MSWM				
Institutional arrangement for Plan Implementation				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Form and inaugurate the Inter-Jurisdictional Coordination Management Committee	-	-	-	-
• Support the activities of the Inter-Jurisdictional Coordination Management Committee (towards the SWM plan implementation)	30000	-	30000	174000
• * Facilitate the engagements and activities Leading to the Declaration of the Joint Development Planning Area (JDPA)	-	-	-	-
• * Establish the Joint Development Planning Board (JDPB)	-	-	-	-
• Support transitional activities between the ICMC and the Joint Development Planning Board (related to implementation of SWM)	5000	-	5000	29000
• Support and Fund the initial Planning and Operational Activities of the JDPA and JDPB (related to the implementation of SWM)	20000	-	20000	116000
Total	55,000.00	0	55,000.00	319,000.00

Sub-theme: 3b. Planning and regulatory arrangements for MSWM				
Planning for Effective Municipal Solid Waste Management				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Review the Solid Waste Management Component of the MESSAPs	17000	-	17000	98600
• Review and Update Structure Plans for the 17 Municipalities	100000	-	100000	580000
• Support Physical Planning and Works Departments of MAs to conduct development control activities within the Basin	425000	-	425000	2465000
Total	542,000.00	0	542,000.00	3,143,600.00

Sub-theme: 3b. Planning and regulatory arrangements for MSWM				
Appropriate Legislative Framework for Project Implementation and Enforcement of SWM Related Bye-laws				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Review and update of bye-laws related to solid waste management	85000	-	85000	493000
• Review fines for Solid Waste and Littering related Offences (to be more punitive)	85000	-	85000	493000
• Support the operation of sanitation courts or “sanitation court days”	51000	-	51000	295800
• Enforce Littering and Solid Waste Management Related bye-laws	850000	-	850000	4930000
• Enforce bye-laws related to Environmental Sanitation within Catchment Areas (e.g., Toilet Ownership)	255000	-	255000	1479000
• Collaborate with WRC/EPA to enforce River Basin Related Legislations	510000	-	510000	2958000
Total	1,836,000.00	0	1,836,000.00	10,648,800.00

Sub-theme: 3b. Planning and regulatory arrangements for MSWM				
Contracting				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Review Existing Franchise Agreements to create opportunities for informal sector players	51000	-	51000	295800
• Develop a Performance Based-Contracting System for Informal Players	20,000	-	20000	116000
Total	71,000.00	0	71,000.00	411,800.00

Monitoring, Evaluation and Learning

Sub-theme: 4a. Development of MEL Framework				
Set-up Monitoring, Evaluation and Learning (MEL) Framework for Implementation				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Assess the existing MEL framework and procedures at the national and MMA levels	15000	-	15000	87000
• Define appropriate indicators to measure progress and achievement of each thematic area	5,000	-	5000	29000
• establish procedure for the conduct of MEL at all levels that aligns with existing structures	5,000	-	5000	29000
• Define the composition and the interrelationships of the MEL Teams at the various levels	5,000	-	5000	29000
• Set-up the Inter-Jurisdictional, Municipal/Metro, and Community MEL Teams	27,000	-	27000	156600
• Assess the capacity needs of the respective MEL Teams	5000	-	5000	29000
• Train the MEL Teams on MEL Framework and Procedure	28,500	-	28500	165300
• Procure and supply required resources to MEL Teams for the conduct of MEL	20,000	-	20000	116000
Total	110,500.00	0	110,500.00	640,900.00

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning				
Monitoring				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHC)
• Conduct of routine monitoring by the respective MEL Teams	340000	-	340000	1972000
• Preparation of Reports on monitoring activities by MEL Teams	6800	-	6800	39440
• Preparation of Quarterly Monitoring Reports on strategy implementation	5000	-	5000	29000
• Set-up and run of a Remote Sensing Monitoring System (Camera's and Satellite Images)	17000	-	17000	98600
Total	368,800.00	0	368,800.00	2,139,040.00

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning				
Evaluation				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHC)
<ul style="list-style-type: none"> • Develop training and monitoring tools for clean communities • Train MMAs on Indicators for cleanliness and refuse mapping • Develop a clean community plan • Develop an award scheme • Assess MMA based on scheme 		-	70,000	
<ul style="list-style-type: none"> • Institute a half-yearly competitive Cleanliness Assessment among the 17 municipalities based on the Cleanliness Verification Protocol 	408000	-	408000	2366400
<ul style="list-style-type: none"> • Organise Annual Review Meetings on implementation progress 	30000	-	30000	174000
<ul style="list-style-type: none"> • Conduct two Mid-Term Evaluations of The Strategy/Plan (end of 3rd Year and 6th Year) 	100000	-	100000	580000
<ul style="list-style-type: none"> • Conduct End-of-Project Evaluation (10th Year) 	100000	-	100000	580000
Total	663,400.00	0	663,400.00	3,847,720.00

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning				
Evaluation				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHC)
• Verify and certify assessment results on cleaner communities	1,000,000	-	1,000,000	5800000
• Award the cleanest communities				
• Provide periodic training for community champions and gatekeepers	250,000	-	250,000	1450000
Total	1250000	0	1,250,000.00	7,250,000.00

Sub-theme: 4b. Conduct Monitoring, Evaluation and Learning				
Learning				
Project Activities	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Institute and Support Monthly Municipal/Metro Level Learning Alliance (SWM)	102000	-	102000	591600
• Organise Quarterly Inter-Jurisdictional Learning Alliances (for SWM)	30000	-	30000	174000
• Produce, publish, and disseminate Quarterly Briefs on strategy implementation	5,000	-	5000	29000
• Conduct Annual Policy Dialogue of on Low-Income Community MSWM	30000	-	30000	174000
• Produce Factsheets (10) based on lessons from the implementation of the strategy	2500	-	2500	14500
• Produce Policy Briefs (3) on Low-Income Community SWM	3,000	-	3000	17400
• Open multi-media Platforms for dissemination of project information	1,000	-	1000	5800
Total	173,500.00	0	173500	1006300

Equipment and Infrastructure

Proposed Equipment and Infrastructure				
Equipment and Facility Tools for Improved MSWM				
Equipment	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHC)
• Procure and distribute 12 No. Compactor Collection Vehicles to MMAs and ISPs		2,000,000	2,000,000	11600000
• Procure 90 No. tricycles		500,000	500,000	2900000
• Procure 8 No. compact compost machine		400,000	400,000	2320000
• Procure 28 Roll-on-Roll-off trucks to be distributed among selected Municipalities	-	4398240	4398240	25509792
• Procure 85 Motorcycles to be distributed to all Municipalities (5 each)	-	96724	96724	560999.2
Maintenance/Repair Tools	-	-	-	-
• Procure basic repair toolbox (containing basic repair tools) for all 17 Municipalities	-	85000	85000	493000
Disinfection & Fumigation Tools	-	-	-	-
• Procure basic fumigation and disinfection machine for all 17 Municipalities	-	16121	16121	93501.8
	0	7,496,085.00	7,496,085.00	43,477,293.00

Proposed Equipment and Infrastructure				
Proposed Infrastructure for Improved MSWM				
Infrastructure	Cost Estimates			
	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Construction of a new composting and anaerobic treatment plant	-	100,000	100,000	580000
• Construction supervision of 17 No. Buy-back Centres		30,000	30,000	174000
• Construct 17 No. Buy-back Centres		200,000	200,000	1160000
•Design and construction supervision of 2 No. transfer stations	-	1,000,000	1,000,000	5800000
•Construct 2 No. transfer stations	-	16,000,000	16,000,000	92800000
•Design and construction supervision of 1 No. landfill	-	1,000,000	1,000,000	5800000
•Construct 1 No. landfill	-	18,000,000	18,000,000	104400000
• Support recycling value chain actors to acquire and develop a recycling hub/village for MSW (Cable and Wireless Otabil could be considered)	-	120,000	120,000	696000
	0	36,450,000.00	36,450,000.00	211,410,000.00

Project Coordination

Coordination and Management				
	Cost Estimates			
Project Activities	Recurrent Expenditure	Capital Investment	Total Budget (\$)	Total Budget (GHS)
• Define the roles of the Project Coordination Teams (i.e. PMU, PIU, ICMC, PSU, CLT) and the relationship between them (in the execution of the implementation of the plan)	20000	-	20000	116000
• Train the Project Coordination Teams (i.e. PMU, PIU, ICMC, PSU, CLT) on their roles in the implementation of the plan	20000	-	20000	116000
• Support the PIU for Plan Coordination	240000	-	240000	1392000
• Support the ICMC for Plan Coordination	60000	-	60000	348000
• Support the PSUs &CLTs for Plan Coordination	510000	-	510000	2958000
	850,000.00	0	850,000.00	4,930,000.00

ANNEX 1

Summarized Action Plan for Implementation of MSW

ACTION PLAN

Objectives and Scope

The detailed action plan for implementation of the Municipal Solid Waste (MSW) Collection Improvement and Litter Prevention within the Odaw River Catchment has been developed after the conduct of the following project activities:

1. Submission of the draft MSW Strategic Improvement Plan (SIP) to the Client
2. Review of the comments on the draft SIP
3. Submission of the revised MSWSIP
4. Discussion of recommended intervention priorities and financial feasibilities towards implementation

The interventions for implementation were grouped into two (2) phases namely:

1. short terms interventions
2. medium term interventions

Also, provision of specifications, realistic budgets and necessary remarks were done to facilitate smooth implementation of interventions. The detailed action plan encompasses two main paths, namely:

1. All interventions related to mixed MSW Collection, Transfer, Disposal and Litter Prevention Improvements have been agreed to be considered within the short term, whilst
2. Interventions related to the diversion of compostable and recyclable MSW from landfills and quality recycling initiatives have been classified to be long term.

The aim of both the Client and the Consultant is to monitor, learn and sustain gains in mixed MSW collection improvements and disposal before rolling out further cost intensive collection interventions (as expected in efficient Segregation at Source and Recycling Programs). A second objective is to allocate enough time to ensure such MSW diversion programs (being introduced officially for the first time in the catchment and the country) are implemented effectively.

The detailed implementation action plan has been developed by categorizing interventions into major activities, sub-activities, logistics and timeliness required for implementation of each sub-activity, the expected cost and both the lead and supporting agencies to see to the implementation. In addition, the column remarks provide further details on specifications and recommendations towards implementation. Detailed time range have been recommended to support implementation. A Gantt Chart has also been provided for reference.

The action plan has been developed under the following thematic areas:

1. Stakeholder Engagements, Organization, Registrations, Training and Baseline Data Provisions
2. Procurements, Installations, and Constructions to Support MSW Collection, Transport, Composting, Disposal and Litter Prevention
3. Management Contract and Services for Collection Trucks, Composting Machines and Hire Purchase of Tricycles
4. Community Sensitization, Communication, Capacity Building and Rewarding of Cleanliness

5. Refuse Evacuation, MSW Collection, Emptying of Bins and Disposal
6. Source Separation, Recycling, Diversion of Recyclables from Disposal and use of Bring (Buy)-Back Centres

Piloting Of Prioritized Interventions in Four Municipalities

Apart from refuse evacuation and construction of bring (buy)-centres which applies to all 17 municipalities within the Odaw River Catchment, the detailed implementation action plan has been developed with focus on four municipalities, namely:

1. Ayawaso East (Nima and Nima Market)
2. Okaikwei North (Akweteyman and Achimota Market, Alogboshie and Dome No. 2 Market)
3. Ablekuma South and Accra metropolitan Assembly (Konkomba Market, Agbogloboshie Market, Old Fadama, Timber Market, June 4th Market and Makola No. 2 Market Enclave).

Whilst the enclave as aforementioned does not fall directly under the presumed GARID communities, it presents implementation dynamics and diversities worth monitoring and learning for future scaling up to other municipalities.

Stakeholder Engagements, Organization, Registrations, Training and Baseline Data Provisions

The objective is to engage and sensitize all stakeholders to own the action plan and to support its implementation. In the process, the main protagonists (incentivized agents) and the supporting agents expected to deliver towards the realization of system improvements in MSW Collection and Litter prevention are to be profiled, registered, and trained. These activities would require a consultant to support implementation. The collection of baseline data on number of households with access to regular collection coverage in these communities and the continuous update and sharing of same with the cooperatives (proposed incentivized agents) will support measurements and verification of results (outputs).

Procurements, Installations, and Constructions to Support MSW Collection, Transport, Composting, Disposal and Litter Prevention

These procurements are necessary with some considered as upstream interventions to support improved waste capture. Whilst some procurements like tricycles are urgently needed to support the cooperatives to achieve their targets, recommendations have been made under management contracts to allow for the management of these tricycles under a management services contract to sustain the anticipated payments to the cooperatives (incentivized agents) under the Results-Based Financing (RBF) scheme.

Management Contract and Services for Collection Trucks, Composting Machines and Hire Purchase of Tricycles

This is necessary to sustain both the strategic action plan and the RBF strategy.

Community Sensitization, Communication, Capacity Building and Rewarding Of Cleanliness

The objective is to provide the necessary support systems, promote inclusivity, empower stakeholders, and create continuous project ownership, which are all considered as important

ingredients to project implementation sustainability. The rewarding of clean communities is particularly important to motivate other communities and municipalities towards the clean initiative of the municipalities and the government.

Refuse Evacuation, MSW Collection, Emptying Of Bins and Disposal

This activity is necessary to measure improvement in litter prevention and waste capture. However, the Consultant highly recommends evacuation of refuse should be undertaken only after all social and technical interventions towards improved collection (such as establishment of ISP cooperatives and their support structures) have been put in place to ensure and/or prevent the incidence of illegal refuse sites within the communities.

Source Separation, Recycling Foundation and Use of Bring (Buy)-Back Centres

The objective is to support the recycling of clean MSW and divert recyclables from landfill sites. This is intended to reduce the climate change burden of the current MSWM practices. The recycling foundation and the creation of a recycling hub are necessary to further increase recycling rates and create a circular economy model to sustain the MSW recycling business. Recommendations for waste-pickers to play a central role in the management of bring (buy)-centres is to sustain their livelihoods even after MSW is diverted from landfills and to bank on their expertise for efficient source separation and central sorting system. The focus is to introduce separation at source by the end of the second year of implementation of interventions targeted at MSW collection improvements and before the commencement of operations of the Ayidan landfill.

Technical Assistance

The Consultant recommends the services of a technical expert for the implementation of the various timely bound activities of the project. This is especially necessary considering the novel nature of the use of ISP cooperatives and the perceived capacity gaps within some of the municipalities of the catchment.

Scale-up Plan

The proposed low-income communities have been identified by the Consultant in collaboration with the municipal representatives on the working groups as the hotspots contributing to the littering and/or flow of MSW to the Odaw River. The objective for the selection is to support the Client make an informed decision towards the selection of pilot communities for the conduct of preliminary studies and further community engagement towards the subsequent implementation of the strategic improvement and litter management plans. They have been carefully selected after a thorough participatory assessment of the MSWM system of the 17 municipalities of the catchment and after several visits to the communities and places to understand the dynamics and the prevailing levels of MSW service.

The following **criteria** was used in the selection of the communities, namely:

- ✚ high population densities
- ✚ short distance of community to the Odaw River/Drain
- ✚ no (or low) collection coverage and low level of collection service within the community
- ✚ high incidence of littering within the community
- ✚ high potential of community to contribute to the littering of the Odaw River directly or indirectly

Together, 33 low-income communities and markets (Figure 1 and Figure 2) and the stretch of railway line from Ofankor to Cocoa Marketing Board (CMB) avenue have been identified for consideration towards the scale up of the action plan. Whilst the 33 does not cover all low-income communities within the catchment, it is the view of the Consultant that the comprehensive and integrated implementation of the strategy in all the proposed communities, markets and sections has the potential to address and sustain the eventual goals of MSW collection improvements and litter prevention in the Odaw River and its catchment. Nonetheless, the Consultant recommends the selection of the three (3) “GARID Communities” (Alogboshie, Akwteyman and Nima and their respective markets) in addition to the Agbogloboshie, Old Fadama, June 4th Market, Makola No. 2 Market, Timer Market, Sikkens and Konkomba Market Enclave, within the catchment for the piloting, monitoring and learning of the interventions. This recommendation is in conformity with the fact that the available project finances may not be enough to support the holistic implementation of interventions in all proposed communities and markets. The rest may be considered for the scale-up of interventions after a successful implementation within the pilot communities. It must, however, be emphasized, that the implementation within the pilot communities, however successful it may be, would not necessarily lead to litter prevention and improved MSW collection within the Odaw River and the catchment, respectively.

The following prioritizations towards scaling up of interventions are recommended:

1. the slum-like communities along the railway line stretch between Ofankor and Cocoa Marketing Board (CMB) within the central business district of Accra
2. The communities and businesses directly along all the primary drains within Kotobabi, Alajo, Caprice and Avenor
3. The community and business along the Odaw river from Avenor to the outfall weir at the Korle Lagoon.

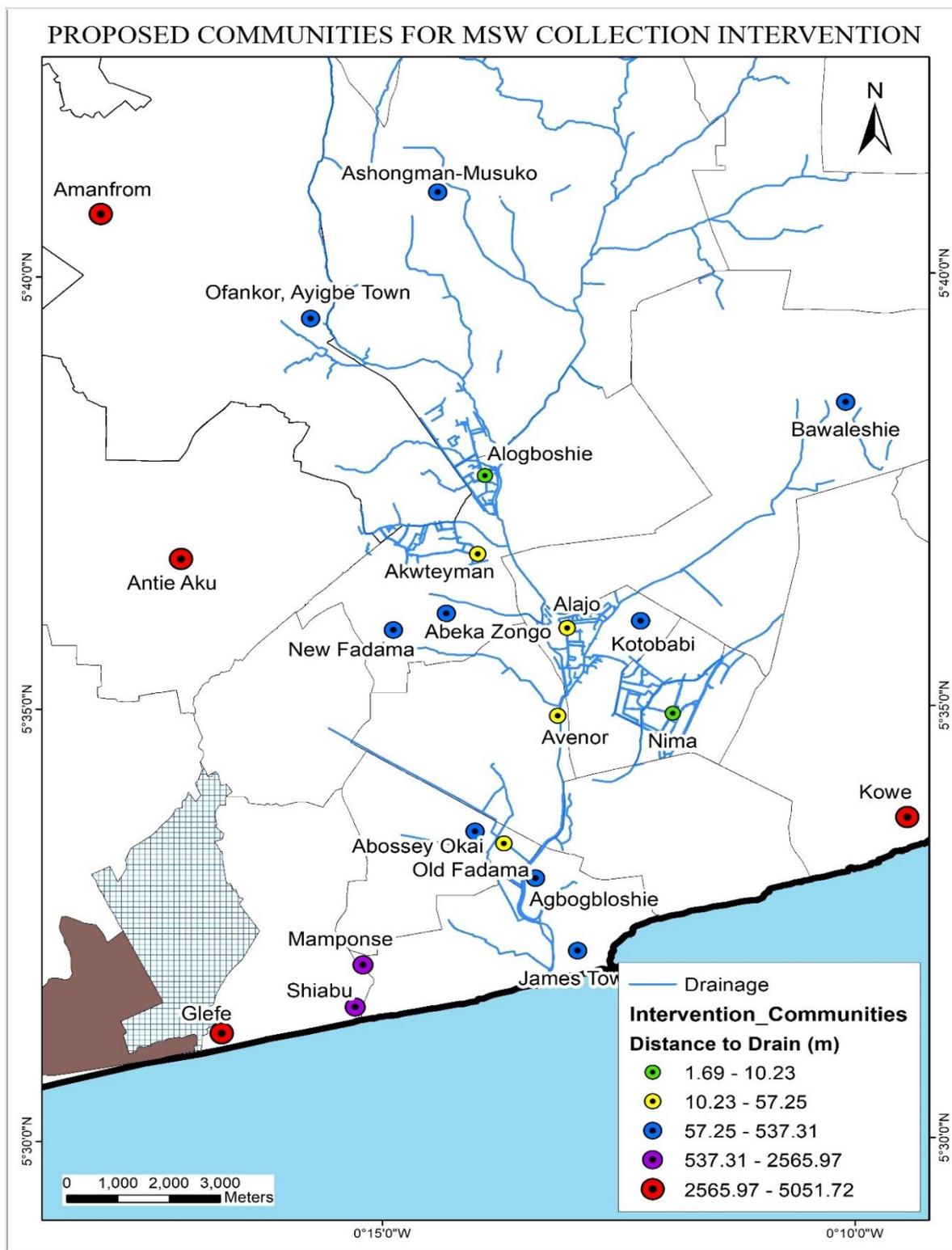


Figure 16: Proposed low-income communities for the implementation of the MSW collection improvement strategy

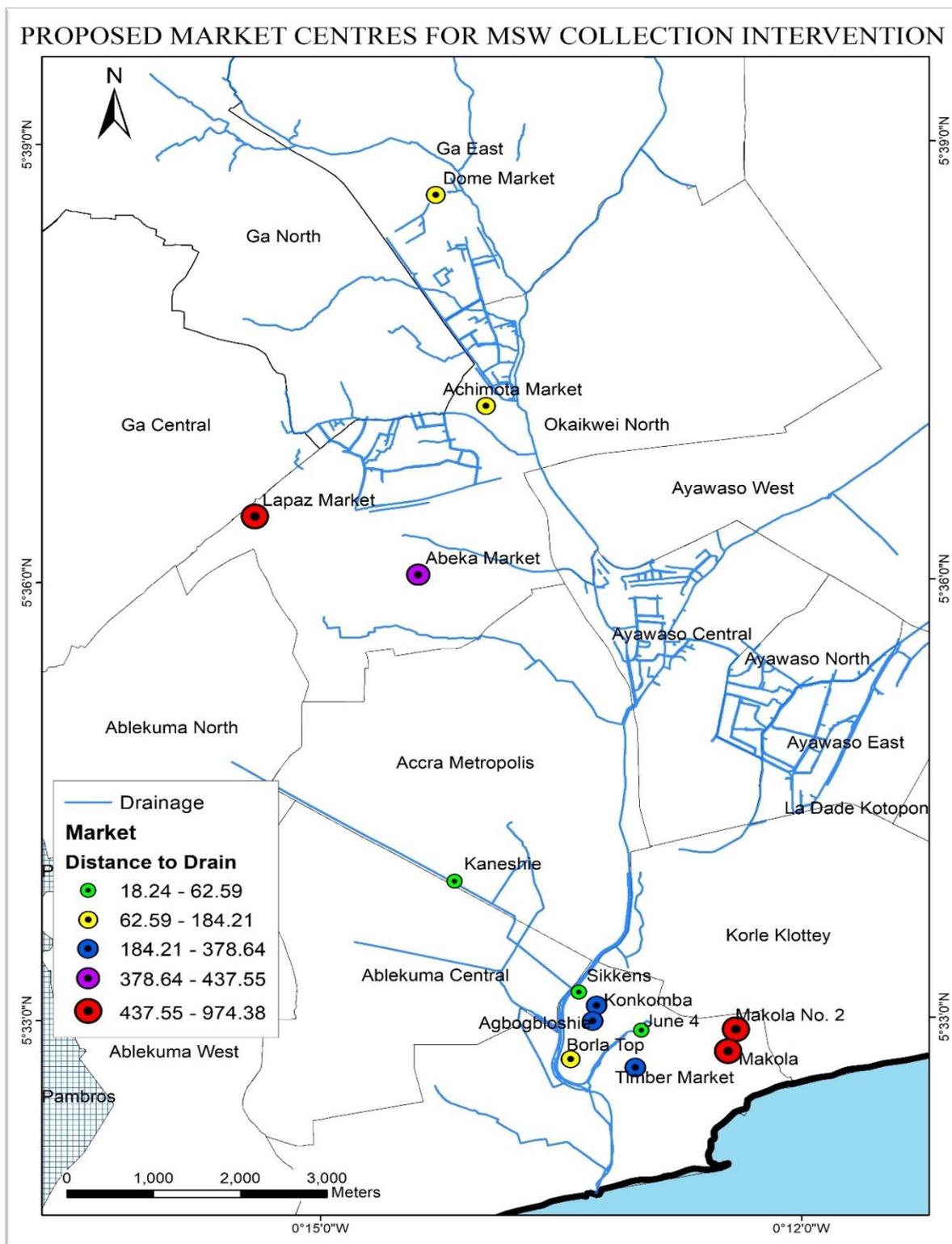


Figure 17: Proposed markets for the implementation of the MSW collection improvement and litter prevention strategies

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

Table 5: Summarized Action Plan for Implementation of MSW Improvement Strategy Within The Odaw River Catchment (1st Phase)

MAIN ACTIVITY	SUBACTIVITIES	LOGISTICS	TIMELINES	COST (USD)	IMPLEMENTING		REMARKS
					LEAD	SUPPORTING	
STAKEHOLDERS ENGAGEMENTS, ORGANIZING, REGISTRATIONS, TRAINING AND BASELINE DATA PROVISION							
Mobilize, Engage and Sensitize Stakeholders	Organize stakeholder validation workshop on the final RBF and Implementation Action Plan.	Conference Package	1 month (June 2021)	30,000.00	MSWR	PIU	3-member team each (planner, social services, & public health engineer/EHO) in 17 municipalities (51). ISPs (2), IRs (3) FSPs (8) Market reps (8), Transport Terminal reps (2), Consultants (7), MSWR/PIU) (7) MESTI (1), CONIWAS (1) [Total 90]
	Engage MCEs and MCDs on the final MSWSIP, RBF and Implementation Action Plan	Conference Package	1-month (July 2021)	10,000.00	MSWR	PIU	All 17 MCEs and MCDs (34), MSWR/PIU (7), Implementation (Technical) Assistants (2) [Total 43]
	Engage FSPs and ISPs on the Implementation Action Plan within the 4 No. communities.	Conference Package	1-month (July 2021)	10,000.00	MSWR	PIU	FSPS (4), 2 No ISPS each (8), MSWR/PIU (6) Implementation (Technical) Assistants (2) [20].
	Sensitize the selected communities to empower and create ownership of action plan	Conference Package	1- month (August 2021)	20,000.00	MSWR	MMAS	<ul style="list-style-type: none"> High level meeting between chiefs, MP, MCE Community durbars, Town hall meetings
Set up the Governance Systems for Project Outcome Implementation	Profile the 4 No. selected communities and markets for project implementation.	Independent Consultant (IC) to collaborate with 4 MMAs	3- months (June-September, 2021)	30,000.00	MSWR	PIU	Communities include: <ul style="list-style-type: none"> Nima/Market & Mallam Atta Market (Ayawaso West) Akweteyman & Achimota Market (Okaikwei North) Alogboshie and Dome Market 2 (Okaikwei North) Agbogboshie, Konkomba Market, Timber Market, June 4th Market, Makola No. 2 Market and Old Fadama Enclave (Accra Metropolitan Assembly & Ablekuma Central)
	Identify community structures, gatekeepers & community champions						
	Develop a structure to support waste collection intervention and litter prevention						
	Facilitate the establishment of the committees						

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	Train committees for waste collection						<ul style="list-style-type: none"> Recommended a 3-member team to coordinate anti-littering plans within markets, transport terminals and communities. Develop a ToR for review Procure consultant Report and analysis
Register and Organize ISPs into Cooperatives	Enumerate and profile the MSW ISPs within the 4 No. Communities and Markets.	Independent Consultant (IC)	3 months (July-September, 2021)	50,000.00	MSWR	PIU	<ul style="list-style-type: none"> 30 No. ISPS in Nima 20 No. ISPS in Akweteyman No. ISPS in Alogboshie 35 No. ISPS in Agbogloboshie and Old Fadama Enclave Develop a ToR for review Prepare concept note with roadmap to support process Recommended training may include global trends in MSW, Occupational health and safety and sustainable livelihoods
	Register all interested ISPs						
	Facilitate the formation of 4 No. cooperatives of ISPs						
	Train and equip cooperatives						
	Support cooperatives to identify office space			10,000.00	MSWR	MMAAs	<ul style="list-style-type: none"> Identify working office for cooperatives Use recyclable materials for construction of office space
Address the Governance Barriers to MSW Collection Improvements	Review existing MSW collection franchise documents within the 4 No. selected communities	Independent Consultant (IC) to collaborate with 4 MMAAs	3 months (July-September, 2021)	80000	MSWR	PIU	<ul style="list-style-type: none"> Develop a ToR for Review Procure consultant Reporting and Analysis Dissemination Strategy
	Delineate and assign franchise zones to ISPs within the 4 municipalities for MSW collection				MSWR	MMAAs	
	Collect MSW collection coverage data to establish baselines and set targets for improvement.				MSWR	PIU	

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MAIN ACTIVITY	SUBACTIVITIES	LOGISTICS	TIMELINES	COST (USD)	IMPLEMENTING		REMARKS
					LEAD	SUPPORTING	
PROCUREMENTS, INSTALLATIONS, AND CONSTRUCTIONS TO SUPPORT MSW COLLECTION, TRANSPORT, COMPOSTING, DISPOSAL AND LITTER PREVENTION							
Procure Tricycles and MSW Collection Trucks to support ISPs and/or MMAs towards targeted MSW Collection Improvements & Litter Prevention Plans in the 4 No. Communities and Markets	Procure 90 No. tricycles (Bola Taxis)	Supplier	6 months (June-November, 2021)	500,000.00	MSWR	PIU	Make of Bola Taxis: WAW
	Procure and distribute 12 No. Compactor Collection Vehicles to MMAs and ISPs	Supplier	6 months (June-November, 2021)	2 million	MSWR	PIU	Make: DAF, Model: CF 340 Gross weight: 27 tons, Volume Capacity: 12 tons L/W/H:9.2m/2.25m/3.65m, Number of tyres: 10 No of Axles: 3, Transmission: Automatic
	Procure 8 No. compact compost machine	Supplier	6 months (June-November, 2021)	400,000.00	MSWR	PIU	Model: Compact 24/1000 Capacity: 1000 kg to 1200 kg per day Power rating: 15 HP, Total Load: 38KW
Construct new MSW Transfer and Disposal Sites	Design and construction supervision of 2 No. transfer stations	Design Consultant	18 months (June, 2021-November, 2022)	1 million	MSWR	PIU	Identify sites for the construction of transfer stations Develop ToR Procure a design consultant
	Construct 2 No. transfer stations	Contractor	24 months (Jan 2022 to December 2023)	16 million	MSWR	PIU	Liaise further with MMAs for the identification of sites for the construction of the transfer stations
	Design and construction supervision of 1 No. landfill	Design Consultant	24 months (June 2021 to May 2023)	1 million	MSWR	PIU	
	Construct 1 No. landfill	Contractor	36 months (Jan. 2022 to December 2024)	18 million	MSWR	PIU	Proposed site at Ayidan
Provide Facilities to Promote Anti-Littering Behaviour	Procure, distribute and install 200 Litter Bins within 4 selected communities	Independent Consultant (IC) and /or Supplier to collaborate	6 months (July to December, 2021)	350,000.00	MSWR	MMAs	Independent consultant to work in collaboration with MSWR and MMA to decide on dimensions of bins Consider use of recycling innovators and local artisans

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	Develop a plan to empty litter bins	with MSWR and respective MMAs					Consider using cooperatives, or MMAs or a combination of both to develop the plan and empty the bins	
	Identify public spaces for the installation of 5 bulletin billboards							Make use of recyclable materials 4 entry points to the Odaw Catchment Aflao to Accra (at Accra shopping mall); Aburi to Accra at Adenta; Cape Coast to Accra at Weija Toll Booth, Kumasi to Accra at Pokuase. Agbogbloshie
	Design and Install 5 Bulletin Billboards to create awareness on litter prevention							

MAIN ACTIVITY	SUBACTIVITIES	LOGISTICS	TIMELINES	COST (USD)	IMPLEMENTING		REMARKS
					LEAD	SUPPORTING	
MANAGEMENT CONTRACT AND SERVICES FOR COLLECTION TRUCKS, COMPOSTING MACHINES AND HIRE PURCHASE OF TRICYCLES							
Manage the tricycles for the support of the work of the ISP cooperatives	Develop management & financial models for tricycles, trucks & composting machines	Independent Consultant	3 month (July to September 2021)	50,000.00	MSWR	PIU	
	Procure a management consultant to manage tricycles trucks & composting machines	Management Consultant	3 months (October to December 2021)		MSWR	PIU	Operational Cost
	Supervise management	Operating Cost	5 years (Jan. 2022 to December 2026)		MSWR	PIU	
	Monitor, learn and scale up			1 million			Memorandum of Understanding

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

MAIN ACTIVITY	SUBACTIVITIES	LOGISTICS	TIMELINES	COST (USD)	IMPLEMENTING		REMARKS
					LEAD	SUPPORTING	
COMMUNITY SENSITIZATION, COMMUNICATION, CAPACITY BUILDING AND REWARDING OF CLEANLINESS							
Anti-littering Education and Awareness Creation	Develop anti-littering communication plan and educational materials	Communication Expert	6 months (July to December, 2021)	500,000.00	MSWR	PIU	Liaise with Communication Component of the Project
	Mass production of communication and educational materials				MSWR	PIU	
Build Capacity of MMAs	Develop training and monitoring tools for clean communities	Independent Consultant	4 months (November 2021- February, 2022)	70,000.00	MSWR	MMA	Training MMA stuff of the 4 selected communities
	Train MMAs on Indicators for cleanliness and refuse mapping						In collaboration with the MMA
	Develop a clean community plan						
	Develop an award scheme						
Verify & Award Communities	Verify and certify assessment results on cleaner communities	Verification Consultants	5 years		MSWR	PIU	Award yearly for 5 years I million USD award price
	Award the cleanest communities				MSWR	PIU	In collaboration with the PIU and MSWR
Periodic Training for Stakeholders	Provide periodic training for community champions and gatekeepers	Independent Consultant	5 years (January 2022 to December, 2026)	250,000	MSWR	PIU	Quarterly in the first year Twice in years 2 and 3 Once in years 4 and beyond
	Provide periodic training for MMDAs			300,000	MSWR	PIU	

SUBACTIVITIES

LOGISTICS

TIMELINES

IMPLEMENTING

REMARKS

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

MAIN ACTIVITY				COST (USD)	LEAD	SUPPORTING	
REFUSE EVACUATION, MSW COLLECTION, EMPTYING OF BINS AND DISPOSAL OF SAME							
Improve Access to Existing Approved Landfills	Liaise with the management of landfills to improve uptake of MSW	Meeting	1 month (August 2021)	N/A	MSWR	PIU	Operational Cost
Commence MSW Collection	Mandate cooperatives to start the collection of MSW within selected communities	Communication Expert	5 years (December 2021 to December 2026)		MSWR	PIU	Share and explain collection targets to cooperatives Sign MoU with cooperatives based on the Results-based financing (RBF) strategy
	Mandate cooperatives or MMAs to empty Litter bins		5 years (December 2021 to December 2026)	N/A	MSWR	PIU	Share and explain bin emptying plan with cooperatives and/or MMAs Sign MoU with cooperatives based on the Results-based financing (RBF) strategy
Conduct Catchment Wide Evacuation and Disposal of Existing Refuse Points	Undertake reconnaissance survey to confirm refuse points on refuse maps	Operational Cost	1 month (September 2021)	N/A	MSWR	MMA	Refuse maps
	Identify disposal sites to receive evacuated refuse	Operational Cost	1 month (October 2021)	N/A	MSWR	MMA	Recommended: Adepa Landfill (Nsawam) Refer to refuse map.
	Package refuse points into three (3) No. contract lots		1 month (October 2021)	N/A	MSWR	MMA	<ul style="list-style-type: none"> Lot 1: Agboghloshie and Old Fadama Enclave. Refuse Vol.: 8113-30331m³. (Consider using Formal Contractor) Lot No 2: Nima Maamobi Kotobabi, Newtown Avenor Kokomlemle, Asylum Down, Adabraka, Circle, Kanashie, Bubuashie, Darkuman and Awudome Enclave. Vol.: 1-60
	Procure contractor (s) for refuse evacuation		3 month (October to December 2021)	N/A	MSWR	MMA	
	Evacuate waste	Contractor (s)	3 months (January to March 2022)	2 million			

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	Supervise refuse evacuation	Technical Expert and/or Engineer	3 months (January to March 2022)	5000	MSWR	MMA	m ³ (Consider using ISP cooperatives) <ul style="list-style-type: none"> Lot No. 3: Madina, East Legon, Nyamekye, Alogboshie, Akweteyman and Ofankor and Kwabenya Enclave Shashi. Vol 1-8113 m³ (Consider using Formal Contractor) Refer to refuse map
	Reporting and Closure	Contractor (s)	3 months (January to March 2022)				

MAIN ACTIVITY	SUBACTIVITIES	LOGISTICS	TIMELINES	COST (USD)	IMPLEMENTING		REMARKS
					LEAD	SUPPORTING	
SOURCE SEPARATION, RECYCLING, DIVERSION OF RECYCLABLES FROM DISPOSAL AND USE OF BRING(BUY)-BACK CENTRES (1)							
Promote Source Segregation of Waste within Households, Markets & Institutions	Design a three-stream source segregation model for adoption in the selected communities and markets	Independent Consultant	2 months (June to July 2023)	10,000.00	MSWR	PIU	<ul style="list-style-type: none"> All biodegradables in one receptacle (60-litre bins) All recyclables (metals, plastics, glass and paper) in another receptacle (240-litre bin) All sanitary waste (used diapers) in a 110-litre bin Determine the number of households in need of bins and the design specification of bins
	Procure and distribute receptacles for the segregation of household solid waste at source	Supplier	6 months (August 2023-January 2024)	250,000	MSWR	PIU	<ul style="list-style-type: none"> Recommended receptacles and liners (60l, 240 l and 110 l) for biodegradable waste, all recyclables and sanitary items, respectively. Recommended to distribute receptacles for free or at a subsidized cost to households as an incentive

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

							towards the pro-environmental behaviour of segregation of MSW at the point of generation.
	Procure 90 No. receptacles within selected market and institutional recyclable waste streams	Supplier	6 months (August 2023-January 2024)	250,000	MSWR	PIU	<ul style="list-style-type: none"> Flexible arrangements must be made with markets and institutions to purchase the required receptacles
Engage, Register and Organize Informal Value Chain Actors into Cooperatives	Mobilize leadership of Informal Recyclers (IRS) for discussions towards diversion of MSW from landfills	Conference Package/Workshop	1 month (February 2024)	20,000.00	MSWR	MMAAs	<ul style="list-style-type: none"> IRs includes waste pickers, intermediate buyers, junkies, recyclers, and innovators
	Enumerate and profile the IRs within the Catchment	Independent Consultant	3 months (February 2024 to April 2024)	50,000.00	MSWR		<ul style="list-style-type: none"> All interested waste pickers within the Odaw River Catchment All interested intermediate buyers All interested junkies All recyclers and innovators Develop a ToR for review Procure consultant Prepare concept note with roadmap to support process
	Register all interested IRs						
	Facilitate the formation of 4 No. cooperatives of IRs						
Train and equip IRS cooperatives						<ul style="list-style-type: none"> Recommended training may include circular economy, alternate livelihoods, occupational health and safety. 	
Construct and Operate Bring (Buy)-Back Centers	Construction supervision of 17 No. buy-back centers		6 months (July to December 2023)-	30,000.00	MSWR	PIU	
	Construct 17 No. buy-back centres		1 year (December 2023 to December 2024)	200,000.00	MSWR	MMAAs	<p>Consider the use of recyclables materials. Collaborate with recyclers and Innovators at Cable and Wireless on this.</p>

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	Sign MoU with the IRs and mandate them to operate the buy-back centers		1 month (January 2025)		MSWR	PIU	
	Monitor and learn the operations of the buy-back centers.		2 years (January 2025 to December 2026)		MSWR	PIU	

MAIN ACTIVITY	SUBACTIVITIES	LOGISTICS	TIMELINES	COST (USD)	IMPLEMENTING		REMARKS
					LEAD	SUPPORTING	
SOURCE SEPARATION, RECYCLING, DIVERSION OF RECYCLABLES FROM DIPOSAL AND USE OF BRING(BUY)-BACK CENTRES (2)							
Establish Recycling Foundation (Advocacy Group) to Drive the Catchment's Recycling System	Mobilize relevant stakeholders towards the formation of the foundation	Conference Package	1 month (December 2023)		MSWR	PIU	Recommended: 7-member team (Academia, MSWR, MESTI, Informal Recyclers and Innovators, Waste Pickers, Associations of Plastic Producers & Importers, MMAs, Formal Recycling Association)
	Develop operational mandate for the running of the foundation		3 months (October 2023 to January, 2024)	N/A	MSWR	MMAs, MESTI, Plastic producers and importers	ToR, Operational Cost
	Create a seed fund for the foundation	Operational Cost	3 months (January to March 2024)	N/A	MSWR	MMA	
Stimulate Local Markets for Business Opportunities in Biodegradable Waste	Provide office space for recycling foundation		6 months (October 2023 to March 2024)			MESTI, Associations of Plastic producers and importers	
	Identify market opportunities and stakeholders	Independent Consultant	1 month (October 2023)	N/A	MSWR	MMA	<ul style="list-style-type: none"> Recommended: Parks and Garden, Farmers, Town and Country planning departments of MMAs,
	Sensitize farmers and communities on compost product usage				MSWR	MMA	<ul style="list-style-type: none"> Seek support of the various associations of plastic manufacturers and importers

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	Establish a demand and supply agreement between stakeholders for the purchase of compost products		3months (January to March 2024)				<ul style="list-style-type: none"> Set quality standards for finished compost
	Monitor and learn						
Support Recycling Value Chain Actors	Procure 5 No. Recycling Extruders, 5 No. Pelletizers, 5 No. Crushers and Washers for use by high chain IRs	Supplier	6 months (October 2023 to March 2024)	1 million	MSWR	MMA	<ul style="list-style-type: none"> Model: ACS-H Waste recycling plant Pelletizing Machine Factory Supply Waste Plastic Extruder, Model Number 160 Recommended to acquire and develop land for use as a recycling hub for MSW within the Odaw River Catchment. The office of the recycling foundation can eventually be located within the recycling hub.
	Procure land for IRs operations	Operational Cost	1 year (June 2023 to May 2024)	1 million	MSWR	MMA	

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GARID, SOLID WASTE IMPROVEMENT STRATEGY																												
SOLID WASTE & LITTER MANANAGEMENT AND IMPROVEMENT PLAN FOR THE ODAW CATCHMENT AREA																												
Recommended Project Implementation Action Plan (June 2021 - Dec. 2026)																												
Description of Activity	YEAR 1							YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6				
	M6	M7	M8	M9	M10	M11	M12	Q1	Q2	Q3	Q4																	
A. ENGAGE STAKEHOLDERS																												
1. Mobilize, Engage and Sensitize Stakeholders																												
1	Organize Stakeholder Validation Workshop																											
2	Engage MCEs and MCDs on finl strategy documents																											
3	Engage FSPs and ISPs on Acrtion Plan																											
4	Sensitize Selected Communities on Action Plan																											
2. Set up Governance System for Project Implementation																												
1	Profile the 4 No. selected communities for piloting																											
2	Identify community structures, gatekeepers & champions																											
3	Develop structure to support MSW collection interventions																											
4	Facilitate the establishment of committees																											
5	Train committees for MSW collection & Litter Prevention																											
3. Register and Organize ISPs into Cooperatives																												
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2	Register all interested ISPs																											
3	Facilitate the formation of 4 No. Cooperatives																											
4	Train and equip cooperatives																											
4. Address Governance Barriers to MSW Collection																												
1	Review existing MSW collection franchise agreements																											
2	Delineate and assign franchise zones to ISP Cooperatives																											
3	Collect MSW baseline (Collecetion Coverage) Data																											
B. PROCURE, INSTALL & CONSTRUCT FACILITIES																												
1. Procure Tricycles and MSW Collection Trucks																												
1	Procure 90 Tricycles																											
2	Procure 12. No. MSW Collection Comapctor Trucks																											
3	Procure 8 No Compact Compost machine																											
Construct New MSW Transfer and Disposal Facilities																												
1	Design & Construction Supervision of 2 No. Tranfer Sta.																											
2	Construct 2 NO. Transfer Stations																											
3	Design & Construction Supervision of 1 No. Eng. Landfill																											
4	Construct 1 No. Engineered Landfill																											
Provide Facilities to Promote Anti-Littering Behaviour																												
1	Procure, distribute and install 200 Litter Bins																											
2	Develop a plan to empty litter bins																											
3	Engage ISPs or MMAs to empty bins																											
4	Identify spaces for installation of 5 bulletin billboards																											
5	Design and Install 5 Bulletin Billboards																											

ISP: Informal Service Providers, MCEs: Municipal Chief Exectives, MSW: Municipal Solid Waste

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

GARID, SOLID WASTE IMPROVEMENT STRATEGY																												
SOLID WASTE & LITTER MANANAGEMENT AND IMPROVEMENT PLAN FOR THE ODAW CATCHMENT AREA																												
Recommended Project Implementation Action Plan (June 2021 - Dec. 2026)																												
Description of Activity	YEAR 1						YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6					
	M6	M7	M8	M9	M10	M11	M12	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4													
C. MANAGE CONTRACTS SERVICES FOR EQUIPMENTS																												
1. Manage Tricycles to Sustain the Work of Cooperatives																												
1																												
2																												
3																												
4																												
D. COMMUNICATE, BUILD CAPACITIES & REWARD																												
1. Create Awareness and Educate to prevent Littering																												
1																												
2																												
2. Build Capacities of MMAs																												
1																												
2																												
3																												
4																												
5																												
3. Verify and Award Communities																												
1																												
2																												
4. Train Stakeholders Periodically																												
1																												
2																												
E. REFUSE EVACUATION, MSW COLLECTION & DISPO.																												
1. Improve Access to Existing Approved Landfills																												
1																												
2. Commence MSW Collection																												
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Conduct Catchment Wide Evacuation																												
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ISP: Informal Service Providers, MCEs: Municipal Chief Exectives, MSW: Municipal Solid Waste

SOLID WASTE MANAGEMENT IMPROVEMENT PLAN - GARID PROJECT

GARID, SOLID WASTE IMPROVEMENT STRATEGY																											
SOLID WASTE & LITTER MANANAGEMENT AND IMPROVEMENT PLAN FOR THE ODAW CATCHMENT AREA																											
Recommended Project Implementation Action Plan (June 2021 - Dec. 2026)																											
Description of Activity	YEAR 1						YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6				
	M6	M7	M8	M9	M10	M11	M12	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4												
F. SEPARATE AT SOURCE & DIVERT RECYCLABLES																											
1. Promote Source Separation of MSW																											
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2. Engage, Register and Organize IRs																											
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3. Construct and Operate Bring (Buy)-Back Centres																											
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4. Establish Recycling Foundation																											
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5. Stimulate Local markets																											
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Support Recycling Value Chain Acors																											
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IRs: Informal Value Chain Actors, MCEs: Municipal Chief Exectives, MSW: Municipal Solid Waste																											