



Funded by
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Sustainable Cities - Phase I

EU-Ghana Partnership for Sustainable cities project

Terms of Reference

Component 4 - Solid Waste Management

Economic and Business Model analysis of the Solid Waste Management sector in 6 Cities of Northern Ghana

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I BACKGROUND

The Sustainable Cities – Phase I project is part of the EU-Ghana Partnership for Sustainable Cities. The project is funded by the European Union and implemented by Expertise France through the Ministry of Local Government, Chieftaincy and Religious Affairs (MLGCRA). The project aims to enhance urban prosperity by supporting the development of sustainable and inclusive cities; addressing urban challenges while fostering long-term growth and resilience. Specifically, the project seeks to support six cities—Tamale, Wa, Damongo, Nalerigu, Yendi, and Bolgatanga—in advancing sustainable urban development and tackling challenges related to spatial growth and climate change. The project also seeks to improve urban governance through inclusive planning, better access to urban services, and the promotion of green economic development and job creation.

Project components include solid waste management (SWM) with the aim to ‘**Build green and sustainable solid waste management systems in the 6 target cities**’. The overall outputs expected from the solid waste management component of the project are as follows:

- Improved Capacity and facilities for the delivery of smart, sustainable and accessible solid waste management services
- Improved Citizens’ engagement for SWM services
- Increased support to local businesses for the delivering of SWM services

As part of the Project’s activities, an **Economic, financial and market assessment of the Solid Waste Management (SWM) sector** will be conducted to identify viable and context-appropriate service delivery and business models for improving SWM in the six target cities.

To this end, the Project will engage a **Solid Waste Management Finance and Business Model Consultant (individual or firm)** to assess the economic performance of the sector, value chain dynamics, market structure and value recovery potential across the six cities, including circular economy opportunities. Building on this analysis, the assignment will compare existing and alternative SWM business models, evaluate their feasibility, sustainability and scalability, and formulate city-specific recommendations. A key deliverable will be a comparative analysis of business models and market configurations, identifying the most suitable approaches for each city and informing tailored business models and related investment programmes.

The study will be implemented in close coordination with MMAs, regional coordinating councils, private waste operators, and other key stakeholders engaged in SWM delivery.

This Terms of Reference (ToR) defines the scope, objectives, and expected outputs of the consultancy, which will support evidence-based decision-making and the design of sustainable and inclusive solid waste management systems under the Project.

2 OBJECTIVES OF THE ASSIGNMENT

The Sustainable Cities - Phase I Project seeks the services of a qualified Consultant to undertake a comprehensive **Economic, Financial and Market Analysis of Solid Waste Management Models** in the 6 target cities.

The overall objective of the assignment is to identify, analyse, and elaborate viable service delivery and business models for solid waste management based on economic, financial, institutional, operational, environmental, and market criteria. The ultimate outcome is to provide an evidence-based framework guiding investment and policy decisions for efficient, financially sustainable, and inclusive SWM systems in Ghana’s northern cities.

In such a framework, the study aims to provide a solid analytical basis for the selection of appropriate management models tailored to the specific contexts of each city.

The analysis will cover the entire solid waste value chain, including collection, transfer, transport, treatment, recovery, recycling, and final disposal. It will also include a value chain and market assessment to evaluate existing and potential value recovery opportunities (e.g. recyclable materials, composting, energy recovery), assess market actors and dynamics, and identify constraints and enablers for private sector participation and circular economy development.

Based on the above, the Consultant is invited to submit a detailed technical and financial proposal to undertake the assignment. The technical proposal should present the proposed approach and methodology, work plan, resource allocation, and procedures for fieldwork, data collection, and analysis. Survey instruments (questionnaires, interview guides, etc.) to be used for the assignment shall be reviewed and validated by the Project Team during the inception phase.

3 SCOPE OF WORK

3.1 Scope of services

The purpose of the study is to carry out an **economic, financial, and market analysis of business and management models** for SWM systems across the six target cities. The assignment aims to characterize, compare, and evaluate existing and potential models in terms of their economic performance, operational efficiency, institutional arrangements, environmental impact, and social inclusiveness, with a focus on identifying the most suitable options for each urban context.

The assessment should provide a comprehensive description of each business model or management option, highlighting its operational modalities, value proposition, institutional and contractual setup, linkages with the SWM value chain, and associated cost and revenue structures. The analysis will also consider the implications of each model on the organization and performance of municipal services, identifying strengths, weaknesses, and opportunities for optimization and scalability.

Special attention shall be given to identifying sustainable business and financing mechanisms such as the use of Internally Generated Funds (IGF), District Assemblies Common Fund (DACF) allocations, service user fees, seed funding, zero-interest loans, or in-kind support (e.g. provision of start-up equipment).

The study should also identify and assess economic instruments that can support improved SWM service delivery, recognizing that user fees alone may not be affordable for most residents. Instruments to be considered may include property or tourism levies, user charges, landfill fees or product taxes, deposit-refund systems, and economic incentives such as subsidies, tax exemptions, or feed-in tariffs for energy-from-waste.

The ultimate objective is with decision-making tools to determine the most suitable operational and financial model for each segment of the waste management chain — pre-collection, collection and transport, sorting and recycling, treatment, and final disposal.

For each identified business model, the Consultant shall:

1. Describe the model comprehensively, detailing its operational processes, the division of roles between public and private actors, contractual arrangements, legal mandates, and key resources mobilized by the service provider.
2. Identify the customer segments which the model is applicable for (vis low-income, high-density, high income, residential vs institutional or commercial etc.)
3. Articulate the value proposition of each model — i.e., the specific benefits offered to customers, operators, and municipalities
4. Analyse the cost structure, identifying the full cost of service delivery and evaluating efficiency and value-for-money based on service levels and fee structures. Key questions to be answered includes what it costs to deliver services under the model; including the cost of resources for the service provider (provide details and structure of the costing arrangement – e.g. staff and labour costs,

equipment and running costs, etc. provide an indication of value for money based on the current fee structures and level of service etc.).

5. Assess the revenue model, identifying all potential revenue streams, examining their stability and sustainability, and evaluating cost recovery capacity over time.
6. Examine the applicability of economic instruments suited to low- and middle-income urban contexts, proposing incentives and financial mechanisms that can enhance sustainability and encourage circular economy practices.
7. Conduct municipal capacity assessment: for each target MMA, assess the technical, financial, institutional and contract-management capacity required to implement, manage and supervise the SWM business models, including key gaps and priority measures to address them.
8. Support definition of procurement and local regulatory instruments required to operationalise the selected models (procurement roadmap, contract structure and key clauses, performance monitoring tools, and by-law/enforcement needs), aligned with Ghanaian rules and realistic local capacities.

The findings will inform policy recommendations and investment programming, supporting the development of green, inclusive, and economically viable SWM business models for each of the six cities.

3.2 Detailed scope of work

Task 1 - Inception Phase

- Desk review: review existing studies and assessments related to SWM in the 6 cities as well as relevant policies, strategies, and regulatory frameworks, including value chain and market studies where available.
- Hold inception meetings with project team and key city stakeholders to refine scope, methodology and analytical framework.
- Prepare a draft inception report with an updated methodology and detailed work plan.
- Hold an inception review meeting with the client to present and discuss the inception report.
- Finalize the inception report incorporating feedback from the Project team.

Task 2- Review of existing situation and assessment/identification of models

- As a priority task, support the MMAs in the ongoing call for proposals process (expression of interest and subsequent call for tenders) aimed at identifying and pre-selecting potential private operators to deliver municipal solid waste collection services, including support to the packaging of bidding documents, clarification sessions, support to the evaluation process (eligibility/technical/financial criteria), and consolidation of results to inform the selection and structuring of feasible business models.
- Collect and analyse data on current SWM systems from an economic and financial perspective in the 6 cities, covering the full waste management chain - generation, pre-collection, collection, transport, treatment, recovery and disposal – as well as associated costs (studies show that operating costs often constitute 60–85% of total waste management costs), and revenues - including upfront and back-end costs.
- Map the institutional, regulatory, and financial frameworks governing SWM, taking into account income levels of the different communities and customer segments, and existing fiscal instruments.
- Review existing SWM service contracts and delegation arrangements, relevant local by-laws and enforcement instruments, and current procurement practices in each city, to identify gaps, risks and practical constraints for implementing the proposed business models.
- Conduct a value chain and market analysis, identifying key actors, material flows, and market linkages, and assessing opportunities for value recovery, recycling, composting, and circular economy initiatives.
- Review and assess existing business and management models, and identify alternative models relevant to the context of each city.
- Ensure that the mapping of business models and value chains explicitly includes informal operators active in collection, sorting, aggregation, recycling), their cost/revenue logic, and their interfaces with formal service delivery arrangements.

- Identify and describe existing and potential business models (e.g., user fee-based, PPPs, recycling-based, circular economy, waste-to-energy, community-based).
- Define the operational structure, financial assumptions and value proposition for each identified model.
- Conduct a Municipal capacity assessment for each city, covering (i) service planning and operational oversight, (ii) financial management and budgeting, (iii) procurement/contracting management, (iv) monitoring and enforcement, (v) staffing and organisational arrangement models. Summarize gaps and implication for model feasibility.

Task 3 - Economic Analysis

- Provide a detailed account of the value propositions offered by each business model — including benefits for users, operators, and municipalities — and how they relate to the SWM value chain and market potential.
- Conduct a cost–benefit analysis of each model, integrating environmental and social externalities such as avoided pollution, health impacts, and opportunity costs of unsustainable practices.
- Estimate the Economic Rate of Return (ERR) for each model, including both direct and indirect benefits (e.g., job creation, material recovery, climate co-benefits).
- Incorporate informal sector impacts into the economic assessment, including employment effects, productivity gains, and externalities associated with improved integration/formalization.

Task 4 - Financial Analysis

- Undertake a detailed assessment of cash flows and analysis of revenue streams for each model and evaluate their financial sustainability. Assess whether current revenues can ensure cost recovery over time and how private sector actors mobilize and reinvest revenues.
- Develop financial models for selected options, including cash flow projections and sensitivity analyses on key variables (waste quantities, tariffs, investment and O&M costs, and market prices for recyclables).
- Calculate key financial indicators (NPV, IRR, payback period) and assess the overall financial viability of each model.
- Evaluate mechanisms for covering operational costs, ensuring service sustainability.
- Given affordability constraints in low-income settings, identify alternative cost recovery mechanisms, including cross-subsidies, blended finance, and municipal fiscal transfers. Assess ability and willingness to pay to define socially acceptable tariffs and develop fee-fixing and billing mechanisms (potentially integrated with existing utility bills such as water or property tax systems).
- Integrate informal actors into the financial analysis of models (e.g., incentive mechanisms, subcontracting arrangements, payment flows, EPR-linked revenues), and assess how inclusion affects model viability and cost recovery.

Task 5- Enabling Environment to support the model

Experience from various SWM models has shown that local authorities often face difficulties in implementing economic instruments for cost recovery without adequate legal backing and national policy support. Therefore, the consultant will assess the enabling framework required for the proposed models:

- Analyze the policy, institutional, regulatory, and fiscal environment conducive to promoting each model (tariffs, subsidies, PPP frameworks, private sector participation). Identify specific reforms or adjustments needed in policy, regulation, and legislation.
- Identify financing gaps and propose investment and funding mechanisms (e.g., waste levies, grants, loans, blended finance, carbon credits, green bonds) to support implementation.
- Review the legal and procurement implications of the shortlisted business models, including consistency with Ghanaian legislation (local government law, environmental law, public procurement law, PPP/PSP regulations) and relevant donor requirements
- Build on the contractual work already carried out by the project's SWM Expert, propose and structure the contractual framework required to operationalize each model (contract type, roles

and responsibilities, performance obligations and KPIs, reporting formats, payment mechanisms and schedules, sanctions/termination clauses, dispute-prevention and resolution mechanisms)

- Identify and draft key local regulatory and enforcement instruments required at MMA level (e.g., by-laws, decisions and complementary texts), and propose a realistic adoption pathway (MMA approval process, publication/gazetting, RCC transmission where applicable)
- Translate the above into practical procurement and contract-management tools for MMAs:
 - standard ToR and evaluation grids
 - model tender documents
 - contract annexes and KPI sheets
 - a simple, user-friendly dashboard (Excel-based or equivalent) enabling MMAs to monitor delegated service contracts, track KPIs and reporting compliance, and document performance issues and corrective actions
 - templates for review meeting minutes and notices of non-compliance).

Task 6 - Assessment of Informal Service delivery models

Given the significant role of the informal sector, the Consultant shall mainstream informal sector integration across the model design and economic / financial analysis, and additionally provide dedicated assessment as follows:

- Identify mechanisms for integrating informal sector actors into formal SWM and value recovery systems.
- Assess potential incentives under Extended Producer Responsibility (EPR), advanced recycling fees, and other market-based mechanisms that could formalize and support informal operators.
- Provide recommendations for monitoring, coordination, and control systems to ensure effective integration of informal collection and recycling activities into municipal SWM and EPR systems.
- Identify capacity-building needs and inclusive financing or subsidy schemes to strengthen the participation of informal workers and cooperatives.

Task 7 – Capacity building and knowledge transfer

- Develop training materials (PPT presentation and short guidance note at minimum)
- Design and deliver targeted capacity-building modules for MMA staff (procurement units, legal officers, Waste Management Departments and finance teams) on: (i) use of the contractual and procurement toolkit (tender documents, evaluation process, contract annexes and KPIs), (ii) contract management and performance monitoring, (iii) enforcement tools and dispute-handling pathways, and (iv) practical compliance with environmental, health and safety obligations.
- Provide user-friendly guidance materials and templates that MMAs can reuse step-by-step (checklists, standard letters/notifications, dashboard or contract-management sheets), and support coached application during at least one procurement/selection cycle where relevant.
- Capture feedbacks and define priority capacity-building needs per city to support ownership and implementation.

4 DELIVERABLES AND TIMELINES

D1. Inception Report

- Refined methodology and analytical framework
- Data collection tools and consultation plan
- Detailed work plan and timeline
- Proposed structure of outputs and validation steps

D2. Procurement Support Note – Ongoing Call for Proposals (EOI + Tender)

- Support package for MMAs to run the ongoing EOI and subsequent call for tenders (reviewed and improved consultation documents, methodology note with timeline, including

eligibility/technical/financial evaluation approach, templates for evaluation, and consolidation of results)

- Brief summary note capturing outcomes and implications for model selection in each city.

D3. SWM Baseline, Diagnostic & Market Assessment Report (cross city)

Consolidated report covering the six target cities, including:

- Current SWM baseline across the service chain (coverage, performance, actors, flows, infrastructure)
- Institutional / regulatory / financial mapping (key gaps and constraints)
- Value chain and market assessment (material flows, market linkages, value recovery potential, circular economy opportunities)
- Explicit analysis of informal operators (roles, interfaces with formal systems, constraints and opportunities)

Annex D3-A – City Diagnostic Profiles (6 annexes - one per city)

Each city annex will include:

- Service baseline across the chain
- Institutional / regulatory / financial mapping
- Review of existing contracts, by-laws and procurement practices
- Municipal capacity assessment (planning/oversight, finance, procurement/contracting, monitoring/enforcement, staffing)

D4. Business Models Options & Integrated Economic/Financial Report

- List of relevant SWM business models and screening criteria (adapted to the context of the six target cities)
- Shortlist per city (1–2 priority models recommended), with clear justification and selection rationale
- For shortlisted models: city-specific operational set-up, key assumptions (based on locally validated data), value proposition (users/operators/municipalities), risks and enabling conditions
- City-specific integrated economic and financial appraisal per model, including: cost–benefit analysis and externalities where relevant, city-level cost and revenue models (cash flows, revenue streams, cost recovery pathways), key financial indicators (e.g., NPV/IRR/payback), sensitivity/scenario analysis on city-specific variables (waste quantities, tariffs/fees, CAPEX/OPEX, market prices), and affordability/ability-to-pay considerations
- Stakeholder validation and consultation with the MMDAs/Assemblies: presentation of the shortlisted business model options and appraisal results, and facilitation of consultative discussions on fee fixing / tariff setting (including billing modalities and socially acceptable fee levels), to support city ownership and decision-making
- Proposed inclusion mechanisms for the informal sector, integrated into both service delivery and payment/incentive systems (e.g., subcontracting, payment flows, EPR-linked revenues), and assessment of how inclusion affects viability and cost recovery.

D5. Contractual, procurement and regulatory toolkit

- Contractual framework note (cross-city guidance + city-specific considerations) covering:
 - Recommended contracting approach per shortlisted model (e.g., franchise, performance-based service contract, management contract)
 - Roles and responsibilities (MMA / operator / third parties), governance and reporting lines
 - Performance framework: KPIs, service standards, reporting frequency, verification mechanisms
 - Payment mechanisms (fixed fee, unit rates, performance-linked payments), indexation, deductions/penalties
 - Risk allocation, change management, force majeure, and dispute resolution options
- Draft contract templates and annexes (in editable Word formats), including:

- Model contract(s) aligned with selected model types
- Service specifications (routes/coverage logic, minimum service levels, equipment requirements etc.)
- Reporting templates (daily/weekly/monthly reporting; incident logs; complaint logs)
- Payment schedules and invoice templates
- Non-compliance and sanctions schedule; corrective action plan template
- Environmental and social clauses (incl. informal sector interfaces where relevant)
- Procurement pack including:
 - Standard ToR / tender documents for SWM collection and related services
 - Evaluation grid (eligibility + technical + financial) with scoring guidance
 - Tender dossier structure and checklist (advertisement, clarifications, addenda, minutes)
 - Bidder due diligence checklist (legal registration, equipment, staffing, past performance)
 - Draft clarification Q&A template and evaluation report template
- Regulatory / by-law support package including:
 - Draft by-law provisions linked to service delivery and fee enforcement (as applicable)
 - Adoption and enforcement roadmap (institutional steps, approvals, communication, enforcement options)
 - Practical guidance on compliance considerations (alignment with national frameworks)
- Contract monitoring dashboard for MMAs (Excel-based or equivalent) including:
 - KPI tracking and reporting compliance
 - Payment status and deductions
 - Non-compliance incidents, corrective actions and follow-up
 - Service coverage

D6. Capacity Building Package & Training Report

- Deck presentation (PPT) covering:
 - Overview of shortlisted models (how they work: roles, flows, incentives)
 - Practical use of the procurement pack and contract templates (key steps, evaluation approach, KPIs/payment mechanisms)
 - Basic contract monitoring using the dashboard
 - Fee fixing / tariff setting: affordability principles, consultation approach and billing options
 - Informal sector integration considerations
- Delivery and training report
 - Deliver at least one training workshop (cross-city or clustered), combining presentation and practical exercises based on the toolkit templates.
 - Include a dedicated discussion session on fee fixing / tariff setting consultation aligned with MMA processes.
 - Brief training report documenting agenda, participants/attendance list, feedback collected, and priority capacity-building needs / next steps per city.

Deliverable table and timeline

Deliverable	Indicative timeline
D1. Inception report	Draft: T0+1 week after commencement Final version: 2 weeks after commencement

D2. Procurement Support Note – Ongoing Call for Proposals	T0+3 weeks
D3. <u>SWM Baseline, Diagnostic & Market Assessment Report</u>	T0+2,5 months
D4. <u>Business Models Options & Integrated Economic/Financial Report</u>	T0+4 months
D5. <u>Contractual, procurement and regulatory toolkit</u>	T0+6 months
D6. <u>Capacity Building Package & Training Report</u>	T0+8 months

5 DURATION OF ASSIGNMENT

The assignment will have a maximum duration of **12 months**.

6 CONSULTANTS REQUIREMENTS

Lead consultant / Team leader

The Consultancy Firm is expected to nominate a Lead Consultant / Team Leader who will be responsible for overall technical leadership, quality assurance, coordination with the Client and stakeholders, and timely delivery of all outputs. The Team Leader should meet the following minimum requirements:

- Advanced degree (Master's or PhD) in Economics / Environmental Economics / Finance / Financial Engineering / Public Policy or closely related field.
- Minimum 15 years of professional experience in financial/economic analysis for infrastructure and/or environmental services; SWM services and infrastructure experience is a strong advantage.
- Demonstrated expertise in SWM service delivery models, PPP/contracting modalities, and/or circular economy/value recovery business models.
- Proven ability to lead multi-city diagnostic and option appraisal assignments and translate results into actionable municipal implementation pathways (phased plans,
- Strong facilitation and stakeholder management experience with municipalities (MMDAs), national institutions, private operators and development partners.

Mandatory technical competencies (firm level)

- Strong quantitative and modelling skills: financial modelling, cash-flow projection, CBA, and sensitivity/scenario analysis.

- Ability to assess and propose cost recovery mechanisms and tariff structures adapted to low- and middle-income contexts (affordability constraints, cross-subsidies, municipal transfers, blended finance).
- Capacity to conduct market/value chain analysis for recoverable materials (actors, flows, market linkages, price dynamics), and integrate market realism into model design.
- Ability to assess the enabling environment (policy, regulatory, institutional, fiscal) and formulate practical reform recommendations for model implementation.
- Demonstrated ability to translate model recommendations into legally robust and operational procurement/contracting packages (tender documents, evaluation grids, contract templates and annexes, KPIs, payment and enforcement clauses), aligned with Ghanaian rules and realistic MMA capacities.
- Demonstrated experience conducting institutional/municipal capacity assessments, including:
 - service planning and operational oversight,
 - budgeting/financial controls,
 - procurement and contract management (including PPP oversight),
 - monitoring/enforcement systems, and
 - organisational/staffing arrangements.
- Demonstrated ability to produce city-level action-oriented outputs, including: shortlisting 1–2 priority models per city, phased implementation plans, indicative budgets/financing sources, and “toolkit/project fiche” notes.
- Proven understanding of the role of the informal sector in SWM (pre-collection, sorting, trading/aggregation, recycling) and ability to mainstream informal integration into business model design and financial/economic analysis (payment flows, incentives, subcontracting structures, EPR linkages).
- Demonstrated experience in designing and delivering capacity-building/training for public authorities and/or operators, preferably using case-based learning (e.g., model selection, tariff scenarios, basic cash-flow logic, contract KPIs)
- Proven experience working in developing countries; experience in West Africa and/or Ghana is a strong advantage.

Required team areas of expertise

- SWM Operations / Service Delivery – expertise in collection systems, service packaging, operational performance and O&M implications.
- Institutional / PPP / Contracting – strong understanding of municipal mandates, PPP/PSP frameworks, contracting modalities, and performance-based supervision, including practical procurement processes (EOI/Call for Proposals, evaluation committees) and enforceable contract/by-law drafting.
- Legal / Procurement – capacity to review and draft tender dossiers and service contracts (including annexes, reporting formats, payment mechanisms and sanctions) and advise on local regulatory instruments required to enforce SWM service delegation at MMA level.
- Institutional / PPP / Contracting – strong understanding of municipal mandates, PPP frameworks, contracting modalities, and performance-based supervision.
- Social Inclusion / Informal Sector Integration – ability to mainstream informal sector integration in business models, incentives, financing mechanisms and governance/monitoring arrangements