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MINISTRY OF WATER AND ENERGY

Term of Reference

Study the Operational Efficiency of Sanitation Treatment Facilities and Development of Reuse Guideline, a Business strategy, Business plan and Legal Framework.

ToR

Nov, 2025

Sanitation infrastructure Monitoring and support Desk, MoWE

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1. Background

Ethiopia has started substantial investments in sanitation infrastructure including fecal sludge treatment plants (FSTPs), wastewater treatment plants (WWTPs), and decentralized wastewater treatment systems (DEWATS). However, many of these facilities face poor performance and sustainability challenges due to weak operational systems, limited technical capacity, inadequate financing, and absence of standardized operational guidelines and legal instruments.

Addis Ababa, the capital city of Ethiopia, is experiencing rapid population growth and urbanization, resulting in increasing wastewater and fecal sludge generation. The city currently operates several wastewater treatment and fecal sludge treatment facilities managed by the Addis Ababa Water and Sewerage Authority (AAWSA). While these facilities play a critical role in protecting public health and the environment, many face operational challenges such as fluctuating influent loads, high energy consumption, intermittent maintenance, and limited monitoring. Additionally, safe reuse of treated effluent and biosolids for agriculture, landscaping, or industrial purposes remains underdeveloped and requires clear, context-appropriate guidelines.

To address these gaps, the Ministry of Water and Energy (MoWE), through its Sanitation Infrastructure Monitoring and Support Desk under the Sanitation Infrastructure Lead Executive Officer, recognizes the need to enhance the operational performance of existing sanitation treatment plants. To this end, MoWE intends to engage a **qualified consultant** to conduct a detailed study on the **operational efficiency of selected sanitation treatment facilities (representative based on technology)**, to **develop practical, safe and regulatory-aligned Guidelines for Reuse of Treated Effluent and Sludge**, **to develop a Business strategy including identifying possible business models and business plan** and to **recommend and draft a legal framework** addressing identified gaps in governance, operation, and management. The aim is to ensure sustainability, environmental compliance, and effective management of sanitation service along the full sanitation value in Ethiopia.

Therefore, this assignment is expected to generate evidence-based insights and actionable recommendations that will strengthen sanitation service delivery, ensure environmental protection, and promote sustainability.

2. Objectives

2.1 Overall Objective

The purpose of this assignment is to evaluate the operational performance of Ethiopia's some representative sanitation treatment facilities, enhance the recovery and reuse of resources from wastewater and sludge, develop a strong legal and institutional framework to support sustainable, environmentally sound sanitation services and develop a business strategy and business plan which will be the roadmap for technical and economic viability and implementation.

2.2 Specific Objectives

- Assess current operational efficiency and technical capacity of representative centralized and decentralized sanitation treatment facilities.
- Identify operational, technical, institutional, and financial barriers to optimal performance.
- Propose cost-effective optimization techniques to enhance treatment processes and comply with environmental standards.
- Assess the current national and global practices for resource recovery.
- Assess and analyze effluent and sludge quality against established national and global benchmarks.
- Develop comprehensive guidelines for safe reuse of treated effluent, biosolids, and other recovered resources.
- Assess the existing institutional arrangements and governance models in sanitation service delivery.
- Identify regulatory and legal gaps that hinder resource recovery, operational efficiency, and service sustainability.
- Propose legal instruments and regulatory recommendations to support optimization of sanitation services.

- Develop a business strategy for resource recovery integrating operational and legal framework findings.
- Develop a business plan for at least two treatment facilities sites.
- Prepare user-friendly and practical training modules and materials derived from the approved Resource Recovery and Reuse guideline and business plans.

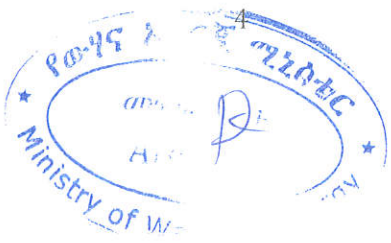
3. Scope of Work

The consultant will perform the following tasks:

1. **Identification and Sampling Framework"**
    - The consultant shall conduct a preliminary mapping of all existing sanitation treatment facilities (WWTPs, FSTPs, and DEWATS) under the Ministry's purview, the consultant's first task is to:
        - ✓ **Inventory Categorization:** Identify and categorize existing facilities by technology type (e.g., Waste Stabilization Ponds, UASB, MBR, Trickling Filters, Planted/Unplanted Drying Beds).
        - ✓ **Geographic Clustering:** Propose a representative sample size that covers at least 8 facilities. This sample must be geographically diverse, covering at least 3 Regional States to account for different climatic and institutional contexts.
2. **Desk Review:**
    - Review national policies, regulations, standards, and guidelines related to sanitation value chain/ service delivery and resource recovery.
    - Review existing reports on operational performance of treatment plants and related institutional arrangements.
    - Conduct literature review and assess international best practices to serve as a bench mark for lesson learning
3. **Field Assessment:**
    - Conduct site visits to a representative sample of **centralized and decentralized sanitation treatment plants** across urban areas.

- Assess operational efficiency, technical capacity, staffing, maintenance monitoring, and reporting mechanisms.
- Collect and analyze data on sanitation treatment technologies capacity, type, efficiency, functionality, energy consumption, sludge generation, effluent quality, resource recovery and the like, how these are being operated, number of operators and all relevant data including sources of liquid and fecal sludge wastes.

4. **Gap Analysis:**
   - Identify gaps in operational processes, institutional arrangements, legal framework, and resource recovery practices.
   - Evaluate challenges in financing, cost recovery, and sustainability.
5. **Resource Recovery and Reuse Guidelines:**
   - Develop technical guidelines for safe and sustainable reuse of treated wastewater, biosolids, and other recovered resources.
   - Include environmental, health, and socio-economic considerations.
6. **Legal and Regulatory Framework Recommendations:**
   - Propose legal and regulatory instruments enabling resource recovery and **operational** efficiency.
   - Align recommendations with national policies and international best practices.
7. **Reuse and resource recovery Financing Strategy and Business Plan**
   - Develop a comprehensive Financing Strategy and business plan outlining revenue generation, cost recovery, and investment needs.
   - Conducting economic assessment to determine financial viability of use of treated waste water and biosolid reuse projects.
   - Include market assessment, sustainability measures, and operational optimization.
8. **Stakeholder Analysis and Engagement**
   - Identify key stakeholders, including government agencies, utilities, private operators, and community representatives.
   - Conduct consultations to validate findings and recommendations.



9. Reporting and Consultation:
    - Prepare and submit a draft inception report and Assessment report for review, incorporating stakeholder feedback.
    - Submit the draft reuse guideline, draft business strategy and business plan and draft legal framework recommendation document.
    - Engage relevant bodies to validate findings and recommendations.
    - Submit all final documents and report with clear, actionable recommendations, including operational, institutional, and legal frameworks.

4. Approach and methodology

The Consultant is required to indicate in detail the approach and methodology to be used for the assignment. Thus, technical approach, methodology and work plan are key components of the Technical Proposal. The Consultant is suggested to prepare His/ Her Technical Proposal divided into the following three chapters:

a) **Technical Approach and Methodology.**

Here the Consultant should explain its understanding of the objectives of the assignment, approach to the services, methodology for carrying out the activities and obtaining the expected output, and the degree of detail of such output. The Consultant should highlight the problems being addressed and their importance, and explain the technical approach it would adopt to address them. The Consultant should also explain the methodologies it proposes to adopt and highlight the compatibility of those methodologies with the proposed approach.

b) **Work Plan.** Here the Consultant should propose the main activities of the assignment, their content and duration, phasing and interrelations, milestones (including interim approvals by the Client), and delivery dates of the reports. The proposed work plan should be consistent with the technical approach and methodology, showing understanding of the TOR and ability to translate them into a feasible working plan. A list of the final documents, including all stage reports and tables to be delivered as final output, should be included here.

e) **Organization and Staffing.** Here the Consultant should propose the structure and composition of its team (the establishment required to effectively undertake the project). The Consultant should list the main disciplines of the assignment, the key expert responsible, and proposed technical and support staff.

5. Expected Deliverables and Timeline

The total duration of the assignment is expected to be ten to twelve (10-12) months, distributed

Deliverables	Major Description	Timeline	No of copies (soft and Hard copy)
Inception Report	• detailing methodology, data collection tools, approach and sampling framework and detailed work plan	Within 1 month from starting contract effective date. Final within one week after receipt of comment from MoWE	3
Facility Assessment Report	• Baseline data, field observations. • Design Capacity & Loading Analysis • System-by-System Evaluation	Draft within Month 2 starting contract effective date. Final within one week after receipt of comment from MoWE	3
Operational Efficiency Report	• Preliminary findings • Treatment Effectiveness and Compliance. • Resource Efficiency • Process Control Audit: • Integrated Recommendations &	Draft within Month 4 starting contract effective date. Final within one week after receipt of comment from MoWE	3

	Action Plan		
Draft and Final Reuse & Operational Guidelines	• Assessment & Benchmarking • Resource Quality & Market Potential Analysis • Technical and operational standards, and technological innovations	Draft within Month 6 starting contract effective date. Final within one week after receipt of comment from MoWE	3
Legal and regulatory framework document	The assessment on legal and regulatory framework and recommended draft	Draft within Month 6 starting contract effective date. Final within one week after receipt of comment from MoWE	3
Draft and **Final** reuse and recycle business strategy and plan document.	narrates the legal, institutional suggestions, business models reflecting cost benefit with financial viability and financial strategy	Draft within Month 7 starting contract effective date. Final within one week after receipt of comment from MoWE	3
Training modules and material	narrate all technical, legal and business-related requirements to implement and expand reuse and recycling	Draft within Month 8 starting contract effective date. Final within one week after receipt of comment from MoWE	3
Validation Workshop	Presentation and stakeholder input	Draft within Month 9 starting contract effective date. Final within one week after receipt of comment from MoWE	

Final Report & Legal Framework	Consolidated outputs and guidelines	Draft within Month 11 starting contract effective date. Final within one week after receipt of comment from MoWE	3
quarterly progress report of the consultancy	Progress	Within the first week of the new month	1 for each quarter totally 3
Final progress report of the cons	Progress report	At the end of the contract period	1

6. Qualifications, Skill, Experience and Team Composition

This consultancy service is expected to be carried out/performed by a well experienced firm.

This consultancy services shall be performed by a team of qualified experts with excellent knowledge of Urban WaSH policies in Ethiopia and abroad, particularly of Integrated Sanitation Management.

The consulting firm should demonstrate:

- Knowledge and experience in sanitation related data and information assessment, sanitation system gap analysis, experience in sanitation treatment technologies operational system analysis.
- Advanced experience and background in Environmental Engineering, Sanitation, Public Health, or related field.
- Proven experience in sanitation facility assessment, operational efficiency studies, and resource recovery.
- Experience in developing guidelines and regulatory frameworks for sanitation services.

- Strong understanding of Ethiopian sanitation sector policies and institutional arrangements.
- Excellent report writing and stakeholder engagement skills.
- The consultant shall have a minimum of 10 years' experience as consulting firm

The following key personnel is required for the assignments

S.N	Position	Qualification and Experience	Person/Month
1	Team Leader	Graduate with M SC Degree in Civil / Sanitary/hydraulic/wastewater/water supply Engineering. At least 10 yrs. international managerial experience and adequate experience Wastewater Design, and strategic sanitation and drainage planning, and in designing of sanitation facilities, including on-site sanitation. 1. Practical experience as Team Leader for minimum two similar projects; 2. Should have good computer knowledge, report writing and communication skills including at least 10 years' experience in design and construction supervision or project management of large water supply / wastewater network Should be permanent employee of the firm or have an extended and stable working relationship with the firm	12
2	Data analyst /GIS & Remote sensing Specialist	MSc or above in GIS or related with minimum 6 years' experience in the water supply and Sanitation sub sector with a high credit to experiences in data preparing and managing similar nature projects.	4
4	Legal Expert	LLM/LLB+ in Law; 8+ years specialized experience in Water and Sanitation Law, with proven ability to draft regulatory recommendations and legal instruments.	4
5	Socio-Economist / Institutional/Policy	MSc or above in Economics with at least 10 years' with experience of at least two similar purpose projects, in cost-benefit	4

	Specialist	analysis, tariff setting, and developing institutional or business models in the water/sanitation sector.	
6	Environmental Engineer/Chemist	MSc/BSc in Environmental Engineering or Chemistry; 10+ years of relevant experience in water/wastewater quality analysis, laboratory setup, and Quality Assurance/Quality Control (QA/QC).	6
7	Public Health and Hygiene Specialist	MPH/MSc/Bsc+ in Public Health or Environmental Health; 8+ years' experience in public health risk assessment and applying health and safety standards for water reuse in agriculture or industry/experience in sanitation and related infrastructure projects. Analysis public health impact on community and environment.	6
8	Process Engineer / Energy Specialist	MSc+ in Chemical or Process Engineering; 7+ years' experience in plant optimization, energy auditing, and efficiency improvement for wastewater or similar utility infrastructure.	6
9	Social/Environmental Safeguards Specialist	MSc+ in Environmental Management or Social Science; 8+ years in Environmental and Social Impact Assessment (ESIA) and ensuring compliance with national and international safeguard policies.	8

The following non key personnel is required for the assignments

1	Data Enumerators	Bachelor Degree in Statics and 5 years' relevant experience in large-scale data collection, surveying, and logistical support and analysis	6

✓ The number of data numerator should be at least 3

7. Reporting and Coordination

The study will be coordinated by the Sanitation Infrastructure Monitoring and Support Desk under the Sanitation Infrastructure Lead Executive Officer, Ministry of Water and Energy (MoWE). The consultant/team will report directly to MoWE through the Desk and will provide regular progress updates, draft reports, and final outputs for review and approval.

- Progress meetings will be held at key milestones.
- All data, GIS files, and analysis tools must be submitted in editable format.
- Final deliverables will be submitted in both **electronic and hard copy** formats.

The consultant team is expected to maintain a **presence at their own local office** for the majority of the analytical and report writing work. However, the **Team Leader and key experts must be available full-time** during the Field Assessment (Month 2 to 4) and for all scheduled **Progress Meetings** and **Validation Workshops** at the MoWE or client-designated location.

8. Payment Modality

Deliverable Triggering Payment	Timeline	Recommended Percentage of Total Contract Value	Rationale
Final Inception Report (Accepted by MoWE)	Within 1 month	10%	Completion of the foundational methodology, work plan, and data collection framework.
Final Facility Assessment Report (Accepted by MoWE)	Within Month 2	20%	Completion of the physical assessment, baseline data, and capacity analysis.
Final Operational Efficiency	Within	20%	Completion of performance analysis,

Report (Accepted by MoWE)	Month 4		audit, and integrated recommendations.
Final Reuse & Operational Guidelines AND Legal and Regulatory Framework Document (Accepted by MoWE)	Within Month 6	20%	The core strategic and compliance outputs of the project are completed.
Final Reuse and Recycle Business Strategy and Plan Document AND Training Modules and Material (Accepted by MoWE)	Within Month 8	15%	Completion of the commercial/financial strategy and the key knowledge transfer materials.
Final Report & Legal Framework (Consolidated, Incorporating Validation Workshop Input, and Accepted by MoWE)	Within Month 11	15%	Final consolidation, sign-off on all project outputs, and successful conclusion.
		100%	

- Consultant submits a detailed budget for professional fees, fieldwork, travel, stakeholder consultations, report preparation, and dissemination.
- Trigger for Payment: Payment is triggered only upon the submission of the Final version of the specified deliverable AND the formal Written Acceptance of that deliverable by the Ministry of Water and Energy (MoWE).
- Draft Submission: Payments are not made for the submission of draft reports.
- Progress Reports: The Quarterly Progress Reports and Final Progress Report are compulsory monitoring documents but are generally not tied to a separate payment; their costs are factored into the main deliverable milestones.

9. Expected Outcomes

- Comprehensive assessment of operational performance and efficiency gaps in sanitation treatment plants.
- Standardized national reuse guideline for sanitation treatment plants.
- Draft national legal and regulatory framework for sanitation treatment facility governance.
- Improved coordination and accountability across the sanitation service delivery chain.

10. Confidentiality and Ownership

All data, reports, and deliverables generated under this assignment are the property of MoWE. The consultant firm shall maintain confidentiality and not use information for any other purpose without prior written consent.