

REPORT ON LOCAL ACTIVITIES IN UGANDA OF THE CLIMATE TECHNOLOGY CENTRE AND NETWORK (CTCN) PROJECT IN KAMPALA, UGANDA

CTCN PROJECT TITLE: Strengthening Waste Management
Policy making in Uganda in Response to Climate Change

[Field Investigation Report]

March. 2024

1. Introduction

The waste management policy making in Uganda particularly at the Kiteezi landfill, is undergoing significant enhancements in response to climate change challenges. The Kiteezi landfill, the sole landfill in Uganda, is currently grappling with environmental and sustainability issues, necessitating urgent policy interventions. Key initiatives;

Policy focus; Kampala City Council Authority (KCCA) is seeking to intensify efforts to bolster waste management policies to mitigate the environmental impact of the Kiteezi landfill. This includes strategies to reduce carbon emissions, enhance sustainability and promote efficient water management practices.

Environmental Concerns: The Kiteezi landfill's operational challenges, such as overcapacity and inadequate waste treatment facilities, are exacerbating environmental pollution. The absence of proper waste disposal mechanisms and the management of harmful emissions like carbon dioxide and methane are pressing issues.

National Urban Solid Waste Management policy (NUSWMP): Uganda's NUSWMP serves as a guiding framework for solid waste management in urban areas, emphasizing the diversion of waste from landfills, resource recovery, and recycling. The policy aims to set targets, modify waste management programs, and establish legal frameworks for effective management.

1.1 Current Waste Management Situation in Uganda.

¹The Kiteezi landfill is the only sanitary landfill in Uganda and is currently managed by KCCA. It is located 13 km from Kampala and is operating beyond its capacity.

Uganda's waste generation is estimated to be around 1,300 to 1,500 tons per day, but approximately 50% of the waste remains uncollected or improperly disposed².

Organic waste is the dominant waste stream generated across urban areas in Uganda³. The lack of proper waste treatment facilities and the absence of a sanitary drainage system at the Kiteezi

¹ Status of Waste Management in the East African Cities; <https://www.mdpi.com/2071-1050/11/19/5523>

² Sector Brief Uganda: Renewable Energy; <https://www.giz.de/de/downloads/giz2023-en-sectorbrief-uganda-waste.pdf>

³ Sector Brief Uganda: Renewable Energy; <https://www.giz.de/de/downloads/giz2023-en-sectorbrief-uganda-waste.pdf>

landfill have contributed to environmental pollution and the release of harmful emissions like carbon dioxide and methane⁴

In summary, Uganda is actively working towards strengthening waste management policies to combat climate change impacts, improve waste treatment facilities, close off kiteezi landfill and promote sustainable practices in line with its national development goals.

2. Overview of the project

Uganda is facing significant challenges in its waste management, particularly at the kiteezi landfill in Kampala:

The Kiteezi landfill, which serves the entire greater Kampala metropolitan Area, has far exceeded its design capacity and does not have proper leachate treatment or facilities to manage greenhouse gas emissions⁵

Uganda's greenhouse gas emissions are projected to increase significantly, from 90.1MtCO₂e in 2015 to 253.7 MtCO₂e by 2050, with the waste sector contributing to these rising emissions⁶.

The national Urban Solid Waste Management Policy (NUSWMP) was published in 2017 to provide guidelines for improving solid waste management in urban areas, including landfill diversion, resources recovery, and reduction goals.

To address these issues and strengthen waste management policymaking in Uganda in response to climate change, key actions are needed;

Policy Establishment; Uganda needs assistance in establishing comprehensive waste management and landfill policies, potentially by benchmarking policies from other countries⁶.

⁴ Kampala Waste treatment and disposal; <https://www.kcca.go.ug/uDocs/kampala-waste-treatment-and-disposal-ppp.pdf>

⁵https://www.researchgate.net/publication/357309591_Understanding_the_impacts_of_waste_disposal_site_closure_on_the_livelihood_of_local_communities_in_africa_A_case_study_of_the_kiteezi_landfill_in_Kampala_Uganda

⁶ https://www.ctc-n.org/sites/www.ctc-n.org/files/request/CTCN_request_%28Uganda_EWP_KCCA%29%20%28002%29-with%20MOO%20comments%20RG%20clean.pdf

Landfill operational plans: Uganda through its agency KCCA requires support in identifying the current state of landfill operations, such as at the Kiteezi landfill, to inform the development of improved operational plans⁶.

Capacity Building: Strengthening the practical knowledge and skills of stakeholders involved in waste management, particularly in reducing greenhouse gas emissions and adapting to climate change impacts. Developing New landfill Infrastructure: There are plans to build a new landfill site in Dundu, 36km from Kampala, to replace the overburdened Kiteezi landfill, which will require support in the planning and implementation stages⁷.

2.2 International Partners:

The HAMM SOLz Co. LTD is a company incorporated in South Korea with a mission providing a variety of solutions in the fields of renewable energy and environmental infrastructure based on differentiated technology and innovation.

The HAMM SOLz Co. LTD aims to contribute to a prosperous future and sustainable growth by providing solutions to solve social, environmental and climate problems through synergy creation in three business areas: business development and investment, facility operation and service, and eco-friendly technology development⁸.

3. Project Area

In Uganda, up to 2100 tons of solid waste are generated daily in Kampala City. The amount is projected to grow by 60% to 3400 tons by 2030 due to population growth of 64% to about 5.4 million people (Aryampa et al., 2019). Hence, it is prudent to ensure that the current and future waste generated in the city is managed sustainably to protect natural resources and human health. As is common in developing countries, waste disposal remains a widespread practice for controlling the enormous municipal solid waste (MSW) quantities in Uganda. This is evidenced

⁷ https://openjicareport.jica.go.jp/pdf/1000048189_02.pdf

⁸ <http://www.thehamm.co.kr/>

by the fact that approximately 50–60% of the solid waste produced in Kampala is disposed of at the Kiteezi landfill (Aryampa et al., 2019).



<figure1. Overview of Kiteezi landfill>

Located in Kampala's peri-urban area, the Kiteezi landfill is the only landfill in Uganda and has been in use for 21 years (Nabukeera et al., 2015). By 2012, the landfill's capacity had reached its limit and because of the restricted land area, expanding the landfill was not possible (Tukahirwa, 2012). However, the site is still being used for waste disposal, receiving about 21,000 tons of waste per year from Kampala Capital City Authority (KCCA) and about 18,000 tons from private waste collection companies (Aryampa et al., 2019).

3.1 Project Goals: The project seeks to achieve these goals as its strengthening waste management policymaking in Uganda in response to climate change under the CTCN Project and these include;

- Support the establishment of national policies related to waste landfills to properly dispose waste.
- Build the capacity of government officials to effectively implement climate change response projects.
- Identify and develop pilot projects to reduce greenhouse gas emissions.

3.2 Landfill Status:

- Only one landfill, Kiteezi, which is currently operating beyond its capacity
- Of the approximately 3,400 tons of waste generated daily in the city, only about 1,400 tons are transported to the landfill.
- There are no facilities for recycling waste, so it is simply dumped in an open dump. This leads to the release of harmful and greenhouse gases into the atmosphere.
- Fire and explosion risk and odor have become major problems.

With the current status of Kiteezi landfill, implementing partners; The HAMM SOLz Co., LTD have been in constant collaboration and meetings with Kampala City Council Authority to see how they can be able to partner in closing off Kiteezi land fill.

These proceedings and minutes of these meetings will be attached along with this report for in-depth analysis on the steps and efforts that have been put into achieving **these project goals**.

3.3 Program Outputs in the month of March 2024:

- With deliberate engagements between THE HAMMSOLz Co. LTD and Kampala City Council Authority (KCCA). **Letter of intent** was given by KCCA where by the implementing parties expressed their interests in landfill closure investments. Through this letter KCCA expressed its intent in willing to collaborate.
- In a meeting with the Science Department, we recognized the need to revise the CTCN's NDE (National Designated Entity) due to departmental changes. Accordingly, we assisted in the process of changing the NDE's Focal Point through the UN.



OFFICE OF THE EXECUTIVE DIRECTOR

REF: ED/KCCA/007/01

15th May, 2023

The CEO,
Water & Life, Inc.
413, 43-10, Cheomdangwagi-ro
208beon-gil, Buk-gu, Gwangju,
REPUBLIC OF KOREA

RE: EXPRESSION OF INTEREST IN LANDFILL
CLOSURE INVESTMENTS FOR KITEEZI LANDFILL

Reference is made to your letter received on 03rd April
2023.

Thank you for your interest in our landfill closure and
remediation project and for taking the time to send us your
letter of interest. We appreciate your enthusiasm and your
interest in collaborating with our team to work on this
important project.

Closure of Kiteezi Landfill is critical to Kampala Capital City
Authority (KCCA)'s mission to promote sustainable waste
management practices, and we are committed to working
with the best professionals in the industry to ensure its
success.



<figure 2. Letter of Interest from KCCA>

- After 1st meeting, the science and technology secretariat had contacted Ministry of Water and Environment to update information in the NDE. Through this engagement Dr. Samuel Okodi was included as the new focal person for the CTCN projects as 2nd kick off meetings with The HAMMSOLz Co. LTD commence.



<figure 3.1st Kick of meeting with Ministry of science and Environment>

- At the second kick-off meeting, the response plan was presented, and NDE's opinions were gathered.
- Meeting held with Dr. Okello, Director of KCCA Public Health Department, to Introduce of landfill technology and discuss future plans.



<figure 5. 2nd Kick off meeting with NDE and Meeting with Dr. Okello>

- Visit to Kiteezi landfill in Kampala to conduct an on-site investigation and network with those in charge
- Kick of workshop with KCCA waste management technical team to introduce a program and collect the practical needs from the acting staff of landfill site and management team of KCCA



<figure 6. Field research for Kiteezi Landfill>



<figure 7. Kick off workshop with KCCA waste management technical team>

- Through these meetings it was agreed to procure some equipment for testing Gas at Kiteezi in preparation for the feasibility study on concentration of Gas at the landfill. Round tubes were purchased and fabricated to the right measurements.



<figure 8. Equipment was procured to carry out Gas Feasibility measurements>

- The HAMM SOLz Co. LTD in the period of march were also able to hold consultative meetings to plan for the feasibility study and policy development. The proceedings of the meeting are attached. Different action points were agreed on and different timelines.



<figure 9. Meeting with technical staff of KCCA>

- Feasibility Study of Gas Concentration started and various equipment was placed in various areas. This included The HAMM SOLz Co. Ltd on site. Equipment was taken on site and installed to get the qualitative measurements of Gas collection. This was so enriching as seen in the by the pictures that were taken.



<figure 10. Feasibility Study at Landfill site>

- Measurements and recording of Gas concentration of data at kiteezi landfill continued and these results were used in the feasibility study.
- Sampling location and measurement of LFG



#1



#2



#3



#4



#5



#6



#7



#8



#9



#10

<figure 11. Gas concentration activity>

- The results of field investigation

| Site | CH ₄ (%) | | CO (ppm) | | H ₂ S (ppm) | | O ₂ (%) | |
|------|------------------------|------|-------------|-------|---------------------------|------|-----------------------|-----|
| | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| #1 | 34.4 | 46.7 | 86 | 303 | 2.9 | 5.2 | 5.0 | 2.6 |
| #2 | 41.5 | 43.1 | 230 | 491 | 6.7 | 10.6 | 5.9 | 6.5 |
| #3 | 41.2 | 44.3 | 178 | 417 | 8.1 | 9.3 | 2.9 | 2.5 |
| #4 | 44.9 | 34.7 | 87 | 203 | 16.8 | 2.5 | 1.6 | 7.0 |
| #5 | 41.8 | 41.5 | 99 | 216 | 14.9 | 10.1 | 3.1 | 2.8 |
| #6 | 40.6 | 42.5 | 84 | 301 | 9.1 | 9.9 | 3.2 | 3.2 |
| #7 | 40.6 | 40.5 | 436 | 1,000 | 7.8 | 11.6 | 3.5 | 2.5 |
| #8 | 42.4 | 43.4 | 281 | 1,000 | 8.9 | 10.0 | 2.4 | 2.2 |
| #9 | 30.1 | 38.9 | 1,000 | 1,000 | 15.4 | 19.9 | 3.0 | 2.2 |
| #10 | 37.4 | 36.4 | 1,000 | 1,000 | 2.8 | 0.6 | 3.1 | 5.2 |

<figure 12. Gas concentration>

3.4 Planned CTCN Project Activities;

- a) With consultation from KCCA technical team and the environmental department, funding is to be realized for the Waste management ordinance.
- b) The services of a consultant will be secured and review of documents, planning presentations and review of stakeholders within the 5 divisions (Central, Kawempe, Makindye, Nakawa and Rubaga).
- c) 5 stakeholder meetings will be held in respective divisions and these will be (Central, Kawempe, Makindye, Nakawa and Rubaga) in the month of May 2024.
- d) 1 capacity Building workshop will be carried out to support private Gabage Collectors in Kampala.