ANALYSIS OF EXISTING POLICIES AND WASTE FACILITIES 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

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1. National Development Strategy, Industry and Sectoral Policies

A. State Status

1) Uganda National Development Strategy

○ VISION 2040(2010-2040)

- VISION 2040 is Uganda's 30-year national development plan that aims to become a middle-income country by 2020 by strengthening the basic capabilities of the country's economy.

- Vision: Transformation from a smallholder-based society to a modern, prosperous Ugandan society within 30 years

2) NDP II (2015/16-2019/20)

- The 2nd Medium-Term Plan (NDPII.) consists of detailed goals, strategies, and areas for the realization of Vision 2040, and aims for sustainable economic development with an emphasis on △ human resource development, △ infrastructure expansion, and △ fostering major industrial sectors such as agriculture and the private sector.

- NDPII. is a major strategy for realizing the above goals: △ Expansion of added value through agricultural product processing and light industry, △ Accumulation of expertise for technology development in major industrial sectors, △ Promotion of export-oriented growth and investment centered on energy, ICT, and transportation infrastructure, △ Implementation of urbanization and substantiation of agricultural modernization linkage plans.

- Priority areas: (1) Agriculture (2) Tourism (3) Minerals, Oil & Gas (4) Infrastructure (Transportation, Roads, Aviation, Energy, Oil & Gas, Water, ICT) (5) Human Resource Development

○ NDP III (2020/21-2024/25)

- With the completion of the Second Medium-Term Development Plan (NDPII., 2015/16-2019/20), the establishment of the Third Medium-Term

Development Plan (NDPIII., 2020/21-2024/25) is being promoted.

- NDPIII. plans to focus on △building a foundation for agricultural industrialization, △developing labor-intensive light industry, and △revitalizing mineral processing and tourism for export-led growth through resource-driven industrialization policies with the goal of increasing household income and improving quality of life.
- It is predicted that it will aim for positive changes in international indicators such as GDP per capita, absolute poverty index, and human development index

3) Solid Waste Management

○ Ministry of Water and Environment (MWE) Mid- to Long-Term Plan

- By 2030, we are pursuing policies with the goal of achieving 100% coverage of individual personal hygiene facilities, 100% provision of safe hygiene services, 0% defecation rate in open spaces other than toilets, and 100% supply of hand washing facilities.
- Feacal Sludge Management and Sewerage Services Enhancement Project with FSTP and WTP construction in 15 cities
- Establishment of Developed a Sanitation Investment Plan (2019 – 2024)
- Expansion and development of GABA and Mukono sewage treatment plants

○ KCCA (Kampala Capital City Authority) Project Promotion Plan

- Establishment of an integrated solid waste management system: Increase the proportion of safely managed waste from 50% to 80% by 2025 by establishing an efficient collection, transportation, disposal, treatment and reuse system
- Achieve more than 80% safely managed manure sludge by 2025
- Establishment of a strong urban environmental management and monitoring and pollution management system
- Establishment of public health monitoring and education system

- Kiteezi Waste Landfill Dundu Relocation

B. Ugandan Government's Environmental Priorities and Priorities

1) Integrated Solid Waste Management System

○ Increase safely managed solid waste from 50% to 80% by 2025 through efficient collection, transportation, disposal, treatment and resource recovery innovations

2) Manure sludge management

○ Safely managed manure sludge to more than 80% by 2025

3) Environmental Management and Pollution Control

○ Establishment of a strong urban environmental management organization, regulatory monitoring and pollution management system

4) Public Health Research & Education

○ Establishment of responsive community-based, public health surveillance, and education systems

C. Environmental Needs in the Greater Kampala Metropolitan Area (GKMA)

○ GKMA is becoming increasingly important in the overall economic outlook in Uganda

○ GKMA consists of the municipalities of Kampala and the nearby areas of Mpigi, Wakiso and Mukono, as well as the municipalities of Entebbe, Nansana, Kiira, Mukono and Makindye-Ssabagabo (area: about 970 km², population: about 4,000,000 people)

○ It lives in more than 10% of the country's population but contributes to about 31.4% of the country's GDP and 65% of the country's non-agricultural GDP.

○ Of the approximately 15% growth rate of urbanization in Uganda, the maximum contribution of GKMA is more than 10%.

○ GKMA's sustainable development is recognized as an important element in the implementation of the Second National Development Plan (NDP II) and Uganda Vision 2040

○ The Local Government, the Kampala Metropolitan Municipal Administration, the

Kampala Metropolitan Authority (KCCA) and the Ministry of Tourism, Wildlife and Antiquities have set five strategic objectives:

(1) Competitive economic infrastructure with a focus on strategic road programs, public transportation and affordable housing

(2) Comprehensive solid waste management, conservation and protection of environmental assets to create a green city with a focus on wetlands and waterways

(3) Supporting projects that transform the informal sector, youth and economic empowerment groups

(4) Development of local tourism

(5) Deliver effective city and local government services

○ With the rapid urbanization of GKMA and the increasing number of people living in GKMA, the National Planning Authority has developed the Greater Kampala Development Strategy (GKDS) to contribute to unlocking the economic potential of GKMA such as job creation, improved living and health conditions, and sustainable development. Among them, the increase in solid and liquid forms (including manure sludge) waste and the low throughput rate are among the challenges that are currently increasing rapidly.

○ GKMA currently has only one Kiteezi landfill in operation, which is operating at an excess capacity. National Urban Solid Waste Policy According to the draft Management Policy, NUSWMP, in 2015, GKMA's solid waste generation rate was 3,206 tonnes per day, which is expected to increase to 4,739 tonnes per day by 2030.

Kiteezi Landfill

○ According to the Kampala Sanitation and Health Master Plan (2040), only 7% of the population benefits from the sewerage system, while the remaining 93% of the population uses traditional latrines (81%) and improved latrines such as putrefactive tanks (10.4%)

○ Most on-site sanitation facilities are private facilities (62.6%), but the remaining 36.9% share the same facility, and on-site sanitation facilities are generally expensive and difficult to collect manure using manure vehicles, so proper maintenance is not provided in low-income areas

○ About 40% of GKMA's population lives in unauthorised settlements in and around the city without access to basic infrastructure such as water services, stormwater drainage, sewage treatment and solid waste collection. In addition, about 23% of the urban population is unemployed, and 57% of the workforce is employed in informal jobs with very low incomes and productivity

○ GKDS recognizes the important role of GKMA in Uganda's sustainable economic development and pays attention to structural, social and economic issues such as environmental degradation and rapid urban poverty. The above problems are exacerbated by poor water and health service systems and inadequate solid waste management and manure disposal systems, and GKDS has developed a more effective legal framework in the solid waste management and manure disposal sectors, Mentions the need to develop efficient institutional frameworks, coordination and integration plans, and financial and resource mobilization systems.

D. Solid Waste Management Plan

1) Key Considerations

○ The accumulation of municipal solid waste is one of the main challenges of the GOKMA, and the KCCA manages solid waste in three ways: including open dumping waste incineration, setting the value of recycled waste), and landfill. Waste management uses 80 percent of the revenue generated by almost all municipalities, but collection efficiency remains below 30 percent, so 70 percent of the waste generated accumulates in the surrounding environment, causing air,

water and soil pollution. In Kampala, the KCCA addressed the current situation of solid waste management. Try to improve Continuously Despite efforts, the efficiency of waste collection has increased by about 58 percent, including all private sectors and KCCA.

Solid Waste Dumping in Kampala City

KCCA's Solid Waste Management Business Promotion Plan

○ In order to increase the value of waste, the Ugandan government has decided to focus on creating waste banks and waste collection centres in the first place before shifting waste to recycling at home. By establishing collection points, waste collection centers can strengthen and expand the existing supply chain for recyclable waste, thereby reducing transit time and costs for both waste collectors and waste brokers. Depending on the nature of local government participation, waste collection centres are waste transfer and sorting stations that are directly managed by municipalities, community-based organisations or local waste

brokers (private sector) that benefit from the sale of landfill and recycled waste.to will be converted.

○ Currently, the Ugandan government is planning more than 5 waste collection centers in GKMA and needs to participate in the project of 1 waste collection center in cooperation with EU funds and the Global Green Growth Institute (GGGI)

2) Solid Waste Management Business Plan

○ In the case of the Kiteezi landfill site operated by GKMA, it is currently operating at an excess capacity, and the leachate treatment facility is not operating normally due to aging and poor maintenance.

○ The sorting work for the reuse of solid waste is done by hand, and since there is no separate workshop, it is a very poor environment where the existing landfill waste and the new waste pile dumped by the solid waste collection vehicle are mixed in a messy manner.

○ As a result, it is difficult to carry out proper sorting work, and the condition of the sorted recyclable solid waste is also in poor condition.

	
Generated leachate	Leachate Treatment Facility (Initial Sedimentation Tank)
	
Leachate Treatment Facility (Bioreactor Inlet)	Leachate Treatment Facility (Bioreactor & Surface Aeration)

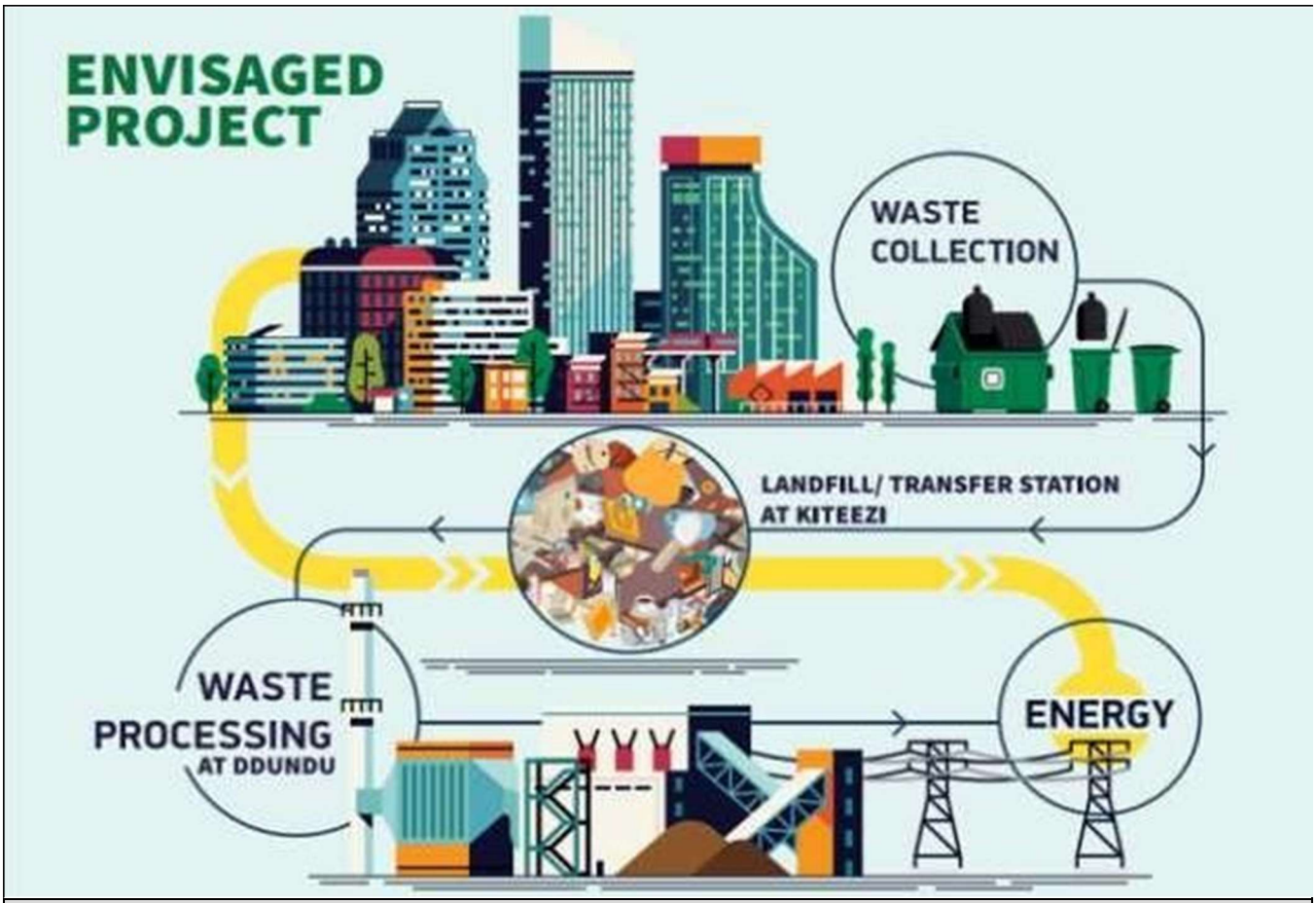
	
Sorting through simple manual work	Reusable solid waste in poor condition

○ KCCA is planning to install a solid waste treatment facility and landfill site in Dundu, about 36 kilometers from Kampala City, instead of the Kiteezi landfill site, which has exceeded its landfill capacity.

○ (Composition area: 136 acre (550,000㎡))

○ Therefore, the Solid Waste Management Business Plan in line with the basic policy direction of the Ugandan Government is as follows:

- Closure of the existing Kiteezi landfill
- Installation of a solid waste reuse sorting plant on the landfill site (improving the working environment of sorters and increasing sorting efficiency, and inducing smooth solid waste disposal at the new Dundu landfill)



Integration Plan for the Kiteezi Intermediate Sorting Facility &
The Dundu Solid Waste Treatment Facility and Landfill

E. Project Priority and Validity of ODA Support

1) Business Priorities

○ Among the projects mentioned in this section, this business plan that can be implemented is as follows.

Priority	Type	Contents	Details
1	Establishment of solid waste management and manure disposal strategy	○ Establishment of Solid Waste Management and Manure Disposal Strategy and Implementation Plan for GKMA Region in Uganda ○ MWE & Local Government Technical Advisory	○ Currently, the solid waste management and manure disposal plan promoted by KCCA is limited to the city of Kampala. → Need to develop a strategy and implementation plan for the entire GKMA
2	Strengthening Solid Waste Management Capacity	○ Kiteezi Landfill Site Changed to Solid Waste Intermediate Sorting Plant ○ Value Chain Configuration Empowerment through training of relevant officials and stakeholders	Further review is required, such as the area to be serviced, the appropriate facility size, and the determination of the processing technology
3	Strengthening manure disposal capacity	○ Manure Treatment Facility Installation Value Chain Composition Empowerment through training of relevant officials and stakeholders	

2) Feasibility of ODA support

○ In the case of the solid waste sorting facility, it will be installed at the Kiteezi landfill site that has exceeded the existing landfill capacity, so it is very difficult to induce

private participation, such as whether to implement resorting for the treatment and reuse of existing landfilled solid waste, and negotiations with existing reusable solid waste sorters and brokers of selected reused waste. Even if it is possible to induce private participation, it is judged that it will take a very long time to complete the project, and it is considered that direct support to the public sector is essential considering the urgency of the project.

○ In addition, in the case of manure treatment facilities, private manure collection and transfer companies are used to transport and inject manure to the treatment facilities, but a fee is charged based on the amount of manure produced, so only manure is collected and transported in areas with relatively low transportation costs due to the nature of private companies. Accordingly, in the reality of Uganda, it is still judged that it is still premature to carry out the project with private participation, and it is considered that the project should be implemented through direct support to the public sector.

2. Analysis of Past Similar Projects

A. Sri Lanka Colombo Waste Integrated Management System Pilot Construction Project

1) Business Overview

○ Business Owner : KOICA

○ Period : 2008~2014

○ Project cost: $4.5 million

○ Purpose : As a pilot project to enhance Sri Lanka's waste management capabilities, the initiative aims to contribute to reducing environmental pollution and improving the living environment for residents by supporting the construction of a sanitary landfill, which will serve as the standard for future national waste landfill projects in Sri Lanka. It also focuses on establishing an integrated management system encompassing waste generation, collection, transportation, and transshipment processes.

○ Business Details

<table>
<tr><th>Division</th><th colspan="5">Contents</th></tr>
<tr><td>Project Name</td><td colspan="5">Sri Lanka Colombo Waste Integrated Management System Pilot Construction Project</td></tr>
<tr><td>Location</td><td colspan="5">Maligawatte, Kirindiwella Divsion, Dompe PS, Gampaha District, Western Province</td></tr>
<tr><td>Targeted areas</td><td colspan="5">Colombo, Sri Lanka (4 pilot areas)</td></tr>
<tr><td rowspan="2">Subsidy Plan</td><td>Division</td><td>Total</td><td>Business site</td><td>Residual</td><td>Remarks</td></tr>
<tr><td>Area</td><td>31ha</td><td>5ha</td><td>26ha</td><td>Landfill area: 2ha</td></tr>
<tr><td>Site Status</td><td colspan="5">• Owner: Land Reform Commission (LRC)
• Topographical type: Hilly area with gentle slope
• Land Status: Chanokite Jilam</td></tr>
<tr><td>Facility Planning</td><td colspan="5">• Landfill Facility
– Capacity: Landfill capacity about 163,000㎥, landfill height 15m
– Landfill Type: Improved Semi-Aerobic Sanitary Landfill (Cell Method)
– Target waste: Domestic waste
– Import: Approx. 5 tons/day (to be expanded to 90 tons/day in the future)
• Other facilities: leachate treatment plant, administration building, weighbridge, fence, etc.</td></tr>
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2) Business Performance

(1) Establishment of Sri Lanka's first sanitary landfill site

- Sri Lanka's first facility to dispose of waste in an environmentally appropriate manner
- Gampaha District: A landfill site that can hold 20% of the waste collected
- Conventional unsanitary landfill solves serious pollution problems caused by the surrounding environment and leachate

(2) Efficient waste collection and transportation

- Support for waste collection vehicles increases the amount of collection, hygienic transportation and landfill.
- Solved the problem that the one-time collection volume was low due to the use of the existing tractor and the transportation process was unhygienically managed

(3) Raising awareness of waste hygiene management

- The landfill has been used as a place for education on the hygienic management of waste, and since its completion, officials from Sri Lanka and neighboring countries, as well as members of the public, have been visiting the site

(4) Raising awareness of Korea's excellent waste management technology

- Four more landfill sites are being built through EDCF as a follow-up to the landfill, and technology transfer and capacity enhancement in the field of waste management, such as waste policy establishment, management administration, and facility operation, are carried out through the dispatch and training of experts.

3) Lessons from other businesses

○ When promoting environmental projects, it is important to have the consent of residents, the selection of business partners that fit the waste management system, the need to establish a waste and facility management system in parallel with the construction of facility water, and the strengthening of waste and facility

management capabilities.

(1) Residents' consent

- In the early stages of the project, the project was suspended due to opposition from residents, and the project was able to resume on the premise that waste from other areas could not be introduced due to opposition from residents in the new project site.

- As a result, there were limitations such as burden of project delay, cost increase, over-retail increase (5 tons/day) compared to design capacity (5 tons/day), and limited business benefits in the Dompe area.

(2) Selection of business partners that fit the waste management system

- Waste collection and landfill in Sri Lanka is the responsibility of the local government, and the actual operation of the landfill site is also the responsibility of the local government, but the local government was not properly prepared to take over the landfill site as the project was mainly carried out with the central government.

(3) It is necessary to build facilities and waste and facility management systems in parallel

- It is difficult to manage a large-scale landfill site due to the lack of financial and technical capabilities of a single local government, and an appropriate collection system and financial support plan such as a cluster system should have been prepared, but the landfill was opened without an appropriate waste management system, and it seems that additional support will be needed for the smooth operation of the landfill in the future.

- At the time of the implementation plan, it was considered how to install the facility after the establishment of a system suitable for the management capability of the source country and the actual situation of the source country, but considering the urgency of building a reclamation facility, which is an immediate task in Sri Lanka, the facility was promoted first, and the maximum amount of manpower training and necessary consultation was

supported (the plan to build a system and train professional manpower is an additional follow-up project in the future or to be carried out by the source country itself)

- Accordingly, a survey of the waste collection system was promoted to advise on the establishment of a system in the early stages of the project, but the results of the survey were useless due to the suspension of the project and the change of the project site.

(4) Strengthening waste and facility management capabilities is important

- Even if a waste management system and facility were established in Sri Lanka, there was a lack of professionals with the skills and experience to properly implement and operate them, so short-term training was not enough to build the necessary capacity.

(5) Sustainability

- Considering the Sri Lankan government's willingness to resolve the waste issue, the high level of satisfaction of the residents of the project site so far, and the government's plan to build additional landfill sites through the successful operation of the landfill, it is expected that the Sri Lankan government will continue to support the operation of the landfill site.

- However, for smooth landfill operation and leachate management,

• Production of operation manual based on the actual operation of the landfill site and training of professional manpower

• In order to maximize the utilization of facilities, it is necessary to establish a regional cluster system and improve the collection system.

B. Kiteezi Sanitary Landfill Site

1) overview

○ The facility was installed in 1996 and is currently in a state of exceeding its landfill capacity

○ Sorting system by manpower (plastics, vinyls, metals) to There is no safety

equipment and workers are exposed to the risk of illness due to unhygienic on-site conditions.

○ After unloading solid waste, the restoration is not carried out

○ Executive Director of Stormwater Drainage and Drainage Facilities

○ Serious pollution of groundwater and discharged rivers due to leachate runoff

2) Lessons from other businesses

○ ○ Kiteezi Sanitary Landfill is currently over capacity, exposing on-site sorting workers to unsanitary conditions, and is facing serious problems such as soil and nearby river contamination due to failure to backfill, lack of drainage and cut-off facilities, and failure to operate leachate treatment facilities.

○ Considering this situation, the newly installed solid waste sorting plant and sanitary landfill site, even if the scale is small, should be planned as a facility that can prevent the sanitary environment of workers and pollution of soil and nearby rivers by considering the working conditions, water discharging facilities and leachate treatment facilities as much as possible in consideration of the limited budget.

○ In addition, sufficient education and training should be provided for operation and maintenance.

3. Uganda Policy Environment & Law/Institutional Analysis

A. Policies and Regulations Related to Solid Waste Management

○ Overall guidance on municipal solid waste management (SWM) is contained in the 2017 National Urban Solid Waste Management Policy (NUSWMP), which includes municipal and commercial and industrial waste streams, which applies for a 15-year period from 2015 to 2030.

○ The specific objectives of the policy are as follows:

- Providing a national framework for solid waste management, including waste diversion, reduction, resource recovery, reuse and recycling
- Setting national solid waste targets and targets, including overall waste reduction targets and plans to monitor progress towards those targets
- Facilitating sub-plan modifications by local governments
- Structuring Appropriate Urban Solid Waste Management Legislation
- Providing national leadership in waste and resource recovery
- Facilitating cooperation with non-state actors on solid waste management issues in cities

○ The responsibilities of solid waste management are set out in the 1997 Act.and Articles 38 and 40 contain the ordinances of the local government (KCCA) on the management of solid waste, and the main contents are as follows:

- The collection and disposal of solid waste is under the jurisdiction of the Kampala City Council Authority (KCCA), and the KCCA separates solid waste at the time of creation.
- Prohibition of processing or collecting solid waste from containers or disposal of solid waste in containers
- Do not throw waste in markets, streets, riverbanks, parks, or public places.

○ 1995 National Environmental Law on Solid Waste Management

○ 2018 Establishment of the National Environmental Management Agency as a semi-autonomous agency that coordinates, monitors, regulates and supervises

environmental management (NEMA, 2018)

○ The National Environment Management Authority (NEMA), in consultation with key agencies, issues guidelines and prescribes measures and standards for the management and conservation of natural resources and the environment.

○ In 2015, NEMA partnered with KCCA to ban polyethylene bags smaller than 30 microns.

4. Site Analysis

A. Waste Water Treatment Target Area

○ Kampala, Uganda and Greater Kampala Metropolitan Area (GKMA)

○ Currently, the population is about 4 million, and there is an urgent need to expand environmental infrastructure as 1 sanitary landfill (Kiteezi) and 1 sewage treatment facility (Lubigi Wastewater Treatment Plant) are in operation for the treatment of solid waste and manure sludge.

○ Kampala and Kampala Neighbouring Capital Region (GKMA) location map

B. Solid Waste Intermediate Sorting Station (Kiteezi)

○ The Kiteezi Waste Landfill is a facility established in 1996 and is currently operating in a state of exceeding the landfill capacity, and there is no safety equipment due to the sorting system (plastics, vinyls, metals) by manpower, and workers are exposed to the risk of diseases due to unhygienic site conditions.

○ In addition, as it is a facility that does not cover soil after unloading waste, and there are no rainwater drainage facilities and water drainage facilities, groundwater and discharged rivers are polluted due to leachate outflow, and the surrounding area is surrounded by villages, so nearby residents are suffering from bad odors.

○ For this reason, Kampala Capital City Authority (KCCA) is planning to relocate the Kiteezi Landfill to Dundu (about 36 km from City Center) and use the Kiteezi Landfill as an intermediate sorting site.

○ The site of the intermediate sorting facility for solid waste (Kiteezi) is located near the Buwambo kiti road, so it is easy to enter and exit, has power supply, and is surrounded by villages, so it is considered to be an appropriate condition for relocating the landfill and using it as an intermediate sorting facility.

○ Kiteezi Landfill

○ After the installation of the intermediate sorting station (example)

5. Stakeholder analysis

A. Beneficiary Analysis

○ This project is a capacity-building initiative for solid waste management and fecal sludge treatment, planning to construct a solid waste intermediate sorting facility and a fecal sludge treatment plant (FSTP). The beneficiary areas include Kampala and the Greater Kampala Metropolitan Area (GKMA).

○ Direct Beneficiaries

- Population benefiting from services provided by the solid waste intermediate sorting facility and landfill site:

(1) Solid waste intermediate sorting site/landfill site

- - Capacity : 1,000 tons/day

- - Service population: Approx. 500,000 people

○ Indirect beneficiaries

- Overall improvement in the sanitation environment of the GKMA region, including reduced risks of groundwater, river, and soil pollution through solid waste management and fecal sludge treatment. This contributes to lowering the risk of waterborne diseases and various hygiene-related incidents.

- Indirect beneficiaries: Approximately 4 million urban residents in the GKMA.

B. Analysis of water source organs

○ MWE(Ministry of Water and Environment)

- 2007 Establishment of the Ministry of Water Resources and Environment (MWE)

- Responsible for the development, management and regulation of water and environmental resources in Uganda

- MWE Roles and Functions

  • Providing sustainable, safe water supply and sanitation in rural areas

  • Providing viable water supply and sewage/sanitation systems for domestic, industrial and commercial use in urban areas

- Water supply used in agriculture, rural industry, tourism and other uses
- National development coordination for production water (agriculture, industry, aquaculture, tourism, trade)
- Promote integrated and sustainable water management
- Providing effective planning, coordination and management mechanisms for the water and sanitation sectors
- Providing sound and sustainable environmental stewardship for optimal social and economic benefits for current and future generations
- Promote effective management of forests and trees to increase economic, social and environmental benefits for current and future generations, especially for the poor and vulnerable
- Receive, transmit and process all weather data from national stations and international centers

- By 2030, we are pursuing policies with the goal of achieving 100% coverage of individual personal hygiene facilities, 100% provision of safe sanitation services, 0% defecation rate in open spaces other than toilets, and 100% supply of hand washing facilities.

- Development plans and facilities related to environmental infrastructure in Uganda are being carried out in partnership with GGGI

○ MoFPED(Ministry of Finance Planning and Economic Development)

- Uganda Financial, Planning and Economic Development Agency

C. Analysis of related institutions in the source country

○ KCCA(Kampala Capital City Authority)

- Kampala Solid Waste Management and Manure Disposal Public Health Agency

- Solid waste and manure collection, transportation, etc.

- Through the establishment of an integrated solid waste management system, the company aims to increase the proportion of safely managed waste from

50% to 80% by 2025, and plans to increase the proportion of safely managed waste to more than 80% by 2025 and relocate the Kiteezi landfill to Dundu.

○ NEMA(National Environment Management Authority)

- Uganda Environmental Management Coordinating, Monitoring, Regulatory and Supervisory Authority
- Responsible for proposing legislation, specifying standards and guidelines on the environment, reviewing and approving environmental impact assessments and environmental impact statements, and issuing licenses for waste disposal (transportation and storage/disposal)