THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG

GGGI

WASTE TO RESOURCES

IMPROVING MUNICIPAL SOLID WASTE AND HAZARDOUS WASTE MANAGEMENT IN RWANDA

TRAINING & WORKSHOP REPORTS

December 2021 - May 2022

CONTENTS

Acronyms and Abbreviations

GGGI	Global Green Growth Institute
RURA	Rwanda Utility Regulatory Authority
RHA	Rwanda Housing Authority
MINICOM	Ministry of Trade and Industry of Rwanda
ICT	Information and Communication Technology
EEE	Electric and Electronic Equipment
GDP	Gross Domestic Product
GoR	Government of Rwanda
MININFRA	Ministry of Infrastructure of Rwanda
MYICT	Ministry of Youth and Culture of Rwanda
PPP	Public and Private Partnership
EPR	Extended Producer's Responsibility
AVC	Asset Valuation Committee

E-WASTE TRAINING
WORKSHOP REPORT

La Palisse Hotel, Nyamata
2 - 3 December 2021

1. INTRODUCTION

From 2nd to 3rd December 2021, the Global Green Growth Institute (GGGI) Rwanda Office successfully hosted the "National Awareness Training for Electrical and Electronic Waste Towards Sustainable E-waste Management (hereinafter the E-waste Training)" at La Palisse Hotel, Nyamata, in partnership with Enviroserve and Rwanda Utilities Regulatory Agency (RURA).

The e-waste Training was targeted for more than 100 staff from various public and private institutions that have a huge potential for generating e-wastes in the country.

The targeted staff were Corporate Services/HR, Procurement, and IT officers from different public and private institutions and districts, among which 33 were female and 70 were male.

The purpose of this training was to raise awareness on proper e-waste management, health and safety measures, asset disposal procedures by Rwanda Housing Authority (RHA), and the government regulations governing e-waste management in Rwanda. The workshop was organized and moderated by Juvenal MUKURARINDA, GGGI Senior Sustainable Waste Management officer, and, on behalf of the Country Representative of GGGI Rwanda Office who was not able to physically attend the workshop; he instead delivered the opening remarks as follows. Mr. Okechukwu Daniel Ogbonnaya, the GGGI Country Representative, welcomed the participants and presenters with his opening remarks.

He appreciated this opportunity amid a critical time where the digital revolution has led to enormous production and massive generation of electrical & electronic equipment wastes in the 21st century. In line with this, Mr. Okechukwu Daniel Ogbonnaya voiced his deep concerns in relation to the MINICOM's statistics which indicates that from 2010 to 2014, the import of ICT equipment increased by five times and the country generated 9,417 tons of e-waste, out of which 7,677 tons (81.52%) were contributed by individuals, 1,143 tons (12.14%) by public institutions, and 597 tons (6.34%) by private institutions.

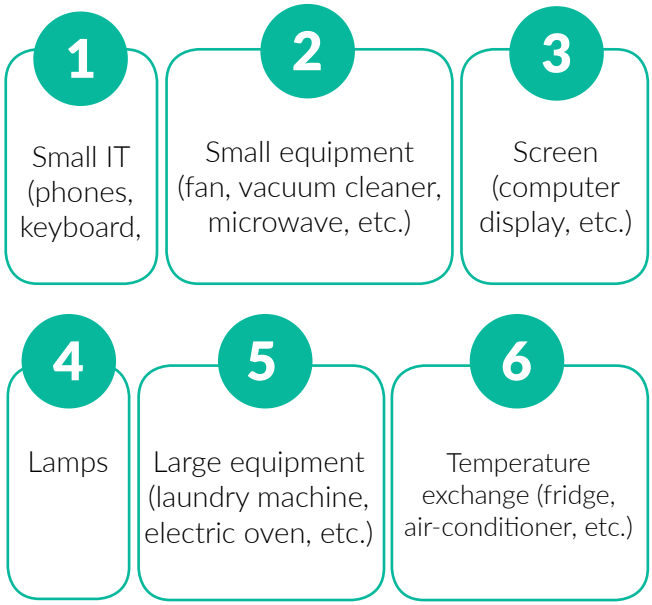
Against this backdrop, he encouraged that this workshop would accelerate the move to advance sustainable e-waste management in respective institutions with solutions high up the waste hierarchy.

2. TOPICS PRESENTED AND DISCUSSED

2.1. Introduction to E-waste & Understanding the Need for Proper Disposal of E-waste

Presenter: **Oliver MBERA from Enviroserve**

The first presenter started his presentation by defining e-waste as all items of Electrical and Electronic Equipment (EEE) and its parts that have been discarded or are no longer working or wanted by the owner. He, then, suggested that there are six different streams of e-waste as the table below, which are used to classify respective waste types.



E-waste workstreams and classification

The presenter specifically emphasized the necessity of sustainable e-waste management. In Africa alone, 2.9 million metric tons of e-waste were generated as of 2019. This translates into 2.5kg/inhabitant. Globally, only 17.4% was recycled, while the remaining 82.6% was processed in an unknown method, among which illegal dumping and trading accounted for the largest share.

This poses serious threats to the earth's sustainability and human health in general since EEEs are primarily manufactured using heavy metals, such as Cadmium, Chromium, or Aluminium. For example, Cadmium is widely used in batteries of phones,

Juvenal MUKURARINDA moderating the workshop

semiconductor chips, and ink toner, but when they are illegally managed (usually by open burning), Cadmium creates toxic substances that can impair the liver and cause immune suppression and cancer. Furthermore, it has been scientifically proven that when the effluent of Cadmium seeps into the soil, it will stay for a long time and be accumulated in the agricultural produce, e.g. vegetables or grains that people eat on a daily basis.

Various heavy metals used in manufacturing these EEEs will cause air pollution, water contamination, and serious health problems when they are not duly processed or treated. However, according to his presentation, most e-waste management is being conducted by informal sectors, without considering the environmental and health impacts of EEEs because they prioritize profitability over social concerns.

In this sense, a better understanding and proper disposal of e-waste is necessary for the sake of the sustainability of the earth and health protection, which will eventually contribute to the achievement of several goals of the SDG 2030 Agenda.

Draft E-waste Management Policy 2011 by MYICT

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National Sanitation Policy 2016 by MININFRA

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National Regulations on E-waste Management 2018 by RURA

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Environmental Law 2018 (Revised later to include Article 20 on E-waste Management)

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PPP (GoR & Enviroserve) to operate and manage the E-waste management facility

Furthermore, the presenter provided the current national context of e-waste generation in Rwanda. A total of 15,000 metric tons were generated in 2015, among which only 20% is formally collected.

And the increase in e-waste generation is expected as GDP per capita keeps increasing in Rwanda. Against this backdrop, the Government of Rwanda (GoR) has equipped itself with relevant legal frameworks. And below [Table 2] indicates the chronological flow of legal framework evolution.

Table 2. Legal framework evolution of Rwanda

Amid the increasing importance of Enviroserve, the presenter further elaborated on its efforts in e-waste management in Rwanda. Aside from being the sole large-scale private participant of e-waste management, Enviroserve is also providing a training course including a field visit to those who recently graduated from waste management disciplines in order to nurture future specialists, as well as making enormous efforts to raise awareness of sector technicians.

He concluded his presentation by mentioning some of the achievements and challenges to be addressed for better performance in the e-waste management sector. Details are attached as below in [Table 3].

Achievements and challenges faced by Enviroserve

Achievements

Collected and recycled more than **5,000** tonnes of e-waste (Including 500 tonnes of solar e-waste)

6,000 computers were refurbished, among which 300 were donated to local schools

More than **4,500** tonnes of CO2 equivalent emission were mitigated

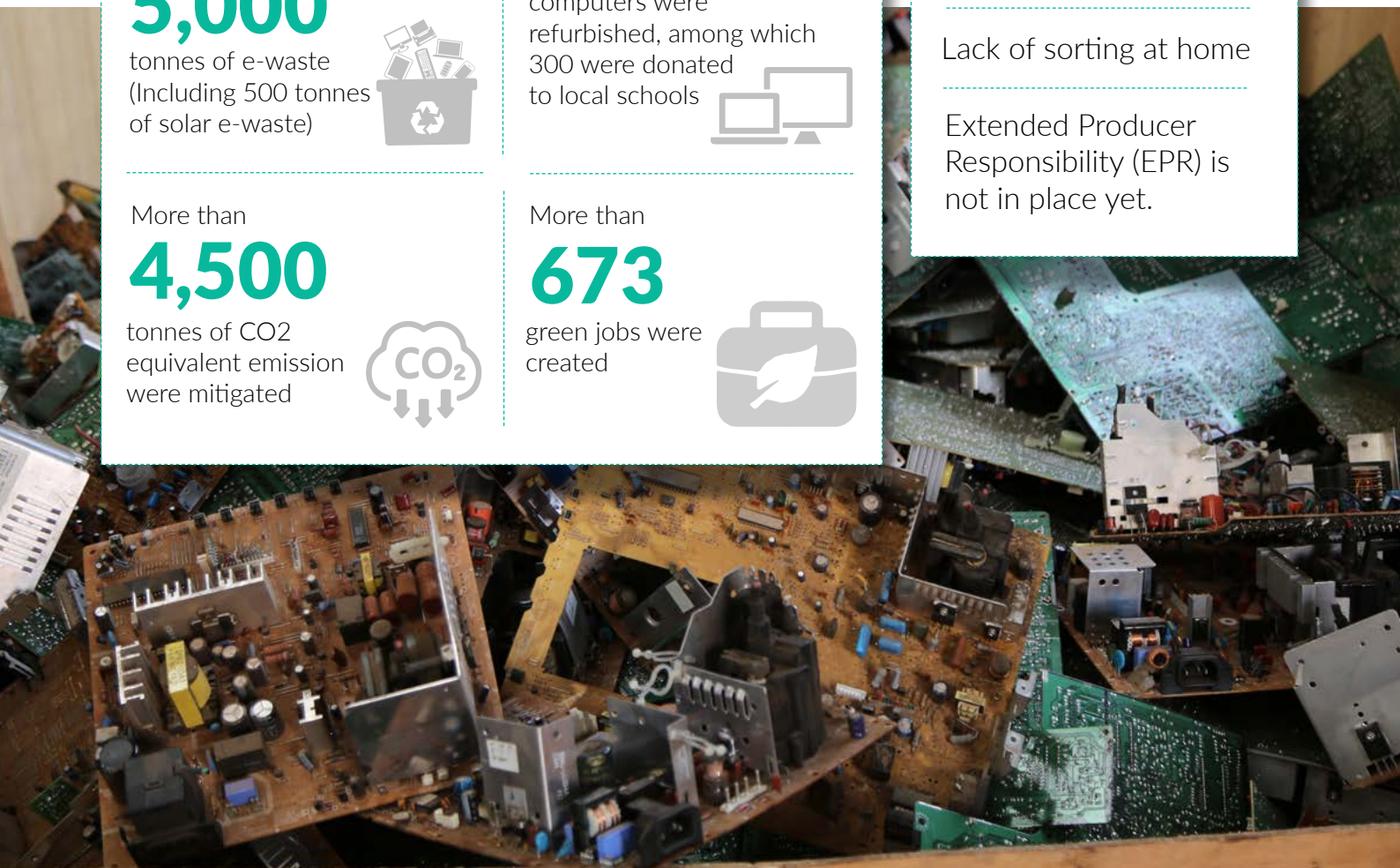
More than **673** green jobs were created

Challenges

Limited awareness on the danger of e-waste

Lack of sorting at home

Extended Producer Responsibility (EPR) is not in place yet.



2.2. E-waste Regulation

Presenter: **Emmanuel Nkurunziza from Rwanda Utilities Regulatory Authority (RURA)**

The presenter started his presentation by briefly introducing the Rwanda Utilities Regulatory Authority (RURA). The RURA was initially created by Law No. 39/2001 as of 13 September 2001 with the mission to regulate certain public utilities, namely: telecommunications network/services, electricity, water, removal of wastes from residential or business premises, extraction and distribution of gas, and transport of goods and persons.

This Law was further reviewed and replaced by Law No. 09/2013 of 01/03/2013, establishing the Rwanda Utilities Regulatory Authority (RURA) and determining its mission, powers, organization, and functioning. The same law gives the RURA a legal personality, financial and administrative autonomy in the fulfillment of its mandate.

The RURA plays a pivotal role between the policymaker, licensed service providers, and consumers and also reports to the Office of the Prime Minister so as to coordinate with relevant ministries which are responsible for each regulated sector in executing its functions.

The presenter then elaborated on the importance of protecting the environment. He stressed that we need a safe environment to live in and we can protect the environment by reducing harmful substances released. The more we want state-of-the-art technologies (e.g., up-to-date electronic equipment like smartphones), the more we pollute the environment.

He pointed out that the e-waste regulation was authorized on 30th July 2018 and is an overarching governing tool for everyone, including, but not limited to, producers, retailers, importers, collectors, repairers, recyclers, and assemblers of EEEs.

He further explained that this recently endorsed regulation strictly prohibits people from selling or auctioning old electronic wastes without authority's permission, as well as to disposing of e-waste in an improper method. The presenter added that, if you commit to bringing EEEs or other unauthorized forms of power products without adhering to duly recognized procedure into the country, you will be fined from Rwf 500,000 up to Rwf 5,000,000.

2.3. Health and Safety

Presenter: **Eric Murera from Enviroserve**

The presenter started his presentation by accentuating the danger of toxic substances that can be found in e-waste. E-waste contains more than 1,000 different substances, many of which are toxic. For example, printed circuit boards contain lead & cadmium, switches, and flat screens contain mercury, and so on. Therefore, the Health and Safety aspects of e-waste should be considered as the top priority in terms of e-waste management. He suggested the following dangers of e-waste management across various phases of treatment and relevant safety measures that should be kept in place in each stage as below.

- Occupational exposure – everyday exposure to dusty work environments, chemicals, loud noise, and excessive heat hazards will gradually damage workers.

- Proper housekeeping – an organization must maintain a safe working environment by keeping their personal workspace clean and tidy.

- Safe metal handling – moving things in the wrong way can cause an accident, expose people to hazards, and may cause physical damage such as strains, sprains, fractures, cuts, abrasions, hernias, and bruising. Material handling includes loading & unloading of wasted EEE, as well as packaging. Wasted EEEs shall be handled and stored with cautions to ease tension.

- Materials sorting and storage – storage areas designated for the EEE intended for preparing for re-use shall have weatherproof covering.

- De-pollution – the treatment operator shall remove all liquids, substances, preparations, and components from EEE containing a hazardous substance. Removal practice shall not damage or destroy components in a way that hazardous substances are released into the environment or distributed to fractions unless subsequent treatment of the hazardous substances is secured.

- Loading and transporting – transportation and collection of wasted EEE shall be done in a way that prevents the scattering of e-waste during its transport, handled by authorized collectors.

- Treatment – Wasted EEE containing hazardous substances shall be treated separately from those that do not contain such toxins.

- Adequate clothes and personal protective equipment are necessary for the handlers such as earplugs, gloves, boots, masks, safety helmets and goggles.

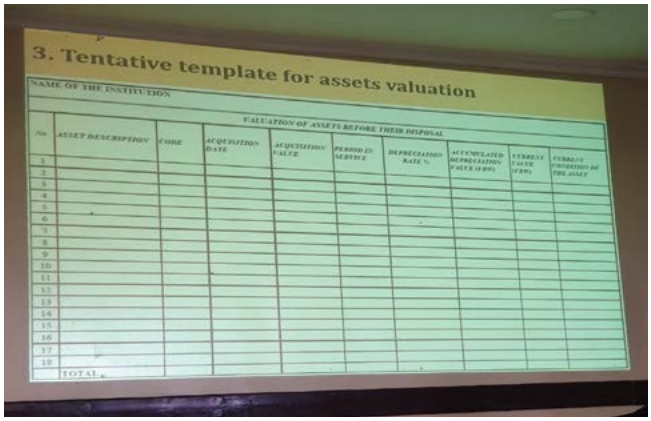
- He then concluded his presentation by emphasizing again the importance of keeping safety measures when dealing with e-waste.

2.4. Public Assets Disposal Procedures

Presenter: **Pierre from Rwanda Housing Authority (RHA)**

The presenter introduced the Public Assets Disposal Procedures, explaining the asset life cycle, whereby planning, acquisition, operations & maintenance, disposal, and planning continues. He then suggested the key documents in terms of Electric Assets Disposal, such as 1) Strategy for the management of government buildings and office equipment (2015), 2) both letters No.044/UHD/018 from MININFRA and No.1659/15.01/PS/2018 from MINICOM.

These letters authorized Enviroserve Rwanda Green Park to collect e-assets from all public institutions after the valuation of each item. [Figure 3] below is a tentative template for assets valuation. Asset registry has to be done within all public institutions by requesting the asset valuation and sending the results to RHA so that Enviroserve can come and take them.



Template of Evaluation form for assets disposal

Following the introduction of Assets evaluation and collection, the presenter also addressed the key challenges of Asset Disposal as follows. First of all, there is a case where a request for authorization to transfer broken e-assets is conducted without an assets valuation report to support it, or with assets valuation but with severe regularities. Also, he mentioned that some public institutions don't have an Assets Valuation Committee (AVC) and sometimes it is very difficult to arrange assets valuation because members of AVC are very busy with their day-to-day tasks. Finally, he suggested that for some people it is difficult to say "good-bye" to damaged e-assets.

The presenter also suggested some of the measures to overcome these challenges as follows. First, he stressed that we always need to make sure that your request for authorization to transfer broker e-assets is well supported by the asset valuation report. To avoid huge irregularities in your asset valuation report, you can request the presenter or the officer in charge, in advance, to check for you if Asset Valuation is well completed.

3. SITE VISIT TO THE E-WASTE MANAGEMENT FACILITY

On the last day, all participants and trainers visited the E-Waste Facility in Bugesera District. The manager of the E-Waste Facility, Mr. MBERA Olivier showed all the dismantling processes that e-wastes must go through.

He showed some electronic materials that have been repaired such as laptops that are ready to be reused. Some plastics were collected and will be mixed with other materials to make bricks for construction.

E-waste dismantling process

4. CLOSING REMARKS

The event organizers in their closing remarks appreciated all participants who joined this meaningful training amid growing concerns over e-waste generation in Rwanda. Also, organizers expressed their gratitude to the participants for joining the workshop during the urgent time of COVID-19 since the event couldn't happen because of the pandemic situation.

The workshop organizers concluded the event by mentioning that it's not too late, the time is now to set goals on how to get rid of e-wastes in our environment and embrace proper handling of e-wastes. Lastly, Olivier MBERA, the Manager of Enviroserve, also thanked the people for their higher participation and requested them to inform him if they have e-wastes that need to be collected.

5. RECOMMENDATIONS

E-waste was quite a new topic for the participants, thus they requested that awareness-raising should be continual to reach out to as many people as possible, through various communication channels such as radio, TV, and media broadcasting.

Procurement and Logistic Officers agreed that they will check all e-wastes from their institutions and ask help from Enviroserve to get rid of them. Moreover, since the current system asset registry is physically conducted, some of the participants recommended that this could be also done in an online platform where everyone can have easy access to it.

Participants were advised to actively utilize the auctioning of used electronics to the authorized companies so that they can be recycled, as well as to get rid of all e-wastes they have in their houses such as old iron, old kettle, and other e-wastes that they are no longer using.

PLASTIC WASTE WEB PORTAL

LAUNCH EVENT REPORT

Norrsken House, Kigali

30 March 2022

1. INTRODUCTION

30th March 2022 marked the launch event of the Plastic Waste Web Portal in Rwanda. The event took place at Norrsken Kigali House. The event was attended by different stakeholders namely the British High Commission in Kigali, German Agency for International Cooperation (GIZ), government institutions, entrepreneurs, waste Recyclers and youth volunteers from Save Environment Initiative who participated in data collection on plastic waste bottles conducted from 4 to 26 March, 2022.

Michelle Defreese, the Senior Officer and Manager of Waste to Resource Project who was the moderator of the launch event, said that the purpose of the event was to launch a tool designed to track plastic waste in Rwanda.

The activity was implemented by the Global Green Growth Institute (GGGI). The portal was developed using an iterative and consultative process to incorporate feedback from various stakeholders on the functionality of the portal and to identify synergies with existing initiatives around the collection and valorization of PolyEthylene Terephthalate (PET), the drafting of Extended Producer Responsibility (EPR) guidelines, and the integration of circular economy principles into sustainable wastes management practices in Rwanda. The tool has been built based on international best practices and examples of efforts to increase the amount of data and information available to track plastic waste. It aims to map the plastic waste value chain, identify plastic waste aggregators and recyclers, and contribute to the valorization of plastic waste. The portal is aligned with national and regional initiatives to promote recycling, increase resource recovery of plastic, and to introduce Extended Producer Responsibility (EPR). The web portal development was funded by the Foreign, Commonwealth and Development Office (FCDO). The data collection was conducted by the youth organization, Save the Environment Initiative (SEI). The portal will be managed by Global Green Growth Institute for a period of 2.5 years and will be handed over to the Cleaner Production and Climate Innovation Center (CPCIC) for future management.

The event launch aimed to promote the use and engagement with the portal to attract companies, entrepreneurs, and waste aggregators to start adding their own data on stockpiles of unused plastic waste, types of plastic that are needed, and to provide contact details for a database of waste producers, recyclers and aggregators.

The web portal draws upon data that has been collected in the City of Kigali and the six secondary cities. The launch of the portal will enable stakeholders to begin actively using the portal to identify opportunities, connect with recycling companies and increase circularity in the plastic waste value chain in Rwanda.

2. OPENING REMARKS

In her opening remarks, Anna Wilson, Development Director at the British High Commission in Kigali, said, "by providing these better data on plastics, the portal will also help with the implementation of an Extended Producer Responsibility (EPR) scheme, which the UK is supporting Rwanda to design through the UK's Manufacturing Africa Programme.

Anna Wilson delivering her opening remarks

The EPR schemes are based on a "Polluter Pays" principle where companies put plastic packaging on the market and pay a fee, which will go towards waste collection, sorting and recycling, and this scheme builds on existing regulations as well as a pilot project that Rwanda leads with the Private Sector Federation.

"So, I'd like to thank Global Green Growth Institute (GGGI), the Save Environment Initiative (SEI) and the Cleaner Production and Climate Innovation Centre (CPCIC) for their work in setting up the portal and leading the data collection." Helena McLeod, the Deputy Director General and Head of Green Growth Planning and Implementation Division at Global Green Growth Institute headquartered in Seoul, South Korea said, "Rwanda is a country very close to my heart. I've visited the country many times before, and I've always been so impressed by what has been achieved in terms of waste management; the leadership of the government has been so impressive, but also the participation of the community as well."

She added that plastic, of course, is something that is so useful, and it has so many functions; however, it's become such a big problem in so many countries. "I've lived in Africa for many years, and I've worked in many countries in Africa; the continent has some of the most outstanding countryside and landscapes, but I've seen over the last two decades how this encroachment of wastes affects infrastructures. Looking at these alternatives, like the biodegradable alternatives, there's also an urgent need to increase the processing capacity to sustainably manage, reuse and recycle plastic waste, especially in the cities.

Helena McLeod from GGGI delivering opening remarks virtually

3. TOPICS PRESENTED DURING THE LAUNCH EVENT

2.1. The Role of CPCIC in Supporting Circular Economy Initiatives and Opportunities in Plastic Waste

Sylvie Mugabekazi, from the Cleaner Production and Climate Innovation Centre (CPCIC), presented the role of CPCIC in promoting the circular economy in industries. The CPCIC introduced to 15 industries and SMEs the concept of resource efficiency, cleaner production and circular economy.

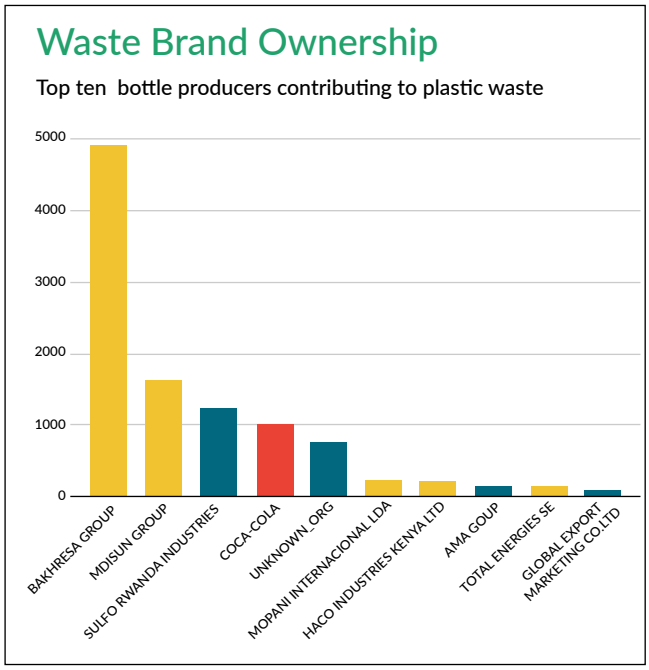
Industries and SMES, were advised to;

- Reduce the level of consumption of natural resources (raw materials, water, energy...)
- Reduce greenhouse gas and other emissions as well as industrial wastes in industries and SMEs.
- Mainstream the adoption of more resource-efficiency and clean production patterns such as recycling, resource recovery, sound treatment and disposal of wastes, waste waters and toxic and/or hazardous chemicals.
- Green technologies investment (renewable energy use, efficient equipment and machinery)

Sylvie Mugabekazi said that there are still challenges in promoting the circular economy as people do not show interest in buying recyclable products. There is a need of awareness raising to promote the circular economy and improve the quality of recyclable products and make them competitive to the market.

2.2. The Role of Data in Beating Plastic Pollution, and Comparative Analysis in the Region

Cameron Smith, Founder of UnWaste, presented via video conference findings from data collected on PolyEthylene Terephthalate (PET) plastic waste in East Africa in 2021-2022. Data were collected in Kenya, Malawi, Mozambique, Tanzania and Zambia.



Over 90% of plastic waste bottles in East Africa are PolyEthylene Terephthalate (PET) bottles, and Coca-Cola is the global giant company leading others in producing PET bottles.

This exercise of scanning plastic bottles contributed a lot in the identification of the names and brands that produce a lot of plastic waste bottles. With these reports, producers can be easily accessed for requests to contribute in collecting plastic waste.

In Rwanda, the same data collection was conducted in the City of Kigali and secondary cities from 4-26 March 2022. Plastic waste bottles were scanned using the Wastebase.app and Bakhresa Group, from Tanzania, was identified as the big producer of plastic waste bottles in Rwanda.

Sulfo Rwanda Industries was presented as the third contributor in producing plastic waste bottles in Rwanda. However, Coca-Cola is the fourth producer in Rwanda.

Plastic pollution is of increasing, global concern. This year, at the fifth session of the United Nations Environment Assembly, the governments of Rwanda and Peru introduced a proposal for an international, binding treaty to combat plastic wastes. The level of international coordination requires the cooperation of the private sector, national and sub-national governments, youth, and civil society organizations to collectively engage in efforts to address plastic pollution.

These actions range from incentives designed to reduce the amount of plastic being produced, high-level policies and regulation to facilitate transparency and accountability of the producers of plastic waste, innovative financing mechanisms to encourage the reuse and recycling of waste, as well as the engagement of non-state actors in challenging the current system that has so far failed to address the urgent challenge of mounting plastic waste in our cities, waterways, and landfills.

The lack of data around the quantities and types of plastic waste serves as a deterrent for more coordinated action and effective mechanisms for reducing the amount of plastic pollution being produced and improperly disposed of. In Rwanda, plastic pollution in cities has resulted in disrupting drainage systems for flooding. Plastic waste has also contributed to the volumes of wastes being sent to landfill with facilities nearing capacity in heavily populated urban centers in Rwanda. The web portal serves as a tool to increase the capacity to identify gaps, opportunities, and challenges in the plastic waste value chain.

The portal aims to connect the producers of plastic waste with recycling companies that can make use of plastic as a material for new products. The portal also serves as a decision-support tool for policymakers to identify the most appropriate actions needed to incentivize the reuse of plastic so as to increase circularity in the plastic waste value.

Furthermore, the portal also provides information for potential entrepreneurs, investors, and the private sector to leverage existing opportunities based on materials currently being produced and how their wastes could be valorized to turn them into resources.

2.3. Introduction on Plastic Waste Web Portal

Joseph Gaga, the Web Developer, presented the web portal and explained its functionality. When someone visits the plastic web portal, there is a search option so you can search on any type of plastic waste you could be looking for.

But you can also browse on the map to identify the different locations where you can find wastes. This content can be provided by recycling companies, or people who provide wastes, and those who need wastes can be able to indicate what they need.

"So, when you visit the portal, there is a dashboard where you can see different sections of the portal. There is a map and we have offers. For people who have wastes and want to sell them, they can be able to check the requests from people who need wastes, then we have FAQs, and a description about the portal itself and then we have a login," Gaga explained.

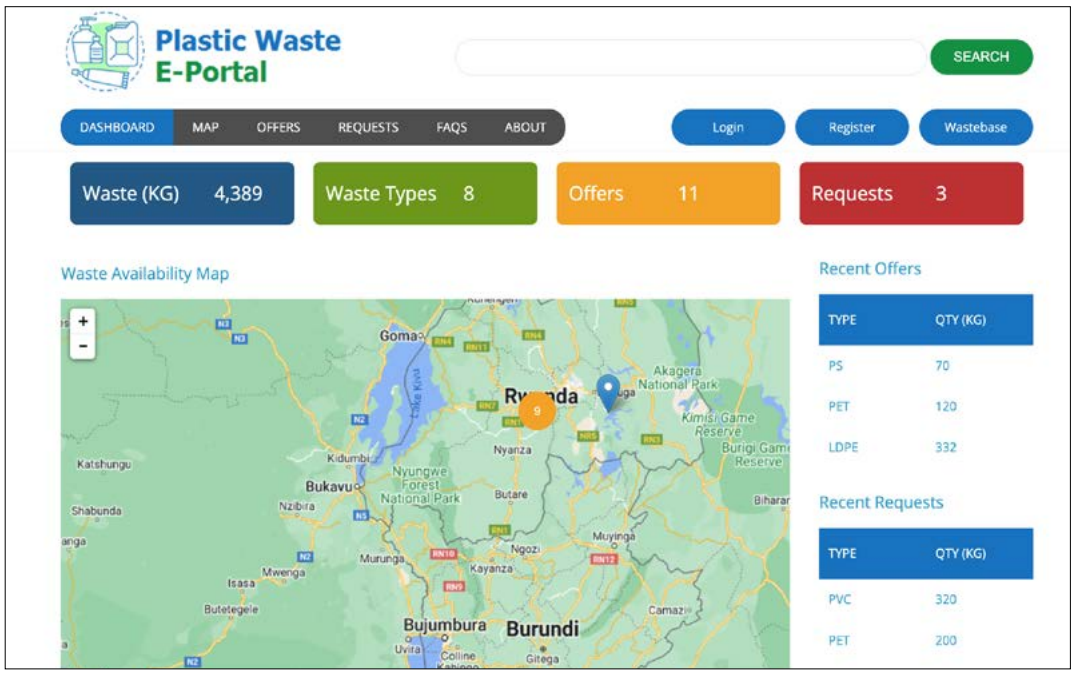
"When you scroll down, you are able to browse the map of the different offers so you can see the offer, the kinds of plastics that are available, the amount stored, the location and the phone number. In case you are interested in a particular waste, you can contact the person with it by email or phone," said Gaga, the Web Developer.

Irutingabo Ange, the Sustainable Waste Management Intern, explained to the participants that the web portal was developed to meet the following targets;

- Tracking plastic wastes that can be used as raw materials by recycling industries and companies.
- Supporting the social behavior change of sorting wastes at source point.
- Valorizing plastic waste and promoting circular economy approaches in the value chain of sustainable waste management.
- The Web portal serves as a selling point to support the Extended Producer Responsibility; the producer's responsibility for a product is extended to the post-consumer stage of product's life cycle. The web portal supports the implementation of the EPR guidelines which encourage producers to take back plastic bottles away from municipalities. The take back mechanism responsibility is placed on producers by establishing collection and recycling for post-consumer plastic packaging wastes, whereby consumers return the used plastic packaging to a specified location such as the selling point, for collection and recycling.

2.4. Role of Youth in Beating Plastic Pollution

Faida Zoubeda, the Representative of Save the Environment Initiative, presented on the role of youth in beating plastic pollution. She mentioned four key areas where youth should be more involved, including raising awareness on plastic pollution, participating in climate actions, conducting research and collecting data, and bringing technologies that can play a vital role in addressing plastic pollution.

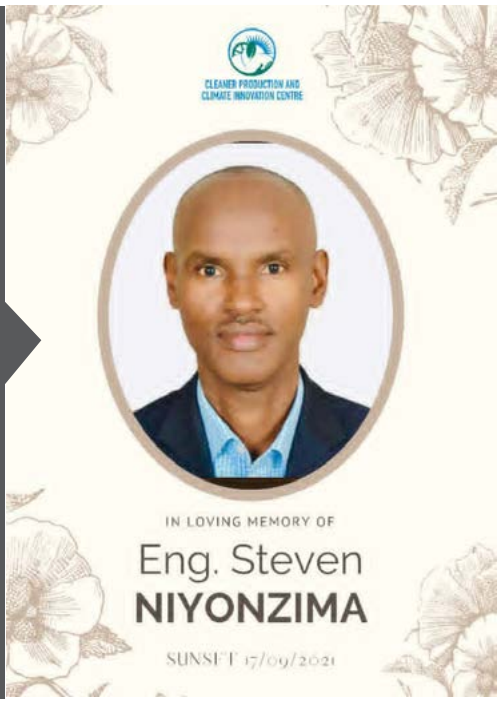


CLOSING REMARKS

Michelle DeFreese, The Senior Officer at GGGI, thanked all participants for their positive feedback for the web portal and looks forward to seeing its impact in beating plastic pollution. GGGI recognized the Save the Environment Initiative for its contribution in data collection of plastic waste bottles in the City of Kigali and secondary cities.

12 young people were given certificates of appreciation for their excellent work done during data collection of plastic waste bottles.

Participants had also a time for remembering late **Steven, the Founder of the Cleaner Production and Climate Innovation Center**. He was thanked for his contribution and introduction of circularity approaches in Rwanda especially in the production chain. He worked with so many industries and promoted resource efficiency in industries. A poem was dedicated to him and to his family.



SUSTAINABLE WASTE MANAGEMENT

WOKSHOP REPORT

Hotel des Mille Collines, Kigali

20 - 21 April 2022

1. INTRODUCTION

From 20th to 21st April 2022, Global Green Growth Institute (GGGI) in partnership with COPED, a leading waste management company operating in Rwanda since 1999, conducted a two-day workshop on Sustainable waste management and greening concepts for building managers of hotels, commercial buildings and public office buildings.

Day 1 of the workshop was attended by 13 Participants representing big hotels operating in the City of Kigali including Park Inn, Ubumwe Grande Hotel, Kigali Serena Hotel, Grand Legacy Hotel, and Hôtel des Mille Collines just to mention a few.

Day 2 of the workshop was attended by 19 participants from commercial buildings and Office buildings including the Administrative Office Complex (AOC), BK Building, MINAFET building, I&M Bank building, RSSB building, Nyarugenge Pension Plaza, MIC Commercial building, etc.

The purpose of the workshop was to:

- Raise awareness on sustainable waste management practices including sorting wastes from the source of generation, effective waste collection and proper storage, effective transport, and proper disposal of wastes at the landfill
- Raise awareness about the current legal framework of waste management in Rwanda
- Increase knowledge about the management of hazardous waste within public and private premises
- Increase knowledge on circular economy approaches such as reuse, recycle and recovery
- Increase knowledge about the link between poor waste management and pollution of the environment and health risks
- Increase knowledge on green building minimum compliance
- Build network and collaboration with stakeholders in the private sector working in the waste management

Daniel Okecukwu Ogbonnayo, The Country Representative of GGGI - Rwanda, thanked everyone who attended the workshop. He said that the workshop came at the intersection of two of the work areas of GGGI Rwanda – buildings and waste. GGGI has been working to support the Government of Rwanda to mainstream green growth principles, especially in cities.

Globally, cities produce 70% of GHG emissions. Within cities, we also see that high occupancy buildings are producing large amounts of unsorted waste that are being sent to landfills. Every workshop is resulting in 2-3 plastic bottles for each participant. Buildings produce food waste as

part of food preparation and produce paper waste. These are all types of waste that can potentially be valorized.

Now, waste collectors collect unsorted waste and transport it to Nduba, with only a few of the resources recovered by the informal sector and by waste pickers. Buildings are producing large amounts of paper, food, plastic, and e-waste which companies are looking for as raw materials.

He mentioned that the workshop is an opportunity to connect the gap between waste producers and recyclers. The workshop is part of the implementation of the Waste to Resources project, a collaboration between the Government of Rwanda and the Government of the Grand Duchy of Luxembourg to reduce waste being sent to landfill, create green jobs from the valorization of waste products, and to reduce the impact of waste on the environment.

He invited all participants to share their experiences as part of the effort to change the business-as-usual practices that have led us down this path. We all have a role to play as individuals, as businesses and as communities.

He said that the workshop will be an opportunity to not only play a role in climate action but also profit and benefit from waste valorization. All the institutions in Rwanda: hotels, schools, commercial buildings and agricultural markets are capable of sorting waste at source.

The more we sort and segregate waste, the more we are all able to benefit through reduced waste, a cleaner, and healthier environment, and the business opportunities that come from waste.

He wished the workshop would be a first step to introducing circular economy approaches on how to manage your waste not only at the building you manage, but also in your household and your community.

In closing, he thanked all partners, the Government of Rwanda as well as the support from the Government of the Grand Duchy of Luxembourg. He said that it was his pleasure to open the workshop this morning, but let's not end our efforts here. Let us continue the practices of sorting and separating waste so that we can create value from these resources and change our mindset about what is possible in our treatment of waste.

2. TRAINING TOPICS PRESENTED DURING THE WORKSHOP

2.1. Presentation for Sanitation Policy (with focus on solid waste)

Emmanuel HATEGEKIMANA from MININFRA presented on the National Sanitation Policy and the developed Strategy for Sanitation Management. He presented all the policy objectives of sanitation policy and mentioned two related to solid waste:

Policy objective: Implement integrated solid waste management in ways that are protective of human health and the environment.

Strategic actions include: Assisting the private sector and community initiatives in establishing markets for recyclable products.

- Conversion of non-recyclable waste materials into usable heat and electricity.
- As for hygiene education, schools shall be a primary target group for waste education.
- Public and political support both financing waste management and keeping waste minimization as cost-effective as possible.

Policy objective: Ensure safe management of e-waste, industrial waste, radioactive waste and health care waste.

Strategic action: Establish and reinforce e-waste collection, industrial waste, radioactive waste and health care waste management framework.
Emmanuel said also that MININFRA has developed a new strategy for sanitation management.

2.2. Regulation for Waste Collection and Transportation

Elisabeth Constance NAHIMANA, Sanitation Regulation Officer at RURA. She said that RURA regulates the service provision through: development of regulations and guidelines, licensing the service providers (operators), monitoring of quality of service & compliance by operators, setting the tariff where applicable (e.g. household solid waste collection service fee) and handling consumers' complaints and facilitating dispute resolution between service providers and consumers.

Currently, RURA has licensed 44 companies for solid waste collection and transportation, 6 recycling companies and 2 hazardous waste management companies.

RURA has identified challenges faced in waste management including; a low level of waste segregation, limited professional capacity of some service providers, inadequate disposal sites, recycling/resource recovery activities still at a low stage and non-compliance with regulations.

2.3. Waste Management Practices in the City of Kigali

John MUGABO, Waste Management Specialist at the City of Kigali, said that around 400 tons of solid waste are collected every day in the City of Kigali. The waste fee is designated by the government and depends on the social economic classes of the residents. Waste collectors do the collection of fees.

Recycling in the City of Kigali is done on a small scale; about 9 companies are involved in recycling plastics and paper wastes (Eco plastic, Agroplast, Jardin Meuble, Soft Packing, Amazi ya Huye, Isuku Super, Soimex in Remera and Coped Ltd), and three companies are involved in recycling of organic waste transforming it into fuel and compost respectively (Coped Ltd, Coocen and Gako farm in Masaka).

The City of Kigali does a regular inspection of buildings and estates. Every building and estate must have a wastewater treatment plant and reuse water for gardening. Sanctions are applied to those who don't abide by those measures.

The City of Kigali initiated the Smart Waste Collection and Management. Big containers were placed in marketplaces and an alerting system was installed for emptying full bins and preparing them for refiling again. The CoK invested in cleaning and greening activities such as planting public gardens, planting trees alongside roads and cleaning and sweeping roads.

Some of the challenges faced in waste management in CoK include insufficient budget, insufficient sanitation infrastructure, unplanned settlement and new infrastructures.

John MUGABO mentioned all the projects that are in pipeline related to waste management in the City of Kigali: the Fecal Sludge Treatment Plant, Kigali Centralized Sewerage System and Construction of engineered and sanitary landfill with a recycling center. Projects that are under implementation are the E-Waste Recycling Plant in Bugesera and the Waste to Resource project implemented by GGGI in partnership with the Ministry of Environment.

2.4. Introduction to Waste to Resources Project

Michelle Defreese, Senior Officer and Projector Manager of Waste to Resource at GGGI, introduced to the participants that the Government of Rwanda, through the Ministry of Environment, initiated a Memorandum of Understanding (MoU) with the Ministry of Environment, Climate and Sustainable Development of the Government of the Grand Dutch of Luxembourg to strengthen the cooperation and technology transfer on sustainable waste management between the two countries. With this MoU, the Grand Dutch of Luxembourg financed the Waste to Resource Project. The project aims to reduce emissions of greenhouse gases through sustainable waste management. The project is led by the Ministry of Environment and implemented by GGGI Rwanda.

As per project title **"Waste to Resource: improving municipal solid waste and hazardous waste in Rwanda",** its focus is mainly the interventions for municipal solid waste and hazardous waste in this case e-waste. It is a three-year project launched on 24th August, 2021 and will be implemented in the City of Kigali and secondary cities.

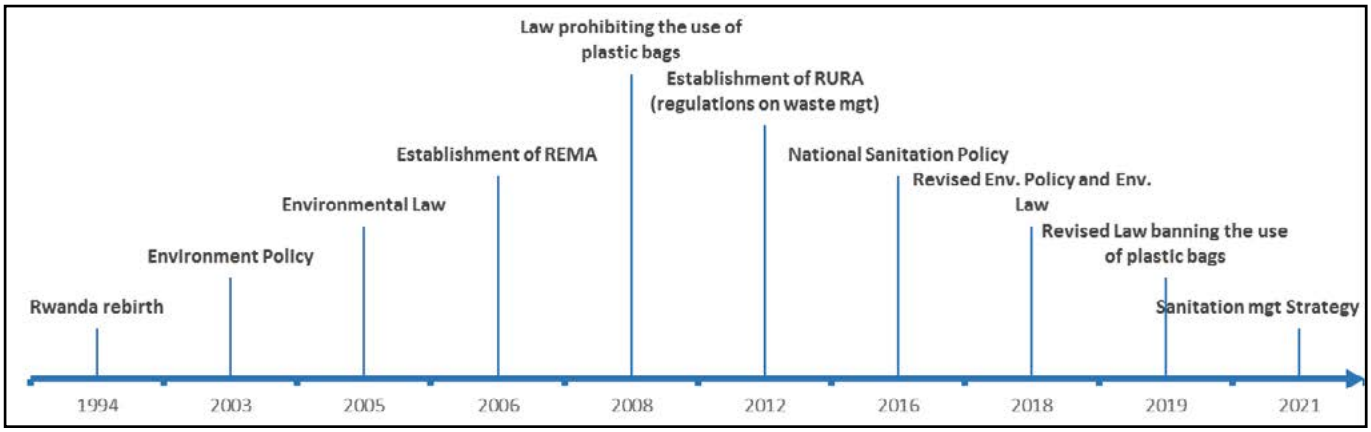
The project has 3 outcomes;

1. Separation and valorization of organic and plastic waste landfilled at Nduba landfill
2. Improved collection rate and management of e-waste in Kigali and secondary cities
3. Improved policy and regulatory environment and enhanced capacity through skills development and knowledge exchange

2.5. Best practices in Sustainable Waste Management

Paulin BUREGEYA, the CEO of COPED, shared a presentation on the history and background of waste management from 1994 to 2021. From 1994 to 2000, there was no system of waste management (collection, transport, disposal), no policy or regulations. There were transit centers in every district where waste would be disposed of and these centers were not protected. There were no professionals in waste management whether in government institutions or in the private sector, and there were no investments done in the waste management sector.

In 2012, with the establishment of Rwanda Utility Regulatory Agency, the government of Rwanda put in place regulation related to waste collection and transportation.



COPED specializes in waste education, waste collection, waste transportation, waste treatment, and safe waste disposal. It provides a wide range of services to various clients from residences to office buildings, hotels, commercial and businesses, government and non-government organizations, industries and medical facilities. Recently, COPED started conducting awareness capacity to its clients for proper waste sorting at source. It has developed training materials to train waste generators about sorting waste into five categories: 1. Green/organic, 2. Blue/recyclables, 3. Black/disposables, 4. Yellow/medical, 5. Red/hazardous. COPED operates in Kamonyi District where 90% of the waste received at the COPED-run facility is now treated. In Kigali, COPED also services non-residential clients, commercial centers, and hotels.

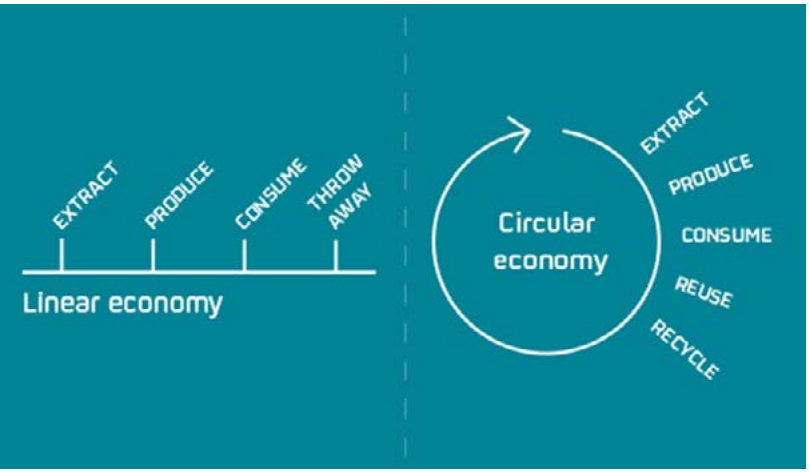
COPED has ambitious targets to encourage hotels, commercial and public office buildings to manage wastes in the three dimensions:

- Sort and save where the building can pay half of the price of waste fee
- Sort and sell where the building can sell the segregated wastes if well separated, cleaned and compacted
- Green award, at this stage the building can be certified as a green building for waste management and resource use efficiency.

2.6. Introduction to Circular Economy Approaches

Juvenal MUKURARINDA, the Senior Officer, Sustainable Waste Management, explained that people need to know the definition of circular economy in order to shift from linear economy. He mentioned some definitions given by experts. Ellen MacArthur Foundation defines the CE as an economy that is restorative and regenerative by design and aims to gradually decouple growth from the consumption of finite.

WRAP defines CE as an economy that keeps resources in use for as long as possible, extracts the maximum value from them whilst in use, then recovers and regenerates products and materials at the end of each service life.



He mentioned all the benefits of a circular economy: minimize pollution, reduce emissions, preserve natural resources, increase competitiveness, new markets, green job creations and social benefits. Participants were encouraged to embrace that concept of Circular Economy.

2.7. Green Building Minimum Compliance.

Dheeraj Arrabothu, Senior Officer, Green Building presented on the rapid building assessment conducted for 4 buildings, RDB, Nyarugenge Pension Plaza, Administrative Office Complex and the building of MINAFET. Performance criteria was based on Energy Performance Index (PEI) based on monthly utility electricity consumption, Water Efficiency Index (WEI) based on monthly utility water consumption and waste management measures.

Buildings are required to comply with minimum greening standards including energy use efficiency and water use efficiency by adopting the following recommendations: installing LED lighting, occupancy sensors, lighting controls, efficient plumbing fixtures and wastewater treatment, just to name a few.

2.8. Influential Factors Affecting Solid Waste Management in Rwanda and Circular Economy Approaches as Solution

IRUTINGABO Ange, Intern-Sustainable Waste Management, presented on her study conducted to 80 workers from 14 waste collection companies operating in the City of Kigali in 2020. The study shows some challenges that hinder effective solid waste management in the City of Kigali, including social behavior, financial, technical, low technology, and lack of support and subsidies that affect solid waste management. Data were collected from staff working in wastes collection companies in the City of Kigali. Eighty workers responded to the questionnaire.

The interviewees were divided into two groups - owners or managers and field workers. Workers were selected from 14 waste companies operating in the City of Kigali. The study shows that the solid wastes collection encounters many problems: no proper sorting of wastes, low willingness to pay, lack of training and lack of awareness-raising on solid wastes management, insufficient budget, low technology in recycling; recycling is done at 2%, low income to the staff working in waste companies.

The government needs to support the sector of waste management and motivate the private sector to invest in recycling. Nduba landfill also needs to be rehabilitated and make it a modern landfill that can accommodate all segregated wastes.

3. STUDY TOUR TO MILLE COLLINES WASTE CORNER TO SEE THEIR BEST PRACTICES IN MANAGING WASTES

Frederic, Manager of Hôtel des Mille Collines, took all participants to the waste corner of Mille Collines to see the best practices they are implementing in sorting waste by category.

1. Green/organic, 2. Blue/recyclables, 3. Black/disposables, 4. Yellow/medical, 5. Red/hazardous.

Waste corner at Hôtel des Mille Collines, they do separation of waste

4. CONCLUSION AND RECOMMENDATIONS

- To facilitate a smooth transition from linear economy to circular economy in waste management, capacity building is very important and should be extended to all stakeholders involved in the entire value chain of waste management including: waste producers such as households, hotels, commercial buildings, public office buildings, health facilities and those who work in waste sector such as waste collectors and recyclers.

- Participants went with an assignment to be change agents in sustainable waste management and resource efficiency.

- Buildings were recommended to comply with minimum greening standards including energy use efficiency and water use efficiency by adopting the following recommendations: installing LED lighting, occupancy sensors, lighting controls, efficient plumbing fixtures and wastewater treatment.

- Buildings were recommended to do sorting of generated waste in five categories: green bin for organic wastes, blue bin for recyclables waste, black bin for disposables, yellow bin for medical waste, and red bin for hazardous waste.

- Participants thanked GGGI for organizing such a workshop and recommended that the workshop would be often extended to other building managers - A big number of people trained could bring more impacts.

EFFECTIVE MUNICIPAL SOLID WASTE MANAGEMENT IN THE CITY OF KIGALI

WORKSHOP REPORT

M Hotel, Kigali

30 - 31 May 2022

DAY ONE:
Enabling Environments for Municipal Solid Waste Management

Global Green Growth Institute conducted a two-day workshop at M Hotel on effective municipal solid waste management services in the City of Kigali from 30 to 31 May, 2022. The workshop was attended by private companies with businesses spanning across the value chain of municipal waste management in the City of Kigali including waste collection and transportation services providers, recyclers, and dumpsite operators.

Opening remarks were done by both the Ministry of Environment and the Global Green Growth Institute. In his opening remarks, Dismas Karuranga from the Ministry of Environment emphasized that private sector deeds will surely contribute to the achievement of short and long-term national development agenda for waste management. He also thanked everyone who attended the workshop and wished them fruitful discussions.

On behalf of Global Green Growth Institute, Daniel Ogbonnaya Okechukwu, the Country Representative of GGGI Rwanda, appreciated the opportunity to be part of the opening of this workshop on "effective municipal solid waste management services in the City of Kigali".

He said that the workshop is critical at a time when urbanization, economic and population growth, especially in the City of Kigali, has been highly increasing over the last two decades.

As a consequence, this is associated with a high generation of municipal waste which requires effective actions to revert challenges associated with enormous quantities of municipal solid waste to protect both environment and public health across the value chain. He said that the workshop's purpose was to enhance service providers' capacities for collection and transportation, recyclers, and dumpsite operators on the best practices for effective municipal waste management in the City of Kigali. It is also aimed at raising awareness on the existing policies and regulations governing municipal solid waste management in the country.

Statistics from various studies conducted for the City of Kigali indicated that 80% of the population has access to waste collection services of which 50% to 60% is collected and transported to Nduba dumpsite for disposal. Recycling is still at a minimum of between 2-5% of all generated waste.

The dumpsite is semi-controlled, there is no access control and there is no control of waste movement in and out of the site. In 2021, it was estimated that the dumpsite accumulated around 850,000 MT since its opening in 2012.

The waste sector still has challenges including limited capacities for service providers and recyclers, limited professionals in the waste sector, limited operational budget to manage disposal sites, and financial constraints for putting up infrastructure for waste treatment.

Rwanda has an ambitious target of reaching 100% universal access to improved waste management services by 2024. Therefore, the private sector must play a key central role to achieve that target. GGGI is implementing a waste to resource project that will contribute to the protection of the environment and public health while maximizing waste valorization and service provision.

In his conclusion, Daniel invited all participants to have interesting discussions and draw conclusions as well as recommendations of accelerating the advancement of sustainable waste management services in the City of Kigali.

2. Enabling Environment for Solid Waste Management

The presented enabling environment includes the national policies, regulations and standards linked to municipal solid waste management. The presented enablers are the National Sanitation Policy and integrated solid waste management strategy, National Policy on Environment and Climate Change, regulations for the collection and transportation of wastes and standards for organic waste fertilizers.

2.1. National Sanitation Policy and Integrated Solid Waste Management Strategy

The representative from the Ministry of Infrastructure, Hategekimana Emmanuel, highlighted that the sanitation sub-sector was initially overlooked by the water supply sub-sector until 2016 when the Government decided to unbundle sanitation from water supply. Sanitation, in Rwandan Context, covers all aspects of wastes including solid waste management.

Emmanuel mentioned that Sanitation policy is umbrella policy that gives policy directions for solid, liquid, human excreta, and special waste. For Municipal Waste, the policy provides that it should be managed following the principles of the waste hierarchy by promoting waste prevention, reuse, recycle and recovery. The same policy recommended formulation of standalone strategies for the above-mentioned types of waste.

Hence, a national integrated solid waste management strategy was developed. It provides clear institutional roles and responsibilities for stakeholders across the waste value chain. The strategy was validated by the sector working group January 2022. It provides key strategic pillars and founding elements to ensure sustainable waste management countrywide across the value chain. It also indicates areas of interventions and required investment for implementation.

2.2. National Environment and Climate Change Policy

KARURANGA Dismas, the focal point of the Waste to Resource Project in the Ministry of Environment, mentioned that the waste sector has evolved over time for the past decade and the first Environmental Policy was introduced in 2003 and was followed by organic law in 2005 for the protection and conservation of the environment. The policy highlighted that every citizen must live in a healthy and safe environment.

Under that policy, most of the activities were implemented such as sustainable mining activities, protecting water bodies; lakes, rivers and wetlands, prohibiting the use of plastic bags.

The current National Environment and Climate Change Policy was developed in 2019 to cover gaps of previous policy to align it with the Government's long-term aspirations on environment protection.

The policy has seven objectives including green economic transformation, enhancing functional natural ecosystems, and managing biosafety, strengthening meteorological and early warning services, promoting climate change adaptation, mitigation, and response, improving environment wellbeing of Rwandans, strengthening environmental and climate change governance and promoting green foreign and domestic direct investment and other capital inflows.

The achievements made so far after the adoption of the policy are restoration of critical ecosystems, green cities, erosion control, emission monitoring for vehicles, promotion of sustainability in rural settlement and protection of riverbanks.

2.3. Waste Collection and Transportation Regulation

Elisabeth M. Constance NAHIMANA from RURA highlighted that service provision are regulated through: development of regulations and guidelines, licensing the service providers (operators), monitoring of quality of service & compliance by operators, setting the tariff where applicable (e.g. household solid waste collection service fee) and handling consumers' complaints and facilitating dispute resolution between service providers and consumers.

RURA regulates the following services: solid waste collection and transportation, solid waste recycling, hazardous waste management and e-waste management. She mentioned the challenges faced in waste collection including low level of waste sorting, limited professional capacity of some service providers, inadequate disposal sites, recycling/resources recovery activities still at low stage, and non-compliance with regulations.

As a way forward, RURA is planning to enforce regulations by monitoring the quality of service, working with other stakeholders for education and awareness campaigns on waste sorting, developing further regulations, advocating for resource recovery and collaborating with other stakeholders for the development of the sector. The regulations provide administration sanctions for example a service provider for collection and transportation of waste if caught with unsorted waste in the truck, the company is fined FRWF 200, 000 and RWF 500,000 is sanctioned for failure to comply with tariffs.

2.4. Standards for Organic Waste Fertilizers

The representative of Rwanda Standard Board (RSB), Uwimana Clement, indicated that standards for organic fertilizer were developed in 2021. The standards define organic fertilizers as the fertilizers that are naturally produced and contain carbon. The coding of the standard is RS 279:2021.

The standard provides different types of organic fertilizer as farmyard manure, green manure, compost prepared from crop residues and other farm wastes, vermicompost, oil cakes, biological wastes (animal bones, slaughterhouse refuse and natural mineral deposits that include but not limited to phosphate rock, greensand, Epsom salt, calcium, and limestone flour.

The standard provides the physico-chemical parameters with minimum and maximum ranges that must be complied. It also mentions minimum nutrient percentage guarantee and test methods. The standard is sold at RWF1500/page. Recyclers for organic waste should ensure that their products (organic fertilizers) comply with standards, otherwise, the products won't be acceptable.

2.5 Environmental Perspective vis-à-vis Waste Management

Jacques NSENGIYUMVA, the Ag. Air Quality Specialist from Rwanda Environment Management Authority (REMA), highlighted potential sources of solid wastes which are medical centers, feeding centers, slaughterhouses, warehousess & markets, agency promises, domestic/municipal areas, industries, mining, and construction but households are the highest potential source of solid wastes.

Poor management of waste contributes to the environmental pollution and degradation, and disease transmission. REMA intervenes in drafting laws protecting the environment and law enforcement and conducting regular inspections related to environmental pollution.

Towards the end of the day, participants had a chance to discuss in groups required actions for effective sorting at source. The outcomes of the group discussion to all teams indicated that service providers should establish smart bins at entity level to facilitate waste sorting at source, and government institutions must provide grants for investors that significantly contribute to the circular economy (machinery, technology, and trucks).

A member of the group hinted that sorting shouldn't be a choice but rather an obligation that every waste generator must practice in order to maximize waste valorization.

DAY TWO:
Best Practices for Municipal Waste Management

This day was more on the presentations for best practices for municipal solid waste. The speakers were University of Rwanda, Green Care and Enviroserve.

2.6. Best Practices in Sustainable Waste Management by University of Rwanda

Elisée Gashugi, Lecturer at College of Science and Technology, Chemistry Department who also does time to time consultancies, explained that Kigali Waste Management has evolved over the last 10 years. Prior to 2010, there was no national policy or harmonized regulatory framework addressing Solid Waste Management (SWM). By gradual changes, urbanization, the emergence of new institutions over time and environmental emergencies, waste collection started. At present, SWM is managed linearly in general.

Overall, waste generated is collected and disposed of in landfill sites, with slight formal recycling of in-organic waste, and with slight waste reprocessing of organic waste. He mentioned that under Rwanda's ambitious targets on waste management by 2024, 40% of solid waste was collected and recycled countrywide, 80% of domestic waste was recycled, reused, or disposed of properly in urban areas and 50% of the generated e-waste was recycled and turned into usable materials.

He hinted that to reach the national target, people need to work together, and innovations should be encouraged at all levels. He also touched on the ongoing initiatives related to waste treatment by private initiatives, for example COPED, Agroplast, Ecoplastic and recommended the private sector to invest more in waste treatment.

2.7. Integrated Solid Waste Management by Producing Organic Compost "Grekompost"

Greencare Rwanda Ltd is a company led by Noel NIZEYIMANA. The company operates a waste processing site in Huye and was invited to share the best practices for waste management, especially for organic waste valorization. The company was registered in 2016 and got a license from RURA to operate in 2017.

The company receives waste collected by different companies of which 70% of total waste quantities is organic waste.

It started treating 1 ton/day with 5 staff and now has grown to 10 tons/day with 25 permanent staff. Green care has a vision to become one of the top companies in waste management services and market leader in the fertilizers industry.

Noel highlighted that the biggest bottleneck of municipal solid waste management recyclers is the reception of unsorted waste which incurs additional operational cost for sorting to enable valorization activities. The company can recycle plastic and other plastic bags into ecological pavers and organic waste into fine organic fertilizers for agriculture purposes. Due to unavailable technologies for recycling, piles of recyclable wastes are stored into the waste processing facility ready to be transformed once technologies are available.

2.8. E-waste Presentation by Enviroserve

Enviroserve Rwanda Green Park as commonly termed Enviroserve has been operating in Rwanda since 2017 and in partnership with Government of Rwanda, Enviroserve is managing a state-of-the-art and environmentally friendly e-waste dismantling and recycling facility located in Bugesera, first of its kind in the East Africa Region.

E-waste is a complex waste stream with more small products which however must be clearly handled to avoid contact with human beings. The representative of Enviroserve highlighted that inventory conducted by MINICOM in 2015 showed that 15,000 Metric Tonnes were generated of which only 500 MT were formally collected. These quantities are expected to double in 2025 and will be ten times in 2050.

To sustain the sector, Enviroserve has been actively setting up e-waste collection centers, training public and private institutions on proper e-waste disposal, training of young graduates & informal technicians and participating in awareness campaigns. The shared challenges include limited awareness raising on the dangers of e-waste, lack of regulation on e-waste and other policy frameworks including EPR and lack of enforcement. Possible solutions include approval of the e-waste regulations, ensure enforcement is done tightly and buy environmentally friendly electronics.

The workshop concluded with key lessons learnt and recommendations that everyone would ponder on regularly in respective institutions to ensure sector sustainability.

3. Lessons Learnt and Key Takeaways

The training was timely, and participants recommended that such workshop to create an impact should reach out to a big number of people including local leaders from grass root level, community health workers, environmental health and sanitation officers at district and sector levels, women council representatives at district level, reserve forces, students in environment departments, households, waste collectors, recyclers, landfill managers, schools and businesses generating wastes.

The government would consider creating an incentive through taxes exemption on the importation of waste collection equipment including waste bins, vehicles for waste collection and transport, and other equipment for waste treatment and disposal. This will lower prices of waste equipment, hence lowering risk for polluting the environment and protecting public health.

Enforcement of existing laws and regulations must be assured by providing penalties and sanctions to maximize protection of both environment and public health. Other lessons learnt include:

- The Government must avail a modern waste disposal landfill, encourage development infrastructures such as roads and encourage production of sorting materials.
- Active participation of all involved stakeholders (waste generators, waste collection companies, recyclers, government on infrastructure side, and development partners)
- Continuous awareness, education, and training
- Develop a simple guide booklet, defining all steps of effective solid waste management, with well-defined responsibilities of actors - individual, leaders and companies.
- Working together by strengthening collaboration between public, private and academia to improve the waste management sector.

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