

THE 22<sup>ND</sup> EDITION | JAN 2023 - APRIL 2023

# MAZINGIRA

*Setu*



***The Plastic  
Question:  
A Losing Battle?***



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Magazine Layout & Design:

Simpaul Design Limited

[www.simpauldesign.com](http://www.simpauldesign.com)

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# EDITORS NOTE

*David Kaman*

The August 1955 issue of Life Magazine depicted a new lifestyle dubbed “Throwaway Living.” This was a celebration of the rise in single-use products at household level. The disposability of cutlery was nothing but positive as “The objects flying through the air in this picture would take 40 hours to clean except that no housewife need to bother.”

Considering their unique properties; chemical and light-resistance, their diversity, light weight and durable, their application in different industrial and domestic uses is continually rising. Almost all aspects of daily life involve plastics in some form or the other. Have these positive attributes together with their low cost driven the less sustainable consumption and resources use pattern, and the mismanagement we see today?

The resolution to end plastic pollution passed at the UN Environment Assembly (UNEA-5) addresses the full lifecycle of plastic, including its production, design and disposal. This is part of a growing global call for action to tackle the crisis. Such international legally binding instrument have legal obligations that require capacity building and, technical and financial capabilities. Will countries effectively implement the wide range of approaches proposed to curb plastic pollution considering respective circumstances?

Globally, lack of strict implementation and enforcement of set laws has led to continued mishandling of waste with illegal dumpsite proliferating in urban centers due to insufficient waste handling capacity by local administration. With this comes the rise in informal sector players. Bulk of the recycling is still handled informally with inadequate capacity to handle all waste types. Do these informal sector players benefit from the EPR schemes set?

This edition will highlight valuable insights and tailored solutions by local communities as well as tools and expertise across different thematic areas examining innovative and integrated approaches to beating plastics pollution. We seek to understand whether the push for technological/innovative responses substituted the much needed behavioral change in waste management.

We intend to continue expanding the scope of review toward not only the sources, and effects of plastic pollution, but also alterations, fates and effects of different plastic types interactions with ecosystems processes. We seek to identify what impact the surge in public attention coupled with local, national and international policy responses has on the efforts to curb plastic pollution.





Mazingira Yetu Org display up cycled products during a community education day in Kibra





# CONTENTS



14

The unseen bombshell: A dive into microplastic pollution at the Kenyan Coast **18**  
A clean, healthy environment is possible for all with holistic, inclusive approaches to address plastic pollution **21**



31

Plastic: What's the problem? **6**  
A word with H.E Prof. Judi Wakhungu EGH **8**  
Status of the implementation of Single-use Plastic ban in Kenya **11**  
Overview of The Current Solid Waste Management In Nairobi City County **14**



26

Why Waste Recycling in Africa is Essential for the world **24**  
IS RECYCLING THE ANSWER? **26**  
Q & A: Mr. Mavji Varsani – C.E.O Vintz Plastics **28**  
Closing the loop on waste plastics through heritage boatbuilding: why it's possible and critical to bring even the most remote communities into a circular economy **31**  
Ecoworld Recycling – Growing the Plastics Circular Economy at the Kenyan Coast **34**  
Smart Solutions for Sustainable Solid Waste Management **37**  
GREEN COLLARED GOALS **39**



34



46

Impact of community-based waste management **41**  
Community-Led Plastic Pollution Management **43**  
Plastic Pollution in Protected Areas **46**  
Impacts of Plastic Pollution on Endangered Mountain Gorillas and Their Habitats and How Young People are Coming up with Solutions in and Around Bwindi Impenetrable National Park (BINP) **48**  
School program **51**  
Coming Full Circle: Our love-hate relationship with plastic **54**  
Establishing a Culture of Sustainability **56**



58

Zabballen **58**  
It's time to beat single use plastic pollution! **60**  
Circularity Space **62**  
The Creative arts and the environment **64**

# **Plastic:** What's The Problem?

*The problem of plastic, well, let's start from the very beginning. It began in 1950, and it continues to accelerate. While it has been touted to be the world's savior and wonder material, it's also problematic as it has left the world grappling in an unimaginable garbage crisis.*

## **Our environment is swamped with plastics.**

No place on the entire planet is without some trace of it; from the deepest point in the ocean to the highest mountain peak, plastic reigns. Besides polluting our environment, it's now polluting our blood, yes, it's deep inside our very being. Surprised!

It is an essential material in the infrastructure of modern societies. We use it for practically everything. Its design versatility, low cost, formability, light weight, and bio inertness have made it the material of choice in a broad range of applications from smartphones to food packaging and 3D printing. Plastics protect food and help reduce food waste, enable the design of lighter vehicles, and insulate electrical cables for maximum efficiency. Our lives largely depend on plastics, but balancing all of its valuable uses are the problems it creates.

This wonder material isn't that old since it was first invented by Leo Baekeland in 1907 as Bakeland, a combination of just two chemicals, formaldehyde and phenol. It was only in the 1930s that plastic

began to be mass-produced, as nylon and teflon. As I write this piece, I am using a computer in which most of the components are plastic, beside it is a smartphone largely made of plastic, not to mention the pen, cameras, office fittings, and so many more. Knowing how important plastic is, can we live with it sustainably without it impacting negatively on our environment and health?

While countries, such as Kenya and Rwanda, have banned single-use plastic bags. Others, like Germany, have mandated plastic bottle deposit schemes. Canada has classified manufactured plastic items as toxic, which gives its national government broad power to regulate them. The world needs to move with speed to cut down on the production of the most problematic plastics, most of which are single-use and cannot be put in the circular economy. The world also needs to double its efforts at recycling, current 9% is a drop in the ocean, and ironically huge amounts of plastic that should be recycled ends up in the ocean- not as drops but as truckloads.



In Kenya, plastic waste makes worse solid waste management, which for speaking out loud is dysfunctional. We cannot address plastic pollution without fixing solid waste management. With the new Sustainable Waste Management Act almost being operational, Kenyans will begin segregating their waste and that will come a long way in reducing plastic pollution. The global north has less plastic challenge because they practice waste separation at source and invest enough resources in improving waste infrastructure.

Throughout its life cycle, plastic is a problem. According to Ellen MacArthur Foundation, Plastic production is expected to double in 20 years, which will far outstrip our current waste management and recycling capabilities. In short, plastic pollution is one of the greatest environmental challenges of our time. The extraction of oil to make it, is catastrophic, during its manufacturing, through the mixing of additives, plasticizers, and a host of other secret chemicals that we may never know of, to plastic packaging, recycling to disposing and recycling, it is a thorn in the flesh. Its very good qualities also make it a very problematic thing to ever be manufactured.

Plastic is indeed a design problem. It is poorly made to satisfy our convenience and to rake in profits now that the world is shifting away to clean energy and there's plenty of oil. While its makers understand its high environmental impact, they don't seem to care.

Scientists, now say that nearly 700 million metric tons of plastic will enter the environment in the next two decades, even with immediate action. If we do not stop the problem now, actually as early as yesterday, by 2050 our oceans will have more plastic than fish.

The recently passed resolution to forge a plastics treaty may be the beginning of the change we have been calling for. As issues are being negotiated, we must hope that the treaty is legally binding but flexible, allowing countries to meet these targets as they choose.

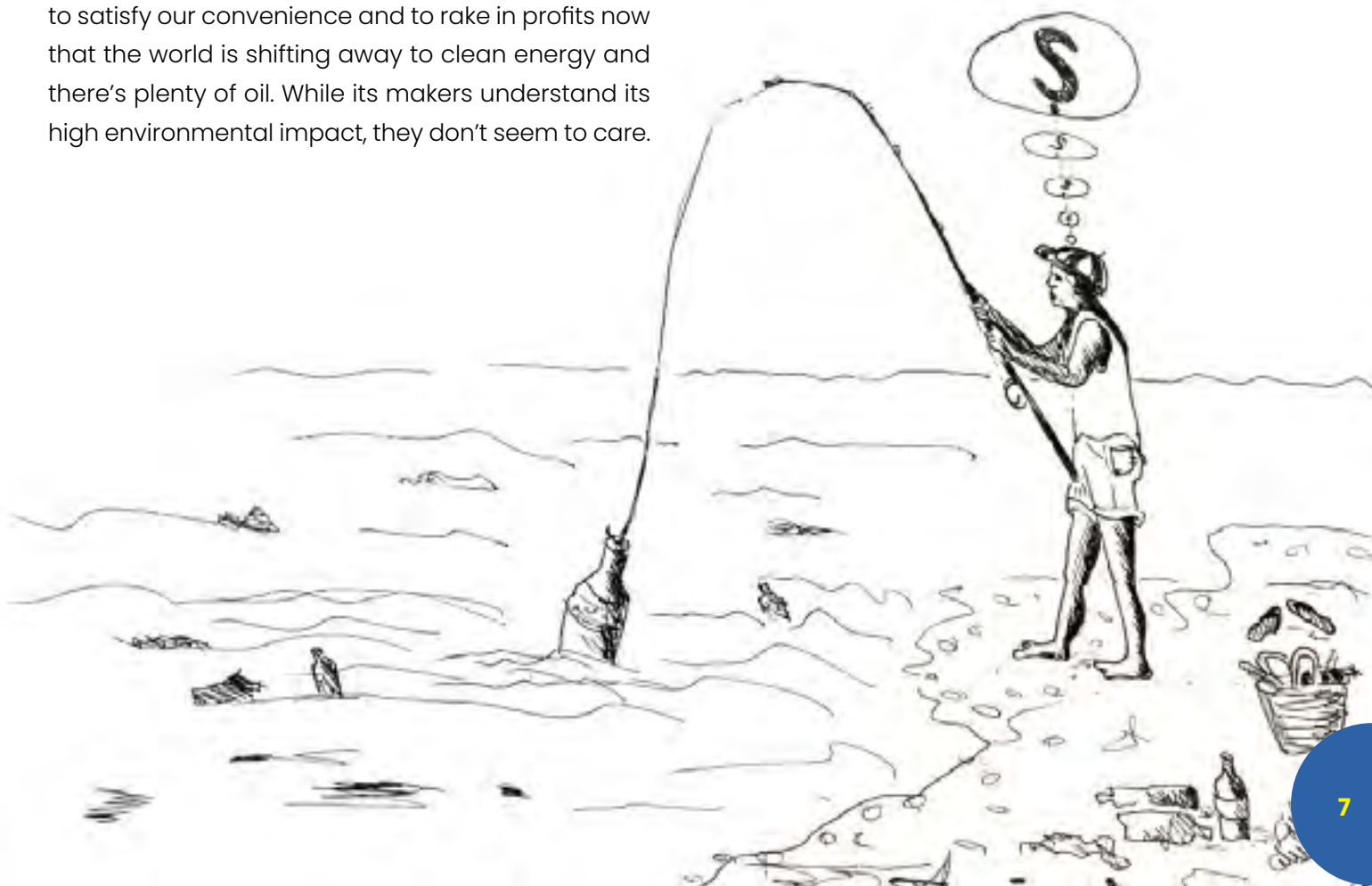
I am a bit hesitant. We don't yet know how long this material will prevail in these environments but it will certainly be longer than the lifespan of the person who used it. It is beyond our control.


Without drastic and immediate measures, the fight against plastic pollution will be a huge mess ever experienced in the world. We're in danger of waiting far too long to turn off the plastic tap. The production of virgin plastic has to stop.

Less plastic is fantastic!

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By James Wakibia  
Photo-journalist and Environmental Activist



A portrait of H.E. Prof. Judi Wakhungu Egh, a woman with shoulder-length brown hair, wearing a dark grey blazer and a patterned scarf. She is smiling slightly and looking towards the camera. In the background, several flags are visible, including the Kenyan flag on the left and the French flag on the right.

# A WORD WITH H.E PROF. JUDI WAKHUNGU EGH

Ambassador of Kenya to The French Republic, Portugal, Serbia and Holy See.  
Former Cabinet Secretary For Environment, Water and Natural Resources.

**Congratulations for the fifth year since the banning on use of plastic polythene bags which took effect in your tenure as the Cabinet Secretary for Environment, Water and Natural resources. Effective banning of plastic carrier bags continues to elude many nations. How were you able to get it done?**

Appreciative of this 5/6th Anniversary recognition of the banning of single-use plastic bags in Kenya in 2017. This was a bold decision at that time considering plastic pollution was fully entrenched in all our ecosystems and livelihoods. It was an ecological time bomb.

The Kenya Constitutional Right to a “Clean and Healthy Environment” was actively being violated. Further, single-use plastics were so cheap that their use had become ubiquitous. As they had no value, Kenyans were immersed in wanton littering. In order to address this menace & health hazard, we

launched monthly clean-ups in 2013 in partnership with all Counties. However, due to lack of meaningful waste management practices, the clean-ups were not effective nor were they a long-term solution. Therefore, other solutions were needed urgently. The NEMA & KMA engaged quarterly on how to phase out single-use plastics as well as adoption of alternatives such as biodegradables & compostables. This encompassed the entire value chain.

A comprehensive road-map and options were considered severally but these options were not time-bound. Meanwhile, the plastic pollution & waste management crisis was unfolding. Understandably, many Kenyans were in uproar. They did not understand why the Ministry of Environment was unable to handle this crisis. It is important to note that Waste Management is a devolved function in Kenya. Therefore, I consulted the Council of Governors



(COG). But the COG was also relying on the Ministry. My thoughts at that time were to propose banning the entire value chain of single-use plastics. I consulted The Presidency, my colleague in Industry and Trade, and Attorney General. It was extremely bold.

The final decision was mine but I had consulted widely. Given this brief background, the reason many Countries have been unable to ban single-use plastics is that their Legislative environment may not be as conducive as ours was at that time. It requires courage for leaders to embrace this Herculean exercise. Partnership amongst the Public, Private Sector, and Civil Society entities is important.

We may take such partnerships and open dialogue for granted in Kenya. Anyway, it behooves me to conclude by stating that implementation is another matter!

**What role can the East African Community play in ensuring all the member countries ban single use plastic carrier bags?**

The role of the East African Community is absolutely critical. Our borders are relatively porous. Therefore, bans in Kenya and Rwanda may not be as effective as they ought to be. I'm aware that strategies aimed at addressing this plastic pollution crisis are at an advanced stage in the East African Assembly. It is worth recalling at this juncture that this cuts across many sectors including Environment, Trade, Health and so on. Decisive leadership will be paramount.

**Polyethylene terephthalate (P.E.T.E) bottles continue to be a menace in water ways across the world. What do you think should be done to stop pollution of the water bodies by P.E.T.E bottles?**

Our original roadmap in 2013 included water bottles (PET). But the industries resisted this proposal amongst others. This is to be expected in any negotiations due to give-and-take and win-win solutions. I had also tabled Extended Producer Responsibility concerning PET. The KMA perceived this proposal as being too draconian. It was dropped at that time as the Industries promised to seek other solutions. I then provided the option of recycling and also returning PET bottles. A few collection centers were opened

for the recycling investors. But as Kenyans, we must acknowledge this embarrassing fact. We are wanton litterers!

Our waste is somebody else's problem. While we complain about water insecurity, we unconsciously toss plastic bottles in our fragile water bodies and then blame somebody else. As waste management is a devolved function, the Counties must take leadership with the guidance of the Environment Ministry & NEMA to address this crisis. Advocacy on such matters is daily.

*It requires courage for leaders to embrace this Herculean exercise.*

**How can the legally binding global instrument to end plastic pollution strengthen national action plans and policies especially in the global south where financial aid and private investment constraints inhibit greater circularity in such growing economies?**

The Global Binding Instrument was inspired by a few countries, including Kenya. I take pride in this as we are the home of UNEP and by extension UNEA. The UN has many worthy documents advising Member States on the state-of-the-art options. Many States have complied with comprehensive National Action Plans. But rhetorically, how many Countries will implement them?

There is general fatigue with the financial aid carrots that are dangled to the global south. In my view, practicing circular economy is common sense at all levels. We do not have an endless frontier of natural resources. However, circularity can extend the life-line of materials that we use. Each Country must take a stance for national interests and preservation.

**Circular economy has for long been advocated for as the solution to solid waste pollution. However, many countries still lag behind due to factors such as lack of proper waste handling infrastructure and poor plastic product designs. How can it be made to work?**

As I may have alluded to in the previous questions, the science and technology of circular economy is at an advanced stage. The plastic designers are

adjusting due to prevailing consumer demands and expectations. Moreover, financial instruments, incentives, and practices exist and are compelling to investors. This is the future and early adopters are paving the way. What is being accomplished, although pioneering, is promising.

Having Waste Management Legislation is important for Kenya. I initiated the process and I hope the Sustainable Solid Waste Management Act 2022 will be implemented to fully realize the potential of circularity in solid waste management. Lastly, we must also at the individual level be conscious of the fact that we are waste producers. I know that it is not easy, but we must be conscious about our individual waste footprint. Being in the field is an eye opener.

**Extended Producer Responsibility schemes are being advanced as transformative as they boost recycling and push for improved product designs. However, the complexities associated with the EPR variants have led to slow implementation and most importantly failure to involve informal sector. How can the informal sector players benefit from these schemes?**

I'm an advocate of Extended Producer Responsibility. But when I first introduced it as one of the circularity value options in Kenya, it was met with resistance. But the manufacturers now understand its importance and the broader reach to diverse consumers. These consumers include partnerships with the informal sector as these will be the easiest to implement. Again, lest I sound like the proverbial broken record, courageous leadership is needed to announce and implement this directive.

**Fossil fuel is a primary ingredient in the manufacture of plastics. Can the world do without the use of fossil fuel?**

Fossil fuels and the use of them are part of our fabric in many sectors. The use of alternatives in the energy and transport sector is making good progress. Proof of concept in Green and Blue energy inventions are commendable. Prospects for the materials sector are also exciting from a STEM perspective. But given the ubiquity of fossil fuels & our universal addiction to them, we shall not be able to live without petrochemicals for the foreseeable



*...we must be conscious about our individual waste footprint.*

future. However, we can use these materials more judiciously and there are many worthy examples both from alternatives and circular economy exemplars.

### Parting shot

Let us take a moment to consider that for most families our most important investment is our homes no matter the scale. We value our homes as a safety net. Collectively, our only home is Earth. Those that plunder the Earth are destroying the future for all of us starting with the most disenfranchised. They are suffering beyond imagination.

The actions we take today, irrespective of the magnitude, are important in ameliorating the situation. Each one counts. I'm proud of the visionary decisions I made as Kenya's Minister of Environment. I run my leg of the race carrying our national flag. I handed over the baton safely and at top speed for my successor to run their leg of the race. I continue to be a steward of our home, Earth!





# Status of The Implementation of Single-use Plastic Ban in Kenya

## Plastic and single use plastics

Plastics are made up of many parts (polymers) more often using carbon atoms provided by petroleum and other fossil fuels they are usually longer than those found in nature. The length of these chains, and the patterns in which they are arrayed, that make polymers strong, lightweight, and flexible and making it very hard to decompose.

The first synthetic polymer/ Plastic was invented in 1869 by John Wesley Hyatt, who was inspired by a New York firm's offer of \$10,000 for anyone who could provide a substitute for ivory. He combined organic cellulose with camphor to create celluloid which was used as substitute for ivory in billiard balls and used to make the first flexible photographic film for movies and still pictures. The invention was praised as the savior of the elephant and tortoise and away the Plastics could protect the natural world from the destructive forces of human need. The plastics became popular during the World War 2 and have been on the increase since the 1970s. There has also been increasing use of single use plastics items which are used once, or for a short period of time, before being thrown away. Single-use plastic products are more likely to end up in our seas than reusable options polluting our environment. Research has shown that 7%-10% of all the plastic produced in the world has been recycled.

## Plastic carrier bag ban in Kenya

Plastic Carrier bags have been a major problem for Kenya posing challenges to the waste management. As a country, we used to generate over a million plastic carrier bags per year, most so flimsy that they could only be used once. The plastic carrier bag was mainly for secondary packaging channeled from the supermarkets and retail shops which offered them for free.



As a result, Kenya is today regarded highly for its environmental stewardship in Africa and the world.

Stop plastic pollution of our Rivers placard in small axe park along River Getharaine

In the year 2017, Kenya through a gazette notice No. 2356 issued by Cabinet Secretary for Environment and Forestry banned Plastic bags. The plastic carrier bags that banned included carrier bags and flat bags with or without handles, these are bags commonly known as “Juala” that are used as secondary packages for items in shops, markets etc. and Flat bags used for carrying items outside industrial setting e.g. groceries, garbage, are banned. The country banned both the import and manufacturing of the plastic carrier bags.

To address the challenges of primary packaging and handling the waste, the authority came up with EXEMPTIONS for flat bags used for industrial primary packaging where the product is direct contact with the plastic and is done at the source. The exemption is subject to:

- i. Extended Producer/User Responsibility and/or effective Take Back Schemes
- ii. Legibly and permanently labeled bags to indicate the name of the industry manufacturing the product, the end-user and physical addresses for ease of monitoring, traceability and therefore ease of enforcement intervention.
- iii. Keeping of inventory/record with the aim of

implementing the take back scheme.

The other exemption was given to Flat bags used as Garbage and hazardous (e.g. medical waste, chemicals etc.) waste liners

- i. Hazardous waste liners are exempted so long as they are legibly and permanently labeled (as indicated in 2 ii above) and color-coded and are incinerated together with the waste.
- ii. Garbage Liners are also exempted on condition that they are clearly labeled (as indicated in 2 ii above) and have demonstrated effective and efficient Extended Producer/User Responsibility and/or effective Take Back Schemes. The liners will NOT be dumped together with the waste but will be emptied and reused or recycled by the licensed waste collector and transporter (the end user).

A point to note is that, as in June 2020, a presidential directive banned visitors to carry plastic water bottles, cups, disposable plates, cutlery, or straws into protected areas in Kenya’s national parks, beaches, forests and conservation areas. With the ban, Kenya become one of the few countries to ban plastic bags globally acting as a benchmark to most countries in the world especially our neighbours in East Africa.

## Why the ban

The plastic had become an eye sore to the country through clogging of the sewerage lines, loss of aesthetic values and also a health issue. The problem is associated with a throw away culture of the Kenyans and poor solid waste collection, sorting and disposal systems.

Research by NEMA and United Nations Environment Programme (UNEP) had indicated that Kenyan supermarkets handed out approximately 100 million plastic bags annually that ended littering the environment before the ban.

Further research by NEMA in 2018 on prevalence of plastic bags in rumens of slaughtered livestock in Nairobi’s abattoirs found out that more than 50% of livestock have ingested plastic bags. As a result, these animals suffer from various conditions such as depression, being weak and bloating affecting milk and beef production. The researchers concluded that the ban on plastic bags should be upheld to safeguard livestock industry and environment.

The research has also shown that the same properties that make plastics so useful — their durability and resistance to degradation — also make them nearly impossible for nature to completely break down. Most plastic items never fully disappear; they just break down into smaller and smaller pieces that enter human body through inhalation and absorption and accumulate in organs such as the lungs, livers, spleens and kidneys however the full extent of the impact of this on human health is still unknown.



## Actions taken

The Authority (NEMA) has developed draft plastic management regulations that are intended to assist in implementation of the plastic bags ban. The regulations are awaiting gazettment by the Environment and Forestry Cabinet Secretary. The plastic bags management regulations seek to bring forth the Extended Producer Responsibility (EPR). Through this approach, producers will have financial and physical responsibility of their products especially paper bags and have a duty to ensure the bags they use are well disposed to ensure the environment remains clean. The regulations also define fines and penalties in line with the Environmental Management and Coordination Act (1999) as amended in 2015.

Kenya's heavy investment in both policies and law enforcement has enabled the country to win the fight against plastic pollution. As a result, Kenya is today regarded highly for its environmental stewardship in Africa and the world.

Since the commencement of enforcement on polythene bags and PET bottles, Kenya has witnessed increased investment in plastic recycling and several new players have come on board. The Authority has upscaled environmental awareness on plastic pollution together with our partners and we are proud of initiatives such as the FlipFlopi, Mr. Green Africa and Vints plastics that have demonstrated great achievements in recycling of plastics.

It's not just its fight against plastic that makes Kenya a green pioneer: the country was also an early adopter of the Green University Initiative. For over a decade, universities around the country have focused on greening their campuses, while enhancing student engagement and learning. Higher education offerings in environmental science, management and policy are also available at both public and private institutions.

The Authority has continued to create awareness on alternatives to plastic packaging to both the public in both local and international media. For instance, various exhibitions and campaigns have been held to educate the public on various available alternatives in the market. These alternatives include:

1. All bags made from non-plastic materials e.g. jute/sisal, Paper, cloth, Papyrus
2. Woven polypropylene plastic bags (gunny bags)
3. Non-woven polypropylene plastic bags (cloth-like bags)
4. Laminated polypropylene bags
5. Polyolefin fibre bags
6. 100% biodegradable bags (starch and cassava bags)

This has been achieved through various communication strategies that have been put in place concerning the plastic ban.

## Challenges for effective management of plastics

- The altitude of the citizen on waste management has been a major setback on management of waste. While most of the Kenyan has accepted the new norm of carrying their own packaging bags some of the citizens are still taking the plastic bags that are offered through the black markets hence facilitating their return to the environment
- The county is still in the process of implementing the sustainable solid waste management Act 2022 that caters for sorting waste at source hence allowing the different waste streams to be managed
- Most of take back schemes are yet to be effectively managed to accommodate all the plastic waste.



*Evacuation of plastic waste from River Ngong in Kibera by Mazingira Yetu Org*

By Dr. Catherine Mbaisi, Ag. Deputy Director Environmental Education and Awareness  
Ruth Nderitu – Principal Education for Sustainable development

# OVERVIEW OF THE CURRENT SOLID WASTE MANAGEMENT IN NAIROBI CITY COUNTY

By Patricia Akinyi K'Omudho  
Chief Environment Officer (MSWM-CE)

Plastic waste mound in Dandora dumpsite in Nairobi City County-Credit James Wakibia

## BACKGROUND

Nairobi County is heavily polluted with solid waste and an urgent intervention to address the menace is needed. We realize that since Nairobi City is a global environment capital, Kenya needs to demonstrate this leadership through proper waste management. It is inspiring when we have entities coming up with solutions rather than the usual complaints that may exacerbate the prevailing problems.

Supported by Japan International Cooperation Agency (JICA), Nairobi City formulated the Integrated Solid Waste Management Strategy 2011-2030 that captures 8 programmes:

1. Waste collection and transportation of segregated waste
2. Resource recovery
3. Sustainable final disposal through a sanitary engineered landfill
4. Organizational restructuring and human resource development
5. Legal and institutional reform
6. Financial management
7. Private sector involvement
8. Public Participation and Promotion

Due to a myriad of challenges, the Strategy was hardly implemented. However, one of the outputs is the NCCG Solid Waste Management Act, 2015 that provides a legal framework for solid waste management in the City. This function is spelt out in Part 2 of the Fourth Schedule of the Constitution of Kenya, 2010. The Solid Waste Management Act captures:

- Colour coding, waste categorization and segregation
- Resource recovery
- Revolving fund
- Duty of care to all waste generators
- Franchise system for a robust waste collection and transportation model
- Cleaner production
- Compliance and enforcement measures

Municipal solid waste is a by-product of our diverse day to day activities. Strictly speaking, we are all generators of waste. Waste Management is the responsibility of everyone (including but not limited to individuals, communities, businesses, industries, institutions and Government). For this reason, the Nairobi City County Solid Waste Management



Act cites Article 69 of the Constitution of Kenya; hence providing a framework to encourage public participation in the management, conservation and protection of the environment.

## STATUS

Currently, the daily waste generated in the City is about 3,086 tonnes. As much as the UN-Habitat Survey, 2019 revealed that the waste collection rate increased to 65% from about 60% as at JICA, 2010 survey; the City was still dirty. This necessitated the transition from the linear model to the circular model in waste management.

The city of Nairobi generates about 422 tons of plastic waste daily. 91% is collected and 9% is uncollected. Of the plastic waste collected, 49% is dumped at the final disposal site, 3% is sorted by formal sector for recovery and 28% is sorted by Informal sector. Indeed the informal sector is a major player in the circular economy. About 21% of plastic waste is leaked in environment daily due to in-efficiencies of collection and management.

*The table below highlights the extent of plastic waste mismanagement at various stages.*

Stage	%
Uncollected waste	42.43%
Informal sorting	26.60%
Waste collection service	24.22%
Designated disposal sites	4.63%
Waste transportation	1.14%
Informal value chain collection	0.89%
Formal sorting	0.07%

Through a circular economy model, we purpose to minimize cases of uncollected waste and maximise opportunities for formal sorting of waste.

The County waste management system is constrained and strategically requires the involvement of all waste generators to actualize separation of waste at source and separation at collection sites in order to reduce the waste taken to the final City dumpsite.

Nairobi City County Government seeks to appropriately

manage solid waste in the circular economy model. As the country transits from the linear model, Nairobi City County is the pilot in this process from which other counties will learn. In this respect, we are implementing the Sustainable Waste Management Action Plan. The purpose is to achieve a clean and healthy City, reduce cost of waste management and create jobs. The Action Plan captures six key components as listed below to be addressed in a multi-sectoral and multi-agency approach including all relevant stakeholders:

- Education and public awareness
- Introduction of waste separation at source
- Upgrading waste collection and transportation logistics
- Investing in waste recovery and final disposal
- Strengthening governance and finance
- Sustainable production for waste prevention

## CHALLENGES

**Inadequate data and information:** There is need for an accessible platform on actors in plastic waste, varieties of plastic that are recyclable and not as well as products made from plastic waste.

**Inadequate public awareness and sensitization:** There should be a continuous collaborative programme that should be included in the education curriculum.

**Inadequate legal framework:** There is need for National EPR regulations and City guidelines.

**Inadequate supporting infrastructure:** There is need for appropriate waste receptacles, MRFs and plastic waste processing facilities.

**Inadequate incentives:** There is need to harmonize waste handling legal requirements amongst lead agencies and provide green affordable authorization for sustainable plastic waste handlers.

## OPPORTUNITIES

### Supportive stakeholders

Adoption of a circular economy model in the City is timely with the new political dispensation that is passionate about making Nairobi work.

The National Government is ready to support this process now that the Sustainable Waste Management Policy and Act were recently published.

There is an increase in green funding opportunities for sustainable waste management initiatives.

Nairobi has a robust private sector that is zealous about circular economy. They have challenged NCCG as they take the lead.

There is a growing capacity building space allowing practitioners to be well informed and skilled.

### Existing legal framework

Nairobi City County Government (NCCG) has formulated a legal framework to enhance sustainable plastic waste management.



*The County waste management system is constrained and strategically requires the involvement of all waste generators ...*



bags and other plastic products so as to maintain and restore a clean environment in the County of Nairobi City and connected purposes. In fact, this was enhanced by the National Ban on manufacture, sale and use of plastic carrier bags and flat bags for domestic and commercial packaging in Kenya, 2017. Since then there has been tremendous improvement in the cleanliness of the City. Plastic packaging was



*Taka ni pato social unclogging a drain*

The Solid Waste Management Act, 2015 provides for the need to segregate waste streams; plastic included. This enables recovery of more valuable plastic for reuse. The Nairobi City County Plastic Control Act, 2016 provides for the control on the manufacture, usage and disposal of plastic carry

a major component of litter especially carrier bags.

Kenya has also recently, in 2019, adopted various standards for recycled plastic packaging materials with a view to not only protecting public safety and health but also to ensure environmental protection.

The use of plastic bottles, straws and related products in all

national parks, national reserves, conservation areas and any other

wildlife designated areas. Indeed, Nairobi hosts a number of these



conserved spaces. The ban took effect on the 4<sup>th</sup> of June 2020.

In 2018, Nairobi actively participated in the World Habitat Day that initiated the 'Waste-Wise-City' campaign. In that breath, Nairobi updated its municipal solid waste data base supported by UN-Habitat. The findings revealed that Nairobi experiences about 35% of uncollected municipal waste. This is the main source of marine pollution. Actually, over 80% of plastic marine waste is from land based sources. In Kenya this results in 4.5Kg per person annual

plastic leakage to water bodies exacerbating climate change effects as well as public health concerns. Nairobi County being a cosmopolitan city, definitely contributes largely to marine litter compared to other counties.

NCCG supports plastic waste recovery by authorizing eligible actors in the resource industry. They operate Material Recovery Facilities

(MRFs) from which plastic is the main waste stream recovered. The actors include private waste collection companies, Community Based Organizations (CBOs) and recycling companies. actors have MRFs.



enterprise employees  
age channel in Kibera



Up-cycling of plastic waste by Taka  
ni pato social enterprise

Led by the National Ministry of Environment and Forestry, Vintz Plastics- a recycling company and Nyayo Estate-residential establishment that has recovered 3.3 tons of plastics in the past 3 years were honored for their circularity in plastic waste management as the country



*... we need to  
explore options on  
sustainable plastic  
production because  
we may not be able  
to face out all plastic  
at once.*



transitions from the linear model of managing waste to the circular economy model.

NCCG has formulated a sustainable waste management action plan- the circular economy model. This will be supported by corresponding National legal framework to create a conducive environment to end plastic pollution. Already

the private sector has taken initiative in the Extended Producer Responsibility (EPR) component by establishing Producer Responsibility Organizations; mainly composed of plastic packaging dealers at the moment.

In light of the above, we need to explore options on sustainable plastic production because we may not be able to face out all plastic at once. Circular Economy is about smart product design to prevent waste production. This was timely for Nairobi City as we hosted UNEA5.2

*Youthful and innovative entities  
ready to offer solutions.*

*A circular economy model is  
an avenue for job creation and  
investment opportunities. There  
is an energetic populace that is  
passionate about tackling societal  
problems with modern technology.*

# The Unseen Bombshell: A Dive into Microplastic Pollution at The Kenyan Coast

Okuku Eric, Maureen Kombo, Catherine Mwalugha, Purity Chepkemboi, Mary Mbucho, Kenneth Otieno  
Kenya Marine and Fisheries Research Institute

Micro plastics sieved from water

## What are microplastics and why are they a concern

Contrary to popular opinion, microplastics (MPs) have been around since the late 1800s, when they were first discovered in soil samples. The exponential growth of plastic production has since caused the amounts of MPs particles in our environment to skyrocket.

Defined by the United Nations Environment Programme as tiny plastic pellets, fragments and fibres measuring less than 5 mm in size, MPs come from a multitude of sources; primary microplastics that are tiny particles designed for commercial use, such as toothpaste and cosmetics, as well as microfibers shed from clothing and other textiles, such as fishing nets whereas secondary microplastics are particles that result from the breakdown of larger plastic items, such as water bottles (Plate 1).

Their small size allows them to pass through water filtration systems, resulting in their dramatic increase in the oceans and lakes where they can devastate

organisms and local economies. Microplastics reach marine environments through a variety of pathways including wind, rivers, wastewater and stormwater (Plate 2).



Plate 1: Global % contribution of microplastics sources (Source Boucher and Friot, 2017)



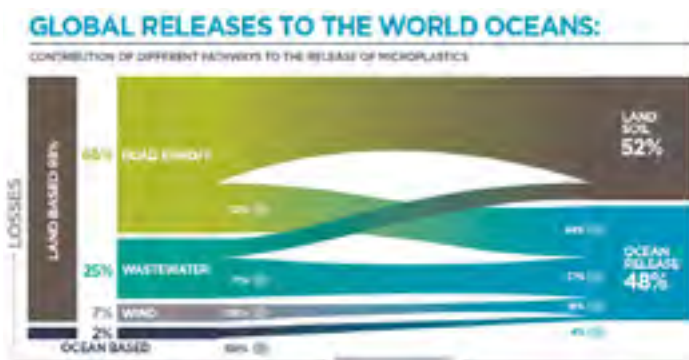


Plate 2: Global contribution of different microplastic pathways (Source Boucher and Friot, 2017)

Microplastics affect marine life in a variety of ways. They can be mistaken as food by unsuspecting organisms, leading to the ingestion of toxic substances and physical damage to the digestive tract of the animals as they are present in an array of colors and shapes and could potentially be mistaken as food sources. They also act as carriers of other contaminants, including microorganisms and substances, and can leach chemicals and other toxins into the food chain.

MPs can also be introduced into the food chain due to their prevalence in surface waters, where marine zooplankton, small, free-floating aquatic microorganisms, often spend most of their time when feeding.

Zooplankton are an essential food source for secondary consumers, such as fish and cetaceans, which can create a pathway for microplastics to enter the food chain, posing a danger to secondary producers, apex predators and potentially human health. In addition to direct impacts on marine life, microplastics can indirectly affect Kenya's economy. The presence of MP in fish can affect seafood safety and negatively impact those who rely on fishing as a source of livelihood and income.

### Where are they found in Kenya?

Microplastics are everywhere. Studies in Kenya have shown that over 90% of the microplastics present were fibres, with fragments and films making up the remaining 10%. suggesting high contamination of the ocean with these microplastics, likely arising from textiles, fishing nets used by local fishermen

and bleaching of colored plastics. Areas such as Mikindani and Nyali Bridge have been reported to have high concentrations of microplastics linked to increased amounts of solid waste from surrounding industrial and domestic sectors.

A recent study reported a concentration range of 0.02 to 2.04 items per cubic meter in 6 sites along the Kenyan Coast. The likely input is River Sabaki, which receives large amounts of packaging plastic waste from the Dandora dumpsite via the Nairobi River.

A study conducted in the Kenyan exclusive economic zone waters reported the presence of MP between 110 and 255 items per cubic meter mainly from land-based sources in Kilifi, Malindi, Ngomeni, and Kipini, as well as riverine input from Sabaki and Tana that emptied into the ocean. Furthermore, the study reported PP (polypropylene) as being the dominant polymer present. This could be explained by the fact that PP is commonly used to manufacture items such as food containers, plastic tableware, disposable cups,

plates and jugs, which are mainly used in urban centers and hotels adjacent that eventually reach the ocean where they are further broken down into MPs.

A more striking finding is the transboundary transportation of MP with a past study encountering MPs in Dabaso, a nature reserve located in Watamu Marine National Park at concentrations as high as those of creeks near Mombasa town despite the fact that this is a protected area with

limited human activity. The transboundary nature of MP results from their ability to travel great distances and highlights the need for global efforts to reduce plastic pollution.

The information currently available on MP is still scanty. Further research is still needed to gain a better understanding of their occurrence, distribution and their potential implications on the health of marine organisms and the environment as a whole.

## How do we deal with microplastic pollution?

There are two approaches to reducing the amount of microplastic in the environment. First, avoid having



offspring by eliminating the parents' approach. Avoiding, refusing and eliminating unnecessary, problematic and non-recyclable plastic packing will eliminate macro-plastics from the environment thereby reducing the chances of their degradation into microplastics. The second approach is a total ban on products with micro-bids.

To address issues of plastic pollution, Kenya recently launched National Marine Litter Management Action Plan 2022-2031 and National Strategy on Plastics and Microplastics in 2020 which outlines steps that must be taken to reduce the use of plastic and microplastics including developing a national policy and legal framework for plastic and microplastic management, promoting waste reduction and recycling initiatives, and enforcing existing regulations. Some of the key recommendations aligned to these steps for reducing microplastics in the environment include:

1. Reducing the use of single-use plastics and promoting the use of biodegradable packaging;
2. Implementing proper waste management;
3. Strictly enforcing laws prohibiting the dumping of plastics into the ocean;
4. Raising awareness on the dangers of plastics and microplastics and the importance of reducing or avoiding their use and
5. Collaboration between governments and other organizations to develop efficient and effective microplastic removal from waste and stormwater.

We hope these measures will help reduce the amounts of microplastics in the marine environment, aid in protecting Kenya's marine life and support the blue economy drive. Let's be the generation that takes a stand against microplastics and works to safeguard the ocean's diverse biological resources for long-term sustainability including supporting our planet's economy.

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# A Clean, Healthy Environment is Possible for all with Holistic, Inclusive Approaches to Address Plastic Pollution

## THE PROBLEM

**C**lose to 400 million tonnes of plastic are produced annually, and with the energy intensive processes required to extract and distil oil, the production of plastic generates enormous amounts of greenhouse gas (GHG) emissions, exacerbating the global climate crisis. Once produced, many plastics are never used again. Given the non-existent or weak infrastructure for managing plastic waste, inclusive, multistakeholder approaches must be taken to stem the flow of plastic pollution into our environment.

With the ongoing negotiations for a global plastics treaty and the growing knowledge base of harmful effects of micro- and nano-plastics, there is an urgent need to rethink design of materials, to measure plastic waste and pollution, and improve waste management. These must be combined with economic and regulatory approaches to produce real change in the fight for a clean, healthy, and biodiverse environment.



## MEASUREMENT OF PLASTIC POLLUTION TO IDENTIFY PROPER INTERVENTIONS

By using the UNEP/ IUCN National Guidance for Plastic Pollution Hotspotting and Shaping Action to measure plastic pollution hotspots, and linking the results to national action plans, improved policy, and economics, enabling environments are created to inspire action that will reduce, and possibly eliminate, plastic pollution.

The methodology allows national users to understand their plastic pollution leakage to the environment at five levels: polymer, application, sector, geographic, and waste management. Once measured, the tools assist users to determine their recommended actions, instruments, and interventions to be able to discuss the findings and recommendations with decision makers.

Linking measurement to policy and economic research as well as the treaty provisions that are being negotiated, others can replicate the model in preparation for implementing the treaty provisions once it has been agreed upon. IUCN's 2022 publication, "A solution package for plastic pollution – from measurement to action : insights from Eastern and Southern Africa, Southeast Asia, and the Mediterranean" provides a broad overview for countries new



to this approach. A tutorial and guidance videos on the methodology are also available.

## **INCLUSIVENESS AND JUST TRANSITION FOR ACTION**

The fundamental connections between the circular economy, plastic life-cycle and global efforts to address plastic pollution were affirmed by States and stakeholders throughout the INC-1 discussions as noted in the official report. A number of States and stakeholders expressly referenced the need to include just transition as part of the Plastic Pollution Treaty during INC-1.

In the plastics context, the transition away from plastic production as well as plastic-intensive industries and the informal sector can be seen as essential yet also carries with it the potential to cause unemployment and poverty. Just transition could offer a bridge through which to address the immediate issues of job loss as well as underlying socioeconomic barriers and achieve synergies with other treaty systems.

This should be done by including just transition terms in the core measures of the Plastic Pollution Treaty, the governance system adopted for the Treaty, and the amendments, annexes or protocols adopted depending on the structural choice made for the Treaty.

Alongside just and fair approaches noted above, economic research is another aspect where the impacts of plastic pollution in the Caribbean, Africa,

and Asia, are dire. The true costs of plastic pollution on communities, livelihoods, biodiversity, and the global ocean are explored, along with economic models such as Deposit Refund Schemes and their effectiveness. The economic sectors of fisheries and tourism were studied, using different lenses to examine how plastic pollution causes detrimental economic impacts at national and local levels. Each assessment differs and explores wide-ranging economic dimensions that should be considered when creating a national plan of action to mitigate marine litter and plastic pollution in the environment.

From impacts upon export revenue, employment and food security, to the economic efficiency of beach cleaning in conjunction with deposit refund schemes, and the impact of ghost gear on fisheries, these four case studies take a reader into the true costs of plastic pollution on our global ocean and coastal communities.

## **BUSINESS PLANS TO MOVE TOWARD A CIRCULAR ECONOMY**

The generation of innovative solutions as outlined in a set of business plans are a means to inspire change for addressing the plastic pollution crisis. These solutions are free to use and share. The business plans are available to encourage entrepreneurs and small and medium enterprises working toward circular economic solutions.

These plans are centred around products made from recycled plastic that have been locally sourced and locally produced. From the segregation at source and the collection of the materials to the market analysis, these business plans cover the end-to-end process of plastic waste. This includes product concepts; user scenarios; unique selling points showing competitor differentiation; and how the collection, sorting, selection and machinery should work.

## **HOW CAN THE GLOBAL SOUTH CAN POSITION ITSELF TO CONTRIBUTE TO AND BENEFIT FROM THE GLOBAL PLASTICS TREATY?**

The upcoming rounds of international negotiations for the creation of the Global Plastics Treaty will have to strike a balance between an effective legal,



regulatory, and scientific agreement for tackling plastics pollution and ensuring political support and significant participation by all States and sectors. To implement the treaty, a design process will be required where parties put forward national action plans to address the regional and global requirements, combined with robust reporting and international legal oversight and accountability mechanisms. Internal national capacity is needed for this work in many countries. Effective participation in the dialogue for a Global Plastics Treaty is needed especially by SIDS and LDCs.

Inclusive design and implementation of national action plans requires broad, public participation, public access to information, and cooperation at all levels. The ability to entrench these national action plans in the legal and policy systems of a State is critical for their success. Additionally, Trade Systems will be a key to delivering solutions to this problem. Capacity building to monitor trade in plastics and polymers and to understand material flows will be required for an effective Global Plastics Treaty.

The rapid speed at which the planned Treaty is to be negotiated means that countries will have less time to devote to preparing their contributions to the negotiation process. For many LDCs and SIDS with small negotiating teams, working on several multilateral agreements, the preparations for the negotiation process can be a challenge.

Building upon work since 2014 in Asia, the Caribbean, Eastern and Southern Africa, the Mediterranean, and the Pacific, IUCN has just begun a new project in West Africa, with GRID-Arendal, to strengthen the capacities of key stakeholders at different levels of governance and improve collaboration amongst key national ministries for active engagement to ensure their views are considered for the global plastics treaty negotiations. IUCN is engaging with Cabo Verde, Guinea Bissau, Sao Tome and Principe, Senegal, and Sierra Leone for this project, funded by Norad. Additional observer countries from Africa and potentially other regions will be included to participate in virtual events over the next two years where project materials are relevant to a broader group of

stakeholders. Part of this strengthening comes in the form of a series of Briefings for Negotiators, prepared by the IUCN World Commission on Environmental Law, and available freely on our website.

Countries will also need to have the capacity to ensure the treaty obligations they agree to can be implemented. The complexity of the plastics life cycle results in many countries requiring support to formulate the requisite tools from a legal, regulatory, and technical perspective. To ensure that the future global plastics treaty delivers on its goals, national capacity building on the tools and designing effective interventions will be required to implement policies (including trade policies) that address plastic pollution. In doing so, the proposed capacity building would contribute to national planning and reporting mechanisms required under a future Global Plastics Treaty, similar to those for existing multilateral environmental agreements (e.g., Nairobi Convention, BRS Conventions, Minamata Convention, and the Convention on Biological Diversity and the UN Framework Convention on Climate Change).

The second session of the Intergovernmental Negotiating Committee (INC) to develop an international legally binding instrument on plastic pollution, including in the marine environment will take place from 29 May to 2 June 2023 at the United Nations Educational, Scientific and Cultural Organization (UNESCO) Headquarters in Paris, France. The meeting will be preceded by regional consultations on 28 May 2023, at the same venue. Registration for INC-2 is now open. The deadline for registration is 28 April 2023. Practical information regarding the meeting and the venue is available in the Information Note for Participants (23 February 2023).

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### For more information

[Plastics@iucn.org](mailto:Plastics@iucn.org)

<https://www.iucn.org/search?key=plastics>

<https://www.iucn.org/our-union/commissions/world-commission-environmental-law>

<https://www.unep.org/events/conference/second-session-intergovernmental-negotiating-committee-develop-international>

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By Ms) Lynn Sorrentino (she/her)  
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Action International Union for Conservation of Nature



# WHY WASTE RECYCLING IN AFRICA IS ESSENTIAL FOR THE WORLD

The globe generates slightly over 2 billion tonnes of solid waste every year, and of this amount, only about 19% of this waste is recycled. In the critical plastic waste area, which was the subject of a groundbreaking global resolution to end plastic pollution at UNEA5.2, the globe recycles less than 10% of over 242 million tonnes of plastic generated yearly. These low levels of recycling are reflected in Africa as well. Of the 125 million tonnes of solid waste generated annually, 70–80% is recyclable. However, the continent recycles only 4% of this total waste and fewer plastics. Africa generates just about a 16million tonnes of plastic waste annually, which is only 6% of plastic waste generated globally. Therefore, there is an urgent need for Africa and the entire globe to shift towards circularity in the waste sector.

## What are the biggest challenges of recycling in Africa?

We need to begin by acknowledging what the region has done correctly and then build on that to identify the gaps that need to be addressed. What Africa has done quite well is on the legislative front. Over 34 African countries, representing over 60% of the continent, have crucial legislation on

waste management, which is the framework for recycling. However, the continent continues to grapple with waste management issues because of the failure to prioritise two contextual issues in the waste landscape.

**First is a lack of incentives for a critical constituency of the continent's waste management supply chain – the informal waste pickers.**

“

*Of the 125 million tonnes of solid waste generated annually, 70–80% is recyclable.*

”

Informal pickers collect a majority of the continent's recyclable waste. In some cities, they collect up to 90% of recyclables. On average, waste pickers deal with between 20% and 50% of the generated waste by collecting, sorting, and selling discarded materials. However, there are no targeted incentives to enhance the contribution of these informal pickers. Instead, they face social stigma, abuse from municipal & security officials, and other disincentives that prevent them from getting their livelihoods. What needs to happen is for such informal pickers to form themselves into formally recognised groups such as communal cooperatives, self-help groups, and



community-based organisations. So they can operate their informal businesses within formally recognised structures that enable them to make their voices heard in terms of specific incentives they will need to further expand their services to the continent's waste management landscape.

### The second is a recycling narrative that does not reflect Africa's waste composition.

While plastic waste constitutes only 13% of solid waste generated in Africa, up to 57% is organic. Recycling organic waste, therefore, offers more advantages for Africa. It is less capital-intensive than plastics, making it more accessible to most continents. It also has the potential for wider-ranging impacts beyond waste. For example, recovering agricultural waste to fuel briquettes or biogas creates clean cooking alternatives for charcoal use, a \$20 billion annual industry. This alternative then minimises pressure in forests, which contributes over 50% of Africa's emissions and health, by minimising indoor pollution, which causes up to 700,000 deaths yearly. Young people across Africa provide a formidable force to be leveraged in recycling organic waste to domestic clean cooking energy, for example, a \$20 billion-a-year enterprise opportunity. But they must inspire themselves to seize such opportunities.

### Why recycling is essential for the African continent and the world

The socio-economic and environmental opportunities that recycling presents for Africa are impossible to ignore.

On the socio-economic front, the informal sector has low-hanging fruits – especially the youth stand to benefit by recycling organic waste, the most prevalent in Africa. Up to \$20 billion in market opportunities stand to be tapped if our young people can retool their skills in the non-capital-intensive area of waste recovery to clean cooking. The building construction area, which is growing, is another that young people can tap into by investing in plastic waste recycling into paving tiles.

But beyond the informal sector, formal plastic recycling is also an area Africa can tap into, as shown by 2 of Africa's largest economies – Nigeria & South Africa. In Nigeria, for example, an additional \$250 million can be added to the economy every year with increased investments in plastic recycling. In South Africa, plastic recycling has created over 4000 direct jobs and over 30,000 indirect jobs, directly adding over \$16 million into people's pockets through the payroll.

Environmentally, projections show that under the status quo, meeting global developmental needs will require a 200% increase in natural resource extraction by 2050. This is happening in a globe where humanity is already overdrawing by 1.6 times the services nature can provide sustainably to guarantee human development well into the future. This calls for recycling to minimise the extraction of resources. For Africa, which experiences the second-highest level of losses from environmental degradation with over \$60 billion of its ecological resources lost every year, including through mining, logging etc., for resources that power global development, increased recycling to minimise extortion of new resources for every production cycle is very critical.

Low recycling levels mean the globe loses over \$120 billion each year in recycling opportunities that could otherwise be invested to enhance the continent's recycling, including through partnerships as provided under Article 6.2 of the Paris Agreement.

Up to \$20 billion in market opportunities stand to be tapped if our young people can retool their skills in the non-capital-intensive area of waste recovery to clean cooking.



#### Dr. Richard Munang

Deputy Director, UN Environment Programme, Africa Office | Sustainability Expert | Creative Leadership | Keynote Speaker | Multi-Award Winner





# IS RECYCLING THE ANSWER?

It is estimated that the world produced over 400 million tonnes\* of new plastic in 2021. The waste that comes from such material is particularly troublesome as plastic takes over 250 years to disintegrate. Meanwhile, this waste chokes up waterways, contaminates the soil with chemicals and eventually ends up in human foods leading to diseases. Which begs the question, why is the world producing so much plastic if it is so problematic?

The ills that come with plastic waste cannot be understated, but the benefits of using plastic can also not be overlooked. Plastic has been instrumental in the packaging of goods and the construction of electronics that have revolutionized communication and the medical field, thereby impacting billions of lives.

A blanket ban on the use of plastic products would not only be impractical but also would

have profound effects for the livelihoods of many families. It is for this reason that we need to find a compromise, between reaping the benefits of plastic and the waste that comes from this plastic, and this compromise is recycling.

Recycling can simply be defined as the process of converting what has been considered waste into new material that is once again reusable.

Locally, about 3,000 tonnes of

waste is produced in Nairobi daily, over 15% of this waste is estimated to be plastic and only 8%\*\* of this plastic is directed for recycling. Why? Is it because recycling doesn't work? If we are converting waste into reusable material, then why wouldn't it work? Shouldn't it be the magic bullet that solves the plastic waste problem?

It is important to understand how plastic is recycled locally to be able to delve into this issue. Most bulk recyclers such as TakaTaka Solutions are currently sorting the plastic into their basic components e.g. PET, PP and HDPE, having them crushed, shredded, and washed to produce flakes and pellets which are sold to manufacturers as raw material to make new plastic products.

Other recyclers have come up with methods to melt and mold several



types of plastic together to form art pieces, fencing poles, or even bricks used to build roads and houses. Both processes entail a laborious amount of time, energy and use of modern machinery, which all translate to hefty investments.

For pellet producers, it is imperative that their recycled plastic must find a ready market from off-takers or manufacturers, who instinctively are keen on keeping their costs low and using only quality raw material.

Such manufacturers in the past have shied away from using recycled plastic pellets, as they have been wary of the quality in terms of size, color and contamination of the pellets. All factors that can severely compromise their machinery and the quality of their end product.

Even though recyclers have made efforts to put expertise, machinery and processes in place to guarantee their quality, there still seems to be a disconnect between them and manufacturers on standardized qualities of the pellets, thereby hindering to some



extent, the uptake of recycled pellets and in turn recycling of plastic in general.

A concerted effort is needed to align manufacturers and recyclers to smoothen uptake of recycled pellets, which will have a big effect on increasing the life cycle of plastics.

With a ready market for recycled plastic, other challenges in the value chain would also be easier to address, as a viable circular economy will see waste pickers & aggregators get an income when collecting waste for recyclers, while government and policymakers will be keen to ensure sustainability for the good of the environment

and the people they serve.

Overall there has been a growing number of proponents who have shown faith that recycling works, with multinationals and even local manufacturers, taking steps to make it easier to recycle their plastic products. Such initiatives include using packaging that is easily recyclable, deploying public take-back systems and funding recyclers through Producer Responsibility Organisations.

Tackling the plastic waste menace requires a multi-prong approach, including setting up environmental policies and laws, product re-engineering, public education and importantly, recycling. Each approach has its unique role to play and is interdependent on the other.

**Brian Sagala**  
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TakaTaka Solutions  
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***When and how did you nurture and develop interest in entrepreneurship and manufacturing?***

By studying the environment and noting local issues, I realised the importance of manufacturing in a country like Kenya where the manufacturing sector is still barely there. I have also endeavoured to venture into business where I can produce products that are sustainable yet helpful to consumers. Manufacturing in Kenya is a necessity given the growing demand of goods within the country. There is also a growing need for sustainably produced goods.

I have always been a fan of entrepreneurship because there are no limits to what one can do. I believe we should all live like that, because truly the sky is not the only limit.

***What inspired you to start VINTZ PLASTICS?***

I have always been passionate about bringing change to the society and protection of the environment has been my key focus area to create this change.

The issue of plastic pollution is unmissable in Kenya as plastic in landfills and rivers leech into the environment whilst releasing dangerous chemicals. Thus, my aim was to come up with a



*I have always been passionate about bringing change to the society*



workable solution to plastic recycling that increased the shelf life of plastics thus preventing leaching of chemicals into the environment.

But Vintz doesn't just stop here. There are more plans in the works that I aim to pursue in the future. One such plan is creating sustainable housing and construction materials from recyclable and hard to recycle .

***How do you source your plastic waste and what type of plastics do you recycle?***

Majority of our plastic waste comes from Nairobi, Nakuru, Mombasa, and Kisumu landfills where waste pickers collect and sort and we pay for it , they drop or we collect with our vehicles to our factories. We recycle all seven types of plastics.



***Is Post-Consumer recycled plastics as good as virgin plastics?***

The post-consumer plastics have an extended lifespan which is safe to use much like virgin plastics for non food grade items and it has to be processed well. These plastics have similar quality to the virgin plastics, however, they do include added materials in them.

***Very many waste pickers are stuck with PETE, LDPE and PP types of plastics because recyclers seem to prefer LDPE plastics. What could be the cause of this preference?***



*Roof truss made out of waste plastic*

LDPE is more flexible when converted and local manufacturers have demand and make alternative products which are safer, PETE processing is very costly capex and hence low demand for recyclers to collect and make new products same as PP which has fewer options.

***You are known for championing blue collar jobs among the youths. How does this concept work in the plastic waste value chain within VINTZ PLASTICS?***

Vintz Plastics provides value for delivering plastic waste materials to the Vintz factory. We provide support of knowledge , innovation and products that can be used as instruments of trade to add in to the value chain.

***What are some of the products that VINTZ PLASTICS manufactures out of recycled plastics?***

We produce plastic basins,egg trays,plates, Jerry cans, hangers and many more. These materials are key essentials for locals in Kenya. Thus, the recycling of these constantly used goods can help reduce the level of plastics present within the environment.

However, we are also pursuing new projects to create new materials that can revolutionise the housing industry. Our new project entails creating construction materials from recycled plastic.

***Creativity is your third name. Kindly tell us more about ICREATE MAKERSPACES LTD.***

iCreate Makerspaces Ltd is a place where we aim to teach young minds on ways they can leverage innovation to create a better world for the future generations. The whole aim of this is to foster creativity and innovation in the youth and promote growth of the community through unique ideas and pursuits.

***How do you think the sustainable waste management act 2022 will help address the solid waste management challenge in Kenya?***

The law can assist and with the support from all apart from government accelerate catalyst play in management of waste

***What can individuals, self help and community based organisations do to partner with VITZ PLASTICS?***



*Vintz limited employees*

Individuals and community based organisations can partner with Vintz Plastics by collecting plastic waste in their communal areas and delivering these to the Vintz Plastics factory. Learn and be part of the change to create wealth from waste.

### *Can we recycle our way out of the plastic problem?*

Yes we can a lot of resources are needed and behaviour changes from individuals, Owning up the waste and assisting the waste management actors by supporting better waste management solutions at household levels.



*Plastic chips from recycled plastics*



*Vintz limited employees preparing waste PETE bottles for recycling*

### *Where do plastic recyclers fit in the Extended Producer Responsibility scheme?*

They play a very important role with waste pickers and the more resources available to both waste will start reducing or atleast stopped from growing more and dumped to landfills in a disorganised manner. Which will have a chain reaction in solution to pollution in air, sea and land.

Plastic recyclers will often produce plastic from old plastic materials which means they are reducing new plastics to the market.

### *Can Kenya achieve the success of Scandinavian countries of ensuring there's zero plastic leakage to the environment?*

Kenya still has a long way to go in terms of preventing plastic leakage into the environment. One of the main reasons is because of a lack of knowledge of the effects of plastic pollution. Governments also tend to ignore the need for stronger measures to control plastic pollution in the society.

#### *Parting shot*

Waste is part of growth, managing it well is going to nourish a better world for us and future generations and ecosystem in whole.





# Closing The Loop on Waste Plastics Through Heritage Boatbuilding:

why it's possible and critical to bring even the most remote communities into a circular economy

The Flipflopi Dhow docked in Lamu port

Is plastic pollution a losing battle? The annual mass of plastic production and mismanaged waste is projected to more than double by 2050. And a report released in February 2023 reveals that the world is currently producing a record amount of single-use plastic waste (1) despite global efforts to reduce plastic pollution and carbon emissions.

So, while it can certainly feel that way, at Flipflopi, our ethos is guided by a 'stubborn optimism', a phrase we borrowed from Christiana Figueres, who was instrumental in the historic Paris agreement negotiations in 2015. That means we are driven to search for positive solutions that will help us move towards a world without single use plastic (SUPs), and to find ways to make all other plastic part of a functioning circular economy in the meantime.

## The Flipflopi – a positive East African solution to the plastic problem

This was why The Flipflopi boat was originally built over 5 years ago – a dream to show the world that plastic is too valuable to be wasted by building a traditional sailing dhow entirely out of plastic waste picked up from towns and beaches in Kenya. A positive campaign that has sailed from coast to coast, spreading awareness and changing mindsets about plastic along the way.

A recent study by Lau et al. 2020 (2) established that 78% of the plastic pollution problem could be solved by 2040 but only if all the possible reduction pathways are followed: that means reducing consumption, increasing reuse, waste collection and recycling, and accelerating innovation in the plastic value chain.

## Bringing remote island communities into a circular economy

Tackling plastic pollution from all these fronts is what led us to setting up the first-of-its-kind material recovery and recycling centre for Lamu County, home to 50% of Kenya's coastline, yet where there is inadequate waste management infrastructure for the 140,000 living around the archipelago. We have been working with multiple island communities to collect plastic and create a new economy for the region from waste plastics, engineering marketable products from waste, including traditional furniture and of course, new artisanal plastic sailing boats. Our aim: to prove that it is necessary and possible to bring even the most remote communities into a circular economy and have a positive social as well as environmental impact.

Results from the Flipflop's initial pilot phase have shown it is possible to collect approximately 15 tonnes of recyclable plastic each month collected from the towns and beaches here, with a total of 97,000 kgs collected in just 7 months.

The Lamu archipelago is a set of islands, with many remote areas, where transportation of plastics remains a significant challenge due to distance and poor mobile network. Despite that, the programme has begun to incentivise communities, overcoming some of the logistical challenges of moving plastics by boat from remote areas, and within months, injected ~1.6million KSH cash into the community which is starting to inspire a "waste is wealth" mantra. The centre now also employs 14 people full-time with ongoing plans for recruitment.

We have found that a significant percentage of the plastics collected are recyclable, and affordable products can be made for the local market once the infrastructure is available and a functioning network of community-based waste management schemes is centralized and sustained.

## Closing the loop on waste plastics through heritage boatbuilding

The plastic collected is sorted, shredded and used as "feedstock" at the Flipflop's recycling centre, where



it's made into plastic lumber, which is being used to manufacture a variety of different products including benches, hand carts, traditional Lamu furniture and artisanal boats.. Already we have captured the attention of the hospitality and waste management industry looking for alternatives to wood-based lumber for various applications including for construction and furniture; the 'plastic wood' market is gathering momentum.

Retaining the traditional knowledge systems and cultural heritage of furniture and boatbuilding is a central element of the centre's design. In fact, a heritage boatbuilding training centre is coupled to the recycling centre, where Flipflop's are passing on the practical skills of heritage boat building and plastic recycling to the next generation of fundi here.

The programme so far has proven that it is possible, albeit challenging, to bring previously excluded communities like Lamu into a functioning circular economy. Despite an overwhelming amount of litter in the towns, beaches, mangroves and the oceans, we are finding possibilities to handle some of it, and starting to develop a new industry from post-consumer plastics.





Preparing the Flipflop dhow for sailing

## The challenges of plastic recycling

Of course, we still face complex challenges. Collections in some of the remote islands are still rare given the logistical challenges, and continual community engagement a top priority. There are multiple issues that are impacting the efficiency of the process: from contaminated plastics, to a lack of identifiable plastic 'type' due to poor labelling or a breakdown of macroplastics, it is a labour-intensive and imperfect process to sort and process the plastics that are collected.

Also, despite our national law that prohibits single use plastics including bottles on beaches, forests and heritage sites (many parts of Lamu fall into all of these categories), PET bottles are ubiquitous. Over a third of the plastics collected are PET which cannot be recycled on-site. We have been trialling the transfer of PET to recyclers away from Lamu, in efforts to reduce the massive build up here: to date we have prevented over 600,000 bottles ending up in landfills, being burnt or leaching into the ocean. As we all work to reduce consumption and find realistic affordable alternatives, we can't just ignore the pollutants and so far, the only solution is to collect them for recycling.

And finally, where we have found a solution for some types of plastic (HDPE, LDPE, PP) it is currently not possible to recycle all types (ABS, PVC, PS) at the centre: for this, the work continues in earnest.

## Recycling alone is not the solution

The biggest challenge? How can we couple reusing and recycling strategies to improve plastic waste reduction and change consumption habits. Because even here, we have shown that only the "better plastics" can really be used effectively in this model. What about all the plastics that cannot be recycled, and all those that are designed to be used once before being thrown away? It is critical to follow an

integrated approach – that means focussing on a total elimination of all unnecessary single-use plastics through enforced legislation, governments taking proper action to support adequate waste management and infrastructures, and continuous community engagement to change behaviours around plastic consumption. We recognise that all of these components are critical to making a difference to this catastrophic problem.

(1) The second Plastic Waste Makers Index, compiled by the philanthropic Minderoo Foundation, found the world generated 139 million metric tons of single-use plastic waste in 2021, which was 6 million metric tons more than in 2019, when the first index was released.

(2) Lau et al. 2020, Vol 369, Issue 6510, pp 1455–1461: Evaluating scenarios toward zero plastic pollution <https://www.science.org/doi/10.1126/science.aba9475>

By Rebecca Faber  
Head of Communications,  
The Flipflop Project.



# EcoWorld Recycling – Growing the Plastics Circular Economy at The Kenyan Coast

Every year an estimated 12 million metric tons of plastic waste enters our oceans.

Worldwide we use 1.4 billion plastic bottles every single day.

In Kenya, we recycle less than 10% of the total plastic waste generated.

Kenya's end-of-life plastics waste problem causes land and marine pollution, and the loss of valuable economic opportunities.

In Watamu, in Kilifi County, we have created a local solution to the global problem of marine plastic litter and plastic waste disposal.

At EcoWorld Recycling, our mission is to formalise a waste collector sector of women and youth to power the plastics circular economy at the Kenya coast, bringing social, economic and environmental benefits. Creating dynamic plastic waste value chains will uplift the quality of people's lives and help protect our coastal environment.

EcoWorld is a social enterprise operating since 2015, and was created to reduce local poverty and combat marine litter pollution, by creating jobs and incomes for disadvantaged women and youth groups in the Watamu community. This has been achieved through setting up plastic waste collection enterprises and establishing a Material Recovery Facility, which operates plastic processing machinery.

## Contributing to the plastics circular economy

The first EcoWorld initiative, was creating dynamic partnerships between the hotels industry and local women and youth groups, who provide an environmental service by cleaning beaches, and recycling both the beach and the hotels plastic waste.

EcoWorld then went on to set up recyclable waste collection service agreements with hotels and private households. This service also recycles glass and metal waste.



*our mission is to formalise a waste collector sector of women and youth to power the plastics circular economy at the Kenya coast, bringing social, economic and environmental benefits.*

A big boost to operational growth came in 2019, when EcoWorld received grant support from the IUCN Marplasticcs Project, which enabled the procurement of a waste collection vehicle and more recycling machinery.

In 2020, in an effort to increase plastic collection and expand operations, EcoWorld introduced a plastic Buy-Back scheme, whereby women, youth and other community groups collect plastic waste, and are paid per kilogram. This initiative collects the biggest volume of waste plastic for recycling, as the financial incentive encourages and mobilizes

Mombasa Marine National Park. These large bottle-shaped containers are for public use, and situated in busy areas where there is a lot of pedestrian traffic, and with easy parking space for people to drop off their plastic. This initiative was sponsored and supported by PETCO and KAM, and in line with national Extended Producer Responsibility commitments and goals.

In 2021, EcoWorld received further grant support from The Coca-Cola Foundation, which has enabled the enterprise to invest in more plastic crushing and processing machinery, and to expand

operations. Additionally, the grant is providing our registered waste collectors with Personal Protective Equipment (PPE) such as overalls, gloves and boots.

With 'proof of concept' secured from our established and on-going waste collection and processing operations in Kilifi County (currently handling up to 20 tonnes of plastic per month), EcoWorld is ready to scale up operations, by establishing plastics buy-back centres county-wide and expand capacity for processing PET plastic. This will generate sufficient feedstock supply to grow the circular economy, and in 2023, we plan to expand operations to Mombasa, and open up much larger circular plastic industry markets. We aim



*Eco-world recycling employees sorting plastic waste*

the groups to join the scheme, which is designed to be a sustainable and long-term recycling solution. Currently, more than 500 women and youth in Kilifi County are enrolled, and receiving a regular income from this growing scheme.

The next step was to target the general public, and EcoWorld installed plastic waste containers (bottle banks) in Malindi, Watamu, and Kilifi towns, and



*Plastic chips from waste plastic*



to target the ever increasing volume of PET waste impacting the environment, and to divert it from landfill, to bring considerable additional value to the plastic circular economy. Ecoworld is targeting 50 metric tonnes of PET per month (600 tonnes per year). This is in addition to HDPE, PP, LDPE and other plastics which are being collected for recycling.

At EcoWorld, plastics are already being re-purposed and upcycled to manufacture novel products of value, with plans in progress to manufacture plastic materials such as bricks, cabro, and tiles, for buildings construction. We are currently collaborating with Delft University in Holland, testing product design for inter-locking plastic bricks.

At EcoWorld, we believe teamwork gets the best results. Over the years we have developed impactful waste management partnerships with the government agencies NEMA, KWS, and KMA, and with other social enterprises, including current partner Kwale Recycling Centre.

With our partners, we aim to collaborate on SME building, training, marketing, advocacy and awareness raising, to promote the untapped potential for entrepreneurship and skills development for the plastic waste management sector within the coastal region.

These collaborations have high potential for business-to-business transactions, contributing to a circular economy, greater resource efficiency and climate mitigation, and potential to offer relief to economic challenges, particularly for women and youth.

### EcoWorld Impacts have:

- Increased Kenya's plastic recycling rate, and especially for PET.
- Raised the value of PET plastic, and established sustainable supply chains for PET plastic waste.
- Developed markets for processed plastic and expansion into new markets.
- Expanded public waste collection services for recyclables.
- Created new employment and income

opportunities for plastic waste collectors and recyclers.

- Boosted women and youth empowerment in the waste management sector.
- Reduced the harmful impacts of plastic litter on the environment and tourism industry.
- Increased awareness and adoption of plastics circular economy concepts and best practices in coastal towns and cities.

All EcoWorld recycling revenue streams are invested to expand plastic recycling capacity and to support community based circular economy initiatives and enterprises.



*Pauline Mwaura of Coastal Bottlers during the launch of the Empowering Women and Youth for the Plastic Circular economy project supported by the Coca-Cola Foundation (2022)*

The EcoWorld model and approach has created multiple win-win initiatives, which is boosting the growth of the plastics circular economy at the coast, and as our slogan says, is "Turning Trash into Cash"

Welcome to EcoWorld!

**By Steve Trott**  
Director – Eco World Recycling

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# SMART SOLUTIONS FOR SUSTAINABLE SOLID WASTE MANAGEMENT



Baus Taka enterprise team and plastic collection centres

The management of solid waste is a significant concern in Mombasa; a small and densely populated island in Coastal Kenya. The second largest city in Kenya produces about 900 tons of municipal solid waste per day, with 81 tons being plastic waste according to a UN Habitat Waste Wise Cities Report of 2020. Nearly half of this waste (44%) is uncollected and is left to pollute both land and the ocean while only . Plastic waste, one of the most problematic materials of our generation takes hundreds of years to degrade causing entanglement, ingestion and death to marine biodiversity which also reduces the oceans ability to act as a climate regulator.

Except for a few affluent households that access efficient private waste management services, the majority are forced to dispose of their municipal waste on roadsides, open spaces and even directly into the ocean in the absence of a reliable service by the constitutionally mandated county government. Even for the households that enjoy waste services,

the challenge of sustainable waste management is exacerbated by the fact that all households mix all types of waste together, including plastic waste. This habit renders a lot of valuable recyclable material worthless or expensive to collect and valorize in a bid to minimize the volumes that end up in the dumpsite.

Out of necessity and smarting from a near death road crush ostensibly due to illegal trash dumped on the road, Dr. Tayba Hatimy rose to the occasion to provide a lasting cure to the waste menace in Mombasa. A dentist by profession, Dr, Tayba or fondly known as 'Miss Baus' founded Baus Taka Enterprise (BTE); a smart digital system that guarantees high-quality and sustainable waste management solutions for residential, commercial, and corporate clients in Mombasa County. The system that revolves around the Baus Taka application was launched in November 2021; is the first of its kind in Kenya and utilizes technology to offer a variety of innovative services to households/businesses, waste collectors, and the county government.



One of the major advantages of Baus Taka App that leverages on cutting edge technology is that it provides real-time data to optimize resource allocation, decrease expenses, enhance sustainability, and support stakeholders make more informed business decisions. This innovative data driven approach towards tackling the challenge of waste management help in reducing carbon emissions, create decent jobs and most importantly allow participation of women and girls who were previously excluded from the waste management sector due to the safety risks that abound in the sector.

The app encourages segregation of waste at source and allows booking of waste collection on-the-go, plastic and other recyclables trading, Geographical Positioning System (GPS) functionality for logistics, onboarding of community-based organizations, self-help groups, and associations, reporting of illegal dumpsites, and redeemable points for outpatient health services in partner clinics. BTE has launched plastic waste collection centers in Ndia Kuu and Old Town, with plans for more, and aims to process waste into eco-friendly products such as plastic paver blocks.

Additionally, the app is able to analyze data on amount of waste generated, collected and processed; a feat that will ultimately improve recycling rates not only for plastics but also for other recyclable materials.

Furthermore, BTE leverages on technology to engage with local communities to increase awareness and participation in responsible waste management practices, including segregation, recycling and trading as well as highlighting the opportunities that lie in waste management and how one can generate income through plastics trading. The team at BTE educate residential homes, schools, higher education institutions and informal waste managers, as well as raise awareness of waste separation at source through partnerships with organizations such as Pwani Circular Economy Association; an umbrella organization championing the welfare and empowerment of waste managers in coastal Kenya.

Entry of Baus Taka into the waste management scene in Mombasa breathed fresh air into the complex and often male-dominated field. For the founder, there is not stopping. She has already set her eyes on a bigger bolder vision that seeks to constantly inject fresher and innovative solution to heal the sector and positively impact her community, specifically women and girls.

"We can't keep pretending that waste is just a burden to be managed. It's a valuable resource that, when harnessed properly, can create jobs, protect the environment and empower communities. Our mission at Baus Taka is to not just manage waste, but to be a catalyst for change and a shining hope of women and girl empowerment through leveraging on technology." – Dr. Tayba Hatimy, co-founder, Baus Taka Enterprises



**BAUS TAKA**  
MOBILE APP

*Enhancing Zero Waste Communities*

Features Include:

- ✓ Book waste collection services on the go
- ✓ Plastic segregation and trading
- ✓ Redeemable Recycle Points
- ✓ USSD Code for informal waste managers/pickers
- ✓ Waste Data Collection

GET IT ON Google Play

Download on the App Store

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www.baustaka.co.ke

By Dr. Tayba Hatimy,  
Co-founder, Baus Taka  
Enterprises

# GREEN COLLARED GOALS

Following in the footsteps of Sustainability, Grace & Gurmeet (Sonia) join the eco-entrepreneurs in Glass Upcycling and Environmental Impact, changing their city for the better by creating products for Kenya and the world.



**A**lmost a decade ago we founded ONISA Designs – a creative design and lifestyle company based in Nairobi, Kenya and subsequently came KIJANI GLASS.

KIJANI GLASS forms the upcycling wing of ONISA Designs, shining light on the possibilities of second chances, with KIJANI Glass we took upcycling into mainstream capitalism by transforming post-consumer glass bottles into glassware and other functional lifestyle products defined as three in one, Iconic, Functional and Purposeful. We have designed a range of products such as lighting, tableware and accessories under the KIJANI brand. Our goal is to leave a Magnus Opus Legacy.

The do WARRIORS – upcycling for environment and society, is an initiative inspired by our very own team to get things done, this initiative has been instrumental in the trailblazing dedication of cleaning up the dirty business of bottles, we

rescue and refresh gin, liquor, whiskey, wine and vodka bottles from local bars and restaurants. With the future in focus as well as the universal call to action the UN Sustainable Development Goals it is our hope that society will take collective action and join us for the good of our planet. We take conscious steps in participating in hosted events to raise awareness on the importance of upcycling and waste prevention for contribution, economic potential and impact on habits.

We urge society to take small eco-focused lifestyle changes with our 5R policy, which we expanded from the worldwide 3R policy to accommodate our business model. Before you purchase a bottle think and RETHINK the use of not just the content but the bottle as well, REUSE the bottle in your environment and attempt for it not to get to landfill, RESCUE if you have no use for it dispose it responsibly and this is where do WARRIORS comes in after which we REFRESH the bottle and the consumer REBUYS the finished product.



Up to the minute we are also gratified to see an interest from the schools who are coming together in Kenya to educate their students on how to follow a sustainable path and we are thrilled to be a part of these discussions in which we intend to raise awareness about the cause we champion and learn about other people who enhance and add value to the environment.

KIJANI GLASS recently received a large scale order from Banange Brewing Company and Yujo Izakaya in Kampala, Uganda and this showed us that there are businesses out there rooted in social responsibility and we are proud to already have presence in the neighboring countries and look forward to global expansion.

The opportunities in glass upcycling are bountiful, at KIJANI GLASS we have created employment opportunities in waste management, in part of our job as creators the creative intervention allows us to make products of good quality and of value whilst spreading our message regarding the environment, it is deeply satisfying to see a glass bottles that would have been disposed off enter our workshop and come out transformed reducing the amount of glass bottles going into landfill, pollution and waste.

The upcycling opportunity does not ensue without its counterpart of challenges and it is no secret that our society generates an enormous amount of glass bottle waste on a daily basis whether from homes, bars and restaurants and this compound effect is leading to mammoth heaps of bottles going into landfill recognizably there are various clean-up companies that have been implemented in our society however the challenge is the bottles outweigh the collection or the land. KIJANI GLASS is making such a small change, which of course is important but a bigger and more dramatic impact is required to make a significant difference in the magnitude of the bottles going into landfill. Consumers also have the mindset that because it is upcycled it has to be cheap or even free and this is a such a serious misconception as bottle collection takes a great deal of patience, the process takes creativity, effort, time and technique. There are many people

involved in each phase of the project from collection through to design and finally refreshed. The logistics of refreshed and not manufactured.

If we could give any advice to start up entrepreneurs who want to be responsible in their entrepreneurship would be to begin with the United Nations Blueprint of Sustainable Goals and incorporate them into your strategy and the expansion will take place from there. Then move onto making small eco-focused lifestyle changes both personally and profession as these two paths go together.

It takes time to clean up the pollution as it has been building up daily for decades and the solution will take persistence of believing in the cause, but little efforts over time will impact the environment. Adaptability is an important part of the journey as in order to effect change, you will be required to think and operate in different ways. Also, promote your work to raise awareness so that people know that you exist. To finish off, read as much as you can as this gives a clear idea and facilitates planning.

**We are in this to leave the world a better place.**



By ONISA Designs  
[www.onisadesigns.com](http://www.onisadesigns.com)

# Impact of Community-based waste management

## Introduction

**S**olid waste management remains one of the most critical challenges nationally, regionally and globally even in developed nations. Daily human activities such as food consumption, construction, transportation etc., all inevitably produce solid waste, of which its accumulation if not properly managed has long term negative impacts on public health and the environment.

The natural order of our world is that things return to their source in a circular cycle, case in point, the earth. However, as our world has evolved, we see that is not the case. Our daily lives are caught up in a take and dispose linear cycle where almost nothing goes back to source. The result of that, is massive levels of pollution and destruction of natural resources. We have become conditioned to believe that we have infinite resources which can be made readily available to us on supermarket and kiosk shelves, and this has made us wasteful to the extent that we have stopped caring about where this waste goes, yet we are surrounded by waste everywhere we go.

Regrettably the solid waste management in Kenya generally has been a failure fraught with uncollected waste, poor infrastructure and technology, inadequate funding and a general lack of public awareness and apathy for waste management. The situation is worse in communities with low income living in informal settlements who cannot afford to pay for privatised waste management as is the case in Kenya. So then what happens in such situations? They are exposed to air pollution, trenches filled with garbage, unsanitary living conditions, Waste management in informal settlements in Kenya is very poorly managed and residents take matters into their own hands by practising harmful waste management such as burning and open dumping of all categories of waste.

*The absence of adequate infrastructure, the burden of recycling falls on ordinary Kenyans and a patchwork of sorters, collectors and buyers who simply cannot keep up with the volume of waste produced.*

## Community based waste management approach – Case Study

The absence of adequate infrastructure, the burden of recycling falls on ordinary Kenyans and a patchwork of sorters, collectors and buyers who simply cannot keep up with the volume of waste produced. A community-based waste management system (CBWM) is an alternative approach to the typical approaches attempted by the government of Kenya, and this is what Kwa Muhia Environmental Group (KMEG) is practising in Kwa Muhia Village in Naivasha. Community Waste Management is defined as 'waste management and recycling practised by community-based organisations, which could be in provincial towns, villages, remote rural



areas, small island communities or parts of cities in low- and middle-income countries where there is no, or inadequate, municipal waste management service' (Lenkiewicz et.al, 2017).

KMEG's CBWM approach is aimed at empowering the residents of Kwa Muhia Village with the tools and knowledge for sustainable waste management, and to provide a vital service to their community and the environment at large. Due to the increase in the waste menace, KMEG was established in 2011 by landlords and residents of Kwa Muhia Village in the quest to have a clean environment to live in and has been working with the community and stakeholders to address the waste menace in the village.

Some activities undertaken by KMEG include setting up nine concrete waste bins at strategic intersections throughout the village for biodegradable and non-biodegradable waste, village-wide and door to door clean-ups in partnership with the community, introduction of 3-bin systems to encourage waste segregation at source, partnering with donors such as WasteAid to innovate sustainable waste management solutions like setting up Kwa-Muhia Waste Recycling Centre in 2018 (which unfortunately had to be put on hold since the outbreak of COVID-19 due to limited funds) and partnering with local business in an attempt to secure funding and donations to continue their operations.

KMEG's impact in Kwa Muhia has been felt not only in terms of a cleaner environment, but also in a socio-economic sense. The residents reported improved public health and a general shift in attitude and behaviour towards waste management. The residents don't litter and anyone caught littering is reported to the chief by the residents. This is a great improvement compared to 10 years ago when Kwa Muhia was plagued with open dumps and flowing sewage. KMEG also employs a number of residents to run its recycling centre and waste collection thus creating job opportunities.

However, this is not without challenges and here are some obstacles faced by KMEG in community-based waste management:

1. Lack of adequate bins within the plots and around the village
2. Challenges with segregation at source due to lack of cooperation and other hinderances
3. Lack of capacity and resources by KMEG to take on all waste produced in the village
4. Inadequate governance and management structure which needs upgrading with capacity building

Research analysis presented some recommendations for KMEG and similar CBOs as follows: there is a dire need for capacity building and support for community-led projects. As seen in KMEG's case, it's a CBO born out of passion and desire for a clean healthy environment by a few individuals who had no initial experience of running organisations. Therefore, such entities should receive both public and private support in running operations and activities. This could be as simple as a record keeping training session. Additionally, community buy in is crucial for impact work, therefore continuous community engagement and sensitization is important, especially in low to middle income areas where tenants constantly move in and out of rental houses and plots as was the case in Kwa Muhia Village.

Going by these recommendations, community-based approaches can benefit from Extended Producer Responsibility Schemes by being the bridge between consumers and producers. These community groups have direct contact with community members who form a large base of consumers. A beneficial scheme which helps community groups derive value from waste generated while at the same time helping producers fulfil their responsibilities and keeping our environment clean. Such schemes can be useful capacity building and support for them to continue playing a role in environmental protection and conservation and attainment of social rights and justice, for a cleaner and greener future for vulnerable communities.

# COMMUNITY-LED PLASTIC POLLUTION MANAGEMENT

One of the significant factors, which is being emphasized today, is the role of the community in waste management. From research, several success stories of community participation across developed and developing countries have strengthened the view of government and local bodies that they cannot work in isolation and require the active participation of all the stakeholders to manage waste.

These success stories have been studied in alignment with community participation in various regions and countries. A section of this article's contribution focuses on the emphasis of community-based projects towards initiatives in managing plastic waste management. How can corporations

effectively hold community projects toward fighting plastic pollution?

Recognized by the UN in a publication on 18 February 2021, Kenya is emerging as a leader in the fight against plastic pollution and is among the first countries in East Africa to limit single-use plastics and sign the Clean Seas initiative to rid waterways of plastic waste (Biao, 2021). Kenya has invested heavily in both policies and law enforcement to win the fight against plastic pollution. The result of this investment is today boosting Kenya's environmental stewardship in Africa and the world.

**How empowering local communities can help solve global plastic waste management.**

Every single day we are confronted with an alarming plastic pollution problem. Worsening the situation is the fact that we have many best examples of practices in recycling plastic waste around the world.

In working with communities, plastic credits are one of the financially viable solutions to this problem. Anytime monetary value is attached to such initiatives, the local population will always be willing to take up the task.



*Cornelius Musila, STTA Youth mentorship program during a clean-up exercise in Kibra slums, Kenya*



### Plastic credits allow corporations to fund high-impact, community-led clean-up projects particularly focused on non-recyclable plastic wastes.

Any effective community-based solutions can be achieved on a local, community-based scale. In this case, the members of the vulnerable communities of non-renewable plastics pollution should be empowered to participate in and even lead clean-up efforts. Such efforts should make use of people's skills and resources within local communities and provide training and education so that clean-up efforts can be continued.

### On the other hand, it is easy to doubt this method of using the locals. One can wonder how smaller and local efforts make such an impact on such a cross-sectoral issue.

The bottom line that everyone needs to understand in this model is how community-led projects have improved local communities while removing plastic waste from the global environment.

It is the socio-economically disadvantaged communities that are most vulnerable to plastic pollution effects like climate change. This is triggered by several factors. The lack of education leads to improper waste practices like burning or burying trash. This is very detrimental especially when the location of these communities is along waterways and shores because it leads to a build-up of potential ocean litter (Nature, 2023)

### Those who live in these communities see an immediate benefit to clean-up efforts.

When a project provides direct benefits like training, safe working conditions, and monetary incentives towards cleaning, it further empowers community members to actively participate in sustainability efforts.

### Critics of Community-based projects in fighting plastic pollution waste

Like many other projects of sustainability, the community-based approach to fighting plastic waste is not without its critics.

Every sustainability champion will say that successful

sustainability and environmentalism projects must focus on and involve the local communities. Nevertheless, not all community-based projects are successful. Poorly managed projects will have little to no impact (Ekshtein, 2022)

The major issue that stands out is that there are no regulations for sub-standard community projects. Global standards and regulations regarding best practices and environmentalism are missing whereas there are many private and civil society-led community-based projects that may not have the best strategies for success.

### Why is it difficult for community-based plastic pollution initiatives to succeed?

For such community-based projects towards plastic pollution to be effective, they must take certain aspects into consideration. Everyone will agree, there are no one-size-fits for all strategy. Best examples that are applied in a certain area are not necessary they will be successful in a different area. This could be part of the reason why part of community-based initiatives can be difficult.

At times, the below factors affect this running!

- Keep the culture and traditions of the local community in mind and develop and run the project around it.
- Always provide incentives for local community members to motivate their participation.
- It's always important to make a meaningful environmental impact that benefits both local and global communities, giving the upper hand to the locals.
- It is always important to follow regulations and recommendations by leading environmental groups.
- Community-based plastic waste solutions are effective, but only if they are designed well.

**Sustainable Travel and Tourism Agenda** is a consulting company committed to supporting the sustainability of tourism destinations and businesses. We believe that sustainable tourism is a value-based management and delivery system that contributes to sustainable destination development. It is anchored on constructive knowledge of the

place, the right environmental values, appropriate skills, equable investments, favorable and inclusive policies, responsible consumption and production, relevant & continuous learning, fair partnerships, respect for all, and equal opportunities.

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## Michael Mugendi

Sustainable Travel and Tourism Agenda Ltd



White stork (*Ciconia ciconia*) in a dumpsite

# Plastic Pollution in Protected Areas

10:00 AM EAT, the weather is sunny, very humid at 29 degrees. Our car docks at Amboseli National Park Iremito gate, ready for the park visit. It's been 4 hours of driving from Nairobi CBD with a friend. We decided to leave the busy city and enjoy the beautiful walk with wildlife. To rejuvenate and get updated photos and stories for our work.

A jovial KWS officer welcomes us. She asks if we are Kenyans, which I confirm, and asks for our National Identity cards. We hand over the cards, and she issues us with our bill for clearance, which we do. Before letting us into the park, she asks if we have any plastics. We did not have any, so we were allowed to enjoy our park visit.

The Ministry of Tourism and Wildlife issued a directive under gazette notice No. 4858 dated June 6, 2019, to ban the use of single-use plastic bottles, straws, and related products within protected areas in national parks, national reserves, beaches, forests, and any other designated wildlife protected area with effect from June 4, 2020. In addition, through the then Minister of Tourism, Najib Balala, the Ministry circulated an implementation plan for the ban of single-use plastics in protected areas to stakeholders for implementation.

The ban was enacted on June 5, 2020, in all National Parks, beaches, forests, and other protected areas as the world celebrated World Environment Day. As a result, visitors can no longer carry plastic water bottles, cups, disposable plates, cutlery, or straws into protected areas. The move followed a ban on plastics in the country.

Plastic pollution is one of the most severe threats to the planet's health. Single-use plastics pollute most ecosystems, from rainforests to the world's deepest ocean trench. Many other risks come with plastics, including upsetting the environment's natural chemical balance, degradation of nature, soil and water contamination, and entanglement of invertebrates, birds, mammals, and turtles leading to starvation, even death, and Biodiversity loss.

By 2050, the UN estimates that there will be more plastic than fish in the ocean unless governments and the private sector promote more resource-efficient design, production, use, and sound management of plastics throughout their life cycle. They estimate that more than 8.3 billion tonnes of plastic have been produced globally since the early 1950s, with some 60% of this volume ending up in landfills or the environment. For example, about 2,000 tonnes of plastics are imported or produced in Kenya daily, with 100 tonnes of related wastes ending up in rivers and the Indian Ocean.

Kenya took the bold step and banned single-use plastics in protected areas in 2020. The ban was to curb the growth of single-use plastics, aggravate disasters such as flooding plastic pollution to modify behavior, discourage single-use plastic bags, reduce plastic waste generation, and prevent illegal plastic waste dumping in protected areas. In addition, reduce, recycle, reprocess, and recover.



The government then provided incentives to promote the cleaning of plastics from the environment. The 2019/20 national budget statement provided the exemption from VAT for all services offered to plastic recycling plants and the supply of machinery and equipment used to construct these plants. The government also reduced corporation tax for any investor operating a plastic recycling plant from 30% to 15% for the first five years. Further, the government deleted the provision for charging Excise Duty on plastic shopping bags to align it with the Environmental Management and Coordination Act which banned them from use.

This gesture by the government was to encourage new investment in plastic recycling plants, create jobs and support environmental conservation as aspired under the Sustainable Development Goal (SDG) No 12, "Ensure sustainable consumption and production patterns." In addition, this initiative enhances the collection and recycling of plastics, hence reducing plastics being drifted into our oceans.

The Wildlife Management and Conservation Act 2013 provides for the protection of wildlife species, their habitats, and ecosystems, and lists measures for the protection and management of endangered and threatened species and adoption of a system of zoning that caters for the protection of nesting, breeding and foraging areas. Therefore, the ban is in line with the provisions of this act. The prohibition through Gazette 4858 buttresses and codifies the earlier one by the Ministry of Environment and Forestry in 2017 and expands the products and scope to other protected areas around the country.

"The preservation of our environment is tied to our well-being and the well-being of future generations. The single-use plastic ban is a plus in addressing the plastic pollution catastrophe facing Kenya and the world. We hope it catalyzes similar policies and actions from the East African community," Najib Balala, Former Cabinet Secretary for Tourism and Wildlife, said.

The ban was hailed by the Conservation Alliance of Kenya, a membership organization that advances the preservation, protection, and management of wildlife and its habitats in Kenya. So many plastics are in the soil in our protected areas and Kenya as a

whole. Kenyans must change their mindset and get used to the 3 R's reduce, reuse and recycle – Steve Itela, CEO of Conservation Alliance of Kenya.

The IUCN analysis 2021 identified interventions that could help surmount the plastic waste and pollution menace. These interventions are strategically crucial for their high leakage mitigation potential and low environmental and socio-economic trade-offs.

1. Kenya must prepare as the global oil and gas giants plan their future around plastic production, with at least \$400 billion in plastic investments by 2024. An urgent intervention for consideration is the establishment of measures to avoid importing or producing plastic objects that do not benefit from a recycling solution in the country.
2. There's a need for systematic waste collection in areas prone to plastic leakage, waste separation at the source with the increased door-to-door collection, and proper disposal of waste at landfills by private collectors.
3. Increase capacity for proper waste disposal, such as creating sanitary landfills. These engineered sites permanently contain waste in a setting isolated from the environment.
4. NEMA requires that waste vehicles obtain licenses and are fit for purpose. Those that operate illegally should be phased out. Where appropriate infrastructure is in place, critical assets must undergo regular maintenance to ensure they can manage waste well.

As we advance, there is reason to be optimistic as the country intensifies its leadership in the fight against plastic pollution. However, we must act now so that people, nature, and the economy thrive sustainably.

One thing noted was the less green vegetation in the park. In late November 2022, Amboseli received its first absolute downpour after four consecutive failed rainy seasons. The community received the rainfall with jubilation and cheers after a prolonged wait. Unfortunately, there has been no more rain since then. The drought is the worst the country has experienced in 40 years due in part to the adverse effects of climate change.

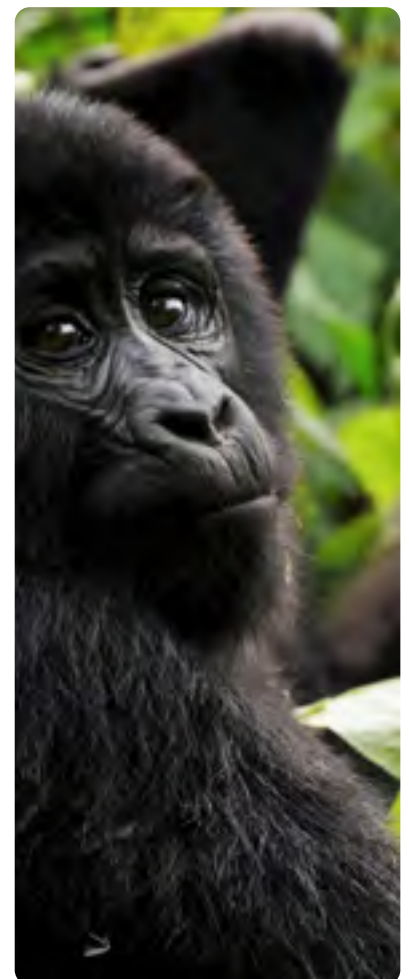
# Impacts of Plastic Pollution on Endangered Mountain Gorillas and Their Habitats and How Young People are Coming up with Solutions in and Around Bwindi Impenetrable National Park (BINP)

There are only 1063 endangered Mountain gorillas remaining in the wild. Just under half of them are found in Bwindi Impenetrable National Park, a UNESCO world heritage site, biodiversity hotspot and critical habitat for the mountain gorillas and other wildlife.

Despite a recent and encouraging increase in their numbers, mountain gorillas continue to face threats including from poaching due to spears and snares set for duiker and bush pigs zoonotic disease infection and habitat destruction, compounded by their already small population size and very limited and fragmented habitat. The use of plastics in Uganda is yet another – and growing – threat to mountain gorilla survival.

The volume of plastic waste in Uganda is estimated to be 600 tonnes daily, much of which is generated from plastic packaging.

In response to this growing environmental concern, the Uganda National Environment Authority (NEMA) prohibited the use of single-use carrier bags with a thickness of less than 30 microns in 2017 and, further, brought into force a requirement for manufacturers of polythene bags and plastics to recycle plastic waste and to label the polythene bags with the accepted specifications. This saw the replacement of some plastic packaging. However, there are several examples of one plastic being replaced with another, for example, plastic liquor sachets being replaced with thicker plastic bottles. From a conservation and environmental perspective, the single use plastic ban has been poorly implemented and enforced. Perhaps this is due, in part, to lobbying from the plastic manufacturers who argue their contributions to the tax base. To date, the only plastic product



*Kanyonyi, former lead Silverback of Mubare Gorilla group. Photo by CTPH*



In a bid to protect wildlife, Uganda's National Parks have put in place guidelines for waste disposal and use of plastics. Garbage collection tins and trash cans have been put at strategic points in all parks in Uganda to reduce littering of plastics and other forms of waste. However, these alone do not address the problem of littering. In Bwindi Impenetrable National Park, littering is most evident near

areas of high population density and around the many lodges and businesses around the park.

Conservation Through Public Health (CTPH), together with Global GreenSTEM and health and conservation partners are working with youth of Bwindi aged 10 to 24 years to identify problems affecting people, animals and the environment and design local solutions that address these problems using Science, Technology, Engineering, Art and Mathematics (STEAM). Plastic pollution is one of the problems the youth have identified. Two of the schools that we are working with on this project funded by National Geographic Society, Buhoma Community Primary School, and Nyamiyaga Secondary School, have written proposals to collect plastic bottles around their schools and in neighboring towns with a goal of making the plastic bottles into bricks that can be used to construct the walls of a water tank. What a great idea! We've also seen some women and girls around the mountain gorilla habitat collect straws and other plastics, recycling them to make beautiful handmade crafts such as arm bangles and table mats.

that was successfully and effectively banned in Uganda is the airtime top up scratch cards which have since been replaced by online purchases. I say, Kudos to Uganda for this one.

Littering and poor plastic waste disposal is an issue across the country but is worse in urban centers. When you are travelling on Ugandan roads, you will notice trash, especially empty soda and plastic water bottles and polythene bags fly out of vehicles.

Plastic pollution can alter habitats and natural processes, reducing ecosystems' ability to adapt to climate change, directly affecting millions of people's livelihoods, food production capabilities and social well-being. (<http://Innk.in/dRia>). Plastics can be harmful to wildlife, especially our close relatives, the endangered mountain gorillas.

Plastic is toxic and can kill wildlife or make them more susceptible to disease. Animals can become trapped in and injured by plastic. It disrupts habitats, making it hard for some species to live and breed naturally.

Plastics decompose very slowly, taking up to up to 450 years to decompose in a landfill. This means that plastic litter won't disappear on its own. It will stay on the ground affecting wildlife and their habitat until people remove it.



In other positive steps, the Uganda National Environment Management Authority (NEMA) also recently launched an Express Penalty Scheme for environmental breaches whereby offenders will be required to pay big fines for importing, exporting, manufacturing, using or reusing plastic carrier bags or plastic products made of polymers of ethane (polythene) and propylene that are below 30 microns. This is intended to strengthen the existing environment protection laws in Uganda.

As a long-lasting solution to plastic pollution in Uganda and in other countries, I call upon every person to act responsibly and know that we all have a duty to maintain a clean, litter-free environment. This includes the duty to prevent plastic pollution and other forms of pollution. This includes finding alternatives to single-use plastic products such as

cloth bags, not choosing to use single-use plastic like straws and plastic eating utensils, putting plastic in trash receptacles as well as picking up litter and disposing of it safely in designated places.

Everyone has a role to play. If you see someone littering, take some time and speak to them about the dangers that come with plastic pollution. If it is a business that is polluting, you can work with the local authorities to make sure that good waste disposal practices are adopted.

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### **Richard Bagyenya**

Logistics Coordinator

Conservation Through Public Health (CTPH)

For any feedback and/comment, please write to [supporter@ctph.org](mailto:supporter@ctph.org)

See our website [www.ctph.org](http://www.ctph.org) to learn more about our work.

# SCHOOL PROGRAM



**Chloe Ochalik**  
Peponi House  
preparatory school  
Class: 6M

1. How do you use plastics at home and school?

At home, we try limit our usage of plastic. When we do use them, it is not single use plastic but items such as water bottles. At school, we use plastic water bottles. Some classroom equipment is also made of plastic. Our school discourages the use of single use plastics.

2. How do you dispose plastic waste?

I try stick to the three R's: to reduce plastic I buy, then I try reuse plastic, and if we have to get rid of it, we try putting it in the recycling bin. We learned in school that it is important to recycle plastic waste to help protect the environment.

3. How can you reduce the use of plastic at home and school?

We can reduce the use of plastic at home and school by using reusable bags, containers, and water bottles instead of disposable ones. For example, if my parents want to buy me a soda, we will but the can one and not one in a plastic bottle.

4. What are the dangers of plastic pollution to the environment?

Plastic pollution can harm animals in the environment by causing entanglement or harm them if eaten. This is very common in sea animals. Plastic waste also harms the soil and water, affecting the plants and animals that depend on them. Plastic pollution also contributes to climate change when plastic waste is burned or decomposes, releasing bad gases into the atmosphere.

5. What can you make from used plastic bottles and paper?

I can make a lot of things from used plastic bottles and paper, such as plant pots, bird feeders, plant pots, pencil holders, and even toys. We can also recycle them to make new products like furniture and clothing. At school, we reuse plastic and recycle some in our art projects.



**Andrew Chelimo**  
Chairman of the  
Environmental Club  
Alliance High  
School

It goes without saying that almost everyone interacts with plastic on a daily basis. From water bottles to plastic cups to keyboards, plastic basically revolves around our lives. Personally,

I use plastic soap dishes and plastic cups for drinking tea. Countless times a day, I interact with several plastic wrappings from biscuit packets to sweet wrappers.

When it comes to disposing plastic waste, I always make sure to throw my plastic bottles in the nearest bin. For food and product wrappings, I store them in my pockets then throw them too in the nearest trash can.

To reduce use of plastic waste, use of reusable water bottles would be a step in the right direction. Moreover, making flower pots out of plastic containers would equally help in reducing plastic use.

Plastic pollution poses a great threat to the environment in the sense that plastics take a long time to decompose. Thus, plastics in the soil prevent plants from accessing the water and mineral salts they require. This causes them to wilt and eventually die. Moreover, plastics in oceans are eaten up unknowingly by fish and other aquatic animals. Due to indigestion, most of these aquatic organisms end up dying. Our landfills have also been severely impacted by the rise in plastic pollution.

Our Kenyan youth have shown great and commendable creativity when it comes to conversion of plastic waste into useful products. For example, countless shoes and couches have been made from already used plastic bottles. To move closer to home, plastic bottles have often been used as flowerpots. Used paper can also be cut into amusing shapes and be used to beautify lamps and lanterns.

We, as the Alliance High School fraternity, have been able to take several steps in the right direction. Initially, students used to throw plastic waste haphazardly in the school compound. As the Environmental Club, we carried out an investigation to identify what prompted the students to take such an action. Afterwards, we realized that they did not know the impact of their actions. Moreover, the number of dustbins in the school were minimal. Thus, we started

an awareness program in which we informed students of the repercussions of their actions. In addition, we mobilized funds from the students as well as the school administration to build more dustbins in the school especially around the canteen area. This has significantly reduced the amount of litter in the school.

At the end of the tunnel, a beam of hope lies – hope for a greener environment and a cleaner atmosphere. This responsibility to care for our environment does not lie on one person, but on each and every single one of us. Together we can.



**Akandinda  
Divine P6**

Rugando Parents  
School, Kanungu  
district, Uganda,  
East Africa

I use plastics to do shopping. Plastic bags are almost everywhere in my community and we use them as bags to carry what we buy from markets. At school, some children carry their books using plastic bags because they are cheap and affordable

We pack what we buy in local markets in plastic bags. In my home, we normally buy sodas that are packed in plastic bottles.

We use the following methods to dispose-off plastics:

We gather them in one place and wait for the garbage collectors who dump them in one place

Some plastics are used in construction. For example, plastic bottles are collected and used as construction materials whereby water tanks have been built using these bottles

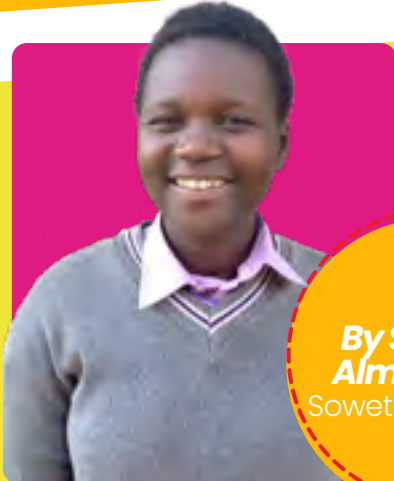


We can reduce use of plastic bags at home and school by making school bags that can last long

Buying shopping bags that can be used many times

Buying water bottles where we can boil water and use for long

We can also sensitize the community about the dangers of plastics and reduce their usage



**By Shanice  
Alma Akinyi**  
Soweto Academy

1. How do you use plastic at home and school?

- At home, we use plastics as utensils and for laundry purposes.
- In school we use plastic chairs, cups and plates for serving lunch and water bottles for drinking water.

2. How do you dispose plastic waste?

- By recycling them and taking them to the industries where they are used to produce other items out of the non-reusable plastic items such as water bottles.

3. How can you reduce use of plastic at home and school?

- Introducing the use of melamine plates and cups at schools and home.
- Replacing plastics cups and plates with glass plates and cups, wooden chairs in place of plastic chairs.

- Create public awareness on the importance of limiting usage of plastic items and embrace the recycling system.

4. What are the dangers of plastic pollution to the environment?

- Plastics don't dissolve in water when they normally flooded in rivers causing water pollution which affect marine health in the long run.
- The plastics do not degenerate or dissolve like paper unless recycled.
- The plastics reduce the rate of soil fertility in some areas of the country thus affecting agricultural activities.

5. What can you make from used plastic bottles and papers?

I can use the plastics for

- Decoration; make arts pieces from the waste bottles.
- Make hand bags, hats and even skipping ropes.
- Make new utensils and even house furniture
- Used by children as toys or learning materials

# Coming Full Circle: Our **LOVE-HATE** **RELATIONSHIP** With Plastic




**A**lthough it's taken me well into my twenty-five years as an academic to realize it, 1971-72 was a very formative period in my life. It was during junior-high science projects when I was first challenged to consider my position on this planet in one of two ways: As a mere resident, or an inhabitant. Sure, I had an address, a residence, but what was my role? Three pieces of pop culture I encountered while conducting that research helped clarify this for me: Barry Commoner's essay "The Closing Circle" in the *New Yorker* magazine, a television ad released on the second Earth Day featuring the iconic Native American Iron Eyes Cody having litter from a passing vehicle thrown at his feet, and the "blue marble" photo of Earth taken by Apollo 17. The dots were connected for me! Technological advancements had led us to the "throwaway" lifestyle, yet there is no such thing as "away", and this lifestyle had led us to disrespecting and polluting the only home we have.

The totality of that messaging eventually helped me realize that I did not wish to be a passive resident, known only by my domicile, but rather an inhabitant who positively interacts with the environment. It is through a critical examination of the nexus between technology, lifestyle, and popular culture within the United States where we begin to see a disconnect

between awareness and behavioral change, and confusing quality of life with standard of living.

The roots of these problems can be traced to the unleashing of technologies that had facilitated the United States playing a decisive role in the outcome of World War II. Manufacturing industries in the United States were ultimately given a plethora of choices for introducing Americans to lifestyles of convenience and efficiency, eventually becoming synonymous with affluence. So profound was our trust in technology that even those who grow our food were told to embrace it, to "get big or get out". Dissemination of "Green Revolution" technologies from the U.S. to the Global South exacerbated dependencies on fossil-fuel based inputs. Technological advancements outpaced policy, and continue to do so. Today, as countries still grapple with environmental and socio-economic legacy issues from both the Industrial and Green Revolutions, it remains challenging to even get all U.S. states on board with banning single-use plastic bags. To date, only eight states and five U.S. Territories have done so. However, outside the States, many inspiring examples exist.

Gjenge Makers Ltd. of Kenya is turning plastics waste into building materials for affordable housing. They partner with various makers of plastic bottle caps and seals in the beverage and pharmaceutical industries



to obtain offcuts and scraps. So impressive are the results that founder Nzambi Matee was named one of UNEP's seven 2020 "Young Champions of the Earth."

A private-sector coalition of eight brewing companies in Tanzania known as "PETCO" began in 2022 with the goal of collecting and recycling 12.5 million tons of plastics within five districts of Dar es Salaam. Recently, PETCO joined forces with United Nations Industrial Development Organization to convert waste into energy.

Uganda-based "Reform Africa" has been upcycling plastic bags into fashionable handbags and school backpacks. The organization employs over 100 single mothers and youth who are paid to collect polythene bags from several dumpsites and landfills around Kampala.

While many other individual examples do exist, the true source of the problem has lingered for decades; namely, the absence of internationally-coherent policy addressing the production and usage of plastics. Some critics of the industry claim that focusing on emerging technologies, such as chemical recycling, is a distraction from the real problems of producing and using too much plastic throughout supply chains. Others point out the plethora of chemical additives and colorants used to give plastic different properties, creating thousands of types which ultimately cannot be mixed together and recycled in the conventional manner. Concurrently, virgin plastic has become so cheap to manufacture that there is no robust market for recycled plastics. The industry pushes back, claiming they are moving us toward a more circular plastics economy. Beyond the finger-pointing, however, some recent glimmers of hope exist.

According to the World Economic Forum from a recent global survey, 70 percent of citizens from 34 countries support government rules that end plastics pollution. Respondents cited the following as key elements of any such treaty: Banning unnecessary single-use plastics and

plastic that cannot be easily recycled, introducing rules demanding manufacturers and retailers to act responsibly by controlling plastic packaging, implementing global regulations requiring all new plastic products to contain recycled plastic, and ensuring that labels showing proper post-use handling are applied to all plastic products.

To this end, in March of 2022, 175 nations attending the UN Environment Assembly in Nairobi endorsed a resolution to end plastic pollution, and forge an international legally-binding agreement, by the end of 2024. But, who should and will lead these efforts? Which countries will accept potential losses of competitive advantage on the global market, particularly during tenuous political and economic times? It will be up to the citizens of those countries where they have a genuine say in how business is conducted, where democratic processes equitably empower and educate all citizens to see beyond the veil of GDP to critically consider antagonisms and contradictions between technological advancements and the quality of their lives and those of fellow earthlings.

So, what has it taken to reach this high point of global awareness about the dangers of plastics pollution? Answering this brings me full circle from the early 1970s when I realized the power that media and pop culture can have in driving social change. With the internet, images of our fellow earthlings being literally choked by plastics waste, and of people being sickened by and, in some cases buried under, garbage dumps, are shown 24/7. These new dimensions of mass media offer opportunities for immediately turning intentions into actions, ideally beyond mere "likes." Converting a linear, throwaway society like the United States into one that embraces circularity will take more time and effort, but we have come a long way since I first saw those images of our only home, that lonely "blue marble", within the vastness of space.

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By Robert M. East  
Associate Professor, Director of Environmental Studies  
Washington and Jefferson College





# Establishing A Culture of Sustainability

**T**he University of Georgia (UGA) is establishing a culture of sustainability within research laboratories and spaces via the UGA Green Labs program <https://greenlabs.uga.edu>. Research and medical laboratories are resource-intensive spaces using 10+ times the energy and water of an office or classroom and generating around 25 times the waste. Though both science and medicine strive to solve many global issues, such as environmental and public health challenges, both sectors actually contribute to the very problems we are trying to solve via operational emissions, supply chains, waste streams and more. Thus, a culture of sustainability *must* be established in order to minimize the negative impacts of these operations and to better meet our goals.

Implementing greener practices need not be complicated, costly or difficult. Green Labs efforts can be as simple as teaching behavioral modifications or adjusting the temperature of a refrigerator. The University of Georgia is an R1 research institution with over 1900 research labs on our main campus and we've found that making small changes can lead to big results. Operating more sustainably also means operating more efficiently, which saves money. This allows research dollars to go further and allows researchers to conduct their science in a more responsible manner. This program is estimated to save the institution over \$186,000 USD/year when fully implemented. Additionally, it helps to fulfill institutional strategic goals for sustainability and better allows us to be good stewards of these precious resources.

The UGA Green Labs program also strives to bring greater equity to the global research enterprise. Though the scientific process has long focused on the *outcome* of our research efforts, we must also be willing to look at the impact of our operations and be globally responsible to communities and ecosystems impacted by our efforts. We must examine our supply chains and ensure we are purchasing laboratory products and equipment that were created using fair, equitable labor.

For example, we've learned through our research that the majority of nitrile gloves coming into the US are created using forced labor in Malaysia. Migrant workers pay up to \$5000 USD for the *opportunity* to work in one of these glove factories, with the promise of generating money to send home to their families, but instead they become trapped in debt bondage and this initial fee takes years to work off. These laborers work 12 hours a day, 7 days a week, and get only one day off per month. Their passports are confiscated by their employer and they are forced to live in a dorm onsite. They are not allowed to leave. As nitrile gloves are used extensively by both the scientific and medical communities, we *must* ensure we are purchasing from manufacturers using fair labor to create these products. Otherwise, we are *directly* driving the suffering and injustice of individuals half way around the world. This is just one example of the work we are doing to bring greater responsibility to our scientific research and greater equity to the global research enterprise.

We also work to minimize the impacts of single-use plastics in our laboratories. Though these plastics allow for greater convenience and sterility in our research, they also create a massive waste stream. It is known that less than 9% of plastics made are recycled, and due to regulatory considerations in research laboratories, the recovery and diversion of these waste streams tends to be limited even more. Urbina et. al estimated in Nature in 2015 that the bio scientific industry produces more than 5.5 million metric tons of plastic waste per year. Thus, the UGA Green Labs program strives to divert single-use plastics via specialized recycling for non-

contaminated lab plastics. We also look “upstream” and encourage researchers to review their processes to seek opportunities to engineer out these plastics when they are not required. Many researchers are returning to using glass products, which they clean and reuse, thus reducing the plastic waste leaving their laboratories.

Consideration must also be given to the extraction of fossil fuels used to make these plastics. Our growing need for petroleum and natural gas has led to increasingly disruptive extraction methods. Petrochemicals are obtained via fracking, offshore drilling, and tar sands extractions and are used for making plastic. These extraction sites poison the air and water in communities where they are located and disproportionately impact poor, rural and indigenous communities.

Plastics become even more hazardous as they breakdown and they pose an even greater threat to public and environmental health. More often than not, the communities impacted by this waste did not generate it, but are left to deal with the negative impacts. Thus, the UGA Green Labs program focuses on waste diversion, responsible recycling, creative reuse programs, educating researchers and engineering out these products when possible.

It is important to remember that sustainability isn't just about the environment...it's also about people. The United Nations 17 Sustainable Development Goals teach us that we cannot have environmental sustainability without considering justice and equity for people. We must be developing policies, practices and cultures that are simultaneously sustainable for our planet, people and profits. UGA Green Labs believes that “conducting good science” isn't just about exciting discoveries or results or grant dollars—our goal is to also minimize any negative impacts of our efforts along the way and practice as sustainably as possible.

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By Star Scott  
Green Lab Program Coordinator she/her/hers  
Facilities Management Division, University of Georgia

# ZABBALEEN

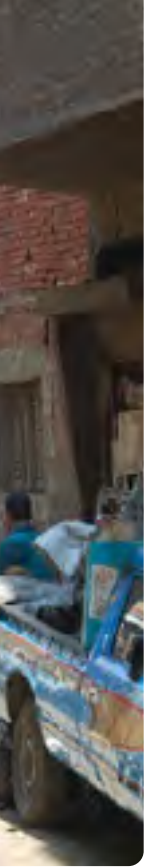


Recycling is part of an ethic of resource efficiency – of using products to their fullest potential. When recycled material, rather than raw material, is used to make a new product, natural resources, and energy are conserved. This is because recycled materials have already been refined and processed once; manufacturing the second time is much cleaner

and less energy-intensive than the first. From the environmental benefits, it conserves energy, reduces air and water pollution, reduces greenhouse gases, and conserves natural resources. In conjunction with the demand to take urgent measures to preserve and restore the environment, it has also become an urgent issue on the agenda of international action.

Africa currently recycles only 4 percent of its waste. The reality is that some 90 percent of Africa's waste is disposed of at uncontrolled dumpsites and landfills, often with associated open burning. Across Africa, recycling is emerging as a viable enterprise, driven more by poverty, unemployment, and socioeconomic need than by public or private sector design.





A community waste collection and management system has emerged in Cairo over the past 70 years, offering what the local government cannot: a consistent, door-to-door, low-cost, and labor-intensive service with high levels of recovery/recycling that helps to reduce poverty through the jobs it generates called “ Zabballen” where more than 70,000 citizens realized the “ Circular economy’ meaning instinctively, Zabballen district Located in Egypt, was established in 1969 and showed us how the community could manage waste more efficiently than any company. Waste management has become the inherited work of many of the Zabballen. It’s passed down between generations, the Zabballen has created what is arguably one of the world’s most efficient and sustainable resources.

An endless conversation, since you entered the place, you see small workshops that work in recycling some parts and work on maintaining the fleet of cars that work in transporting the waste, inside the area, everyone integrates with each other, and the number of workers in this profession in Cairo is estimated at about one million, in addition to the 3 million who are distributed in the rest of the governorates. Workers in the Zabbaleen neighborhood remove 16,000 tons of rubbish from Cairo alone per day from housing units, tourism, and government facilities.

Manshyit Nasser where 85% of Cairo’s waste is recycled -This is a high percentage compared to other countries in the world, as it is not even approached by the world’s highest recycling rates found in Austria (63%) and Germany (62%)- and sent to seven thousand factories working in recycling, including factories in China. garbage recycling factories are spread in the Zabballen neighborhood, including plastic and hard bags, tools such as perfume, soft drink bottles, and cardboard, which are recycled, saving the state millions of dollars from importing solid materials from abroad. The Zabballen community has succeeded in one of the most industrialized systems in the recycling of agricultural materials, and traditional waste collection tools, and

recycling of various chemicals can be done using simple mechanization.

Africa’s emergence in recycling is characterized by poverty, unemployment, and socioeconomic needs that arise from the demands of public and private demands, especially for those in urban centers and cities. Interestingly, the waste generated in most urban centers and cities in Africa is recyclable waste however only a very small percentage have adopted recycling. Further, recycling is conducted by the informal waste pickers to subsidize their livelihoods by actively recovering valuable resources in the waste to sell to the private sector. But, Africa has a lot of challenges. like a lack of incentives for a critical constituency of the continent’s waste management supply chain. The second recycling narrative that does not reflect Africa’s waste composition. While plastic waste constitutes only 13% of solid waste generated in Africa, up to 57% of the waste in Africa is organic. Recycling organic waste, therefore, offers more advantages for Africa. Young people across Africa provide a formidable force to be leveraged in recycling organic waste, On the socio-economic front, the informal sector has low-hanging fruits – especially the youth stand to benefit by recycling organic waste, the most prevalent in Africa. Up to \$ 20 billion in market opportunities stand to be tapped if our young people can retool their skills in the non-capital-intensive area of waste recovery.

The use of the informal sector to conduct recycling renders can help to establish a community-led waste management system, According to estimates, nearly half of the waste produced in Africa is still not collected within African cities and towns, where it is instead dumped on sidewalks, open spaces, rainwater drains, and rivers. This represents a significant resource what we have to highlight is the informal community, and the transfer of successful experiences and technologies for recycling to all

African countries that lack these technologies to generalize Community waste management, which can be used to address a variety of issues in Africa, support the global sustainability trend, and lessen the harm that climate change will cause to the continent.



# It's time to Beat Single Use Plastic Pollution!

Hossna inspired her Artwork from the history of ancient Egyptians who have been making pottery out of clay for thousands of years. The natural properties and adaptability of clay make it the perfect material to use for almost anything; it's affordable and accessible.

She worked with kids for years to influence them to be the future green leaders and keep on fighting single-use plastic and search for alternatives.

Single –use plastic everywhere and to beat that.

Green society created original Artworks by talented visual artist hossna hanafy.

I selected this Artwork which refers to return to use our traditional Egyptian Olla/Clay water jug to beat single use plastic bottles as you see in pic "1"

pic"1" "Fakriny"

With powerful message in Arabic language "Fakriny/ فكريني" which means in English "Did you remember me?" to empower kids and schools students to use the Egyptian Olla to beat plastic bottles.

It's simple and easy but nobody knows.



One day she said that “Art is the best way to deliver your message and reach your goal”.

I agree; sometimes backing to roots is way of solutions but also, you can add makeover or modern touch to deal with life changing.

Hossna invested her time and experience not only to paint this original Artwork but also to design Exclusive Environmental puzzle game as shown per pic“2” to empower the younger generation to beat single use plastic pollution. She focused on the importance to change our consumption behavior to restore our earth.

It was challenging to manufacture it from Eco friendly materials and well finished pieces, bright and safe colors on children but still interesting to have it finally and see its impacts to grassroots to climate action.

*Pic“2”Environmental Puzzle game*

Green society works on Climate education because it plays an essential role to divest fossil fuels, beat single –use plastic and move to clean energy to achieve sustainable development goals.

Yes, we are all committed to raise awareness to reduce carbon footprints and to enhance climate action.

Environmental puzzle game created with original artworks to identify environmental challenges, ways to adapt to students in local communities, and



possible solutions through Art to cross boundaries and make it a global activity.

Green skills; one of the most skills that green society is adopting to support young people boost abilities that cannot be replaced in the future with other resources, such as problem-solving, innovation, resilience, empathy, and determination.

It was fantastic to spend time playing and brainstorming to set goals to climate action.

I still remember one student said that “We are the creators and we are the solvers”

That was awesome!

We are seeking for building green society to ignite climate literacy; together, we can be a part of the solution.

Finally, I would like to give big Thanks for our Artists Hossna and Esraa who made it possible tools to unleash creativity and supported our movements and activities with unique Educational tools.

It was valuable experiences to improve inner health and refuse single use plastic by Art. Recycling & upcycling are vital to protect the environment and sustain our consumption.

Green societies succeed to raise awareness for 10k of schools students and plan to have one million by the end of 2024.

Just like us, you can also take an action Now and beat single use plastic.




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By Asmaa Hanafi  
Green Society, Egypt



# Circularity Space



Circular economy is a buzzword in the world of sustainability, and for good reason. The idea is to reduce the amount of waste produced by reusing and recycling resources, instead of extracting new ones. This not only helps protect the environment but also creates new economic opportunities. Kenya-based Cleantech company Circularity Space is a prime example of how circularity can be put into practice, with its innovative solutions for waste collection, sorting, and recycling.

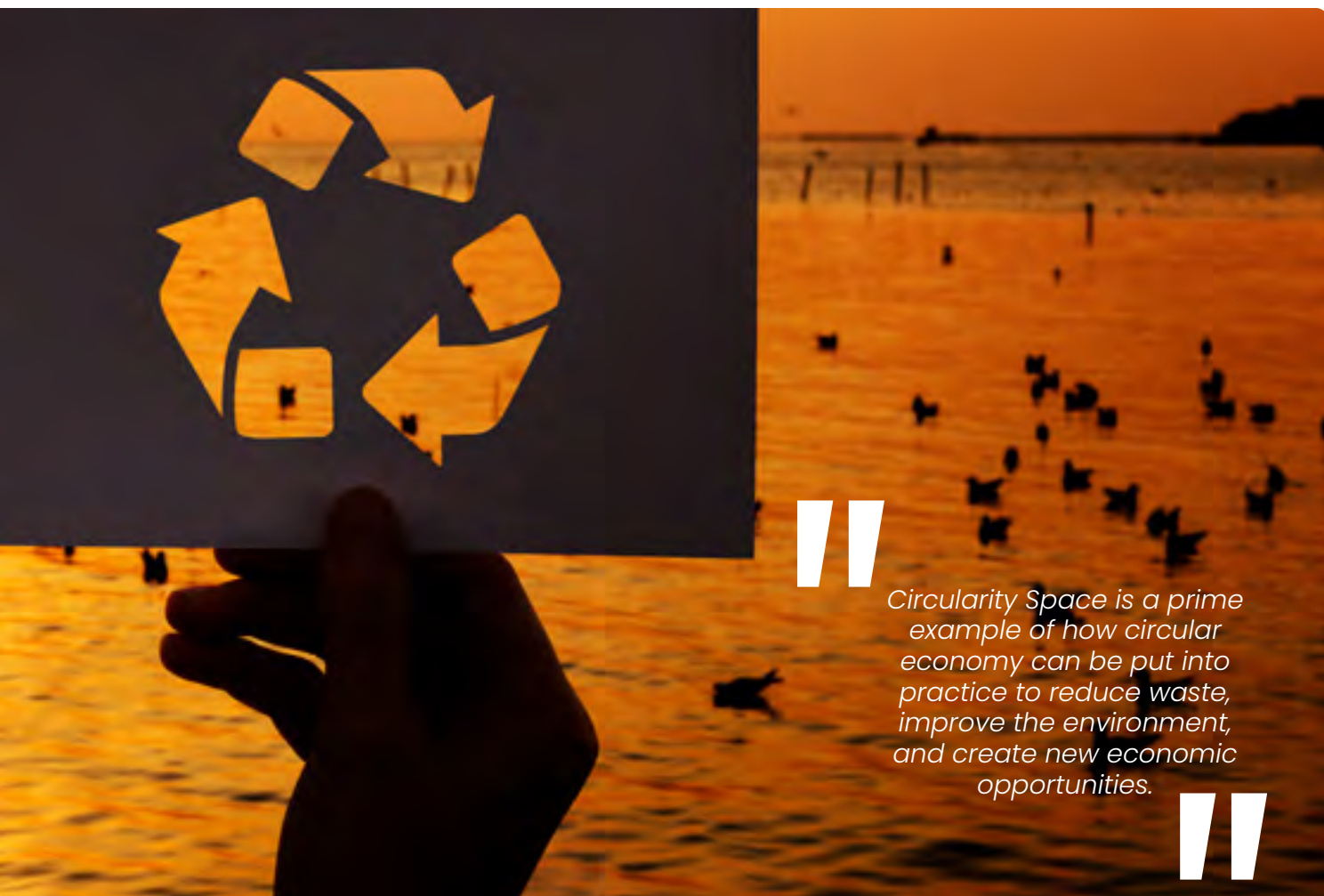
With an estimated 2,400 tons of solid waste generated every day in Nairobi, the need for effective waste management is pressing. Despite efforts to increase recycling rates, only 45% of the waste generated in the city is recycled or transformed into something that can yield an economic or ecological benefit, far from the 80% target set by the National Environment Management Authority. Plastic waste is a significant contributor to this environmental challenge, with 20% of the waste generated in Nairobi in the form of plastic.

Circularity Space was founded with the aim of reducing waste in Kenya, starting with plastic waste. The company has implemented a Smart Bin technology that incentivizes proper waste disposal and increases efficiency. The Smart Bin is equipped with IoT sensors and AI tools that enable automatic sorting, reducing the need for manual sorting of mixed waste. The technology

ensures that the waste is sorted at source, making it easier to recycle and reducing the risk of waste contamination.

Circularity Space's Smart Bin technology makes use of IoT and AI to improve the waste collection and management process. The technology can quickly and accurately identify different types of waste, reducing the time and effort required for manual sorting. It also improves the accuracy of sorting waste, reducing contamination and increasing the value of recyclable materials. IoT technology also provides real-time monitoring of waste collection and management processes, allowing for the identification and resolution of problems in a timely manner. Additionally, the technology generates valuable data about waste collection and management processes, which can be used to inform waste management decisions and drive positive change in communities and cities.





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*Circularity Space is a prime example of how circular economy can be put into practice to reduce waste, improve the environment, and create new economic opportunities.*

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Incentivizing responsible waste disposal is key to the success of the circular economy, especially in Kenya where a lack of proper waste infrastructure and low consumer awareness of recycling have contributed to a culture of waste. Circularity Space's innovative approach to waste reduction has been successful in motivating people to engage in responsible waste disposal practices. The Smart Bin generates points for every recyclable item dropped into it, allowing

users to redeem their points for cash or discounts on products. For example, for every three plastic bottles dropped in the Smart Bin, a user earns one point, equivalent to one Kenyan shilling. This new way of incentivizing waste reduction not only helps create a circular economy but also provides economic opportunities for those living in communities affected by waste.

Circularity Space has expanded its waste categories from plastic to include e-waste, glass, metal, and organic waste. The company works with recyclers

and various stakeholders, such as manufacturers who need the waste data, to onboard new waste categories. This makes it easy for anyone to drop their waste in the Smart Bin and earn points, contributing to the development of a circular economy where waste is transformed into valuable resources.

In conclusion, Circularity Space is a prime example of how circular economy can be put into practice to reduce waste, improve the environment, and create new economic opportunities. The company's innovative Smart Bin technology, combined with its incentivizing approach to waste reduction, has been successful in motivating people to engage in responsible waste disposal practices. Circularity Space's expansion of waste categories, along with its partnerships with recyclers and stakeholders, is a step in the right direction towards a sustainable and circular future.

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# THE CREATIVE ART AND THE ENVIRON



Use of Music in Waste Management Sensitization by Taka ni pato Enterprises

There is a branch of cultural studies called ecocriticism. This is a scientific and systematic study that critiques texts and writings that consider ecological spaces as their locations. While this is the preserve of critiques, they certainly pay homage and salute the efforts made by artists and writers in writing stories whether as warnings against the destruction of mother earth or simply celebrating the abundance that mother earth affords us.

For a long time, the creative sector has had a symbiotic relationship with ecology. In the precolonial Africa, song and dance were used to warn against wanton destruction of nature. Wise sayings were composed to praise the environment and endangered species of

both plants and animals were regarded as totems in a bid to conserve them and avoid their extinction. In many communities, the python snake was considered sacred; not because there was anything really sacred in it but it took too long to reproduce and the risks in its life were so many that it always took too long to multiply. Declaring it sacred meant that at least it had escaped the most destructive predator in the animal kingdom; the human being.

Among the Wanga people of Western Kenya, the short antelope popularly known as Imbongo was declared sacred and if he was telling the truth and his friends doubted him (especially the men), he had to swear by Imbongo. SO, it is not uncommon to hear a Wanga man to date say that Imbongo



# S MENT

yesira embolanga obhwatoto.' (I swear by Imbongo that I will never eat, that I am speaking the truth). With such swearing, environmental conscious took root in the younger charges when they were quite young. They knew that Imbongo was never to be hunted for food. It was to be left to roam. Imbongo is herbivorous and had many other predators. Chances of it making it in life in the forest were slim due to the many predators. If human beings were also to hunt it, it would easily become extinct. That's why the Wanga people devised a way of increasing its chance of survival by not hunting it for game meat.

Declaring an animal or a flora sacred is an act of performing it. It's an act of acknowledging its vulnerability and tapping the artistic prowess to balance the ecosystem through performing that flora or fauna. In this case, art comes at the service of ecological conservation.

The artist has long been a vehicle through which nature speaks to mankind. For eons, the artistic has tapped and continues to tap into the universal human desire to make some contribution to undoing the damage to nature.

Performance artists remind us of our inextricability



*The artist has long  
been a vehicle through  
which nature speaks to  
mankind.*

from nature and of the fact that there are many humans who still live close to nature. The artistic and performative ritual is timeless in its connecting humans to natural processes that we undergo on a day-to-day basis. Against the dire consequences of ecological crisis, the performative aesthetic is a creative solution for rethinking the role of humans and for taking seriously indigenous forms of knowledge that affirm all biological life and the balance of the ecological system. Man is nothing without water is still a true statement. However, the same man must conserve the same water for it to nourish him and

his kind. All-natural life must share the same natural resources, breathe the same air and drink the same water. Creative inspirations like the ones mentioned in precolonial Africa, bringing communities back to the nature, engaging with each other and with nature, engenders an uplifting hopefulness and a return to the belief in human possibilities.

How can the arts ameliorate the scale of the intractable and wicked problem of climate change and other similarly challenging environmental problems such as land degradation and loss of biodiversity? The visual and performing arts have an important role in helping to encourage our society to reduce its environmental impact. The ways that artists can enact this role are as varied as the arts practices they use. Ecocritics such as David Curtis have argued that artists being the creative mouthpieces of the society can communicate messages of hope for ecological sustainability through their art in various ways including but not limited to the following;

1. Collaborating with scientists and other stakeholders to fashion messages that target the public on sustainable development as well as create increased understanding of various environmental issues;
2. Being champions of environmental education;
3. Support and insist on a culture of conservation and pro-environmental behaviour in every sector of life;
4. Proactively engage in using participatory arts practices that subtly encourage ecological balance;
5. Using music, performance, films or the beautiful design to celebrate ecological restoration;
6. Making a personal or thoughtful response to a particular landscape and

communicating a love and empathy for natural areas or expressing deep concern about a particular issue.

Since art is persuasive and it does so through nuanced ways of gregariousness and vibrancy, one hopes that these can be deployed particularly in our Kenyan situation to preach the gospel of pro-environmental behaviours and ecological consciousness today and

in future, for nature for our children and their future. The present artist in Africa must not shy away from the sacrosanct duty that his forebearers carried of conserving nature through song and dance and other forms of art. If the Wanga people, through their art were able to declare Imbongo (the short antelope) an endangered species without consciously saying so, the present art of the Wanga people and Kenya in general can pick lessons from this silent and salient conversation enterprise, to teach

them in schools and to reinforce the importance of conservation.

Filmmakers have always declared that no animals were harmed in the making of this film. This is good but not enough. Film is a booming business in the west. It is slowly picking here in Kenya. It can be made bigger and better. How about having in those film budgets a budget line dedicated to environmental conservation? It would be a good point to start thing about film and environment.

And it behoves us critics in the Universities, to recommend to policy makers that indeed there is need to teach creative arts and the environment. And this creative eco-criticism must not be limited at the University faculties along but cascade to the lower cadres of education. It is always easy when you catch them young.



*The present artist in Africa must not shy away from the sacrosanct duty that his forebearers carried of conserving nature through song and dance and other forms of art.*







Photo: Dennis Otieno Onyango



# A Tale of Ignorance

I did not see,  
The flooded streets,  
And chocked whales,  
On that fateful day.  
I just thought,  
This bottle is heavy,  
And I'm far from home,  
So let me throw it in this ditch,  
So it's finally gone.

I did not think that my house would flood,  
Or my car would float,  
Because the drainage is blocked.  
Or even that the fish in the seas,  
See plastic and think,  
Is this food I see?  
But...  
I did think of the convenience,  
Of throwing my trash,  
In the river,  
Next to my house.  
Because anyway,  
The river always flows,  
I don't know where it goes,  
I never know where it goes.

I did not think,  
All my actions,  
Somehow,  
Have reactions.  
That the seas,  
And me,  
Are somehow,  
Connected.  
That my action,  
Of ignorance,  
Impatience,  
Stubbornness,  
Will have a dire,  
Consequence.



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