

Circular economy in Africa: examples and opportunities

PLASTICS



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This article is part of a collection of resources on the circular economy in Africa. The goal of this collection is to explore the potential of the circular economy in key economic sectors for Africa and highlight examples of the circular economy in action. The sectors explored in this study are: food and agriculture; fashion and textiles; plastics; e-waste; automotive; and the built environment. The collection also considers the key role of public policy and the financial sector in creating the conditions for the transition to a circular economy.

The collection is the result of a joint effort led by four organisations: Chatham House; the Ellen MacArthur Foundation; ICLEI Africa; and the University of Lagos, who worked closely to combine their complementary knowledge and expertise on this broad topic. While the collection was curated by the Ellen MacArthur Foundation, it reflects a plurality of views and analyses. The introduction to the collection can be found [here](#).



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Introduction

In recent decades, global production and consumption of plastics have soared. Between 1950 and 2015, global production of plastics increased nearly 200-fold to 381 million tonnes per year.² Today, in African countries, the per capita plastic consumption remains relatively low.³ However, it is predicted that in Egypt, Nigeria, South Africa, Algeria, Morocco, and Tunisia, the imports of plastics will double by 2030.⁴ The main drivers for this predicted increase are the rapid rate of urbanisation and Africa's growing middle class, which is creating new consumer markets.⁵

Thanks to being low cost, versatile, durable, and lightweight, plastics have brought many benefits globally and in African countries. Plastic packaging, for example, has increased accessibility to clean water and food products, helped ensure hygiene by protecting goods from contamination, and reduced the consumption of fuel during transport due to its low weight. However, it is also increasingly understood that the way we use plastics is incredibly wasteful and polluting.

Globally, around 85% of plastic packaging ends up in landfills or incinerators, or leaks into the environment after a short single use. This means plastic packaging material worth USD 80-120 billion is lost to the economy every year.⁶ In African countries, on average, only 4% of municipal solid waste is currently recycled.⁷ The informal sector plays a critical role in plastic collection and the reduction of plastic pollution by collecting packaging that may have otherwise leaked into the environment. Indeed, data shows that about 60% of all plastic recycled globally is collected by the informal sector.⁸

Our current take-make-waste linear plastics economy has significant negative impacts on the environment and on local communities, with low-income and vulnerable communities often being the most heavily impacted.⁹ Plastic waste entering the ocean represents a potential threat to food security and economic development,¹⁰ and unmanaged waste on land may also contribute to the spread of diseases and viruses, such as malaria or Ebola.¹¹ As such, plastic pollution presents not only an environmental issue, but also a major socio-economic and development challenge. Moving away from today's linear model and fundamentally rethinking the design, use, and reuse of plastics is crucial to tackle plastic pollution and enable healthier livelihoods and economic development.



165

million tonnes

of plastics are expected to reach their end-of-life in African countries!

The circular economy for plastics offers a vision for an economy in which plastic never becomes waste

So far, many efforts to tackle plastic pollution have focused narrowly on improving waste management or clean-ups. But the scale of the problem has only increased. [Recent data](#) shows that if we continue to make and use plastic in the ways we do now, by 2040 there will be twice as much plastic on the market, triple the amount of plastic entering the ocean each year, and four times the volume of plastic in the ocean.¹² While waste management and clean-ups are part of the solution, these downstream solutions will not solve the problem of plastic pollution on their own. We cannot recycle our way out of this crisis, and we cannot pull plastic out of the ocean as fast as we are putting it in. It is now widely recognised that a comprehensive circular economy approach is the only solution that can match the scale of the problem.

The [circular economy for plastics is a vision](#) for an economy in which plastic never becomes waste or pollution.¹³ One in which we eliminate the plastics we don't need, innovate so those we do need are reusable, recyclable or compostable, and circulate all of the plastic items we use to keep them in the economy and out of the environment. By implementing these three actions, we can maximise the economic, societal, and environmental benefits that plastics bring us and minimise – and eventually eliminate – their negative impacts. This is especially relevant to African businesses and governments as eliminating unnecessary plastics and circulating existing plastics will create an opportunity to become less dependent on imports.

Voluntary actions and growing political momentum

There is broad and growing momentum behind this vision, globally as well as in Africa. Through the New Plastics Economy Global Commitment and the Ellen MacArthur Foundation's Plastics Pact Network, more than [1,000 organisations](#) - including many of the world's largest producers, users, and recyclers of plastic packaging - have united behind [this common vision](#) of a circular economy for plastic. Through the [Global Commitment](#), led in collaboration with the UN Environment Programme (UNEP), businesses and governments have agreed to concrete 2025 targets under this vision. Currently, 71 of the business signatories of the Global Commitment are operating and/or registered in African countries.¹⁴

Through the Ellen MacArthur Foundation's [Plastics Pact Network](#), collaborative initiatives have brought together businesses, governments,

NGOs, and other key organisations to implement solutions towards a circular economy for plastics across 27 countries. As part of the [South African Plastics Pact](#) delivered by GreenCape, 40+ businesses, NGOs, and supporting organisations (including the Department for Forestry, Fisheries and the Environment of the Republic of South Africa) are working together towards achieving a set of [circular economy targets for plastics by 2025](#). The Kenya Plastics Pact (KPP), which was launched in October 2021, is officially supported by the Kenyan Government through the Ministry of Environment, and its membership covers the entire plastics value chain with leading organizations from across the country. The recent Global Commitment report¹⁵ and first Plastics Pact progress reports, show that - while much more work is required - initial and accelerating progress is being made.¹⁶

Next to voluntary action, there is also political momentum behind tackling plastic pollution by putting in place regulatory measures. On the national level, several African countries have taken steps to ban plastic bags or eliminate the production and distribution of certain types of single-use plastics. Cameroon, Egypt, Eritrea, Ghana, Kenya, Mauritania, Morocco, Nigeria, Rwanda, Senegal, and Tanzania have taken the lead, while others, like Botswana and Ethiopia, are following suit (see more in the [Public Policy article](#)).¹⁷ On the international level, Rwanda and Senegal are among those countries contributing to the draft resolution on an internationally legally binding instrument on plastic pollution that is due to be submitted for adoption at UNEA 5.2. This political momentum represents a unique moment to move from selected interventions, like plastic bans, to a more comprehensive approach for a circular economy for plastics in African countries.

Key strategies to take action

1

Elimination - removing unnecessary packaging or innovating so that packaging is no longer needed

2

Reuse - refillable or returnable packaging, which can create opportunities for more affordable products

3

Material circulation - keeping all materials we use in the economy and out of the environment



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New Africa via Adobe Stock

By rethinking packaging, products, and business models, it is possible to take an upstream innovation mindset to find solutions to plastic waste. There are three key strategies that help design out packaging waste in particular: **elimination, reuse, and material circulation.**

Elimination is about finding ways to design out packaging, either by removing unnecessary packaging or innovating so that packaging is no longer needed.

Reuse business models keep packaging in use for more than one cycle, meaning the packaging is either returned to the business or refilled by the customer.

Material circulation is about redesigning packaging so that it can be recycled or composted. Some innovative solutions harness the power of two or all three of these strategies at once.¹⁸

1

Elimination – removing unnecessary packaging or innovating so that packaging is no longer needed

While it is important to improve collection and recycling, it has become clear that we will not recycle our way out of the plastic waste crisis. Innovation efforts need a strong focus upstream to stop waste being created from the outset. In other words, we need to rethink what we put on the market in the first place.

It starts by eliminating unnecessary or problematic items. For example, in Egypt, Nestlé removed the plastic tear-offs that covered the bottle cap and neck of Nestlé Pure Life water bottles. This saved nearly 240 tonnes of waste in the first 18 months.¹⁹ As part of the Global Commitment, over 85% of signatory companies that use single-use straws, carrier bags or cutlery, and packaging made from PVC or expanded polystyrene, have identified these as problematic or unnecessary and committed to phase them out by 2025 at the latest.²⁰

However, elimination needs to go far beyond just removing straws and carrier bags. We need to scale innovative solutions that deliver products to customers without the need for single-use packaging in the first place. This can be done by rethinking the packaging itself (e.g. films that dissolve in water), rethinking the product (e.g. solid shampoo bars), or rethinking the supply chain and business model (e.g. hyper-local production and delivery of goods).

Innovators and entrepreneurs on the African continent are already capturing this opportunity. One example of this is I-Drop, a South African based company that tackles two issues at once: providing access to affordable, safe drinking water and eliminating single-use plastic waste from pre-bottled water. I-Drop's 'Waterpods' are self-service, purified drinking water refill dispensers for grocery stores, retailers, and hospitality venues. I-Drop has installed and piloted Waterpod systems and technology in over 100 locations in seven countries in Africa: Botswana, Ghana, eSwatini, Namibia, Senegal, South Africa, and Zimbabwe (read more about I-Drop in the case study box).



2

Reuse – refillable or returnable packaging, which can create opportunities for more affordable products

In reuse models, packaging is refilled by the customer or returned to the business to be used again, rather than discarded after one use. There are many different reuse business models. Next to reuse models for B2B packaging (e.g. reusable pallets, crates), the range of B2C reuse models can be split into four categories, depending on the ownership of the packaging – i.e. whether the packaging is refilled or returned – and where the refill/return occurs – i.e. at home or on-the-go.²¹

Beyond the environmental benefits of reducing waste generation, reuse models can also bring significant business benefits and savings for the customers. For example, reuse can help to cut costs, adapt to individual needs, and optimise operations.²²

In African countries, there is significant potential for successful reuse solutions for packaging. The 2021 South African Plastics Pact Reuse Innovation Challenge has featured multiple innovators coming up with reuse solutions.²³ Reuse models and deposit-return schemes (DRS), such as for soda bottles either glass or plastic, are widespread and the logistics to enable these business models are already in place. For example, in Tanzania and Kenya, refillables currently represent over 25% of the sales portfolio of the Coca-Cola Company.²⁴

Mazzican, which operates in Tanzania, is another example of a commercial upstream reuse solution for hygienic milking and transportation. Mazzican offers a durable and reusable 10 litre food-grade plastic container. It aims to replace single-use plastic bottles and plastic buckets usually used by farmers. The reusable solution offered by Mazzican not only prevents plastic pollution from accumulating in rural areas, but it also benefits the farmers and processors by increasing health and safety standards, and minimising the rejection of supplied milk.

Other reuse business models include existing grocery shopping practices in which customers buy products in small quantities or in bulk at food markets where food is not pre-packaged. This is a widespread practice at food markets in African countries which is also now being more formalised and promoted in zero-waste shops such as [Good Source](#) or [The Refillery](#) in South Africa, and the delicatessen counters of Marjane and Carrefour supermarkets in Morocco.²⁵



Photo credit:
Mazzican

3

Material circulation – keeping all materials we use in the economy and out of the environment

For all packaging that cannot be eliminated or reused, we need to make sure the packaging materials are kept in the economy and out of the environment. This starts upstream, by designing all packaging to be recyclable or compostable.

As with innovative elimination solutions, there are opportunities to rethink the packaging, product, and business model to design for material circulation.²⁶

Upstream innovation towards material circulation should be complemented by measures downstream to scale the necessary collection, sorting, and recycling systems so that materials are collected and circulated in practice.

The need for Extended Producer Responsibility (EPR) policies

One of the major barriers is that collecting, sorting, and recycling packaging costs more than the amount recyclers get paid for recycled materials, resulting in a net cost. In order to attract investment and meaningfully scale recycling as a viable solution, that cost needs to be covered, so the process becomes profitable.²⁷ It is now widely recognised that the only proven way to generate dedicated, ongoing, and sufficient funding to cover this cost is through programmes in which the companies putting packaged products on the market remain responsible for the packaging after its use and are required to pay for its collection, sorting, and recycling – such programmes are called Extended Producer Responsibility (EPR)²⁸ (see Policy article to read more policies that support circular economy).

EPR schemes for packaging are already being implemented in a number of countries including Senegal, the Gambia, and Zimbabwe, and are currently in development in Kenya and South

Africa.²⁹ EPR schemes for packaging have been proven to drive up recycling rates and could deliver a host of other benefits, for example the creation of local jobs, reductions in greenhouse gas emissions, and incentives for companies to design more easily recyclable packaging or even design out single-use packaging altogether. In countries that do not have formal collection systems in place, there are questions to be resolved on how to best design and implement EPR schemes that are fit for the local context, including how to integrate the informal sector in a way that ensures a just transition, enhancing the livelihoods and wellbeing of all people involved. It is clear that leaving these questions unanswered is not an option. Without EPR policies, packaging collection and recycling is unlikely to be meaningfully scaled and millions of tonnes of packaging will continue to end up in the environment. The existing political momentum to address plastic pollution is an opportunity to implement EPR schemes.



Leveraging digital innovation

While well-designed EPR policies are vital to scale collection and recycling infrastructure, this policy tool by itself is not enough to solve the entire issue, and it does not mean there is nothing that can be done in the meantime to improve collection and recycling. In addition to policies and legislation, there are also growing opportunities to leverage digital innovations to support and accelerate a transition to a circular economy for plastics in Africa.³⁰ The case for leveraging digital innovation for circular economy in African countries is compelling as Africa has the fastest-growing internet penetration and the continent has attracted significant investment in digital platforms such as Google AI hub in Ghana and Facebook hub in Kenya. Various digital innovations are being applied by entrepreneurs, including web-based solutions, reward systems, and mobile apps to improve collection services, exchange data about waste materials, and enable value creation from waste. In the private (formal and informal) sector across Africa, smart ecopreneurs and social impact investors have identified these opportunities and are turning them into viable value-added businesses, employing people in collecting, sorting, and recycling.

In Nigeria, Wecyclers and Recycle Points have partnered with the Lagos Waste Management Authority (LWMA) to collect recyclable waste items (e.g. plastic bottles and bags, cans, glass bottles, paper, and cartons).³¹ They incentivise people to collect and sort their used recyclable waste at home by exchanging it for points which can later be redeemed for household items, food, or phone credit. Another example is the Packa-ching project run by Polyco (a Producer Responsibility Organisation in South Africa), which comprises a mobile kiosk where citizens can take their their household recyclables for compacting and recycling, and in return get an instant cashless payment to their phone.³² The goal of the mobile kiosk is to provide the opportunity for people in informal settlements to both manage their waste and get cash for it. Digital innovations are being applied by entrepreneurs and innovators across the continent and they contribute to the circular economy for plastics by improving:





Identification (e.g. Recyclebot AI solutions that use AI to identify the types of plastics),

Collection (e.g. Yo-waste that use mobile and web based applications to link consumers, waste collectors and recyclers),

Transportation, sorting, and processing (e.g. Mr Green Africa who leverage technology to streamline operations).

While so many innovative solutions exist in African countries, it is worth noting that the majority of these are focused on collection for recycling. Digital innovations, however, offer significant opportunities for elimination and reuse as well. For example, implementing efficient delivery mechanisms for reuse, educating consumers on how to reduce and reuse plastics, and supporting producers in redesign their products to eliminate unnecessary packaging. The use of digital technologies is also important for addressing the current data gap about plastic waste volumes and leakage points.

If paired with a wider strategy that includes extensive collection systems development, the combination of a broad informal

economy and digital innovation in Africa presents a great opportunity for workforce upskilling and income generation. While the examples above are a step forward, it needs to be recognised that they do not provide a comprehensive solution for all packaging types. As workers in the informal sector are typically paid based on the value of the material they collect, these efforts focus almost exclusively on the highest-value packaging items. All others are not collected and typically are burned, or end up in dump sites and in the environment. Therefore, in order to circulate all packaging materials, it is important for these efforts to be part of a wider strategy that includes rapid scaling of collection and recycling infrastructure supported by EPR policy, informal sector integration, as well as private and public efforts towards eliminating, reusing, and redesigning packaging in the first place. This is especially pertinent to markets with limited waste management infrastructure and high economic growth.

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Case study

I-Drop Water: Refill at the grocery store and refill on the go



Photo credit:
i-Drop

I-Drop's 'Waterpods' are self-service, purified drinking water refill dispensers that were launched in South Africa and piloted in Botswana, Ghana, eSwatini, Namibia, Senegal, South Africa, and Zimbabwe. 'Waterpods' are dispensers connected to the main water supply. The dispensers have in-built filters allowing users to buy or dispense purified, chilled, or sparkling water in multiple sizes using reusable bottles/containers. A bespoke 'Internet-of-things' (IoT) technology platform improves market reach, reduces operating expenses, and improves system reliability by allowing remote oversight of all installed Waterpod systems in real-time. I-Drop's connected technology also enables accurate environmental impact assessment by tracking plastic, water, and carbon waste reduction in real-time.

BENEFITS

- **Competitive pricing:** with the I-Drop Water grocery store model, drinking water can be sold at prices that are 75–80% cheaper than bottled water, making access to clean drinking water widely affordable. With the public spaces and locations model, companies can cost effectively provide an alternative to single-use plastic 'grab-and-go' bottled water and profit from the sale of a range of refill bottles, without the clean-up cost of single-use plastic bottles
- **Waste prevention:** at a single grocery store in the lowest-income province in South Africa, the equivalent of a 500ml bottle of water is sold through a Waterpod every 45 seconds of trade. This means that in the first six months of 2020, this store sold purified refills equivalent to over 200,000 500ml single-use bottles
- **Carbon emissions:** transport emissions associated with transporting bottled water are reduced
- **Water use:** I-Drop's preferred purification technology produces no wastewater by-product

Endnotes

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- 22 For further information on reuse models, their business benefits and plenty of case examples, see the Ellen MacArthur Foundation's 2019 REUSE book.
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