The Circular Economy: Our Journey in Africa So Far

FOOTPRINTS AFRICA

Contents

1 Introduction

The initial spark

In recent years the circular economy has become a Hot Topic. The teams from Footprints Africa and our partner, the African Circular Economy Network (ACEN), have been invited to present at events in Ghana, across Africa, and globally. The response to this 'new' concept has been overwhelmingly positive. The core principles of doing less with more, repairing and innovating with what is there can be seen everywhere in Africa. At the same time, the dirty underbelly of the linear economy is becoming even more apparent (climate change, soil degradation, the waste crisis, income inequality and so on). However, the conversations on circular economy are often very conceptual and draw on European and North American examples. The people we speak to want to know what it looks like in practice and in a context that they can relate to.

So we decided to embark on a project to help bridge this disconnect: between the mainstream discussion, the theory and what's happening across Africa.

Our focus

We are interested in bringing together tangible examples of what people are doing to put the circular economy into practice across Africa. We want to help articulate the core principles, to give insights into what's possible and show what could be replicated in other contexts. We believe that the stories we have uncovered have the potential to inspire people and stimulate collaboration. This is why we have decided to focus on case studies, 23 of which are showcased in the second half of this report.

Our approach to mapping case studies

The case study collection has been driven primarily through a questionnaire that we have co-designed with invaluable help from Shifting Paradigms, which draws on Circle Economy's Key Elements to articulate the different circular strategies adopted by each initiative. This builds on an earlier collaboration to map circular economy case studies with ACEN, Big Circle and the RSA.

Next, we wanted to work out how we could get the biggest platform possible for these initiatives to get a result, the case studies will be presented on the new version of Circle Economy's Knowledge Hub. They have been geo-located on a map by our partner GRID-Arendal and can be found here.

Our approach is cross-sectoral and pan-African. In the first phase of our project we wanted to test our tools and see what patterns and trends are emerging. So we have kept our focus broad, rather than homing in immediately on any one geography, circular strategy or business model from the start.

We are aware of the risks and contradictions in talking in broad terms about a continent of 54 countries, 1.2 billion people and over a thousand languages. But we believe that many countries share the twin challenges of a lack of good information on the circular economy, as well as quantitative data on the economic, social and environmental impact that the circular economy is having in specific contexts. Our approach is not just filling in information gaps, but brings the advantage of connecting and creating networks of business initiatives.

The Knowledge Hub is Circle Economy's online, open-access library of circular case studies. The new version, launching in January 2021, will enable users to contribute, update and curate cases in the database. Footprints Africa will create a dedicated 'collection' of African cases, curated by Footprints and connected to the broader hub.

Developments in early 2021

This project and report are complementary to a series of initiatives which will be made public in the first part of this year:

- The Ellen MacArthur Foundation will publish a report on circular opportunities in Africa, together with Chatham House, ICLEI Africa and the University of Lagos
- The African Development Bank is setting up the Africa Cicular Economy Facility, a multi-donor trust fund to support circular businesses. This is being supported by research carried out by the African Circular Economy Alliance and Dalberg
- The European Union will publish the results of its study on the circular economy in EU-Africa cooperation
- ICLEI- Local Governments for Sustainability and ACEN will release a report on Circular Cities in Africa.

Presentation of early findings

This report showcases 23 case studies, individually laid out in the second half, themselves drawn from a larger set of 63 questionnaire responses. So far, we have mapped over 160 circular economy initiatives. This first step, outlined in this report, is not intended to be comprehensive but act as the entry point for a much more ambitious undertaking. Our objective is to build up a comprehensive set of 500 case studies by the end of 2021.

For this first sample, we have grouped the case studies under six broad themes:

- Bio-waste to compost
- E-waste
- Plastic
- Construction
- Bio-waste to feed
- Textiles and fashion.

These are not meant to be a rigid thematic classification but rather a way to make sense of the trends that we are uncovering and help you, the reader, navigate this report.

There is important work being done to look at the 'macro' side of the circular economy in Africa and its enablers - policy, law and governance, finance and technology. Here we focus on the individual stories that we feel need to be told.

Footprints Africa and our mission

Footprints Africa supports SMEs to adopt future-friendly practices, address the challenges of growth and create jobs using value chains as a tool for development. Focusing on the catering and commercial waste management sectors in Ghana, we are championing business as a force for good and piloting new business models that exemplify this. We advance sustainable, scalable and inclusive approaches for the development of African economies. We are a charity registered in the UK and Ghana and exist for public benefit.

FOOTPRINTS AFRICA

2 The circular economy in Africa

A note on the circular economy

The principles of the circular economy are well-documented, so here we give just a simple overview. The circular economy is about revisiting our current 'take-make-waste' extractive industrial model, which has delivered tremendous benefits but also created many downsides. Circular systems employ the concepts of reuse, sharing, repair, refurbishment, remanufacturing and recycling to create 'closed loops'. These systems do three things:

- Design out waste and pollution;
- Keep products and materials in use for as long as possible; and
- Regenerate natural systems.[1]

Transitioning to the circular economy could deliver many benefits: a reduction in pressure on the environment, improvements in the security of supply of raw materials, increased competitiveness, greater innovation, a boost to economic growth, and, critically, job creation.

For the purposes of this report we have used the impact organisation Circle Economy's key elements of the circular economy[2] as a reference point. For each case study, we show which of these circularity strategies they incorporate.

> "We're not going to build African cities from materials that we get from China. COVID 19 has highlighted how their design and their purpose needs to better match what works for the continent."
>
> Christian Benimana, MASS Design, Rwanda

Key elements of the circular economy

Drawn from Circle Economy's Making Sense of the Circular Economy: 7 Key Elements

The circular economy in the African context

The rest of the world has a lot to learn from Africa's approach to circularity, not to teach it, or nor import ready-made solutions. If the circular economy is more about a mindset than complex technical solutions, it's likely that many African countries, with indigenous and ingenious approaches to keeping scarce materials in circulation, are already more circular than countries in the industrialised North. From the Suame-Kumasi vehicle cluster in Ghana, to the Kihamba Forest garden in Tanzania, there are already many inspiring examples of circular practices and creative ways of dealing with material scarcity.

We started by saying that until now, the discussion on the circular economy has focused on Europe and America. That may be because it is in the so-called 'developed' or industrialised world that, the problems created by the linear economy have been revealed most starkly: overconsumption, baked-in inefficiencies and environmental degradation.

There are a number of reasons why we think it's important to show what is happening across the continent. African countries are both the source of many of the world's raw materials, from the rare-earth metals in our smartphones to the food on our plates. They are also treated as a dumping ground for the world's waste products: plastics,[3] clothing,[4] cars[5] and electronics; including those reaching expiration or banned in other countries. African markets extend the useful life of products that have reached premature obsolescence elsewhere, but they also have the downside of locking in inefficient consumption models- for example through extending the lifespan of second- or third-hand diesel vehicles.

Regenerative architecture in the Democratic Republic of Congo: The African Wildlife Foundation and MASS Design Group partnered with the people of Ilima into create a new conservation-focused primary school and community centre. In its construction they used exclusively local materials that were harvested and made within a 10 kilometre radius.

We believe it is also important to look at the circular economy in Africa because the human development model that the continent needs is different. It's in Africa that we will see some of the greatest growth in consumer spending, population increase and urbanisation over the next few decades.[6] It's been argued that the continent is the last emerging market frontier, and a linear approach has the potential to create enormous human benefit.

But if economic development is pursued using a take-make-waste approach, it is not sustainable. African countries have the opportunity to break a pattern that isn't working to everyone's benefit, and to develop technology and business models that are adapted to specific African realities and needs. Together with other strategies, a circular approach offers an opportunity for a rethink which is both radical and deeply rooted in traditional practices.

The circular economy as a response to megatrends in Africa

A re-imagining of the linear economy in African contexts is not just a philosophical exercise. It is vital in the light of the megatrends that are set to produce extraordinary impacts in Africa over the next decades:

- By 2050 there will be as many as 2.5 billion people in Africa.[7] Population-wise, it's already the fastest growing continent in the world, with the youngest population.
- By 2100, the three biggest cities in the world are projected to be in Africa: Lagos (88 million), Kinshasa (84 million), and Dar Es-Salaam (74 million).[8]
- In terms of infrastructure, the African Development Bank suggests that two thirds of the infrastructure investment needed by 2050 has yet to be made.
- African countries situated at the lowest latitudes will be struck disproportionately by a climate crisis which is largely not of their making. It's hard to project the impacts on human health and safety, food and water security and socio-economic development.[9]

The stakes are high and the challenges complex. Fortunately, African countries are at an advantage when it comes to the circular economy transition. As ACEN's co-founder Alexandre Lemille points out, African countries have 'linear barriers' which are actually advantages in the circular economy,[10] for example:

Addressing the plastic waste crisis: Jibu Tanzania equips Tanzanian entrepreneurs to create affordable access to drinking water, while using more durable plastic and keeping it in circulation for as long as possible before recycling.

- The circular economy is a 'performance economy', and is labour intensive. Africa has a comparatively young population in a world which is otherwise ageing. Right now, 77% of the population is under 35.[11]
- Most of Africa's 'developing' economies don't suffer from the phenomenon of 'linear lock in'. That is to say they haven't invested so heavily in linear infrastructure such as bricks and mortar banking that would hold them back from seizing innovations such as mobile money.
- The continent still has a very low ecological footprint compared to industrialised countries. In 2012, for example, Sub-Saharan Africa (minus South Africa) emitted only 2% of total global emissions of greenhouse gases, despite having roughly 16% of the world's population.[12] Additionally, as a continent, Africa's overstep of the biophysical boundaries required for a healthy planet is still much lower than the rest of the world. [13]

Pioneering inclusive business in Kenya: Like many of the initiatives we are mapping, Mr Green Africa is working to empower people working in the informal sector, which accounts for nearly 300 million Africans.

> Circularity in Africa has to be reachable and it has to be tangible. It needs to be a thing that people will embrace because they can afford it, and because they see its value.
>
> Ruka Sanusi,
> Footprints Board Member

- The technological enablers of innovation in the circular economy are growing. We are seeing a proliferation of tech hubs - fablabs, makerspaces, hackerspaces - that propagate innovation and collaboration. The GSM Association counted around 450 such tech hubs across Africa in 2018.[14] As of 2019, there were some 700,000 professional developers across the continent.[15]

- Africa is home to many collaborative practices which are used to manage scarcity: in Rwanda, on every last Saturday of the month, Umuganda is the gathering of local communities who carry out specific activities, whether it is the collection of waste, the construction of a building or the repair of roads. In South Africa, the concept ubuntu is "the belief in a universal bond of sharing that connects all humanity".

To this we can add the fact that African countries have relatively low material consumption compared to the rest of the world. This means that they have conditions for creation of circular economy models which are re-localised, regenerative and restorative by design.[16]

The potential for circular economy approaches, as well as their necessity, is evident. In order to help create a roadmap for the transition, we need to set the starting point, and ask: **where are we now**? With this project we explore what is possible by looking at what is already in existence. The initiatives we have mapped are reimagining an inclusive, regenerative future for the continent in very pragmatic ways. By connecting them to one another and understanding their needs, hopes and ambitions, we can help visualise one piece of the puzzle.

3 What we are seeing

We have talked with initiatives across the spectrum, from bootstrapping startups to platforms supported by multinational enterprises. We have chosen to highlight 23 of them, across six themes.

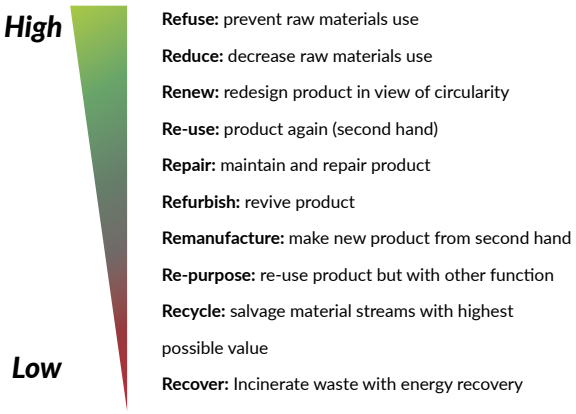
Emerging insights

Here are some of some of the observations we have made so far and some salient points of feedback from the entrepreneurs themselves:

- **A focus on waste:** we are seeing a predominance of case studies at the 'lower' end of the circularity hierarchy, focusing on the use of waste materials rather than, say, designing out waste, or providing services rather than products. Does this mean that the circular economy in Africa is all about waste management? We think it is not. Many challenges can be addressed by redesigning the waste economy: diverting organic waste to enhance soil and capturing by-products for energy generation; repurposing waste materials as construction inputs to tackle a continent-wide housing crisis; and along the way cleaning up communities, and so benefiting the environment and human health. In Africa, as elsewhere, we need to rethink our views on 'waste'. It's simply a resource that is in the wrong place.

Levels of circularity: The 10 R's[17]

Order of priority



After Jacqueline Cramer (2017)

- **Vital processes in the loop happen outside of the continent:** for some businesses the remanufacturing or recovery facilities they need just aren't available in Africa yet. This includes businesses who want to recycle e-waste, batteries, certain types of plastics (such as PET), or fabrics. The collection and aggregation of materials happen locally but the main value addition (and capture) takes place offshore. In some instances this is a case of economy of scale, where a business is not yet operating at a level where high-tech, high cost applications will meet the capital return on the investment.

- **Entrepreneurs' experience underlines the value of rapid prototyping:** the entrepreneurs that we have interviewed have emphasised the importance of getting their products and services to the market earlier rather than fine-tuning them. Indeed, some of them have concluded that perfecting their offering could be counterproductive to the things that they are trying to achieve in getting their business off the ground rapidly.

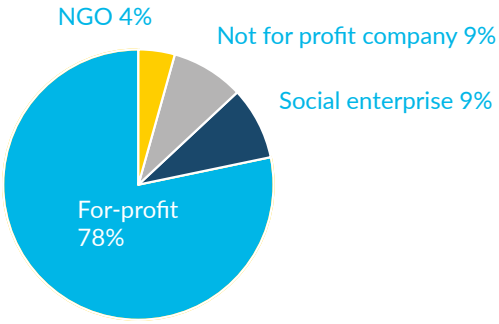
- **Multiple examples of 'parallel evolution' of business models:** we are seeing multiple initiatives working in different geographical contexts in very similar fields, who have done research and development independently. Transformation of plastic waste into construction materials (bricks, paving stones, and tiles) is one notable example. Black soldier fly farming for production of animal feed, fertiliser and compost is another. We set out many examples of each later in the report. The amount of information in the public domain is increasing, but this underscores the importance of this mapping work.

- **Equipment improvisation:** many entrepreneurs have started by inventing and building their own machinery because it wasn't easily accessible on the local market, or was outside their price reach. These solutions are often low tech and low volume, easy to operate and maintain, and cost-effective to build.

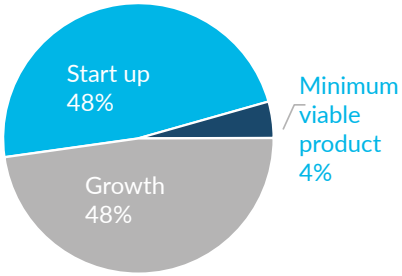
- **Barriers to scaling:** many initiatives have built their model, developed successful products and are serving a growing market but face a major barrier to scale: Import costs. Even though making the leap to more sophisticated equipment could bring down unit costs and dramatically increase scale, the costs of transporting and maintaining imported equipment for small to medium sized businesses breaks the economic model, so reinforcing the trap of the 'missing middle' - that segment of enterprises whose demand for credit remains largely unmet.

Characteristics of the 23 case studies

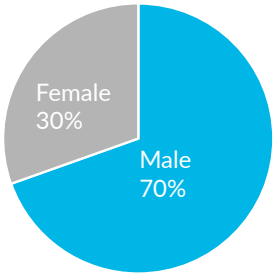
Type of initiative



Stage of initiative



Gender distribution of senior leadership

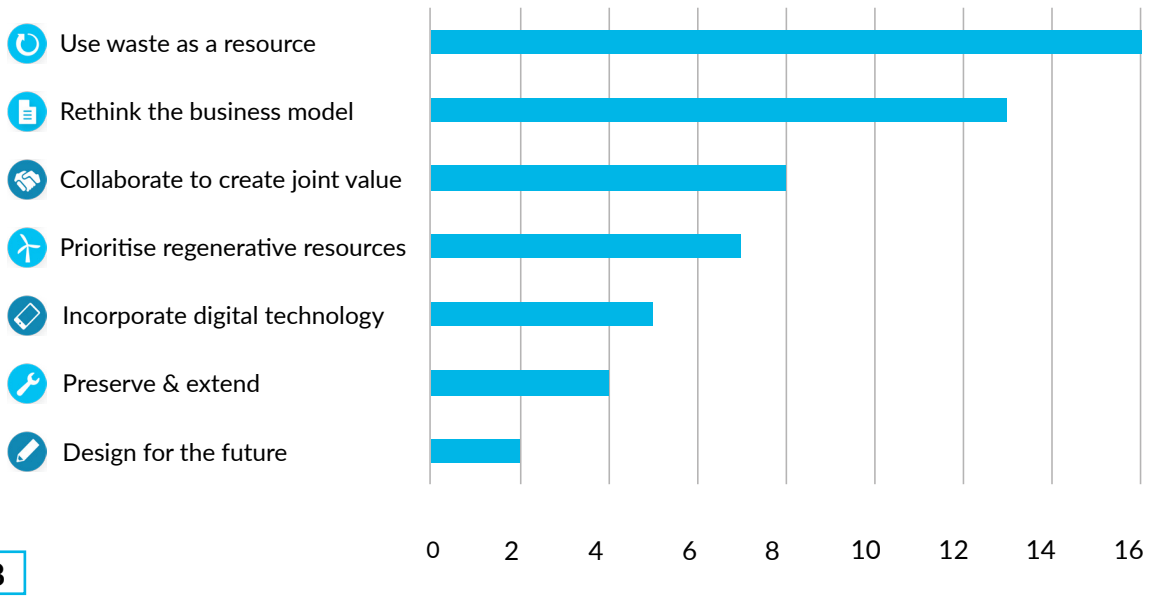


What do entrepreneurs need to succeed?

We asked all of the entrepreneurs we interviewed what they need to take their initiative to the next level. Some of their responses were surprisingly simple and familiar to those working in the world of startups:

- **Mentorship:** access to someone with whom to talk business development ideas through.
- **Peer networking:** the opportunity to learn from others from across the continent running similar initiatives.
- **Funding:** access to investment to help scale businesses.
- **Technical advice:** the opportunity to ask an expert to review their plans, from financial modelling to operational strategies, to research and development.
- **Support programmes:** programmes that are tailored to circular economy innovations to help them optimise the circularity of their models/ full value chains.
- **Government support:** from policy to public procurement, to physical space, to tax incentives.

Circular strategies adopted by the initiatives



4 Next steps

We began this project to test the tools we created. In collaboration with Shifting Paradigms, we developed an online questionnaire. With ACEN we discussed how to embed circularity in the project itself: creating knowledge commons that are open-access, with distributed ownership and curation - effectively handing over the narration of the stories to their protagonists. With GRID-Arendal we are geolocating the cases that have responded to the questionnaire using ArcGIS

Next, we will develop a more comprehensive resource encompassing what is happening across the continent by doing three things:

1. **Expanding the geographical focus:** Ghana, Kenya, Rwanda, Tanzania, Uganda, and South Africa predominate in our case studies. We need to capture more examples from North, Lusophone and Francophone Africa.
2. **Focusing on circular businesses that might not be aware they are employing circular strategies:** Our findings have been driven by our networks and desk-based research. It's been more difficult to uncover business initiatives that are harnessing circular principles but have not branded themselves as 'circular'.
3. **Capturing a broader range of circular practices and enablers:** We want to bring in examples of laws and policies, academic research, circular society or cultural practices, multinationals' value chain interactions with small and medium-sized enterprises, and industrial ecosystems.

As the database expands we will be able to better analyse the data and report more systematically on the themes where respondents have self-evaluated: enabling technologies, impact and environmental measurement, and contributions towards the Sustainable Development Goals.

How you can be part of this project

We would love to hear from you if you:

- Have further case studies that you think should be included.
- Would like to collaborate on:
  - » Expanding the mapping or improving the tools
  - » Analysing findings
  - » Turning the case studies into training materials
  - » Designing and delivering training programmes with us
  - » Further research on any of the areas that we have identified as lacking in-depth research: regenerative agriculture, industrial symbiosis, enabling technologies, and circular architecture and the built environment.
- Have ideas on sectors we may have not touched on: energy, water, health, transport, or tourism.
- Would like to be part of the community that builds out and curates the Knowledge Hub Collection.

If so, contact us at:
changemakers@footprintsafrica.co
putting "CE cases" in the subject line.

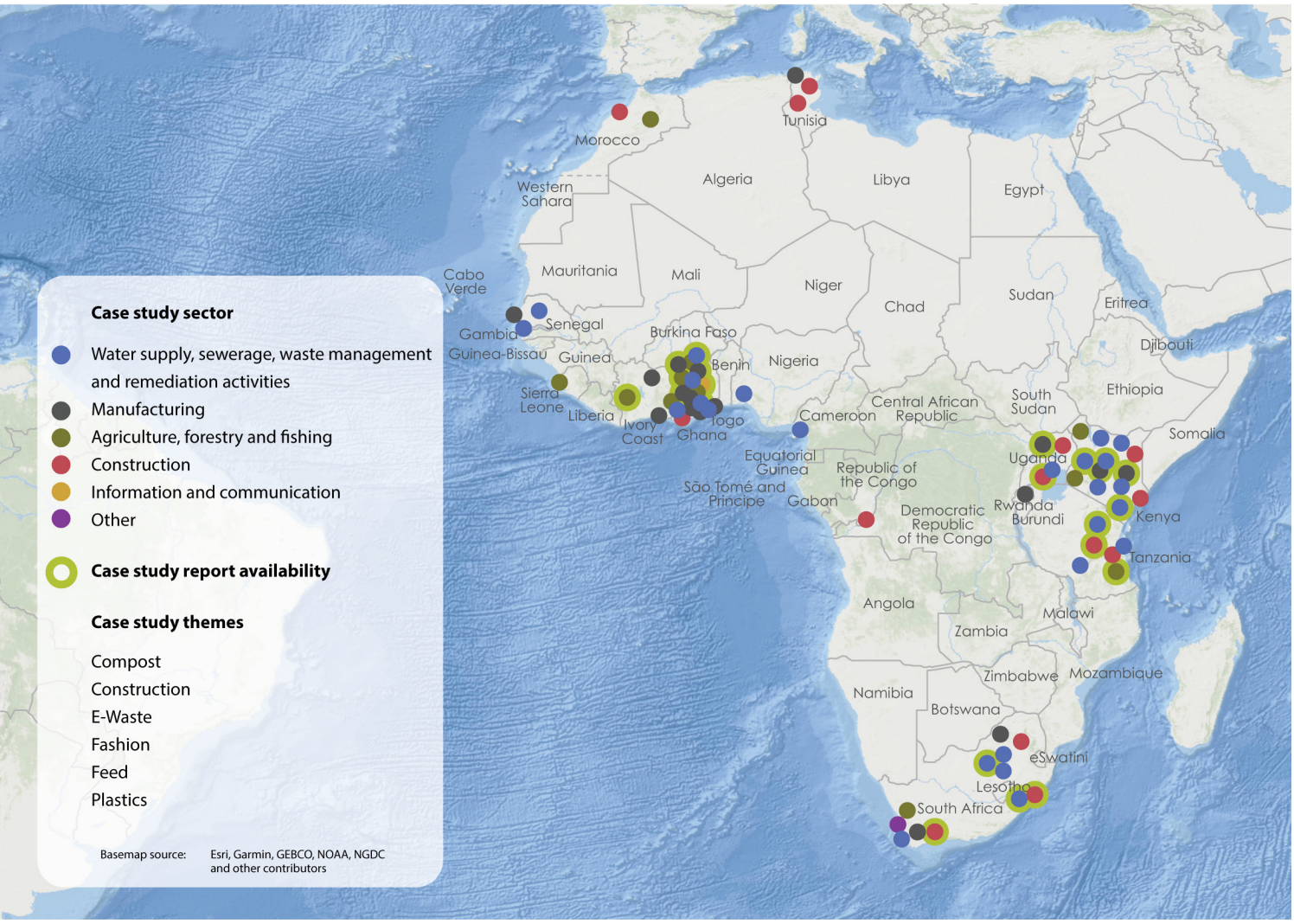
If you would like your business initiative to be included in the database, please complete the **questionnaire.**

5 Case studies

We have clustered the case studies we have collected around six themes. It may not be a coincidence that these are areas with the continent's significant 'macro' challenges. These are not rigid categories. After all, there are plenty of examples of crossovers: plastic used as a construction material, for example, or black soldier fly frass transformed into compost or fertiliser.

For reasons of space and readability, we have chosen a selection of case studies rather than set them out exhaustively. You will find this ever-growing set on Circle Economy's Knowledge Hub, and mapped out by GRID-Arendal.

Map of case studies



***GRID-Arendal** is a non-profit environmental communications centre based in Norway that transforms environmental data into innovative, science-based information products and provides capacity-building services. GRID-Arendal collaborates with the UN Environment Programme and other partners around the world.*

Bio-waste to compost

African soils have huge importance for food security and sustainable development, both for the continent and the world. However, some 40% are already degraded. This impacts negatively on food production and leads to soil erosion, which in turn contributes to desertification. This is especially concerning since 83% of people in sub-Saharan African depend on the land for their livelihoods. It is estimated that by 2050 food production will have to increase almost 100% to feed Africa's future population. How can agriculture in Africa meet this goal while not continuing the trend of adopting sustainable practices?

Part of the answer lies in regenerative agriculture, and one solution is the use of agricultural or domestic waste to produce compost. Compost adds organic matter to soil, macro and micro nutrients and beneficial soil organisms that improve the health and structure of soil, store water, and sequester CO_2 from the atmosphere. The 'waste' that can be used to make it is often as abundant as it is undervalued: organic waste can make up as much as 60% of municipal waste in African cities. Using locally generated waste also brings savings for African farmers, who often pay a mark-up of between two to five times the price for soil correctives.

In the next section, we have profiled four initiatives who are seizing the business opportunities in transforming biowaste to compost:

- The Compost Kitchen - South Africa
- LONO - Côte d'Ivoire
- Sabon Sake - Ghana
- Safisana - Ghana

Other initiatives working in this space

Name	Location	Business focus	Web
EcoFertil	Morocco	Revaluing manure, spent grain and wood chips to produce composts, potting soil and other derivatives	ecofertil.ma
FibreWealth	Ghana	Production of multipurpose growing medium made from coconut husk	facebook.com/pg/fibrewealth
Green Africa Youth Organisation	Ghana	Community-led circular economy waste management	greenafricayouth.com
Humanure	Kenya	Human waste to compost products	humanurekenya.co.ke
Jekora Ventures	Ghana	Food waste from hospitality businesses to compost	jekoraventures.com/jv-compsoil-compost/
Reliance	South Africa	Municipal green waste to compost	reliance.co.za
Safi Organics	Kenya	Decentralised transformation of rice char to compost	safiorganics.co.ke
Waste Transformers	Sierra Leone and South Africa	Using urban organic waste for biogas, heat, and compost	thewastetransformers.com

E-waste

What does the future of electronic waste management in Africa look like? Globally, it is the fastest growing waste stream. In 2019 it amounted to roughly 53.6 million tonnes, of which only 17.4% was properly collected and recycled[18]. We know that digital solutions can provide answers to Africa's socio-economic challenges, but digitisation - and the built-in obsolescence of many devices - has its own environmental implications.

As a continent, Africa produces very little e-waste - just 2% of the world's total. However, many countries, such as Ghana, Kenya, and Nigeria, have become illegal dumping grounds for the gadgets the rest of the world throws away. As a result, informal recycling channels have sprung up to turn this into a business opportunity, capturing the value in waste materials and prolonging the useful life of much equipment that is thrown away. However, these practices are inefficient, often dangerous and have significant impacts on public health and the environment.

Here we profile three initiatives who are taking three different approaches to recovering the value in e-waste:

- Closing the Loop - Netherlands, Ghana, Kenya and Nigeria
- greenABLE - South Africa
- The WEEE Centre - Kenya

Other business initiatives in this space

Name	Location	Business focus	Web
AST Recycling	South Africa	Recycling of electronic waste and scrap catalytic converters	astrecycling.co.za
Atlantic Recycling International Systems	Ghana	Training, collection, recycling and marketing of e-waste from businesses, household and landfills	Currently unavailable
Close the Gap Kenya	Kenya	Provision of refurbished IT equipment for social and educational projects in East Africa	close-the-gap.org
DESCO Electronic Recyclers	South Africa	E-Waste recycling for SMEs and government institutions	desco.co.za
Enviroserve	Angola, Egypt, Kenya, Nigeria, Rwanda, South Africa, Zimbabwe	Recycling of e-waste in Dubai hub	enviroserve.org
Safaricom's e-waste programme	Kenya	Providing an end-to-end management solution for out of use electronic gadgets	safaricom.co.ke
SetTIC	Senegal	E-waste collection, audits and awareness raising	settic.sn

Plastic

How might African countries make the transition to a circular economy for plastics? There is no denying that plastic is one of the most important inventions of the twentieth century. Across Africa, for example, it's been fundamental for the provision of safe food and drinking water. The problem, however, is that in most African countries the infrastructure does not exist to manage plastics effectively, and plastics producers have for the most part left the state and public to deal with the expense of addressing the harm these products cause.

This is complicated by the fact that recycled plastics must compete with subsidised virgin plastics, the price of which is set on the global market and strongly linked to global oil prices. To develop a sustainable business model, companies working with plastic waste must find a way to add value to the material. This means exploiting not just conventional mechanical recycling, but other ways of valorising the waste.

Momentum is growing to tackle the problem, however. According to the United Nations Environment Programme, Africa stands out as the continent where the largest number of countries instituted a total ban on the production and use of single-use plastic bags. Of the 25 African countries to have introduced national bans on plastic bags so far, more than half shifted to implementation between 2014 and 2017- although lobbying from plastic manufacturers has made this challenging, for example in contexts such as Kenya. In the last few years, there has also been an explosion of research and development on bio-based plastic alternatives, on how to slow the release of more plastics, and how to make best use of the plastic waste that is in circulation.

We showcase four businesses which are looking at keeping plastic in circulation for as long as possible, extracting value from waste plastic, and exploring bio-based plastic alternatives.

- Hya Bioplastics - Uganda
- Mr Green Africa - Kenya
- Pyramid Recycling - Ghana
- Tanzania Maji Jibu Company Ltd - Tanzania

Other business initiatives in this space

Name	Location	Business focus	Web
African Global Recycling	Togo	Processing and recycling of waste plastic	africaglobal-recycling.com
AfricWaste (Veolia)	Côte d'Ivoire	Plastic waste recovery for recycling	livingcircular.veolia.com/en/city/abidjan-africwaste-optimizes-plastic-bottle-collection
Coliba	Côte d'Ivoire	Web, mobile and SMS platform that connects households and businesses with waste pickers	coliba.ci
Green Eco-works	Ghana	Waste plastic to wood plastic and other products	URL unavailable
Libe Green	Tanzania	Processing and upcycling of waste plastic	libegreeninnovation.mystrikingly.com
Mckingtorch Africa	Ghana	Upcycling plastics into valuable products	mckingtorchafrica.org
Reaval Uno Limited	Ghana	Processing and recycling of waste plastic	reavalworld.com
Recuplast	Senegal	Collection and recycling of plastic into domestic goods	recuplast.org
Trashy bags	Ghana	Bags manufactured from water sachets and pieces of fabric	trashybags.org

Construction

How can African countries address both their current housing crisis, the continent's growing infrastructure gap, as well as anticipate technological developments? The continent will be home to the world's fastest growing cities over the next 30 years. Projections are that in 2100 the world's three biggest cities will be in Africa. Without the right infrastructure - particularly housing - they will serve neither their citizens nor the environment well, and existing social problems will be exacerbated.

This is a complex challenge. One of the things to get right is to produce circular construction materials that are affordable, accessible, and even regenerative. We are seeing a swathe of innovations, from people turning waste plastic into modular construction materials that outperform concrete, to initiatives using locally sourced materials from nature.

There are obstacles to innovation. The construction market is conservative, and users may be sceptical of alternative construction materials and technology. Regulatory standards sometimes simply do not recognise new products, or fail to provide the incentives for the use of recycled materials. And they may not yet have reached a level of affordability that is suitable for the informal construction market.

In this report we profile five initiatives who are pioneering waste-based or regenerative construction materials, and streamlining the flow of materials, from demolition to construction.

- Arena Recycling - Tanzania
- DigiYard (Arup) - South Africa
- Eco Brixs - Uganda
- MycoTile - Kenya
- USE-IT's Rambricks - South Africa

Other business initiatives in this space

Name	Location	Business focus	Web
Aggreg8	South Africa	Repurposing construction waste into building material	buildingmaterialrecycling.co.za
Brickify	Nigeria	Recycling waste plastic bags into modular bricks and lumber for roads and housing	brickify.xyz
Build for You Company Ltd	Ghana	Waste wood to construction materials and furniture	buildforyoultd.com
EcoPlastile	Uganda	Plastic waste to construction materials	ecoplastile.com
EcoTech RDC	Democratic Republic of Congo	Waste plastic to modular paving tiles	facebook.com/EcoTechRDC
Gjenge Makers	Kenya	Plastic waste to paving blocks, tiles and manhole covers	gjenge.co.ke
Green Axis	Nigeria	Agricultural waste to composite boards	greenaxisng.com
Green Pavers	Kenya	Plastic waste to paving, fence posts and solar tiles	greenpavers.co.ke
Green Venture	Tanzania	Plastic waste to blocks, bricks, tiles and paving	greenventuretanzania.com
Gunjur Plastics	Gambia	Plastic waste to construction materials	gunjurplastics.com
Zelij Invent	Morocco	Plastic waste to paving and bricks	zelijinvent.com

Bio-waste to feed

How do we satisfy the growing demand for protein for animal feed in Africa? Farming animals on a large scale relies significantly on protein from grains and fish meal. However, agricultural protein requires massive amounts of land and water to produce. Soy, one common source of food, brings damaging consequences in terms of land degradation and deforestation. Another common source, fish meal, has material consequences for marine ecosystems. Globally, some 67% of fishmeal is produced from wild catch, despite over a third of global fish stocks being fished at biologically unsustainable levels.

At the same time, a vast amount of waste in African cities is organic waste: as much as 50% in many places. When organic waste goes to a landfill it releases methane, a greenhouse gas 84 times more potent than CO_2. According to the UN, rotting food waste accounts for 7% of global greenhouse gas emissions.

One elegant circular solution to both problems has taken off across Africa in recent years in the form of black soldier fly farming. Black soldier fly offers a way of transforming organic waste to produce a high protein, inexpensive and high-quality alternative to the otherwise unsustainable feeds on the market. With black soldier fly, one tonne of waste can produce 400 to 600 kilograms of insect biomass, with larvae that are approximately 40% protein and 30% fat. The flies themselves can be used to extract high value biomaterials, from chitosan (for use in pharmaceuticals and agritech) to organic semiconductors.

We feature three businesses who have been working in different ways to harness black soldier fly technology:

- Ecodudu - Kenya
- Neat EcoFeeds - Ghana
- NovFeed - Tanzania

Other business initiatives in this space

Name	Location	Business focus	Web
Agrimax	Nigeria	Organic waste to animal feed	agrimaxllc.org
Agriprotein	Global, including South Africa	Feed, oil and fertiliser from black soldier fly larvae and frass	agriprotein.com
Biobuu Limited	Tanzania	High protein chicken and fish feed, as well as organic compost	biobuutz.com
InsectiPro	Kenya	Black soldier fly for animal feed and crickets for human consumption	insectipro.com
iProtein	South Africa	Black soldier fly for animal feed (grubs, meal and oil) and fertiliser	bsf-protein.com
ProTeen	Uganda	Black soldier fly to produce feed and fertiliser	marulaagribusiness.com
Sanergy	Kenya	Converting toilet waste into fertilizer and animal feed using black soldier fly	sanergy.com

Textiles and fashion

Global production of apparel and textile fibres amounts to more than 110 million tonnes annually. The textile sector is expected to represent 26% of the world's carbon budget and use, and 300 million tonnes of non-renewable raw materials by 2050.

A large proportion of previously owned clothes ends up in market stalls across Africa, sometimes representing 50% of the clothing sector by volume in many countries. But as much as 40% of the clothes that are imported in bulk, packed in bales, are declared unsaleable and are consigned to landfill. This means that in effect African countries are importing clothing waste[19]. Most of the existing solutions can only simply downcycle this material, converting textile waste into low-grade products such as insulation and carpeting.

This has prompted a call to rethink the fashion sector, reorganising production and consumption. By using old fabrics to create new fashion items, even incorporating other waste materials such as tyres, it is possible to satisfy the fashion trends and yet be less wasteful.

Below are some companies leading the charge on reducing waste in the fashion and textiles sector:

- Dignified Wear - Ghana
- Kolics Footwear - Ghana
- Kyuma Goods - Kenya
- Rewoven - South Africa

Other business initiatives in this space

Name	Location	Business focus	Web
Clothes to Good	South Africa	Buys and sells used and new clothing (i.e. textile recycling), trains and creates inclusive employment across the value cycle.	clothestogood.com
Clothing Bank	South Africa	Takes excess inventory and customer returns from retailers and runs practice-led entrepreneurship training for unemployed mothers.	theclothingbank.org.za
MH Couture	Ghana	Jewelry made from waste fabric	facebook.com/MHCouture77
Salubata	Nigeria	Low-cost shoes made from plastic waste	salubataofficial.com
Uzuri K & Y	Rwanda	Footwear from waste tyres	shop.uzuriky.com

Bio-waste to compost

Bio-waste to compost

Case study

LONO

Location
Côte d'Ivoire

Context
Rural

Sector
Agriculture, forestry and fishing

Circular strategy

- **Use** waste as a resource
- **Rethink** the business model
- **Design** for the future

Link

lonoci.com/

> The technologies are now mature enough to transform biowaste into income. Now we just need willing investors and business models that match the context."
>
> -Noël N'guessan

Community-scale clean technology

LONO has developed community-scale, clean technologies to transform agricultural waste and by-products into compost, animal feed and biofuels.

What is the opportunity?

Côte d'Ivoire is a global producer of cocoa beans, cashew nuts, natural rubber and tropical fruits, the harvest of which produces huge amounts of agricultural waste. This contains calorific value for energy and minerals that could be cycled to replenish degraded soils. Biogas is a by-product from this process, which can be captured for cooking. Yet this agricultural waste is often burnt, releasing potent greenhouse gases into the atmosphere.

The entrepreneur's story

Growing up in Côte d'Ivoire, Zambia, Zimbabwe and South Africa, Noël N'guessan was fortunate to witness various agricultural models and their impact on rural populations. He saw some recurrent patterns: smallholder farmers lacked access to information and remained victims of systemic poverty. As a chemical engineering student, he decided to specialise in skills that could be deployed to address these challenges: bioprocessing biowaste. He also saw the potential for technology that is appropriate to the context, accessible and easy to maintain. He returned to Côte d'Ivoire and co-founded LONO with his future wife.

Their solution

LONO has developed community-scale, clean technologies to transform agricultural waste and by-products into compost, biogas, animal feed and biofuels. They work with agro-industrial companies and farmer cooperatives to create value out of their waste and by-products. LONO operates in rural communities to reduce transport costs and ensure easy access to the customers who need their solutions the most.

LONO has two different models. First, they produce patented, domestic scale, prefabricated composters and digesters for farmers to process their own biowaste. Their outreach team visits farmers and advises on how to enhance the compost to suit their soil and crops. Second, LONO partners with medium-sized factories to build industrial scale biowaste composting and biodigestion units and thereby avoid waste incineration. Revenue generated from the facility is shared between LONO and their clients. As part of this model, LONO is setting up a compost brand to sell their biofertilisers.

LONO has received a number of grants to develop their prefabricated equipment and a larger grant for industrial scale production, which they are now co-financing. They carry out their lab tests and field trials for biogas output and compost quality in a dedicated local laboratory, in partnership with Yamoussoukro Polytechnic.

SDGs

Bio-waste to Compost

Case study

Sabon Sake

Location
Ghana

Context
Rural

Sector
Agriculture, forestry and fishing

Circular strategy

Collaborate
to create joint value

Prioritise
regenerative resources

Rethink
the business model

Link

facebook.com/sabonsake

> Growing food as medicine can be achieved and made accessible with healthy, regenerated soils."
>
> -Audrey Darko

Regenerating soil

SABON SAKE

Sabon Sake uses agricultural waste to create microbe-enriched biochar that regenerates infertile and degraded farm soils.

What is the opportunity?

Soil degradation is a common problem that farmers experience after years of farming their land. Most farmers in Ghana depend on costly chemical fertilisers to artificially boost nutrients and enhance their yields. The use of chemicals can cause further soil degradation, which in turn affects the nutritional value of the food that is grown. Meanwhile, farmers either burn or openly dump agricultural waste, which could otherwise be used to rejuvenate degraded soil with nutrients and organic matter.

The entrepreneur's story

Audrey Darko was at Ashesi University when she started research into what would become Sabon Sake. The idea for the company was born after she read about the collapse of the sugarcane industry in Ghana. As a student of business and agriculture, and coming from a family with a passion for farming, Audrey felt personally connected to this topic. She made a visit to a sugarcane plantation and discovered that, to support the industry, it was critical for farmers to improve the quality of the soil. Her ongoing research revealed that farmers produced tonnes of waste from which this value could be created.

Their solution

Sabon Sake produces regenerative soil solutions to help reverse infertile and degraded farm soils. The amendment is produced with agricultural waste from sugarcane. Sabon Sake uses thermochemical conversion technology to produce biochar, which is inoculated with microorganisms and used as a customised soil blend. This sequesters carbon released into the atmosphere.

Sabon Sake has partnered with agro-waste producing districts in the South Volta region, where they have easy access to waste produced as an agricultural by-product. Their location enables easy distribution of products to farms in other communities. They organise knowledge-sharing workshops with farmers where they raise awareness of their soil blend and provide training on climate-resilient agricultural practices.

Sabon Sake was the winner of the 2019 Climate Launchpad competition in Ghana.

SDGs

Bio-waste to compost

Case study

Safisana

Location
Ghana

Context
Peri-urban

Sector
Water supply; sewerage, waste management and remediation activities

Circular strategy

- **Collaborate** to create joint value
- **Prioritise** regenerative resources
- **Use** waste as a resource
- **Rethink** the business model
- **Design** for the future

Link

safisana.org/en

> Our circular model treats waste as a resource while creating broad impact in the community"
>
> -Marleen Nelisse

Replenishing soil from urban waste

safisana

Safisana designs and operates systems that take market waste and sewage to produce electricity, compost, irrigation water and seedlings.

What is the opportunity?

In Accra, 73% of the population use shared sewage facilities from which faecal sludge is drained mechanically by trucks, with 72% of this ending up untreated in the environment. The only remaining landfill site in Accra is estimated to have reached capacity. Of the 2,385 tonnes of municipal waste produced daily, organic matter comprises 65%. On the other hand, Africa has some of the most degraded soils in the world, with land being stripped of micro and macro nutrients. Waste organic matter can return vital nutrients to the soil and create energy and irrigation water from by-products of the process.

The entrepreneur's story

In 2009 an NGO, a knowledge institute and three companies (Aqua for All, University of Wageningen, Rabobank, Shell and Royal Haskoning DHV) came together in the Netherlands and set an ambitious goal: 'to develop and test a business model that uses sanitary waste as a raw material for valuable end products; generating an economic model to make it locally owned, financially sustainable and replicable'. Their aim was to address challenges at their roots and create a model that could not only be operated by locals in Ghana but could also cover operational costs from the sale of treatment by-products.

Their solution

Safisana designs, constructs and operates waste-to-energy anaerobic digestion plants. The company combines organic waste from food markets and abattoirs with faecal matter from urban slums to produce biogas, soil conditioner and irrigation water. They have their own nutrient rich organic fertiliser brand, 'Asaase Gyefo' ('Soil Saviour'), which they both sell and use to produce seedlings. A significant portion of revenue comes from selling electricity generated from captured methane to the national power company.

Collaboration has always been at the heart of their model, right from their founding. The local municipal assembly contributed land for their plant. They work closely with NGOs improving public toilets, and they have a deep relationship with local communities. Improving sanitation requires them to encourage behaviour change, which entails educating customers on proper segregation and disposal of organic waste. In this regard, every employee of Safisana is an ambassador for the change they are contributing to.

They have benefitted from blended financing - from grants to establish the plant, to a diverse revenue mix to cover operating costs. This reflects the deep value they provide, which goes beyond sanitation services to customers, or soil enhancement to farmer buyers and extends to cleaning up the environment and communities, while alleviating the burden on an over-encumbered waste management system.

SDGs

Bio-waste to compost

Case study

The Compost Kitchen

Location
South Africa

Context
Urban

Sector
Water supply: sewerage, waste management and remediation activities

Circular strategy

- **Prioritise** regenerative resources
- **Preserve** and extend what's already made
- **Use** waste as a resource
- **Rethink** the business model

Link

compostkitchen.com

> The mistake that some entrepreneurs make is to think that they have to start where they want to end up."
>
> -Himkaar Singh

Organic waste recycling

The Compost Kitchen collects and recycles food waste into vermicompost with the help of earthworms.

What is the opportunity?

How can we harness the power of organic waste to improve soil condition? According to the UN Environment Programme, some 60% of South Africa's land has very low levels of organic matter, making it susceptible to degradation and low productivity. There is an urgent need to restore organic matter. At the same time, domestic organic waste that is capable of improving soil structure is simply being driven into landfill. Up to 40% of Johannesburg's municipal solid waste is food waste. It decomposes into methane in anaerobic conditions, causing these sites to be the second highest producers of methane in the country.

The entrepreneur's story

Himkaar Singh vividly remembers a visit to a water treatment facility some 20 years ago, where the guide warned of the need to conserve water in the future. These were words that stuck with him. After training as a civil engineer, and working in Durban and Johannesburg, he became acutely aware of the country's need for more effective water management. He left South Africa during its recent water crises – not to avoid the problem but to find a solution. He spent time in Germany, Vietnam and Jordan to look at different models of water management. Then he returned, to start a business with a circular model to improve the soil's ability to hold water, with a larger vision of improving food security.

Their solution

Vermicompost is compost made by earthworms. They eat organic waste and excrete rich compost which is especially good for organic farming. It is known as the best type of compost because it is so biologically rich and nutrient dense.

The Compost Kitchen collects food waste from its subscriber households on a weekly basis. They then heat treat it and, with the help of earthworms, recycle the waste into vermicompost. They then give the vermicompost back to the customer for free in a craft paper bag, so they can use it in their vegetable garden to grow food again. His customers, who have no access to municipal recycling or composting services, pay 190 rand per month for this service.

The business started at neighbourhood level, but Himkaar's vision is to evolve the model using a circular economy approach which would valorise food waste and allow the company to go global. This would enable people to earn income from making vermicompost at home, which is expected to be a significant enough incentive to get people to compost their food waste.

SDGs

E-waste

Case study

Closing the Loop

Location
Ghana

Context
Urban Area

Sector
Information and Communication

Circular strategy

- **Collaborate** to create joint value
- **Use** waste as a resource
- **Rethink** the business model

Link

www.closingtheloop.eu

> We practice circular economy not because it is easy to do, but because it is our only option.
>
> -Joost de Kluijver

Offsetting the impact of electronics

For every new device their customers buy or lease, Closing the Loop collects and recycles electronic waste in low income countries.

What is the opportunity?

The global use of electric and electronic equipment increases by 2.5 million tonnes annually. Only approximately 17% of these items are formally collected and recycled at the end of their life. Much e-waste is shipped to low-income countries as second-hand devices, even though they are often unusable. In Ghana, Agbogbloshie houses a dump site known globally for its negative effects on the environment and human health, but also for its resourceful entrepreneurs.

This e-waste contains valuable materials such as indium and palladium, and precious metals such as gold, copper and silver. These items of value can be recovered, recycled and reused as secondary raw materials.

The entrepreneur's story

Joost de Kluijver, founder of Closing the Loop, used to work with an IT company that sent mobile phones to Africa for reuse. However, he realised that these ultimately ended up as waste on a continent without the facilities to process them. After several years of experimenting with the value proposition to address this challenge, he developed the 'One for One' model. For companies looking to procure electronic goods sustainably, they can offset their purchase by guaranteeing that a device will be safely removed from the environment.

Their solution

Closing the Loop provides e-waste compensation to businesses that purchase or lease ICT devices. Customers pay a compensation fee for any new device they procure. This fee is used to cover the cost of safely collecting and recycling an e-waste device in countries that lack recycling capacity.

Closing the Loop is currently operating in 10 African countries with a particular focus on Ghana, Nigeria and Zambia. Formal networks such as phone repair shops, schools, churches and other registered agents collect e-waste material from around the country and sell this to Closing the Loop's local partners. The waste material collected consists of mobile phones, and batteries of phones and laptops. Closing the Loop incentivises collectors who do not dismantle the electronics, which can be unsafe and lead to toxic elements going into the environment.

Waste materials are registered and shipped out of the respective country of collection to a network of recycling plants in Europe. Closing the Loop's waste management approach has been reviewed, adopted and TCO Certified.

SDGs

Case study

greenABLE

Location
South Africa

Context
Urban

Sector
Water supply; sewerage, waste management and remediation activities

Circular strategy

Use
waste as a resource

Collaborate
to create joint value

Link

greenable.co.za

> We have taken the initiative to be responsible for our industry's waste, whilst adding value to the lives of persons living with disabilities."
>
> -Mark Valentine

Value from waste printer cartridges

greenABLE supports disabled women in the collection and disassembly end-of-life printer cartridges to preserve their valuable components.

What is the opportunity?

Unemployment amongst people with disabilities stands at well over 70% in South Africa. Disabled women are particularly marginalised. Providing them with meaningful employment and empowerment is a challenge. Meanwhile, there is an opportunity to create jobs from the recycling of empty printer cartridges. Less than 10% of the 12 million printer cartridges that enter the South African market each year are recycled after use; the rest simply end up in landfill sites.

The entrepreneur's story

greenABLE started life as a solution to a problem identified by its parent company, Green Office, a business that provides managed printing services and aims to make businesses more efficient and sustainable. In 2010 Green Office made the decision to create a non-profit company that could divert printer cartridge waste from landfill. Instead of sending the used cartridges to landfill, they asked themselves: what could we do with this?

Their solution

greenABLE diverts empty printer cartridges from landfill by extracting their valuable material. In the process, they create jobs and opportunities for people with disabilities. greenABLE's specialists dismantle cartridges and separate their components to extract plastic, metals such as mild steel and aluminium. The plastics are granulated, extruded, and pelletised, and, along with the other materials, are sold to manufacturers for recycling. Each year greenABLE processes about 306,000 printer cartridges, which equates to approximately 220 tonnes of waste being diverted from landfills.

Some of the recycled plastics are used by another company to produce portable laptop stands with the brand name eezigo. In the past, greenABLE has provided recycled plastics to the South African government's low-cost housing initiative.

greenABLE works with disabled people who have had limited access to high quality education. Its employees are upskilled whilst working at greenABLE, spending 75% of their time working on cartridge recovery, and 25% receiving vocational training to further their education and increase their chances at better job positions. greenABLE's people are also encouraged to act as agents to start cartridge collection businesses from their neighbourhoods.

greenABLE's employees are sponsored by companies, and the organisation also benefits from this in terms of South Africa's Broad-Based Black Economic Empowerment programme.

SDGs

Case study

WEEE Centre

Location
Kenya

Context
Urban

Sector
Water supply; sewerage, waste management and remediation activities

Circular strategy

- **Collaborate** to create joint value
- **Use** waste as a resource
- **Preserve** and extend what's already made
- **Incorporate** digital technology

Link

weeecentre.com

> Through creating an inclusive value chain that rewards all stakeholders, we can change the perception of waste and achieve significant impact."
>
> -WEEE Centre

Value from e-waste

WEEE Centre collects e-waste from companies, NGOs, government and individuals to repair, upcycle, recycle or extract its valuable components for reuse.

What is the opportunity?

E-waste management in Kenya represents a significant challenge: half of the estimated 51,000 tonnes of electronic waste produced in Kenya in 2019 was not disposed of appropriately. Much e-waste contains harmful materials which are detrimental to the environment and human health when not properly disposed of. Many of the discarded devices can be repaired and reused, giving mobile connectivity access to someone who may not otherwise be able to afford it. For equipment that cannot be repaired, precious metals and recyclable materials can be extracted, and their material value recovered.

The entrepreneur's story

Waste Electrical and Electronic Equipment Centre (WEEE Centre) was originally set up to manage the proper disposal of waste IT materials generated from its mother company Computers for Schools Kenya (CFSK). CFSK was established in 2002 to advance information technology learning in schools by distributing computers and educating students and teachers. When computers needed to be disposed of, CFSK accepted its responsibility, leading to the setting up of WEEE Centre in 2012.

Their solution

WEEE Centre is a recycler that processes all types of electrical and electronic waste for a safer environment and improved human health. As well as serving their mother company, they collect or receive e-waste from at least 8,000 clients, including learning institutions, embassies, corporate clients and residential customers.

All products received are dismantled and treated differently; each fraction has its own processing line. Products are either recycled locally or exported for recycling where facilities are not yet present in Kenya. Electronic waste can be repaired, upcycled, recycled or have its remaining value extracted. Certain repaired products are sold to second-hand electronics dealers.

WEEE Centre is also committed to building awareness on e-waste. The company hosts community sessions in their offices and has collaborated with commercial partners, such as Safaricom, to set up over 100 collection points. Beyond Kenya, they are part of a growing continental network with partners in 15 African countries who do similar work, and to whom they provide training and support.

WEEE Centre is ISO 9001:2015 and 14001:2015 certified.

SDGs 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Plastics

Case study

Hya Bioplastics

Location
Uganda

Context
Peri-Urban

Sector
Manufacturing

Circular strategy

Prioritise
regenerative resources

Rethink
the business model

Link

hyabioplastics.com

> We are looking at giving every business across the whole of Africa a cost-effective alternative to plastic packaging."
>
> -Mark Musinguzi

Biodegradable packaging from plants

Hya Bioplastics produces biodegradable consumer packaging from plant fibres such as maize husks, sugar cane bagasse and water hyacinth.

What is the opportunity?

The water hyacinth is an invasive species, covering about 20,000 hectares of Lakes Victoria, Albert and Kyoga in Uganda. It blocks waterways, causing eutrophication. It affects water quality and aquatic life and contributes to the spread of disease. It has even caused power outages through clogging of hydroelectric power plant intakes. However, it also has unique properties. If combined with certain biodegradable components it can be used to produce packaging products and can serve as a viable alternative to plastics. Similarly, agricultural waste with packaging potential is also usually disposed of in applications that fetch low value to farmers, such as composting and, in some cases, burning.

The entrepreneur's story

Mark Musinguzi and his colleagues at Makerere University were one of the winners of the Wege prize in 2019 with their wastewater innovation, Wet Technik. During the competition, Alysia Garmulewicz, founder of biomaterials platform Materiom and a judge at the event, introduced Mark to bioplastics. Mark formed a team of experts to research the properties of water hyacinth and various forms of agricultural waste. The team was driven by their first-hand experience of the devastating impacts of water hyacinth on the communities living along the shores.

Their solution

Hya Bioplastics produces biodegradable packaging from plant fibres. Their current range of products is made from plant-based agricultural waste. Currently, Hya Bioplastics uses maize husks and sugar cane bagasse for their products, but they are trialling water hyacinth as the major feedstock for future production of plastic alternatives. The main challenge relates to the logistics of collecting sufficient volumes of water hyacinth to process.

The packaging materials are biodegradable and compostable. Hya Bioplastics aims to track and collect used packages at centralised points. The waste packages can then be used to produce compost for the cassava farmers in their supply chain. In addition, some of the waste packaging can be combined with other components to produce briquettes.

Hya Bioplastics has received support from the Mechanical Engineering department at Makerere, mentoring advice from Mike Werner, head of circular economy at Google, and input from Alysia Garmulewicz, founder of Materiom. The initiative is the first-place winner of the Wege prize 2020 and one of the winners of the Texas A&M University Invent for the Planet 2020 prize.

SDGs

Case study

Maji Jibu Company Ltd

Location
Tanzania

Context
Urban

Sector
Water supply; sewerage, waste management and remediation activities

Circular strategy

- **Prioritise** regenerative resources
- **Preserve** and extend what's already made
- **Rethink** the business model
- **Design** for the future

Link

jibuco.com/tz

> We have produced less than three or four truckloads of plastic waste to date. Plastic companies want to partner with us for recycling, but we just don't have enough waste."
>
> -Tayeb Noorbhai

Affordable, quality drinking water

Jibu Tanzania equips Tanzanian entrepreneurs to manufacture and create affordable access to drinking water, in the process keeping durable plastic in circulation for as long as possible.

What is the opportunity?

About 4 million people in Tanzania do not have access to safe water, and many government- and donor-sponsored programmes that have sought to provide access to water have met with failure. But with a growing population and an expanding middle class, there are opportunities to provide water according to a low cost, decentralised model, which also minimises material use.

The entrepreneur's story

Tayeb Noorbhai, founder of Jibu in Tanzania and a fourth generation Tanzanian, started his career by studying international development. Before starting Jibu Tanzania, he worked in a number of development programmes, and became increasingly frustrated at their mixed long-term impact. He decided to change the narrative by looking for private sector solutions to hard problems. This led him to start business initiatives in cookstoves, maternal health, primary education and, ultimately, water.

Their solution

Jibu Tanzania provides safe, affordable and accessible drinking water through a decentralised franchise model. Tayeb Noorbhai saw franchisees that were operating successfully in Rwanda and Uganda and wanted to create a Tanzanian-owned franchise, so that in the long run the business could become the backbone of a development distribution vehicle that is both localised and profitable.

Jibu Global, the licensing partner of Jibu Tanzania, operates across seven African countries and has launched 122 franchises. Jibu offers small entrepreneurs the opportunity to purchase franchises with them. Water production units are paid for through a royalty per litre fee. They support the businesses with both set up and continuous training.

From a circular perspective, the idea is to use less plastic, and keep it in circulation for longer through refilling. Jibu Tanzania uses sturdy Polycarbonate 20 litre bottles that have a higher grammage and last for over 200 to 400 refill uses. The bottles are inspected and sanitised before reuse. Any damaged bottles are delivered to recycling companies. There are some interesting advantages to this model, not least the substitution effect. In supplying clean water in reusable containers, Jibu are reducing the labour intensity and time spent in collecting and purifying water through boiling (typically done by women) and the consumption of single-use plastic bottled water.

SDGs 6 CLEAN WATER AND SANITATION · 8 DECENT WORK AND ECONOMIC GROWTH · 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Case study

Mr Green Africa

Location
Kenya

Context
Urban

Sector
Water supply; sewerage, waste management and remediation activities

Circular strategy

- **Collaborate** to create joint value
- **Use** waste as a resource
- **Rethink** the business model
- **Incorporate** digital technology

Link

mrgreenafrica.com

> Through creating an inclusive value chain that rewards all stakeholders, we can change the perception of waste and achieve significant impact"
>
> - Mike Stockman

Fairly traded recycled plastics

MR. GREEN KENYA

Mr Green Africa is an innovative circular economy company reshaping the waste plastic value chain to create tangible social, environmental and economic impact.

What is the opportunity?

Many types of plastic that are 'recycled' in Kenya are often exported to another country. The few that are recycled locally are often downcycled into a product of lower value. The vast stocks of plastic waste could in fact be considered a resource if we could 'close the loop', i.e., use old plastic to make new plastic products. For example, bottle-to-bottle recycling, in which, once the contents of a water bottle are consumed, the container is collected, processed and turned into a new water bottle. This could save on the costs of importing virgin materials and the associated pollution and environmental degradation, as well as create huge numbers of local jobs.

The entrepreneur's story

Kieran Smith founded Mr. Green Switzerland in Zurich in 2010 and four years later came to Kenya to do the same. Social change had always been at the heart of the Zurich entity, but became increasingly relevant as the business model was developed to trade directly with low-income, marginalised waste pickers in the Kenyan capital.

Their solution

Mr Green Africa (MGA) collects, converts and sells more than 140 metric tonnes of post-consumer plastic per month, operating 15 trading points in Nairobi. About half comes directly from informal waste pickers, representing a regular supply from around 550 of Kenya's most marginalised workers. MGA focuses on three types of plastics (HDPE, PP and PET), and is experimenting with collecting and processing 'flexible' single-use plastic. MGA converts this post-consumer plastic 'waste' into valuable material, which is sold to local manufacturers, including suppliers of packaging to Unilever and other strategic partners.

MGA works with fast moving consumer goods companies and third-party plastics manufacturers to three-way offtake agreements for high quality post-consumer recycled content, helping partners to realize their sustainable packaging goals by accessing ethically sourced and locally produced material. They have strategic partnerships with Unilever, Dow and TOTAL. With Unilever they have developed the Waste Picker Transformation Journey to provide waste pickers with access to benefits, goods and services that improve their quality of life. With Dow they are piloting an app that links drivers with consumers for household pick up of plastic waste. The TOTAL pilots aggregation centres at TOTAL petrol stations, allowing customers to gain points for bringing their plastics, and redeem those points at TOTAL shops.

They secured Series A funding in 2019 and have since doubled their revenues

SDGs

Case study

Pyramid Recycling Enterprise

Location
Ghana

Context
Urban

Sector
Manufacturing

Circular strategy

Collaborate
to create joint value

Prioritise
regenerative resources

Use
waste as a resource

Link

facebook.com/Pyramid-RecyclingEnterprise

> My ambition is to change the mindset of cutting wood and provide an alternative to wood and wood products."
>
> -Ibrahim Yougbare

Keeping plastic off the street

Pyramid recycles all types of recyclable and non-recyclable plastics into new products.

What is the opportunity?

Recent statistics from a 2019 UNDP report indicate that only 2-5% of plastics generated in Ghana are recycled, while the rest end up in landfills, in the ocean or burned. Meanwhile, as a material, plastic has a wide range of applications, meaning recycled and reused plastics can replace virgin resources, even preventing deforestation where it can provide a substitute for wood.

The entrepreneur's story

Ibrahim Yougbare's infectious passion for the environment led him to design his own machinery and start recycling plastics in 1999. Realising that he could use this material to make new products, he established Pyramid Recycling Enterprise as a company in 2007. Throughout this time, he has been inventing and testing products that can be sold in local and regional markets. His main concern is to address deforestation and his most recent innovation is a prototype of a product that can be used in the place of wood in construction, which he has been testing for over 6 years.

Their solution

Pyramid Recycling began by recovering plastic waste. However, they realised that this was not enough to prevent the plastic returning to the streets, as most was downcycled into plastic bags, used once and then ending up in gutters. Pyramid invented their own products such as curtain ropes, chair fittings ('chair shoes') and 'wood plastics', which they sell in Ghana, Ivory Coast, Togo and Burkina Faso. They recycle PET, LDPE, HDPE, PS, GPPS and PVC into plastic products.

As one of the first to start recycling in Ghana, Pyramid has trained many others who have gone on to establish local recycling companies. Most pelletise and export plastics. Yougbare helped found the National Plastic Recyclers Union, which comprises 50 member companies. In addition, Pyramid has created livelihood opportunities that would not otherwise have existed, by training waste pickers, including many single mothers, who supply Pyramid and other recyclers with plastics, supplying 65% of the four to five tonnes of plastics Pyramid receives each week. The rest are collected from plastic producing companies, often from waste packaging.

Pyramid's innovative 'wood plastic' has been certified by the Council for Scientific and Industrial Research in Ghana.

SDGs

Construction

Case study

Arena Recycling Industry

Location
Tanzania

Context
Urban

Sector
Construction

Circular strategy

Use
waste as a resource

Link

arena.co.tz

> Our aim is not just to collect and transfer the plastics from one point to the other. We want to extract value and prevent them from infiltrating our system."
>
> -Hellena Sailas

Construction blocks from plastic waste

Arena Recycling collects plastic waste from beaches in Dar es Salaam to produce building materials for construction of affordable houses, toilets and other buildings.

What is the opportunity?

Approximately 740 tonnes of plastic waste are thrown out in Dar es Salaam every day. It blocks drains, contributing to devastating floods during the rainy season, and ends up in watercourses causing harm to marine life. At the same time, Tanzania has a housing deficit of some 1.2 million units. An estimated thirty-six percent of the shortfall is concentrated in Dar es Salaam, where most people are unable to afford building materials. Plastic waste is one possible input to produce affordable construction materials to help resolve the country's housing crisis.

The entrepreneur's story

Hellena Sailas is a medical laboratory technologist. As a youth activist, she often took part in beach clean-ups, where she was struck by the quantity of single-use plastics. Being aware of the implications for marine life, she started research into a solution that would divert plastic waste from the beaches. After 10 home-based experiments, she finally developed a formula for producing blocks from LDPE and PET plastics.

Their solution

Arena Recycling was founded in 2018 and now recycles between 500 and 1000kg of plastics per week. They melt and extrude LDPE and PET plastics to produce both construction blocks and paving slabs. Their Eco-bricks consist of 80% plastic waste and 20% sand and contain neither water nor cement. The bricks are waterproof, anti-corrosive and mould resistant. Arena Recycling has experimented to develop its own formula to melt and mix the materials, giving them the required properties to meet Tanzanian construction standards.

To collect plastic waste, Arena Recycling organises campaigns for beach clean-up around marine areas, which serves the additional purpose of educating and promoting behaviour change in waste disposal. They also purchase plastics from community collectors.

Arena Recycling has partnered with Young Water Solutions Organisation, an NGO, to collaborate with the municipality and the community members of Temeke District to construct 12 pit latrines and two water tanks for 2000 students.

The Tanzania Bureau of Standards is currently verifying the Eco-bricks for certification.

SDGs

Case study

DigiYard (Arup)

Location
South Africa

Context
Urban

Sector
Construction

Circular strategy

- **Collaborate** to create joint value
- **Rethink** the business model
- **Incorporate** digital technology

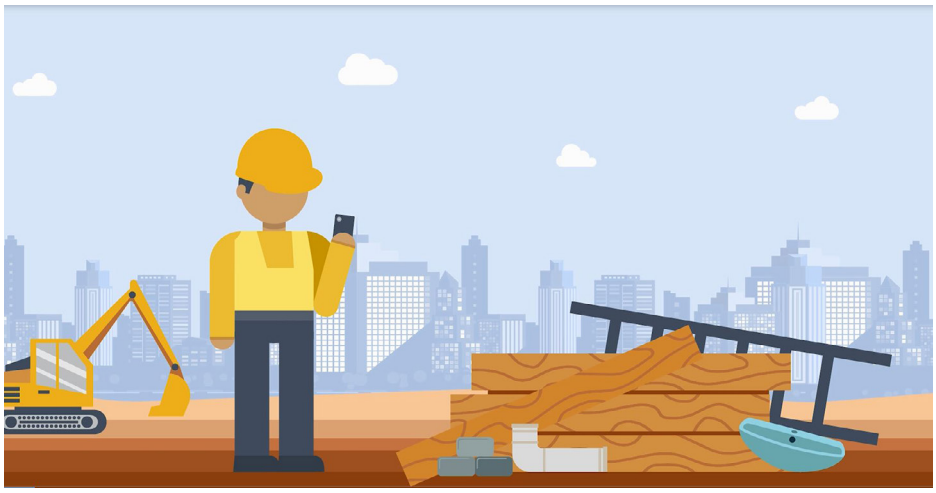
Link

research.arup.com/projects/article-digiyard

> Ultimately our goal is to create a self-sustaining service which could be rolled out in cities across South Africa, and the wider world."
>
> -Kausar Khan

Repurposing reusable construction waste

ARUP



DigiYard is an app-based service connecting unused construction site materials and waste with small-scale builders and traders in the informal sector.

What is the opportunity?

The construction industry has for a long time worked on the basis that waste is an inevitable by-product of doing business. Some 30% of all materials delivered to construction sites is wasted, usually ending up in landfill. In South Africa, millions of people live in poor quality housing in townships on the peripheries of cities. These townships are a legacy of Apartheid, and their low-quality construction and distance from services and economic opportunity, effectively reinforce inequalities. It will become increasingly critical not only to recycle more construction waste, but also to repurpose perfectly good materials to address this imbalance.

The entrepreneur's story

Kausar Khan has worked on utility scale renewable energy projects in South Africa over the course of her career, as well as in building services and sustainability. She is an SDG ambassador and has a strong interest in the circular economy and use of technology for positive social impact. Together with her colleagues Jaco Kemp and Carin de Beer, she has been developing DigiYard for the past two years after winning the Arup innovation competition 'Shaping our World'.

Their solution

Arup is developing DigiYard as a digital platform that facilitates the flow of usable construction waste and surplus building material from construction sites to informal settlement upgrading projects. The platform aims to reduce construction waste in landfill whilst addressing the need for affordable, high quality building materials in the informal housing sector.

Through the platform, construction companies donate materials and users pay a fee to use the app. They typically pay half the price of materials they would have paid at the second-hand market. This means that low-income customers are able to purchase expensive materials at a lower cost, improving the quality and safety of their construction.

Construction companies should ultimately be able to have a detailed understanding of their material waste streams in order to minimise waste and increase efficiencies. Smaller construction companies in particular benefit from saving transport costs and landfill fees.

SDGs

Case study

Eco Brixs

Location
Uganda

Context
Peri-urban

Sector
Construction

Circular strategy

Use
waste as
a resource

Preserve
and extend what's
already made

Link

ecobrixs.org

> We want to build systems that our partners can trust, but also create the space for us to innovate and create."
>
> -Andy Bownds

Tackling plastic waste and unemployment

Eco Brixs is a closed-loop recycling system providing employment and creating a positive environmental impact in Masaka, Uganda.

What is the opportunity?

About 600 tonnes of plastics are generated in Uganda every day. Some 90% of this is sent to landfill or burnt illegally, as there is no formal means of waste collection. A small proportion is collected, pelletised and shipped to markets such as China and India to be used as raw materials. However, this unmanaged plastic waste is a tremendous opportunity. It can be recycled to make construction materials with a smaller environmental footprint, and in the process create jobs to help tackle Uganda's high unemployment rate.

The entrepreneur's story

Andy Bownds is the director of the Uganda Marathon Foundation. He was spurred into action when his friends pointed out that although he professed concern over environmental issues, he had yet to do anything about it. After researching the impact of plastic waste on the economy and the environment, Andy started a collection site in his backyard and named it the Masaka Recycling Initiative. Two years later, the company, now called Eco Brixs, started to produce pavers and other valuable items from waste plastic.

Their solution

Eco Brixs started in 2017 as the Masaka Recycling Initiative, at which point it focused on plastic recovery. After two years of operation, Andy realised more could be done to capture the value in plastics as well as support the local economy, and Eco Brixs was born. In collaboration with universities and other experts they have researched how to transform the plastic. Now, they recycle seven types of plastics to make various products, such as an innovative plastic-sand composite paver, which has proven to be stronger, lighter and more durable than concrete. A series of other prototypes are in the pipeline.

Eco Brixs' other focus is on creating jobs – especially for people with disabilities – supporting the local economy and educating people on plastic waste. They have set up 20 recycling centres in different communities across Uganda. They also collaborate with schools to educate students on good environmental practices, establishing 31 'Eco Clubs' with over 900 students.

More recently, to support COVID-19 efforts, Eco Brixs have produced PPE from recycled plastics.

SDGs

Case study

MycoTile

Location
Kenya

Context
Urban

Sector
Manufacturing

Circular strategy

Prioritise
regenerative resources

Rethink
the business model

Link

mycotile.co/

> The construction industry is quite conservative. It's hard to convince people that they can make a wall from mushrooms, but we are steadily receiving positive feedback and acceptance."
>
> -Mtamu Kililo

Construction materials from fungi

MycoTile produces locally manufactured, alternative building materials using agricultural waste and fungal mycelium.

What is the opportunity?

Imagine a tough, fire-resistant building material that could simply grow from a combination of mushrooms on agricultural waste.

In Kenya, most construction materials are imported, and for this reason are relatively expensive and often simply not the best quality. The country has an annual housing demand of 250,000 units with an estimated supply of just 50,000, leaving an 80% deficit. At the same time, there are natural resources whose potential application in construction is largely untapped. One is agricultural waste produced by small-scale farmers. Another is mycelium, a natural fungal material with industrial-level strength.

The entrepreneur's story

Mtamu Kililo is a Kenyan architect and designer at Cave Bureau. During a recent fellowship with the architecture studio MASS Design Group in Rwanda, he was given the space and time to pursue his own research interests. He came across examples of 'leather' being made using mushroom mycelium and this sparked his imagination on applications for the technology in the construction industry. He went on to co-found MycoTile.

Their solution

MycoTile offers a high performance and cheaper alternative to traditional building materials. MycoTile uses a carbon negative process to bond agricultural waste (such as maize cobs, coffee husks, coconut coir and rice husks) with mushroom mycelium. The product is denatured through heat treatment in order to inhibit mycelium growth.

Their first product was suspended ceiling panels, which have superior acoustic performance and fire-retardant properties compared to the available alternatives. The fire-retardance is naturally enhanced by the chitin that is present in mycelium. They have big plans and are prototyping a larger portfolio of products, such as wall insulation, construction blocks, MDF-style panels and even furniture.

Although the major challenge has been changing public perception on the use of mycelium in construction, MycoTile currently has more demand than they can supply. A recent important step in their growth was the conclusion of a co-manufacturing contract with a government entity. They are establishing partnerships with small scale farmers, who they pay for agricultural waste, to assure security of supply.

SDGs

Case study

USE-IT's Rambricks

Location
South Africa

Context
Urban

Sector
Manufacturing

Circular strategy

- **Collaborate** to create joint value
- **Prioritise** regenerative resources
- **Design** for the future

Link

rambrick.co.za

> eThekwini Municipality has shown the return on investment from diverting waste from landfill and turning it into new products is 1,500 percent. Where else will you get that kind of return?"
>
> -Chris Whyte

AFRICA'S FIRST 5-STAR ECO RATED BRICK

RAMBRICK smarter bricks

Turning construction waste into bricks

RamBrick converts waste soil and rubble from landfill into building products with a reduced carbon footprint.

What is the opportunity?

Urban development means removing many tonnes of soil and rubble, which mostly treated as waste and dumped in expensive landfill sites. Construction waste constitutes an average of 30% of all waste that goes to urban landfills. At the same time, there is a huge deficit of housing in South Africa's urban centres where alternative construction materials can fill a gap. What if we were to start thinking of construction waste as a resource, in the same way as the packaging that is sent to landfill?

The entrepreneur's story

USE-IT is an eThekwini (Durban) based non-profit company that focuses on waste beneficiation, with the aim of diverting substantial volumes from landfill and creating sustainable employment opportunities and viable private sector investment.

Their solution

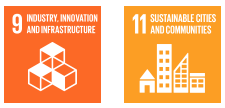
RamBrick is a compressed earth block application using waste soils from construction and development sites and crushed rubble to manufacture blocks for housing construction.

The RamBrick is composed of a blended mixture of 70% waste soils, 25% crushed builders rubble and 5% cement stabilizer. They are made without water, using a hydraulic compression system to press the waste materials into blocks that are subsequently air cured, creating a very low-embodied building material (251kg CO2/m2 compared to concrete blocks at 760kg CO2/m2).

The RamBrick offers two main benefits: firstly, landfill diversion. Urban centre landfills are rapidly filling up and it makes no sense to use an expensive engineered lined landfill to store inert waste materials. Secondly, the RamBrick is highly thermally efficient, bullet-proof, sound-proof, cheaper (16% cheaper than concrete blocks and 45% cheaper than clay bricks), requires zero water in manufacturing, and has a very low embodied energy. The idea behind the RamBrick was to create new enterprises to divert waste from landfills and manufacture blocks for the gap in the housing market.

RamBrick's work has been supported through partnerships with the eThekwini Municipality (Durban), and the Development Bank of South Africa through the country's Jobs Fund and the Green Fund.

SDGs



Bio-waste to Feed

Bio-waste to Feed

Organic fertiliser and feed from insects

Case study

Ecodudu

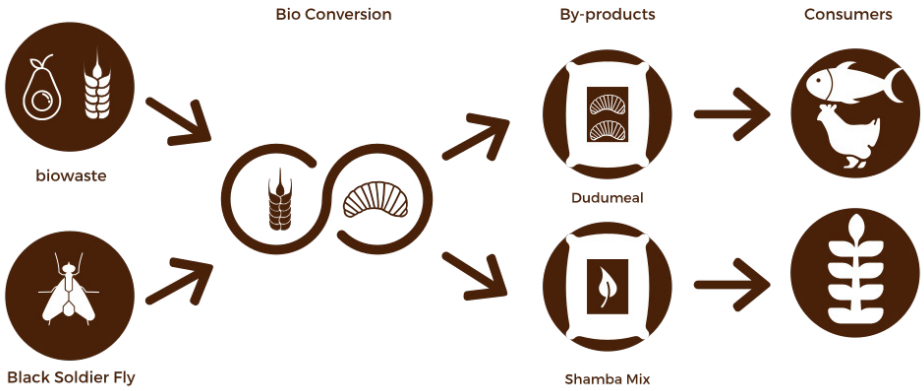
Location
Kenya

Context
Peri-urban

Sector
Agriculture, forestry and fishing

Circular strategy

- **Prioritise** regenerative resources
- **Use** waste as a resource
- **Rethink** the business model



Ecodudu's black soldier flies convert organic waste from food producers into animal feed and organic fertiliser.

What is the opportunity?

Most farmers in Kenya depend on imported, synthetic fertilisers for their crops, and processed feed for their animals. This is often imported, costly, and – in the case of feed – uses foodstuffs that are also in demand for human consumption. Meanwhile, as much as half of the 3,000 tonnes of waste produced in Nairobi alone every day is organic – that is, a feedstock. If treated and processed appropriately it could be used to produce organic fertilisers and animal feed for poultry, pigs and fish.

The entrepreneur's story

Mohammed Hussein, an engineer, began his career with a traditional animal feed company in Kenya but soon left to set up on his own. He was struck by how difficult it was to source protein for feed domestically; it often had to be imported from Rwanda, Uganda and Burundi. While in search of a solution, he met his co-founder, who was researching black soldier flies for animal feed. Inspired by its potential, in 2015 Mohammed sold all his assets and invested everything into setting up his new business. This led to the establishment of Ecodudu, which incorporated in 2018.

Their solution

Through a process of bioconversion, Ecodudu's black soldier fly larvae convert waste into fertiliser ('Shamba Mix)', and the larvae are used to make a high-protein feed source ('Dudu Meal'). Currently their main raw material – which represents about 90% of their inputs – is avocado waste from a single producer. In using this, they divert some 20 tonnes every day from landfill. To close the loop further they also supply this same producer with Shamba Mix to feed the avocado trees.

Ecodudu is now also working to decentralise production by training farmers to produce the feed and organic fertilisers themselves. This will enable them to scale with less capital, increasing their impact by reducing waste to landfill, enhancing soils and improving farmer livelihoods. At the same time, Ecodudu is developing different fertiliser formulae – some 34 in total – that they plan to use to provide farmers with precision nutrition for their crops.

They have benefitted from a unique investment from GreenTec Capital, who provide operational support and market linkages, which will convert into equity if certain milestones are achieved.

Link

ecodudu.com

> "Our operations are carbon negative. Ultimately we want to enter the carbon trading business."
>
> -Mohammed Hussein

SDGs

Case study

Neat Eco-Feeds Limited

Location
Ghana

Context
Peri-urban

Sector
Water supply, sewage, waste management and remediation activities

Circular strategy

- **Use** waste as a resource
- **Rethink** the business model
- **Prioritise** regenerative resources

Link

neatecofeedsltd.com

> It is fascinating how we manage to replicate the development of living organisms in our natural environment for a good cause."
>
> -Lincoln Peedah

Animal feed from insects

NEAT ECO-FEEDS

Neat Eco-Feeds uses slaughterhouse and food manufacturing waste to produce black soldier fly-based animal feed.

What is the opportunity?

In Ghana, a total of 2,620 tonnes of blood, intestinal contents and waste tissues from abattoirs are discharged into the environment – including watercourses and landfills – annually. Abattoir waste causes land and air pollution, releasing greenhouse gases into the atmosphere. On the other hand, abattoir waste is a resource that can be processed using natural methods to produce maggots – a cheap protein feed that can be used as a replacement for soya and fish.

The entrepreneur's story

In 2014, Lincoln Peedah started a meat processing company, Neat Meats. Their slaughterhouse generated large quantities of waste, and so they decided to close the loop by using the waste to produce cost-effective feed for farmers. They first experimented by leaving abattoir waste for three days. Maggots grew in it and chickens started feeding on them. From there Lincoln established Neat Eco-Feeds as a sister company to their meat house.

Their solution

Neat Eco-Feeds converts organic waste to high-protein feed for fish and poultry, with the help of black soldier fly larvae. The company was established to convert abattoir waste generated by Neat Meat. Currently, Neat Eco-Feeds does not use waste from Neat Meat's abattoir alone but also waste from local breweries, granaries (sorghum, millet, maize), and porridge vendors, as well as rice bran and sawdust.

Neat Eco-Feeds raises and collects the eggs of black soldier fly in an insectarium. The black soldier flies and their larvae feed on the waste collected, and the maggots can also be used as animal feed. Their feed production is zero-waste because the by-product is used as a compost for crop farms. Customer surveys of farmers also indicate that their feed has the interesting benefit of reducing poultry mortality.

Neat Eco-Feeds has received awards from the Ghana Climate Innovation Centre, and was a winner in the 2019 UNDP Waste Recovery Innovation Challenge.

SDGs

Bio-waste to Feed

Case study

NovFeed

Location
Tanzania

Context
Urban

Sector
Agriculture, forestry and fishing

Circular strategy

Collaborate
to create joint value

Use
waste as a resource

Incorporate
digital technology

Link

novfeed.com

> We want to reveal the value in household waste by encouraging people to segregate their waste at source."
>
> -Otaigo Elisha

Fish feed from insects

NovFeed uses market waste in the production of black soldier fly larvae as an alternative to fish meal for low-income fish farmers.

What is the opportunity?

Commercially manufactured feeds are too expensive for fish farmers in Tanzania. An estimated 76% resort to making their own feed in small batches from local ingredients. The resulting feed is nutritionally inadequate since farmers do not have the right knowledge, ingredients or equipment. The result is slower growing, smaller fish, which diminishes farmers' potential returns. Meanwhile, markets in Dar es Salaam produce as much as 4,200 tonnes of waste every day, which could be converted to high protein fish feed, but instead goes to landfill

The entrepreneur's story

Otaigo Elisha is an environmental economist. He founded NovFeed in 2017 while pursuing his master's degree at Bogor Agriculture University in Indonesia. After investigating the problem of access to fish feed, he developed a process and formula to produce biological fish feed and brought on co-founders to support its production.

Their solution

NovFeed converts food market waste to high protein feed and organic fertiliser with the help of black soldier flies, crickets and worms. The resulting insect-based product is an alternative to the soy and fishmeal that is used in producing commercial fish food. Black soldier flies and their larvae break down the organic waste and the maggots can be converted into high-protein fish food. The by-product can be converted into compost, with the help of worms.

In collaboration with local universities and research institutions, NovFeed is conducting trials of their fish feed, laboratory tests on fertiliser formulae, and is exploring further use of crickets in their process.

They reach their fish-farmer customers through KCG Aquatec, a consultancy that provides guidance and technical assistance to farmers. The Tanzanian government has also provided them with office space to operate for the next two years.

NovFeed's team is also reviewing their model to empower women to collect organic waste, especially from marketplaces and restaurants. As part of the next phase of their development, they are exploring how to collect household waste and address the harder challenges of unsegregated waste.

SDGs

Textiles & Fashion

Case study

Dignified Wear

Location
Ghana

Context
Urban

Sector
Manufacturing

Circular strategy

Preserve
and extend what's already made

Rethink
the business model

Use
waste as a resource

Link

dignifiedwear.com

> People underestimated her, but my disabled grandmother single-handedly raised her family and supported them financially."
>
> -Mabel Suglo

Jobs for people with disabilities

Dignified Wear trains people with disabilities to create shoes, handbags and accessories from waste tyres, excess fabric and broken beads.

What is the opportunity?

The opportunity is twofold. On the one hand, people living with disabilities in Ghana are often marginalised, living in poverty because they struggle to gain employment. However, with the right support and opportunities, there are many paid roles they could take on. On the other hand, there is abundant waste that could be repurposed in the fashion industry instead of causing harm to society and the environment. Old tyres, for example, harbour stagnant water, providing a rich breeding ground for disease-carrying mosquitoes. Alternatively, they are burnt, creating noxious air pollution. Other 'waste' products that could be repurposed - scrap fabrics, cotton threads, recycled glass and plastic bottles – are mostly neglected.

The entrepreneur's story

Mabel Suglo is a social entrepreneur who grew up in a community where disabled people were subjected to discrimination and stigmatisation. Mabel saw how her grandmother, a single mother who had leprosy, was able to defy the odds by farming a piece of land to provide for and educate her children and grandchildren. Mabel set up Dignified Wear in her honour to empower marginalised people living with disability and to prove that their disability is no obstacle.

Their solution

Dignified Wear is a social enterprise that uses circular economy principles to turn waste into value. They manufacture and sell shoes, handbags, traditional clothing and accessories. They buy waste tyres at a low price and collect discarded pieces of fabric from local dressmakers. They embellish their products with beads they manufacture themselves from broken glass.

Inspired by the incredible achievements of her grandmother, Mabel provides training and employment for people with disabilities and rural women. The first few employees were sponsored to attend a vocational school and they now act as trainers for new employees. In addition, Dignified Wear provides support for selected trainees to go on and set up their own businesses.

SDGs

Case study

Koliko Company Limited

Location
Ghana

Context
Urban

Sector
Manufacturing

Circular strategy

Preserve
and extend what's already made

Use
waste as a resource

Link

kolikowear.com

> "As a start-up with limited resources, we had to make our own machines in order to produce our first line of shoes."
>
> -Peter Anowie

Repurposed fabric for footwear

KOLIKO WEAR

Koliko produces hand-made shoes from repurposed materials such as second-hand jeans, offcuts of fabric, flour sacks and waste car tyres.

What is the opportunity?

Ghana is Africa's number one recipient of second-hand or unsold clothing from Europe. About 50% of these clothing items end up in landfill almost as soon as they are imported, while many others are burnt. Manufacturers are obliged to make more to respond to evolving fashion trends, causing a significant carbon footprint, the creation of ever more waste, and more dumping in secondary markets such as Ghana. With this surplus, however, there is an opportunity to convert discarded materials into other fashion items of higher value at a lower cost.

The entrepreneur's story

Peter Anowie was inspired to leave his career in banking by a friend who made shoes using traditional methods. He decided to start a company that would train and support young people to develop technical skills. Peter's co-founder, Kwabena Obiri Yeboah, introduced an idea that would make their brand and products unique: using repurposed materials rather than 'brand new'. They worked with a local artisan to make their own machinery, which they continue to prototype and develop even today.

Their solution

Kolics produces hand-made shoes from repurposed materials. They sell their shoes under the brand name Koliko Wear. Koliko Wear shoes, for example, are made with materials such as second-hand jeans, pieces of excess fabric from local seamstresses, flour sacks from bakeries and waste car tyres. They also upcycle used footwear into new designs. Because of their approach to the supply chain, it is sometimes hard to match customer demands, but equally customers love that each pair of shoes is distinct.

The Kolics team is also passionate about training. They run an informal internship programme for fashion students from the local technical university in their community. The company recently participated in the Zongo Development Project, which was started by the Ghanaian government to support young people with technical skills.

Kolics play san advocacy role to educate the public on proper clothing disposal through radio features and they run a scheme to accept old clothes from community members for use in their production.

Kolics also participated in the Ghana Climate Innovation Centre's Climate Launchpad in 2019.

SDGs

Case study

Kyuma Goods

Location
Kenya

Context
Urban area

Sector
Manufacturing

Circular strategy

Use
waste as
a resource

Link

facebook.com/
KYUMA-GOODS

> When you are working with leather, you have to measure everything. This makes it easier to understand your business' impact."
>
> -Victor Nzau

Value from waste hides

Kyuma uses a proprietary, non-toxic tanning process to produce sandals and accessories from reject hides of cattle lost to drought in Kenya.

What is the opportunity?

Kenya has no shortage of animal hides and a huge leather industry, but there is much inbuilt waste in the system. After leather manufacturers purchase their materials from the slaughterhouses, the low quality, third grade hides are discarded or used for dog food. Wasted hides cause both air and land pollution, as well as unpleasant smells for the people living near slaughterhouses. Another largely untapped source of hides comes from the cattle that die during the frequent droughts in northern Kenya, the loss of which can otherwise destroy the livelihoods of cattle owners.

The entrepreneur's story

Victor Nzau describes himself as a 'leather technologist'. As a young boy, he accompanied his mother, a teacher at a leather school, to work. He saw first-hand the waste in the leather industry and tirelessly applied for business plan competitions and accelerator programmes as he developed his business, Kyuma Goods. At the Kenya Climate Innovation Centre, he was inspired to develop a method for tanning leather that avoids the harmful chemicals applied by the industry. He has developed his own experimental trials with natural tanning products.

Their solution

In 2014 Kyuma Goods started by collecting discarded hides from farms and slaughterhouses to produce leather for footwear.

Next, they began to partner with communities affected by drought by engaging women and young people to collect discarded waste cattle hides. They developed a 21-day training programme for collectors on how to collect and preserve the hides using natural techniques. This minimises air pollution and ensures that the hides are in good condition when Kyuma Goods collects them.

Committed to removing the negative impacts of hide processing, Kyuma Goods have researched the use of vegetable extracts instead of harmful chemicals in tanning their leather. They are now researching the possibility of incorporating other plant and animal-based tanning products, such as rhubarb, red cabbage and pig manure.

In addition to employing people from the local community, Kyuma Goods offers vocational skills training and serves as an incubation centre in the community. They also run an internship programme for students to come and learn from their workers.

Kyuma Goods is ISO14000 certified.

SDGs

Case study

Rewoven

Location
South Africa

Context
Urban

Sector
Manufacturing

Circular strategy

- **Collaborate** to create joint value
- **Use** waste as a resource
- **Rethink** the business model

Link

rewoven.africa

> The future of fashion depends on building an ecosystem. We won't get there unless we get everyone in the industry together."
>
> -Esethu

Reimagining textile waste

REWOVEN
REIMAGINING TEXTILE WASTE

Rewoven collects textile waste from garment manufacturers, putting it into recycling loops where it is processed into fibres for a variety of purposes.

What is the opportunity?

The fashion industry in South Africa has high job creation potential, especially in the textile sector. However, about half of these manufacturers either dump at landfills, burn or sludge their waste fabric. Until now, there has simply been no recycling on a significant scale.

The entrepreneur's story

Rewoven was founded in 2018 by Tshepo Bhengu, Esethu Cenga and Lonwabo Mgoduso. After finishing university, they knew they wanted to make an impact in the fashion industry. They had the idea that textile recycling was going to be both a massive business and job creation opportunity. They joined an incubation programme run by the Allan Gray Orbis Foundation during which they did research to understand the industry and its challenges. Rewoven began operations in 2020.

Their solution

Rewoven diverts textile waste produced by clothing manufacturers from landfill in Cape Town by recycling and upcycling.

They collect a range of raw materials: off-cut fabric, end-of-roll fabric, clothing rejects, and unsold inventory. The fabrics are then sorted into two different processes. Domestically recycled textile waste fibres are processed in South Africa and used as filling materials, construction insulation, disaster relief blankets and so on. 100% recycled fabrics are processed by Rewoven's R&D partner in India – although their ultimate plan is to set up recycling facilities in South Africa.

The team at Rewoven is also doing further research to understand the journey and impact of fashion waste. In 2020 they launched Future of Fashion, a sustainable fashion indaba dedicated to enabling collaborative knowledge-sharing that can help the development of a thriving, inclusive, ethical and future-fit local fashion industry.

SDGs

6 Endnotes

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Our partnering organisations

AFRICAN CIRCULAR ECONOMY NETWORK

The African Circular Economy Network is working to build a restorative African economy that generates well-being and prosperity inclusive of all its people through new forms of economic production and consumption which maintain and regenerate its environmental resources.

CIRCLE ECONOMY

Circle Economy's mission is to empower a global community of businesses, cities and governments to accelerate the transition to the circular economy through practical and scalable insights and solutions that address humanity's greatest challenges.

G·R·I·D ARENDAL

A Centre collaborating with UNEP

GRID-Arendal is a non-profit environmental communications centre based in Norway that transforms environmental data into innovative, science-based information products and provides capacity-building services. GRID-Arendal collaborates with the UN Environment Programme and other partners around the world.

shifting paradigms

Shifting Paradigms is a consultancy that makes our tread on our planet lighter by supporting the transition to a low-carbon, circular economy. It applies a systems approach to both material and energy resources as a basis for sound business and policy development.

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