






ACE Africa
Accelerating Circular Economy in Africa


ACE Africa Entrepreneur Profiles







ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

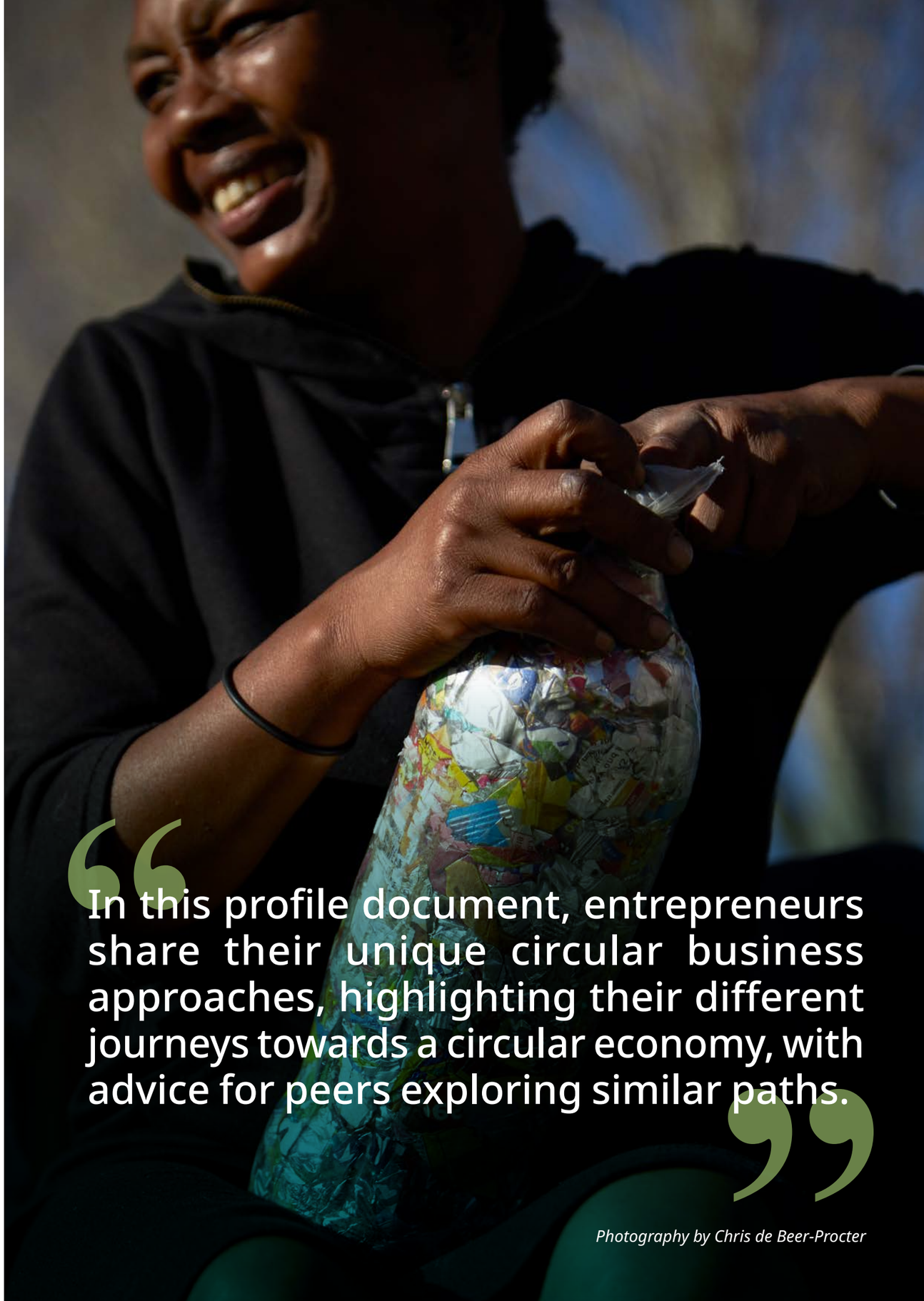
Embassy of Finland Pretoria

INTRODUCTION

Given the increasing recognition of the negative impacts of extractive, linear economies, ‘circular economy’ is gaining traction as a model to promote sustainability-oriented innovation and to accelerate resource sustainability. Circular economy is a growing area of interest for achieving sustainability across multiple sectors, and it is noteworthy that in Africa, many businesses are already leading the way in the circularity transition. Circular businesses offer services or goods that, through their creation, sale, use or dismantling, can positively affect consumption and production patterns, regenerate communities and ecosystems, or improve resource productivity. The circular economy therefore offers a great deal of possibilities and opportunities for businesses.

Despite this, there exists limited skills and technical resources, particularly for start-ups and small or medium enterprises, for setting up and running sustainable businesses with a life-cycle perspective. The Accelerating Circular Economy Innovation in Africa (ACE Africa) project was initiated to guide selected entrepreneurs and new start-ups through an incubation programme and provide a platform for exposure to circular economy ideas and practices and interaction with mature circular economy businesses, funders and government officers. The ACE Africa project is driven towards the growth of circular development in African cities through innovation and collaboration. The overarching objective is not just to facilitate the creation of an enabling environment for the uptake of circular economy concepts and innovative approaches, but to unlock the potential of the circular economy by supporting and upskilling start-up companies and small businesses that show promising circular economy contributions in African cities.

This set of ACE Africa Entrepreneur profiles showcases ACE Africa businesses implementing circular economy solutions in African cities. In this profile, our entrepreneurs share their uniquely circular business approaches, highlighting their different journeys towards a circular economy, with advice for peers exploring similar paths. The profile document explores the intersection between business and circularity – how circular models and principles are providing sustainable business solutions. Through this profile document, we hope to inspire a wider audience to acknowledge the possibilities and opportunities circular economy models may offer, and further encourage the design and uptake of circular solutions in Africa. It is an accompaniment to the ACE Africa Recommendations Document and the Circularity is... catalogues.



> “In this profile document, entrepreneurs share their unique circular business approaches, highlighting their different journeys towards a circular economy, with advice for peers exploring similar paths.”

Photography by Chris de Beer-Procter

AquaGel (Pty) Ltd

ENTREPRENEUR: Clayton Postma
ESTABLISHED: 2017
TEAM: 3
LOCATION: Johannesburg, Gauteng, South Africa
CONTACT: info@aquagel.co.za

www. aquagel.co.za

AquaGel sells innovative agricultural products designed to balance soil, water and nutrients to prevent waste and increase yields. Partly made with a waste material called biochar, their products can be used for a variety of purposes, adding huge benefits to clients, food security and the regeneration of nature.

> You have to drive people towards change. If I demonstrate to you that you can use this product to sequester carbon, improve your yield, save on water and fertilizer while improving on long term soil health, that's a real incentive.

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Seeing HydroCache at work can be perplexing at first. Initially, AquaGel's flagship agricultural product is a rather unassuming, fine charcoal-coloured black powder which sits low and level at the bottom of the tall drinking glass Clayton Postma has placed on a table between us. Clayton, who created and sells the product through his company, AquaGel, makes little theatre of pouring water into the glass while explaining the incredible potential of this rather miraculous dust. "In a nutshell, we create the balance between soil, water and fertilizer," he says, turning the glass around in his hand as the product slowly mixes with the water.

"There's a few ways you could use this," Clayton says, lifting the glass which is now filled to the top with a light grey gel where water and an unbelievably small amount of HydroCache once were. Using this soil conditioner, he explains, farmers can greatly improve yields, save water and fertilizer, improve long term soil health and sequester carbon dioxide and nitrous oxide from the atmosphere.

"We know that up to 50% of applied fertilizers either volatilize into the atmosphere or leech down into the earth beyond where the plant can use it," he explains, a process which also contributes CO2 into the atmosphere. But when mixed with fertilizer and added to soil, HydroCache acts like a sponge, retaining the water and solubilized nutrients, and releasing it slowly over the season. Considering the skyrocketing costs of fertilizers, as well as increasing water and food insecurity, a product like this could make a huge impact on farmers and the communities they serve.

> *"The soils are getting depleted. With desertification, the karoo is getting bigger, the Western Cape green belt is getting smaller. We need to reclaim those soils. The only way to do that is to put back what you've taken out in the last 100 years."*

So, how does this tiny powder with big promises work? And how does it contribute to the circular economy? There are two main components which make up HydroCache: a polymer which can absorb moisture and release it as needed, and biochar which is an activated carbon created by burning biomass in an oxygen-free environment. "We use waste from forestry to generate biochar," says Clayton. "Forestry has a lot of waste which they typically burn to power their saw mills, but doing so in an oxygen-free environment means you can carbonise a proportion of it," he explains. Doing this drives off volatiles and results in a (microscopic) graphitic structure, which stores water like a sponge and provides the perfect home for microbes and the nutrients they produce.

"Coming back to forestry, we then use it to plant trees again. When a sapling comes out of the nursery, we put a litre of this gel around it," he says. The gel protects the vulnerable sapling from transplant shock by creating a buffer with all the water and nutrients it needs to thrive.

Aquagel's technology can also be used for a process called hydroseeding, by creating a gel that can easily be applied to soil with standard farming equipment like tractors. "We're doing this with the fruit tree guys," Clayton explains. "The raised area between the rows of trees is usually treated with mulch and compost to return carbon and nitrogen to the soil, but then they still have to spray for weeds." However international pressure from importers to cut back on pesticides and herbicides has encouraged the search for more environmentally friendly alternatives, like hydroseeding. "You end up with a living mulch which is nitrogen-fixing for the soil and takes nitrogen out of the air," says Clayton. The resulting suppression of weeds also decreases the need for harmful chemicals. "It's a win-win for the industry and the environment," says Clayton. It's just another example of how AquaGel's products offer value to clients, while simultaneously contributing to regenerating nature.

AquaGel's mission is underlined by the knowledge that food security is paramount. "It's evident that this is our biggest concern," says Clayton. With Africa's population set to rise by up to 55% by 2050, he wonders, "how will we feed these people?" Clayton hopes that their products can help, by increasing soil health, reducing the need for harmful chemicals, retaining water and nutrients and keeping carbon and nitrogen in the soil where they ultimately increase yields. It all starts there, he says, "in the soil."

VISION FOR THE FUTURE

"We're expanding our range and building relationships with organisations who can help us produce every part of the product in South Africa, thereby creating jobs. We want to be a major contributor to food security and the fight against climate change."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

> **Find a problem that you are passionate about and make it your business to find a solution.**
>
> When you focus on the 'why', the 'how' gets easier.

Bioregional South Africa

ENTREPRENEUR: Sarah Alsen
ESTABLISHED: 2011
TEAM: 1 full time, 1 part time
LOCATION: Durban, KwaZulu-Natal, South Africa
CONTACT: sarah.alsen@bioregional.com

www.bioregional.com

Bioregional is a not-for-profit organization that promotes sustainability using an action planning tool known as One Planet Living, a framework of 10 principles of sustainability and an easy way to operationalize the Sustainable Development Goals. Their latest project is a composting initiative at The Sisonke Composting Garden, which diverts local food and green waste from landfill and into compost for local food gardens, giving it new life and a new chance to nourish the community.

> “Climate change is showing us that we can’t carry on with business as usual. We need to move towards localized economies, local production for local needs. Composting and food growing is an opportunity to do that.”

Words by Chris de Beer-Procter; photography by Rogan Ward

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

During South Africa's COVID19 lockdown, a group of homeless men in downtown Durban started a food garden. The project found some success, but as Sarah Alsen of Bioregional noticed, its productivity had started to wane as the months passed by. One day as she drove past the garden, she decided to investigate and found that because of the garden's success, many of the men who started it had since found full time employment elsewhere. The garden was suffering without their skills. Sarah, who has since become a facilitator for the garden's transition into an SMME, hired a permaculture mentor and trainer to advise. The soil, he said, had been depleted. And so arose an opportunity.

"I approached a nearby hotel and asked about their food waste," Sarah reflects. "And there are trees and a park right by the site, they had lots of green waste, some of which is collected in plastic bags and transported to landfill." Sarah joined the dots, persuaded the hotel to purchase Bokashi bran which accelerates food waste composting, even of cooked, dairy and meat products –it is like 'composting on steroids', she says- and the pilot composting project was born. Six months after the project's inception, the circularity dimension which characterises the business is proving its worth. Weekly compost is turned and made, and the food garden is flourishing. By collaborating and making connections with local businesses like a nearby Spar, an early morning food market, a restaurant and even residents of nearby flats, Sarah has helped find a market for the organic produce. And the garden is also being used as a work experience site for final year DUT (Durban University of Technology) horticulture students.

> *I believe a waste free society is possible, but we all must play our part. We need to do things differently in order for our planet to survive.*

"The consequent benefit is to the local people," says Sarah, who notes that serious disruptions in supply chains caused by social unrest and environmental disasters in the last year have highlighted the need to shorten supply chains and look at local production for local needs.

"By creating one's own compost, there's a 98% savings in greenhouse gases that would have been emitted had the waste gone to landfill, not to mention the carbon associated with transporting food and waste from place to place," says Sarah. "Plus, we're not only providing local, seasonal, organic and fresh produce, we're also promoting zero waste as most of the produce is not packaged" she adds. "Any waste from the garden can also be composted, adding to the circularity of the system too".

"We've proven that it can be done, now is the time to ramp this up," she says. Bioregional has identified four additional sites that they would like to work with, with existing restaurants and gardens where compost production can occur. "Food waste use, food growing and composting, if we can stitch that together, that's beautiful circularity." But for the initial pilot project with Sisonke Durban Garden, the benefits reach beyond creating livelihoods and a great circular economy project. "Local residents are generally grumpy about homeless communities near them," Sarah says, "but we're starting to change that narrative. We're not only providing employment and local organic produce at a fair price, we're creating a positive story and showing that with collaboration we really can create healthier and happier neighbourhoods for the good of all, while also having a positive impact on the environment."

VISION FOR THE FUTURE

"The vision is to expand this project, teaching people how to make compost using food and garden waste such that we have an established network of production for local needs and with it, training and employment opportunities and a network of urban food gardens.

We need to value waste as a resource to tackle climate change, build resilient communities and regenerate the living systems of our earth. Sisonke – together – we can."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

> **Just start, no matter how small. If you are passionate about whatever the business is - see where it takes you.**

Pilot projects are important and can inform scaling up to bigger things. It also begins your exposure to new audiences e.g. as bought by publicity coverage.

Collaboration and tenacity is key! And it's useful to take part in business incubation along the way to know what is expected from a business point of view, which is important if you are going to seek funding at some stage.

BN-Aqua Solutions

ENTREPRENEUR: **Boitumelo Nkatlo**
ESTABLISHED: 2016
TEAM: 1 full time (2 directors)
LOCATION: Pretoria, Gauteng, South Africa
CONTACT: boitumelonkatlo@gmail.com

www.bnaqua.co.za

BN-Aqua Solutions is a water treatment company which processes acid mine drainage (water that has been contaminated by mining activities) to drinking stage. Using a groundbreaking innovation, the company treats waste using waste while also retrieving valuable minerals which would otherwise be discarded. They present a cost effective, environmentally responsible and circular way of dealing with these mining waste streams while contributing to water and food security.

“Circularity for me is about accountability and responsibility. We shouldn’t just discard water irresponsibly. Everything should be done in a responsible manner from A-Z.”

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Following his first few years in the mining industry, metallurgist and innovator, Boitumelo Nkatlo was stunned after witnessing the millions of liters of water which are contaminated by mining activities in South Africa every day. Acid mine drainage, as it's called, which poses a significant environmental risk as well as compliance and productivity headaches for mining companies, struck Boitumelo as an opportunity. What if that water could be treated beyond the usual neutralization needed to make a mine compliant and instead be used to increase our country's water capacity?

"I identified this problem as a business opportunity," reflects Boitumelo. "Water is a scarce resource, but we have millions of liters of contaminated mine water underground. The problem is that it's contaminated and we can't do much about it." And so, BN-Aqua Solutions was established in June 2016. Over the next 7 years, Boitumelo and co-founder Ntaoleng Nkatlo set about intense research and development in partnership with the University of Johannesburg and the City of Johannesburg, as well as other organizations. In 2016, their first prototype was designed, assembled and commissioned and has since been scaled from 3500 to now 20 000 litres per day. "We have developed a technology that uses a waste material called metallurgical slag to treat another waste stream, the acid mine drainage. After much trial and error, we are now at the stage where we can safely treat acid mine drainage (AMD) to drinking quality."

This was a significant victory in proving the viability of the concept, since the process could effectively treat the AMD at scale and resulted in high quality water which could be fed into the grid at a competitive price. It's a win for mining companies, local municipalities and even for the low-income communities surrounding the mines. But the benefits only grew once Boitumelo encountered the concept of circularity. "I didn't know about the circular economy before starting BN-Aqua.

My objective in the beginning was to solve the water problem," he says, "but once you've embarked on a project you grow as you go as an innovator." Learning about the concept encouraged Boitumelo to investigate the problem of waste at every level in the process. "We did a mineralogy analysis on the residual slag that is left after we've treated the water," he says. And the results were exciting.

"We found incredibly useful minerals that we could sell. We don't throw it away. Actually, gypsum can be used for plaster, soil fertilizer and also in road construction. Magnetite can be used in a coal washing plant. Synthetic lime can be used for pH control."

> *"For us to live we need water, for animals and for plants to live they need water. It's not just about water security, it's about food security."*

Along the journey, Boitumelo has learned more than just what is possible with science. "From the circular economy, I've learned that accountability is number one," he says. "The environment wasn't all that important to me in the beginning, but now I've learned that you can't just discard as you wish. You need to be accountable for your process from A to Z. You can't just discard waste into the environment."

The journey has been a challenging one for Boitumelo, who says that he is most proud of his persistence and patience. "That's the nature of innovation," he says. "Sometimes your ideas don't work, and sometimes they do. You must keep going even when the odds are against you because you believe in the project." His drive to solve the national water crisis kept him going even when times were tough. And he knows there's more for other innovators to learn from his business's story.

"To find value in the valueless, in what is considered waste. That is the biggest inspiration I think people can get from my story."

VISION FOR THE FUTURE

"We hope to build a number of modular plants to treat acid mine drainage. Modular because we want the flexibility to move around. For society, we'd like to 1. Increase water capacity. 2. Provide employment to hosting communities. And 3. build a number of different plants in South Africa and beyond. This problem is not only a South African problem, it's also an African problem and beyond."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"Hard work pays. We should all follow our passions, work hard towards our goals and never shy away because to get to where I am now, (to my prototype) I've had more 'nos' than 'yesses'.

What's kept me going is my passion to solve our water problem. Those 'nos' kept me going, I wanted to prove them wrong. Dedication, curiosity for the results, and what we could achieve kept me going."

Coffee Zen

ENTREPRENEUR: **Alex Ralston**
ESTABLISHED: 2021
TEAM: 1
LOCATION: Johannesburg, Gauteng South Africa
CONTACT: alex@coffeezen.co.za

Coffee Zen is a startup innovating a circular use for one of humanity's most ubiquitous waste streams, used coffee grains. Entrepreneur Alex Ralston hopes to find an effective, circular application for this waste, giving it new value and keeping it from landfill.

> It's not just the environment and profit that drives me. It's about the people who can benefit, the promise of social enterprises to create jobs, and profit while impacting the world.

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

We usually hear about entrepreneurs after they've already found some degree of success. But it's not often that we encounter stories about the grafting it takes to get there - the many hours of research, the trials and errors, the doubt and the motivation which drives budding entrepreneurs through the uncertainty of pioneering a new innovation. But this is where we meet Alex Ralston. Through his startup, Coffee Zen, Alex is exploring useful solutions to one of humanity's most ubiquitous waste streams, coffee waste.

"We all take for granted that we get a cup of coffee in the morning and don't actually think about the impact that cup of coffee is having on the environment."

"I think it's one of the most neglected waste streams," Alex says. The potential value of coffee waste first occurred to him while he was working in an office. He noticed that a colleague would take all their coffee grounds and stockpile it. When he asked why she did this, she told him that it was a brilliant fertilizer for her garden. "I wondered if I could use this waste stream to generate an income and build a business out of it," he reflects. He set out to discover the useful properties of coffee waste.

It is early days for Alex who has only been running Coffee Zen since late 2021. Right now, "it's just about testing and trying to build something out of what is pretty much nothing," he says. But already there are some promising uses for the waste, most notably in 3D printing. Alex has invested in a 3D printer and found ways to integrate coffee waste into the base material by up to 20%. If he can use this method to create coffee cups at scale, he could help build a more circular economy around our daily caffeine intake.

"Why coffee? I just love coffee!" he says, sitting in the dining room of his parents' home in Johannesburg, where he has claimed their garage space to develop his business. He finds the humble beginnings of starting a business from your parent's garage an amusing cliché, "just the typical entrepreneur story" he laughs. But in one important way, Alex's story is not so typical.

His initial success with coffee waste in 3D printing might, for most entrepreneurs, be the end of the testing phase. But Alex doesn't see 3D printing as the best long-term solution. "From the perspective of circularity, I'd want to use it in a more natural way. It's great to try to mix technology and waste streams but if I'm just creating another product that becomes waste, am I making a difference?" These are some of the difficult questions that circular entrepreneurs often face in their journey; how to balance making a profit with making the world better.

"I'm trying to bring it back to a circular focus and not just something that's going to sell," he says. And so Alex has followed his curiosity to various other uses for this waste stream. He hopes it will eventually lead him to the agricultural sector. "There's potential in mushroom farming, it makes a very good substrate," he says. Not to mention, it makes a perfect feed for black soldier flies and an excellent source of nitrogen and therefore an excellent fertilizer. There is also massive potential in the service of collecting the waste from sellers like coffee shops, he's found. "We still have some way to go in understanding that it's a service that's beneficial to the companies, especially as policies like carbon taxes and credits become more mainstream," he notes. "Companies can pay to offset those expenses which will become more expensive in the future," he adds.

Alex hopes that eventually his business can create jobs and help alleviate unemployment in some way, however small that may be. And in so doing help prevent this huge waste stream from ending up in landfills. On a more philosophical level, he hopes it'll remind people that there is so much more to a product's life cycle even once it's fulfilled its purpose. Or, as he likes to say, "your coffee doesn't end with your last sip."

VISION FOR THE FUTURE

"I aspire to gain more experience working with new and vibrant people along the way. And to grow Coffee Zen into a well-known and recognisable brand."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"The circular economy is an obviously different way of doing business, it is forcing companies to rethink everything from how they design and produce products, to how they relate with customers, basically what comes around goes around.

Enjoy the challenge of figuring out what your business needs to be a success."

Green X Engineering

ENTREPRENEUR: **Jason Samuels**
ESTABLISHED: 2021
TEAM: 8 operations, 4 board members
LOCATION: Stellenbosch, Western Cape, South Africa
CONTACT: jason@gxe.co.za

www.gxe.co.za

Green X Engineering helps buildings and organisations achieve energy optimization through energy audits and a smart metering app to inform critical interventions to save electricity, money and carbon emissions. They envision a world where buildings not only use power more efficiently but become hubs for renewable energy production, through the installation of solar panels.

> I want to have impact. And it is possible. That's what I want to do with my life, I want to do research and then help.

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

It is said that knowledge is power. And through his company, Green X, Jason Samuels is out to prove that knowledge is also key to saving power, and the planet. The company uses their engineering expertise along with an innovative smart monitoring app and sustainable interventions to reduce electricity usage and ease dependence on South Africa's strained power grid - saving money, and carbon emissions.

"Basically, Green X helps organisations do more with less," Jason says. The company, which he co-founded, was born out of his PhD research at the University of Stellenbosch. "I found that there was almost no literature on schools and energy usage from the South African perspective," he reflects. Jason wanted to change that. "We started off documenting what schools use, doing energy audits and seeing where they could save consumption," he says. The results were staggering and the research team realized that they could take their idea out of the academic realm and into the commercial.

"Schools could function as a power generation node to aid the energy crisis. I know it sounds 'out there'. But they're perfectly positioned."

Since their inception in 2021, the company has already made waves and even national headlines for their work with schools throughout the Western Cape. Most notably with Cloetesville Primary School, where Green X helped the school became the first in the country to receive their Energy Performance Certificate, with a rating of A through the use of smart metering. This, alongside energy audits, provided insight into their energy usage and revealed that there was still room for further optimisation. After understanding and optimising existing energy usage, Green X went on to install solar PV panels to further reduce energy use. As a result of interventions like replacing outdated, energy-heavy lightbulbs with efficient LED lights, the project saved the institution an average of R 2 000 per month and an estimated R 20 000 per year on energy costs. It is also reported that the renewable renovations will reduce the school's carbon emissions by 13 tons every year.

The project was also a personal one for Jason who is from the community and was a pupil at a neighbouring school. "We all have this dream of going back to build up our home, [and] seeing Jason do it was beautiful," says Grace Chidavaenzi who is a business intern at Green X.

Following their great success with Cloetesville Primary, the Western Cape Education Department has tasked Green X with rolling out the energy intervention to 100 schools in the region over the next 3 years. The project is an encouraging step in the transformation towards a more circular economy in these pivotal public institutions - reducing waste, saving money and providing an opportunity to generate localised, renewable energy that will directly benefit communities.

"Climate change is a reality, unfortunately. And Eskom is another reality," says Grace, "we need country-wide ways to reduce our power consumption because our current infrastructure cannot handle it." Green X approaches their mandate not only as a necessity in a country that is burdened by chronic power instability, but as an opportunity to create optimized buildings that are platforms for innovation for a future that is not only brighter, but more efficient!

VISION FOR THE FUTURE

"As the Green X team grows in capacity and experience, we would like to have proven sustainable impact through efficiency. We would like to see the schools in South Africa fully optimised and functioning as energy hubs to supply their nearby communities, making them sustainable and cost-effective and giving them the ability to play a part in solving our energy crisis. Green X intends to walk alongside the schools to accomplish these ambitious goals.

Green X also seeks to play a part in the efficiency of the private sector, particularly in private schools and hospitals. Lastly there is also opportunity to also provide value in the residential space, i.e. homes and guesthouses."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"Pay attention to sectors of society that are overlooked, like poorer schools. There's a gap there.

I think there's value to monitoring- if you know what's happening and you can measure it, you can do something about that. That can be applied to food wastage, water wastage – all these streams."

Kudoti Solutions

ENTREPRENEURS: **Gift Lubele & Matthieu de Gaudemar**

ESTABLISHED: 2020

TEAM: Est 10

LOCATION: Johannesburg, Gauteng, South Africa
Operational – India, South Africa, Columbia, Kenya & Ghana

CONTACT: gift@kudoti.com

www.kudoti.com

Kudoti is a data-driven digital platform which digitises waste operations, records and quantifies sustainability efforts and connects stakeholders in one centralised place. Using the platform as the digital infrastructure for a circular economy, the company foregrounds waste as a valuable resource and activates new supply chains to help industries unlock the power of circularity.

> We haven't designed our current supply chains for circularity. We have designed them for a linear economy, consumption, throw away, consumption, throw away. That needs to change. We must redesign our supply chains to enhance and accelerate circular economy applications.

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

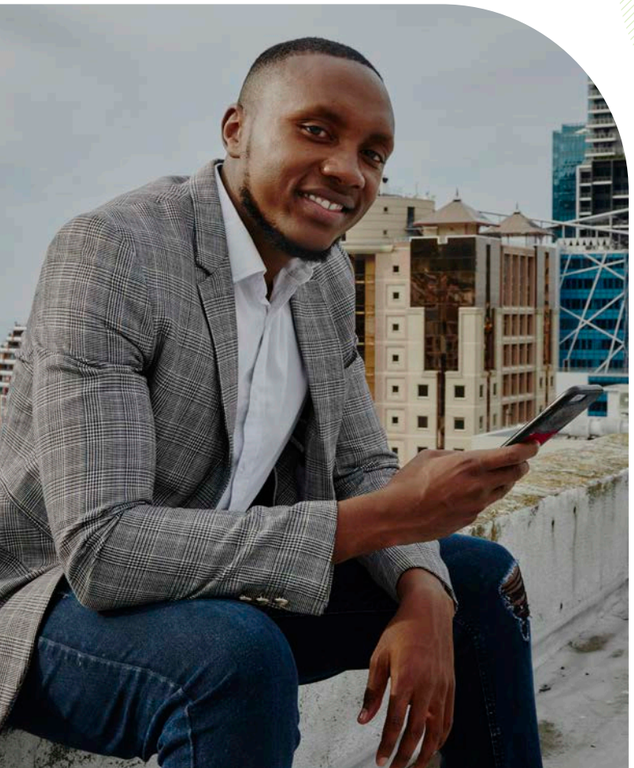
We can't solve a problem we haven't fully defined. It's a simple assertion, but one which Gift Lubele, the co-founder and COO of Kudoti, sees as the key to transforming our economy from the exploitative and wasteful linear model in use today to the sustainable and thriving circular economy of the future. This is why he and business partner Matthieu de Gaudemar set about creating Kudoti, a platform which digitizes waste operations to form the technological backbone of a self-sustaining, circular system.

With the power of data, Kudoti helps stakeholders track waste, measure their environmental impact and unlock new supply chains, creating new networks and opportunities for circularity. "We work across the entire value chain," says Gift, "working with informal waste pickers, buyback centres, waste companies and manufacturers, essentially bringing them all into our platform."

The capabilities of such a platform are threefold. Firstly, as brands attempt to comply with extended producer responsibility laws, data captured on the platform is crucial to quantifying their impact and efforts in reporting and allowing them to plan better for the future. Secondly, Gift says, the platform encourages brands to move away from virgin materials in favour of recycled ones. "The idea is to start making companies aware that any type of waste can be a resource," he explains. This is helped along by the platform's third capability, which is to map out and establish new supply chains for integrating these materials in new circular applications. Gift says that Kudoti's capabilities help us make better informed decisions like where to direct investment.

> *"The only way we can achieve a fully circular economy is if we revisit all our processes and redesign them for recycling. Brands need to prioritise circularity from the start in their operations."*

When it comes to transitioning our economy towards sustainability, Gift acknowledges that the will is there. What Kudoti hopes to provide is the way. "It's not that people aren't doing anything, they're trying their level best to fight the good fight but it's useless when you're up against an established system," he says. It is a system which he notes is still critically fragmented and lacks collaboration. "[with Kudoti] We've built a system that centralizes these efforts across industries and various stakeholders," he continues, "and that's what is going to have a big impact."



Connecting the industry players and opening up capabilities for new supply chains also creates exciting opportunities to incentivize circular activities. Take for example a recent project the company ran with Nestle in Thembisa township, where they recommended that the brand award top performing waste pickers with food parcels. In the end, this resulted in a 30% increase in recycling in the community.

Since the company became operational in 2020, it's seen 9 million kilograms of material tracked on the platform, over 500 companies registered and around 400 waste pickers impacted in 5 different countries. It's an impressive start for the young company who knows it is no small thing to transform an economy. Luckily, with the power of big data, Kudoti is providing the technological backbone for a new, better, way of doing business.

VISION FOR THE FUTURE

"I'd really love to see Kudoti become the biggest waste company that doesn't handle waste. We want to touch across all sectors and industries.

For society, I hope to help people see their impact on the world. Understanding that, I'd like to believe that the majority of people will start living more sustainably, especially if they have information."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

Choose something that serves a purpose bigger than you. This journey is tough and on those days when you feel like giving up, purpose will push you. Do something that is not just good for you, but for humanity.

Secondly, learn in the field. Be a student of the real world. There isn't always a class or a book to learn from. Sometimes you are the pioneer and the best way to learn is in the field. But make sure you learn quickly.

Lastly, keep learning. If you don't, your business will stagnate or outgrow you. Listen to podcasts, read, go to summits. These days it doesn't even have to cost much, all you need is mobile data to access so much knowledge.

Mangau Animal Feeds

ENTREPRENEUR: Matome Matalane
ESTABLISHED: 2019
TEAM: 1
LOCATION: Limpopo, Western Cape, South Africa
CONTACT: Matome.Motalane@mangauanimalfeeds.co.za

www.mangauanimalfeeds.co.za

Mangau Animal Feeds is an agroprocessing, agritech and e-commerce company which uses a circular business model to manufacture animal feeds, fertilisers and other agricultural products from organic agricultural waste. Through their innovative mobile app, clients can buy products and obtain veterinary services, as well as gain access to community networking and educational content specific for farming communities.

> “I’d love to see disease outbreaks lowering. Reduce disease outbreaks. If our animals can be well fed, they will have a stronger immune system to fight off diseases naturally.”

Words by Chris de Beer-Procter; Photography by Lucas Ledwaba

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Matome Matalane does not think that the health of one animal should come at the cost of countless others. As the founder of Mangau Animal Feeds, a circular business that produces agricultural products for plants and animals, he hopes to transform the agricultural sector and prove that humans, plants and animals can co-exist without destroying the environment. And that we can do so while improving the health of the animals and by extension, humans.

When you know more about Matome's background, it won't come as a surprise that his journey has led him here. He grew up herding cattle in rural Limpopo, in a family with a long legacy of farming. Even after completing his BSC in biochemistry and microbiology, he says that he couldn't deny that farming is in his blood.

"I'm not just about making profit. Yes, I have to make profit but I'm also sharing knowledge with communities, farmersto show them more environmentally friendly farming, like which trees and crops sequester the most carbon."

"It all starts with food," he says, "I realized during my studies that 90% of the diseases we encounter come from what humans and animals consume." In this fact, he found one of his business's core values, to reduce disease, increase health and in the long term, alleviate food insecurity and poverty all while finding value in agricultural waste products. "The feed is made out of products that are mostly accessible to livestock farmers like sunflowers, maize, grass, it depends on the kind of animal that I want to cater for," he explains.

But Matome's entrepreneurial journey has not been without significant bumps in the road. Not long after he had established a small production plant with equipment like a small hammer-mill to make his products, it was stolen. "It was a nice setup, I loved it. It was flexible enough to change as my research developed and was even powered by solar," he says. At this early point in his business, he could not afford insurance. The loss was massive. Matome says that it was a moment of reckoning for him - despite the significant setback, he would not give up. "I had to sit down and face the reality of my life, that the entrepreneur's journey is the only one for me," he says.

But Matome did not want to lose momentum, and so he started developing a mobile app. "Everything is going towards the digital economy now," he says, adding that he wanted to keep living the ideals of the circular economy by reducing customer travel. "They can easily access it on the app and I deliver it to their doorstep. So I save them time and money, which they can invest in something else instead of traveling long distances for products," he says. The app has been an outlet for Matome's drive to innovate after the loss of his equipment. "I want to keep developing the mobile app so that it can be accessed and operated by those who don't have high tech skills and also the disabled. I don't want to leave anyone behind because knowledge should lie with everyone."

Matome has come a long way from the young boy who loved to herd cattle so much that he would do it even when his family had none, to the entrepreneur aspiring to transform the agricultural industry and society. He hasn't lost his love of the farm and animals - he's harnessed it to make a difference and pursue his inevitable path as a circular entrepreneur.

VISION FOR THE FUTURE

"I've noticed that there is over-farming of marine animals so I want to make products for them, so they can reproduce and grow faster. What is happening now is endangering marine species as well.

I have started with animal feeds, but I'm not only going to focus on that. For example, the leaves of plants are often thrown away when plants are harvested- I'm saying, instead of throwing those leaves away, let me do more research on the leaves and produce more products instead of sending it to landfills. That's the kind of value chain I want to have in the market, not just for animal feed."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"Becoming an entrepreneur is not easy, don't try to copy what others are doing. Follow your beliefs.

Know yourself and pursue your entrepreneurial journey based on who you are. It starts with research. Ask yourself which products need more attention and what your target market needs. The circular economy is very important, there's always something to do."

Meant to Bee

ENTREPRENEUR: **Drienie Botes**
ESTABLISHED: 2019
TEAM: 3
LOCATION: Johannesburg, Gauteng, South Africa
CONTACT: info@meanttobee.co.za

www.meanttobee.co.za

Meant to Bee is a honey company which empowers small scale beekeepers with an introduction to the business, training and ongoing mentorship in sustainable beekeeping and access to market, all under a common brand.

> “A lot of the time, smaller scale African beekeepers end up giving their honey away at the end of the season because they don’t have buyers. I want to help change that. My goal is to get as many beekeepers as possible as meaningful partners who are personally invested in the business.”

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Nature is full of real-life inspiration for the circular economy. For Drienie Botes, one need look no further than the mighty bee. These tiny creatures have been in the business of circularity long before it was a buzzword for us. “They’re incredible little beings that most of us don’t know much about,” says Drienie, who became fascinated by the business of beekeeping in 2018. “They’ve shown me that it takes extreme teamwork to be successful and serious commitment to your cause,” says Drienie.

“When I started learning about circularity, I wondered how my work fit in. But it’s become clearer to me now that bees are more a part of the circular system than anything.”

After becoming captivated by bees and what she was learning about the honey industry, Drienie founded Meant to Bee, a honey company which hopes to enable small scale beekeepers for a much bigger scale vision. The cause she and her partner beekeepers have committed to is no small thing: they plan to put African honey on the map and encourage more farmers on the continent to integrate hives into their ecosystems.

“I don’t think people realise how important bees are to the food system,”says Drienie, “a third of the world’s food is pollinated by bees. If we don’t have bees, we don’t have food.” When bees pollinate crops, she tells me, yields can increase by 70-80%. Farming honey as a companion to many popular crops is a natural boost for farmers’ yield and business, but it could also benefit the surrounding communities and environment.

“I imagine that if we can grow the industry, we can pollinate more food,” says Drienie. “The knock-on effect will be huge.”

While Drienie appreciates the role bees play in our environment and food system, she also has big dreams for what they can do for Africa. According to the international entrepreneurship and sustainability program, SEED, Africa is the only continent where bee populations remain stable against the threat of diseases which endanger populations on other continents, making it a prime location for beekeeping to flourish. But despite this, countries in Africa still import the majority of the honey they consume and even that is not enough to make up for the growing demand as consumers look to the product as a healthier alternative to sugar.

Drienie’s idea for filling that gap in the market is to empower black and previously disadvantaged beekeepers, partner with and support them as they build successful businesses. Drienie recognised the need after hearing about the experiences of black beekeepers in the industry. “I heard them asking for mentorship but no one wanted to mentor them,” she reflects. She realized that her skills could be shared with the wider beekeeping community. “I know how to get into markets and how to create a brand, that’s my background,” she reflects.

Much like the way of the bee, Drienie’s organization will consist of a network of hives, each producing their own high-quality honey under the leadership of these partner beekeepers. But each part will work towards the good of the whole, towards building up a respected name for African honey both at home, and abroad for export markets. “My ultimate vision is to have an African brand,” she says. “I really believe that we can make a product that will stand amongst the best in the world. It’s my goal, my obsession. It’s my drive.”

VISION FOR THE FUTURE

“Next year we hope to have a harvesting truck that will be the first of its kind in Africa. My ultimate vision is for Meant to Bee to be an African brand that represents Africa, a ‘premier Africa’ brand. I want 40 000 hives and penetrate the SADC (Southern African Development Community) and then the entire continent!”

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

“If we can learn anything from the bees, I think it’s teamwork. We need to stand together, work together and be committed to our cause.”

Organic Waste to Energy (OWE)

ENTREPRENEUR: **Rosley Sibanda**
ESTABLISHED: 2019
TEAM: 2-10 employees
LOCATION: Western Cape, South Africa
CONTACT: rosley@weoweourplanet.africa

www.weoweourplanet.africa

Organic Waste to Energy (OWE) provides sustainable waste management services with the added benefit of independent energy. It seeks to make use of the 22 million tons of food waste that end up in landfills each year and convert it to biogas. The company aims to build a circular economy business model that converts organic (food) waste into “clean and affordable energy”, thereby promoting positive societal behavioural change with regards to how we view and dispose of food waste.

> We owe it to our planet to become better stewards. Change is possible. We always must strive to be a better version of ourselves.

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Rosley Sibanda's life changed the day she asked herself, "what can we do about food waste?" Having lost her last corporate role due to redundancy and inspired by her studies towards a master's in leadership and sustainability, she was on the hunt for new ideas to implement the values of circularity.

"It started out of mere interest about my personal carbon footprint and wanting to know what I could do to save the planet in my own capacity," she reflects. After some research, Rosley found that there was a gap in the market. A meeting with the Western Cape Government revealed that there was a need for companies to assist with separating organic waste at a household and corporate level, "that's basically where OWE started," she says.

"Our waste is no longer out of sight, out of mind, it's in our faces. Circularity can put a spanner in the works and stop this current trajectory because it is not sustainable."

But Rosley was not about to send that waste to our rapidly expanding and environmentally harmful landfills. She had a far more circular purpose in mind. Using waste-to-energy technologies, like a biodigester, OWE could extract methane gas from fermenting organic waste, which can then be transformed into biofuel or electricity. Additionally, left over slurry can be used as rich soil nutrients, which can replace chemical fertilizers.

"It's a process that leaves nothing to waste," says Rosley, who believes biogas outwits other renewable sources of energy. "This is a good business model that promotes the circular economy," she adds, using food waste to produce energy as well as its by-product, digestate, that can be used to organically restore the nutrient content of our soils.

In terms of scaling up, we have a long way to go if society is to gain all the benefits of food waste in the future. "Separating food waste at source does require a lot more effort," says Rosley. "We will need to dramatically change behaviours, encourage a culture of food waste separation throughout the food value chain. Everything affects everything else, and it is key to build a good foundation of incoming quality food waste to feed into our biogas plants and eventually into the national grid," she explains.

"Everything we produce is wasteful, it may be helping development, but it's a double-edged sword," reflects Rosley. But with "circularity we extend the life cycle of products as much as possible. It's all about preserving the future for generations to come," she adds. That legacy is paramount to Rosley. And core to that is a commitment to conscientizing society about taking care of our planet. "In being conscious stewards, we become thankful and don't take anything for granted," she says.

VISION FOR THE FUTURE

"We see ourselves eventually feeding into the national grid, although that's not the ultimate. The ultimate is seeing a change in behaviour when it comes to the disposing of food waste. Then, the success would be seeing all those different energy forms emerging - where mobility is being fuelled by biogas, electricity is being fed into different onsite and offsite solutions, and where we sell a rich nutrient compost to farmers to help maintain their water levels in our soils."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"It's vital to constantly research and be abreast of what's happening.

Join relevant associations or organisations because it's important to find like-minded people to strengthen and broaden collaboration amongst diverse stakeholders."

PWK Waste Management and Recycling

ENTREPRENEUR: **Susan Kone**
ESTABLISHED: 2015
TEAM: 6 full time
LOCATION: Thohoyandou, Limpopo, South Africa
CONTACT: Kone.susanl@gmail.com

PWK Waste Management is a woman-led organization that collects, prepares and resells various waste streams for recycling, repurposing and reuse. The company advocates for separation at source and responsible recycling to reduce the amount of waste that ends up in landfill. They believe that 'there is no such thing as waste' and that community engagement is key to protecting our environment.

> I want to see more people getting involved in recycling and waste collection. We need to reduce the load for the government. There is a lot of money that is being wasted maintaining our landfill sites.

Words by Chris de Beer-Procter; Photography by Vhembe Photoshoot na Reza Reza

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

When Susan gave up her corporate job to start a business in waste, people around her were perplexed. "Even my family didn't understand me," she says. "Going from this clean woman to working in the dirt, it didn't make sense to them." But Susan saw the need, took the plunge, despite having little knowledge of recycling and waste management, she started PWK Waste Management. Now, 7 years on, the business employs 6 full time employees and collects an average of 4,5 tons of waste per week for recycling. And through her business, Susan is spreading the message of environmental responsibility and the ideals of circular economy throughout her community.

"Let's not wait for people to do things for us, we must be creative. The answers are all around us, we have land, we have waste. We must think outside the box."

"Wherever there is a human being, there is waste, it's something we have to live with," Susan says. "Our work is to make sure that we live in a clean environment," she adds. To do this, her business takes care of clients' various waste streams, collecting used materials like glass, cardboard and plastic. They then identify what is recyclable and resell these materials for reuse or recycling. "We're trying to manage as much waste as possible and divert it from landfill sites," she reflects.

But waste management is not just a line of work for Susan, it's her mission. "Our motto is that we are protecting Gaia, our mother earth," she says. "We need to start changing people's behaviour, to start being accountable and responsible for all the waste we produce," she adds. In alignment with her mission, Susan has become active in community outreach. Alongside her advocacy work with the government, which has seen her addressing schools and waste pickers about responsible and effective waste management, Susan has run campaigns like 'Keep Thohoyandou Clean' since its inception 3 years ago.

And Susan has noticed a difference. The number of waste pickers in her community has been steadily increasing, people even seek her advice about waste, "now they see me as a book of knowledge," she says. "People are learning. I get so happy when I see people waste picking. You come into town now and everyone has a trolley with boxes," she says with a smile.

"We have to be creative and realise that there is no such thing as waste," Susan says, adding, "but we can't do it alone, we need everybody on board." Susan recognizes that her vision for a waste-free world is about more than keeping pollution out of rivers and off our streets, she sees its value for our economies. "We are creating jobs, we are stimulating the economy, we are increasing our GDP," she says. Susan wants to show people that there is money in waste. And of course, as she says, "your trash is my treasure".

VISION FOR THE FUTURE

"I want to grow my brand and get more people on board. I want to achieve the goal of 'Keep Thohoyandou Clean', which is to clean up our town's environment, by year 5 of the campaign. In the long term I want to produce either school desks or other products from recycled plastic because plastic pollution is a problem for the universe."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

There is a lot we can do in the circular economy space, there is a gap. However, you need passion.

Don't think you'll make money overnight, or you won't do it right, it's a learning process. Knowledge is power. Give yourself time. Start learning. Read. Attend seminars, get knowledge. Then you will be able to conquer.

Sista Sista

ENTREPRENEURS: **Jeanne Hugo & Lise-Marie Hugo**
ESTABLISHED: 2020
TEAM: 2
LOCATION: Cape Town, Western Cape, South Africa
CONTACT: jeannehugo18@gmail.com

Sista Sista is a subscription service that collects non-recyclable plastics from customer's homes and delivers it to community partners who turn it into eco-bricks. Subscribers who join the community also have access to exclusive deals, ongoing education about living more sustainably as well as live support from the experts. This interesting business model gives customers a convenient and circular way to take care of non-recyclable plastics in their homes.

"We think it's important that people don't feel overwhelmed when trying to follow a more sustainable lifestyle."

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Even with ever-rising public awareness about the waste crisis and its toll on our planet, many of us are unaware of just how many environmentally harmful non-recyclable plastics make their way into our shopping bags and homes daily, after which they inevitably end up in landfills.

"Single-use plastics are everywhere," says Jeanne Hugo, co-founder of Sista Sista, a subscription service that collects these plastics from consumers' homes. "The ratio is much higher than recyclable plastics," she notes. In fact, the regular offenders are most likely in your pantry right now. "The most common non-recyclable plastics come from food packaging, like chip packets, chocolate packets, inners of boxes like cereal and tea," says Jeanne. The sad reality of just how many tonnes of single-use plastic ends up in our landfills every day spurred Jeanne and her sister Lise-Marie to start Sista Sista.

> *"It's amazing to see people realise that you can actually make money by cleaning up the environment!"*

Their company helps divert some of these plastics into eco-bricks, instead of landfills. Eco-bricks are a construction material made by stuffing these plastics into plastic bottles, resulting in an effective and useful method of plastic sequestration. "The biggest issue with plastic is that it doesn't break down, so the inventor of the eco-brick cleverly used this characteristic to its advantage," says Jeanne. But the method, she notes, is not without flaws, "if it isn't done properly, it can fail," says Jeanne.

To be a plausible solution, the bricks need to be densely packed and plastics used within must be completely clean and dry or risk becoming vectors for bacteria, which compromises the structural integrity of the brick. To produce their bricks, Sista Sista has partnered with women in a local community who properly manufacture the bricks, ensuring that they are strong and safe. "Our partners and their community have become so passionate about the project. Seeing how the business affects their lives is one of the most exciting things for me," says Jeanne. The response from the community was so positive, in fact, that residents started cleaning up their own area to make the bricks. And so, the sisters decided that for each client's monthly pickup (which generally creates 2 bricks), the company would sponsor 1 eco-brick from plastics collected in the community. They plan to train their staff to build with the bricks, adding many opportunities to benefit their communities.

But Sista Sista's subscribers don't just become a part of the eco-brick movement, they also gain access to nifty educational tools, ongoing tips and tricks for sustainable living, and exclusive deals on Sista Sista's line of plant-based products which includes delicious nut milks and butters. In this way, Sista Sista is turning the problem of single-use plastics into an opportunity to build community around sustainable living, one eco-brick at a time.

VISION FOR THE FUTURE

"Right now we're focussing on expanding our client base. More clients means more eco-bricks!"

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"Starting a circular business is not easy, but it's incredibly fulfilling.

Like any other business, it will be challenging, but just remember that you are serving a greater purpose and that it will be worth it in the end. Stay true to your values, don't be discouraged and just keep going!"

Smart Eco-Highway

ENTREPRENEUR: **Yvon François Tsolefack**
ESTABLISHED: 2021
TEAM: 2
LOCATION: Ouagadougou, Burkina Faso
CONTACT: Yvon.tsolefack@unmgcy.org

Smart Eco-Highway is a tech startup based in Burkina Faso that is developing an innovative device that can harness the kinetic and thermal energy of roads to produce affordable electricity for energy-strapped populations in Africa. They hope to do this using raw materials recovered from e-waste and recycled tyres, that will be recycled again once the device has reached the end of its life.

> “Sometimes it’s difficult for scientists to take all their theoretical knowledge and apply it to real life. I’m always asking about how we could apply all of this knowledge to solving real life problems.”

Words by Chris de Beer-Procter; Photography by David Armel Relwende Sawadogo

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

The year was 2020 and Yvon François Tsolefack, who was completing his energy engineering masters in Burkina Faso, was searching everywhere for practical, real-world applications of the theoretical knowledge he was gaining in his studies. “They were always speaking about kinetic and mechanical energy and I wondered how I could harness this source of energy to resolve Africa’s power crisis,” he reflects.

One afternoon in April, the hottest month in Burkina Faso, while Yvon and a few of his friends were driving to a party, they were hailed by a broken-down taxi. The vehicle had run out of petrol and needed to be pushed. It was not an easy task, the taxi was heavy and the sun was burning down, Yvon says. But as he directed his strength towards the taxi, his attention was drawn to the road and to the potential energy that lay beneath its hot, weighty tyres. “I realised I was witnessing kinetic and thermal energy, but where was this energy going?” he recalls. It was then that Yvon started researching if it was possible to recover mechanical and heat energy from highways to produce electricity.

“Waste in Africa, especially e-waste harms the environment. We plan to give e-waste a second life in our product.”

Today, Yvon is the co-founder and CEO of Smart Eco-Highway, a circularity-minded startup based in Burkina Faso that hopes to harness the thermal and kinetic energy generated on Africa’s highways to bring electricity to underserved populations. They plan to do this using two types of raw materials, piezoelectric which converts mechanical stress into electricity and thermoelectric materials which does the same for heat. With two years’ worth of research and theory in place, they are weeks away from attempting to build their first feasible prototype.

From the very beginning, Yvon was on the lookout for points of potential circularity in his business. Most notably he plans to source the majority of their raw materials from e-waste, a process which has already been fraught with the challenges of pioneering a circular business in a non-circular economy. “There are startups in west Africa who recycle e-waste, but many of them don’t know that those particular materials have value,” explains Yvon. By creating a demand for the materials and building relationships with e-waste companies, Yvon hopes that he can “open their eyes to all the valuable electronic components” which are often overlooked and wasted.

But the circularity doesn’t end there. By recovering mechanical and thermal energy from roads, Yvon says, their device will provide a sort of cooling service for roads because heat represents one of the three major factors which reduce their life cycle. They also plan on integrating used tyres into protective covers which will increase the lifespan of the device as well as the roads they’re embedded in. And then, once a device has come to the end of its life, it will be taken back to e-waste companies who will recover the raw materials for reuse. “This is how we see our circularity model,” says Yvon.

The open road has long been a near-mystical setting for stories we tell ourselves about modern life, progress and dreams of endless opportunity. But for Yvon, they represent something much greater - a powerful source of energy and maybe, just maybe, an answer to Africa’s power crisis.

VISION FOR THE FUTURE

“We want to prove that there is also a huge amount of energy in our roads and pavements, especially in Africa. The long-term vision is to install our devices in all major roads in all major cities in Africa to contribute to the power supply of African populations.”

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

“The business of waste is a business which has a very high added value. So, I would advise many entrepreneurs, especially youths, to develop their interest in this business.”

There is huge potential for value in the textile industry, for example. The business of waste is a gold mine especially in Africa where our waste management is poor. Young people should get involved and add value into our economies.

SolarCool

ENTREPRENEUR: **Chris Edeh**
ESTABLISHED: 2021
TEAM: 5
LOCATION: Abraka, Delta State, Nigeria
CONTACT: Info@solarcool.com.ng

www.solarcool.com.ng

SolarCool provides solar-powered cold chain storage to help combat food and other waste (like vaccines) in regions with unstable access to electricity and power. By providing this solution, SolarCool helps reduce food waste, boosts food security and does so off the grid with the goal of circularity at its core.

> Nigeria imports about 60% of its wheat, it imports 30% of its fish and poultry consumption. The lands are not growing and expanding while the population is. It's gotten to a point where if we don't do something now to farm sustainably and be able to preserve our produce, we will have a crisis in a short time.

Words by Chris de Beer-Procter; photography by Adekunle Owolabi & Wendy Hado

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

The recent COVID-19 pandemic and the multitude of logistical challenges associated with the roll out of vaccines, especially in the global south, served as an unexpected catalyst for many innovations with effects that spread far beyond the field of public health. Especially for the founder of SolarCool, Chris Edeh, who was inspired by his involvement in mobile vaccine rollouts in South Africa. "We saw the amount of people in Africa that could not get proper vaccination because there were no adequate cold chain facilities," he reflects. The root cause of this problem is simple, but substantial and far reaching: cold storage requires a reliable source of power, which is in itself a significant obstacle in developing nations.

"In 2019 Nigeria imported about 5.6 billion dollars of food alone and from what we are seeing from the Ukraine Russian war, if Africa doesn't become self-sustainable, we have a problem."

And the issue affects more than public health, as Chris discovered. It also impedes agriculture and by extension, food security, as farmers who are based mostly in rural and semi-urban areas with limited access to reliable power require cold chain storage to preserve their produce.

Chris asked himself, how could he help bring cold storage to these areas? And how could they do it while reducing carbon emissions? To solve these two problems, Chris turned to one technology - solar power.

In 2021, Chris founded SolarCool and their pilot project was launched in Nigeria's Delta State. SolarCool01, as it's called, is a 20-foot-long container converted into a -16 degree cold room, powered entirely by solar panels. It services about 40 nearby farmers who now have access to cold chain storage for their produce at reasonable rates. A survey conducted by the company found that the service helped client farmers increase their revenue by 30%.

"Without cold storage, farmers are forced to sell their produce for much less than the market value because they don't have adequate means of preserving it," says Chris. This is especially pertinent to mitigating the millions of tons of food that goes to waste every year.

His focus on the issue of access to cold storage and its consequences for Africa's food security is timeous, given that the war in Ukraine has further exposed the disastrous effects of many nations' dependence on food imports. "Considering huge population growth and urban migration in Nigeria, it's gotten to a point where if we don't do something now to farm more sustainably and preserve our produce, we will have a crisis in a short time," says Chris.

Through SolarCool, Chris hopes to reduce and prevent food loss and waste and plans to deploy around 300 more cold rooms to strategic areas all over Africa in the next five years. The eventual goal, he says, is to help prevent malnourishment in Africa, especially for children. The company has also developed a large refrigerator and freezer for small farmers which can run on solar and are in the process of partnering with the Rural Electrification Agency of Nigeria, supported by the result-based financing of the World Bank, to deploy thousands as part of their access to energy program.

"My passion about agriculture is driven by the need to fight poverty and food insecurity, but also to stand as a role model for young Africans to see that agriculture is an attractive profession," says Chris. And SolarCool seems to further that goal with its 'cooling as a service' business model which allows customers to pay for only what they use as opposed to requiring capital upfront. "Our policy is that customers must pay for their last service before they can use it again. So, you can take your produce to the market and pay us after you've sold it," says Chris.

Chris believes that Africa has at its disposal all the tools to achieve sustainable food security. And the one he's offering manages to simultaneously find its way around the energy crisis, while saving on emissions and giving farmers the opportunity to grow their operations like never before, on their own terms.

VISION FOR THE FUTURE

"Our vision is to reduce and prevent food loss and food waste in the value chain. We are looking to deploy around 300 of these cold rooms in strategic areas all over Africa in the next five years. We have a vision of trying to prevent malnourishment, especially in children."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

"My advice is for entrepreneurs to assess their business operations, supply chains, end-of-life, and waste disposal measures and build a blueprint for their circular economy.

They should ensure it adds value to economic development and benefits businesses, society, and the environment. Having a vision of a circular economy plan that is regenerative by design and aims to gradually decouple growth from the consumption of finite resources is key.

Tamu by Jane

ENTREPRENEUR: **Jane Nshuti**
ESTABLISHED: 2020
TEAM: 3 full-time employees, 2 interns
LOCATION: Cape Town, Western Cape, South Africa
CONTACT: janenshuti@gmail.com

Through her business, Tamu by Jane, Jane Nshuti hopes to raise awareness about much of Africa's forgotten food culture. Through various forms of education and development, she aims to raise the profile of African food, including many ancient grains and traditional fermentation processes.

> "There is a lack of global understanding of what can and can't be eaten. For me its lack of awareness and lack of documentation. African food is not documented."

Words by Chris de Beer-Procter; Photography by Vhembe Photoshoot na Reza Reza

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Jane is on a mission to change the way Africans – and the world -think about African food. She is doing this by highlighting aspects of our food culture and heritage which have in great part been forgotten. “Right now in South Africa you can order a pizza in seconds,” she points out. But try to find cassava leaves or curry with sorghum and you’ll have a difficult time.

“I want to put real African food on the map,” she says. “By not sharing our food, we’re robbing the world of something great, and we’re robbing ourselves,” she adds.

“The earth has become global, but our gut has not. I believe that where we are placed, the food that grows there, is what speaks well to our bodies.”

Jane’s passion for food started when she was young. “It wasn’t the easiest childhood,” she reflects. After the tragic loss of her parents in Rwanda, Jane and her siblings struggled to make ends meet in a refugee camp in the Democratic Republic of Congo. “I had to stay home because I was too young to work. So whatever they brought home, I would make into a meal,” she remembers. “When I say we didn’t have much, I mean we didn’t have much. I had to be creative.” In these painful years, her love of food only grew.

Moving around various African countries during her childhood, Jane struggled to connect with other children due to language barriers. Instead of playing with her peers, she often found herself in the kitchen. “Everywhere I’ve been, food has been the connector for me,” she says. “I understood what it meant to be hungry, I understood food insecurity. But I also had an opportunity to taste foods from all over Africa”.

Now, as a food entrepreneur based in South Africa, Jane says that food security is at the forefront of everything she does. She believes that the answer to much of Africa’s food insecurity lies in our backyards. “For example, I focus on African grains which we have neglected for so long,” she says. Grains which are healthy, which grow well in African climates (like many which are drought resistant) and which don’t require costly transport halfway across the globe.

“Sometimes it’s not about lack of food, it’s about lack of awareness because people go to bed hungry while having food in their backyard,” she says. Through her work, Jane hopes to document and share aspects of African food culture that have been forgotten in an ever globalizing world, like ancient grains and preservation methods.

Through her business, Tamu by Jane, she runs cooking classes on preparing African food, sells at markets, hosts feasts and experiments with storytelling.

She also develops recipes which feature ancient African grains. “I want to normalize something that’s not only good for us but for the environment,” she says. Jane also spreads the message to larger audiences by working with organisations like Bertha House, a space for activists in Cape Town, where she heads up a food security program. Here they teach cooking to children and sell healthy, affordable food. She’s also focused on teaching African methods of fermentation to preserve food and minimize waste. “It’s one of the biggest culprits of food insecurity,” she says.

Jane believes that “...health should not be a privilege for the rich but a right for all,” and that returning to our diverse African food culture can make a huge difference. “Food is a connector. Food brings people together. Food tells you who you are. Ultimately, I believe that food is the most political thing in the world,” she says. “If we want to reconnect with our ancestors, with ourselves, we have to reconnect with our food.”

VISION FOR THE FUTURE

“I’ve written a book which is really stories and food. The idea is to tell a story about my movements from Rwanda going through war, living in refugee camps and coming to South Africa and about how food carried me along. I’d love to publish it and keep teaching people about real African food.”

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

“It’s hard. It’s much easier to do things purely for money, without any moral stance. But, if you want to do things for ethical reasons, it’s harder.

A lot of times, because of the way the world is structured, you will be set back by your ethics. But you need to look at the bigger picture. I wish I’d known that pioneering something is not easy, I’ve almost given up so many times, especially in the beginning. I wish I’d known that it gets really hard before it gets better.”

Uku'Hamba Prosthetics & Orthotics

ENTREPRENEUR: **Sibongile Mongadi**
ESTABLISHED: 2020
TEAM: 5
LOCATION: Soweto, Johannesburg, South Africa
CONTACT: sibongile@ukuhamba.co.za

www.ukuhamba.co.za

Using 3D printing technology and plastics that are recycled and collected locally, Uku'Hamba Prosthetics and Orthotics create unique, lightweight prosthetics in bold styles, giving users access to empowering prosthetics that delight, at a fraction of the cost to both users and the environment.

"We get our material from discarded plastic water bottles which people usually throw away and we just need to pick it up. So, it's more affordable for the user, as well as being more profitable as a business."

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Sometimes inspiration comes from unexpected places, as Sibongile Mongadi, founder of Uku'Hamba Prosthetics & Orthotics discovered while she was being treated at Chris Hani Baragwanath Hospital in 2018. She had been booked in for a health issue of her own, a fact that she soon forgot when her interest was piqued by the story of a fellow patient who had been struggling to access a prosthetic limb from the public sector for over five years. "I forgot that I was ill, I forgot why I was there. I saw that something was happening, and I needed to pay attention to it" she says.

> *"I forgot that I was ill, I forgot why I was there. I saw that something was happening, and I needed to pay attention to it."*

Inspired, Sibongile began asking questions. She spoke to a surgeon at the hospital's orthopedic center who explained that even though the hospital wanted to help amputees, they did not have the capability to produce enough prosthetics to meet the demand. Sibongile wondered, 'is there nowhere to outsource this in the private sector?' As soon as she returned home, she got to work.

"I started doing more research, I thought one way or another there must be a way to solve this" she remembers. To start, she set out to understand the problem at hand. Prosthetics were partly so inaccessible to most amputees in South Africa because manufacturers relied on expensive imported materials like silicone and carbon fiber.

As an alternative to these, she turned to an ubiquitous waste material, discarded plastic. Uku'Hamba works with local waste pickers, alongside some collection efforts of their own, to gather discarded plastic water bottles which are recycled into the material required for their 3D printing manufacture process.

The benefits of utilizing this waste product as their primary material are massive, says Sibongile. "We don't rely on imports, we find the bottles all over our communities. Plus, because it's something people throw away, we're not spending money on buying the material and we get to put that plastic to use again," she says. "It's more affordable for the user, as well as being more profitable as a business," she adds, noting that Uku'Hamba's prosthetics are close to 80% cheaper than other traditionally manufactured prosthetics.

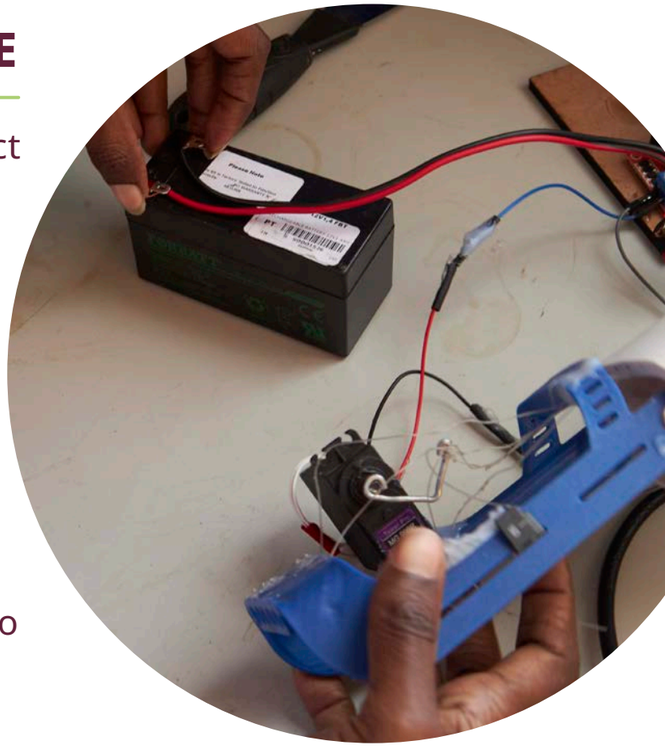
During her research, Sibongile also engaged directly with prosthetic users about their concerns and desires. "We heard that some prosthetics are heavy, it's hard to carry the weight. They're also not often designed according to a customer's exact needs, you just get what you get," says Sibongile. Sibongile realized then how the company could set themselves apart.

"We cater to a client's specification, they get exactly what they need," says Sibongile. "Plus, they're personalized. If you want your prosthetic to be purple, we can make it that way." Sibongile says that she wanted to bring the power of fashion to the experience so that users would be encouraged to display their prosthetics proudly and possibly overcome some of the shame typically associated with disability. "We saw that if we could do something with flavour, we could excite the users," reflects Sibongile.

"What I'm most proud of is that this all started with an idea, born out of just a conversation" says Sibongile. "These are humble beginnings, but when you work on your vision day by day, you see it changing people's lives. It's so exciting to me."

VISION FOR THE FUTURE

"Our long term goal is to impact 70% of South Africa's amputees. Right now, only around 30,5% have access to prosthetics. Those people are usually of a higher income bracket or have been sponsored. Research has shown that there is a high increase in people with disabilities dropping out of the education system and out of civic life because they don't have access to mobility. We want to be a part of the solution."



ADVICE ON CIRCULARITY FOR ENTREPRENEURS

> "Map your value chain."

Viro Solutions

ENTREPRENEURS: **Murray Charter, Kyle Kingwill, Justin Croxton**

ESTABLISHED: 2019

TEAM: 10

LOCATION: Cape Town, Western Cape, South Africa
Johannesburg, Gauteng, South Africa

CONTACT: sales@viro.org.za

www.virosolutions.co.za

Viro Solutions is a food and beverage packaging supplier that offers small and medium-sized businesses custom-branded packaging that is recoverable, recyclable and truly sustainable. Utilising only materials that can be recycled – as in widely collected and highly valuable even post-use, Viro Solutions enacts their sustainability mandate of disrupting the post-consumer packaging to landfill pipeline.

> We're of the opinion that there is already enough material out there, we need to turn off the tap, stop turning finite resources into virgin plastic. Let's rather scale up our collection infrastructure and processing plants so that we can take dirty plastics, process it into clean plastic which we can use to make new products.

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

ABOUT THE BUSINESS

Buying food or drinks is a relatively straightforward activity for most of us. Everyday, we simply enjoy our treats and discard the packaging without a thought. In our consumer-driven marketplace, the hallmarks of the take-make-waste culture seems a given. Until our assumptions are disrupted.

"When I discovered that what we throw away on a daily basis are, in fact, incredibly valuable materials, the illogical nature of our current throw-away culture of convenience dawned on me," reflects Murray Charter, a founding director of Viro Solutions.

That was the point, says Murray, that he began to ask, "how do we redesign our packaging so that it's recoverable? How do we put products into the market with enough value that someone will want it back even after it's been used?"

The answer? Designing packaging from valuable materials that are widely collected and as easy to separate as possible. "In the recycling process, materials need to be separated," says Murray, "and so mixing materials drops their value significantly due to the extra cost associated. Most of the time if a product comes in with multiple layers of materials, recyclers just discard it."

> *"It's frightening how much valuable material sits in landfills, it's worth hundreds of millions. It's not just environmentally devastating, it's bad business.*

Besides focusing on adding valuable and easily recyclable products into the market, Viro Solutions is also testing the recovery of their products through programs with clients that rewards their customers for bringing products back to smart eco-bins. "It recognises the product via a barcode and the customer is rewarded for the recycle value of the product via an e-wallet," says Murray. "The waste is collected and sent to the relevant recyclers who process and turn it into a raw material which we then use to make our products again."

In this way, the company is trying to identify how they can shift consumer behaviour away from throw-away culture and help highlight the benefits of a more circular way of consuming.

Viro Solutions believes the key is transparency. "People are more conscious these days, we know we have a waste crisis on our hands and customers want to know where their packaging comes from and where it's going," says Murray. And so, the company puts significant effort into giving customers information about the packaging they use, by displaying the percentage of recycled content on labels and experimenting with hyperlinks that show customers how it's produced, what the product's footprint is, and where it goes if it's collected.

With their custom-branded packaging solutions, Viro Solutions helps brands express their personality, build trust and highlight sustainability efforts. As Murray notes, "it's' really a massive marketing opportunity especially for brands aligning with a more sustainable outlook, which is a necessity in today's world." And the outlook, it seems, is towards a better, more circular economy that uses what it has and takes no packaging for granted.

VISION FOR THE FUTURE

"The ultimate goal would be to collect and process more packaging than we put into the market. We'd like to have a net carbon footprint. If we can achieve that, I feel we will have achieved circularity."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

> **The beauty with circular thinking is that it gives a new perspective on existing business models.**

The best way to deepen your understanding about circularity is to identify all the existing solutions in the market and how they have shifted a linear model into a circular one. Soon you will find yourself identifying circular solutions on your own, one step closer to starting a circular business.

WasteWhales

ENTREPRENEURS: **Brendan Visser, Jaco Du Plooy & Mark Gibson**

ESTABLISHED: 2020

TEAM: 4

LOCATION: Johannesburg, South Africa

CONTACT: info@wastewhales.co.za

www.wastewhales.herokuapp.com

WasteWhales is an app which gamifies recycling by connecting all stakeholders in the waste system, streamlining the process, incentivising action and rewarding users. The founders hope that the app will improve how society deals with waste, maximise our recycling efficiency and encourage the transition towards a more circular economy.

> The Sustainable Development Goals for the world are very much our goals, we want to work towards them by partnering with organisations and individuals and letting the app be a tool for that collaboration.

Words and photography by Chris de Beer-Procter

ACE Africa
Accelerating Circular Economy in Africa

ICLEI Local Governments for Sustainability AFRICA

LAUNCHLAB STELLENBOSCH UNIVERSITY

Embassy of Finland Pretoria

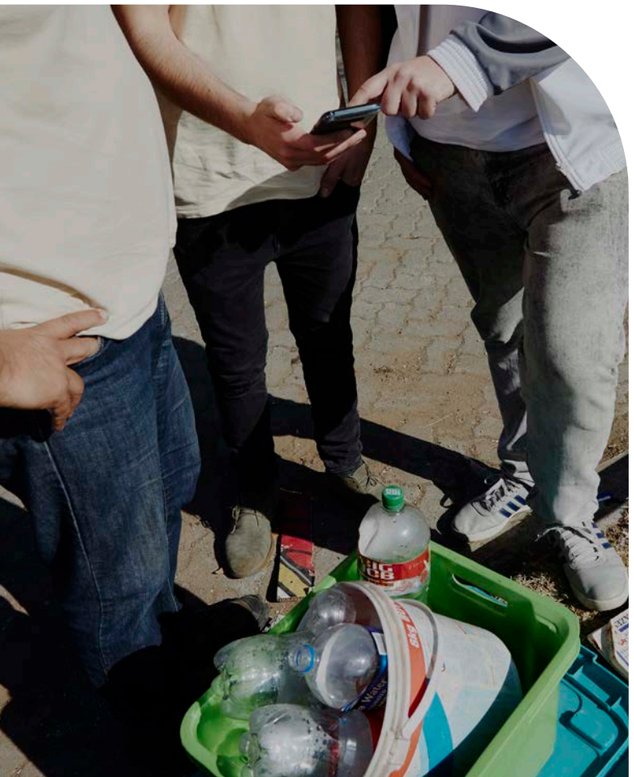
ABOUT THE BUSINESS

What if taking care of your recycling was as easy as calling an Uber? Does it seem too good to be true? Brendan Visser doesn't think so. In fact, his company, WasteWhales has developed an app to streamline the recycling process for households, companies, recycling plants and waste collectors. The app, which shares a name with the company that built it, has recently become available in app stores and aims to make recycling easy and rewarding for everyone involved. The concept is simple: If you have waste you need collected, just open the app, log a waste drop, place your waste outside (you get bonus points if you separate your waste before doing so) and wait for a nearby waste picker to collect it on their route.

"We see WasteWhales as an app that can give households visibility of who their reclaimers are and get them more comfortable with the idea that someone is going to come to your house and separate your waste at source. We want to legitimize them and give them a platform."

"We asked ourselves, why don't people recycle? Most of the time it's because it's a hassle or they don't know how," says Jaco. To help, WasteWhales are making the process of recycling easier at every level, even before users open the app. From simple clips that help separate waste inside a typical black bin, to an upcoming call centre to answer user questions, the team hopes to support all stakeholders in our waste system (which is us all) in their various roles. "We want to aid all points of contention in the system and give people all the tools they need to recycle," says Jaco.

The service is free (for households and everyday waste collectors) and users are rewarded with points (or 'Droplets') which they can use for deals and discounts in the app's marketplace. The app is also primed to connect with social media networks, bringing a social aspect to the process, further incentivising activity and spreading the word.



The platform is developed with the specific desire to benefit the waste pickers, who do much of the unrecognised and often informal work in South Africa's waste management system, yet are largely unappreciated or invisible to households despite their invaluable service. "You put your waste out on Tuesday and on Friday it's not there anymore. You don't know where it went," Brendan says. Either that, or "households get annoyed when collectors rummage through their trash, without realizing that they're doing them a huge favour," adds Brendan. Along with the other two directors of WasteWhales, Mark Gibson (Chief Operating Officer and Head of Sales) and Jaco Du Plooy (Co-Founder & Chief Technology Officer), Brendan hopes that the app will help legitimize the work of waste collectors and integrate them more into the formal economy, partly by logging their collections into a database.

Mark also notes that the app's database capturing capabilities have huge potential. "Imagine we gave brands the option to buy back certain items, which they can recycle and use to make new products instead of just going to landfill," muses Brendan. "It's an interesting use case for WasteWhales and the circular economy, to answer how we can keep resources in use in the economy."

The usefulness of a database doesn't end there, though, as Mark notes, "the whole idea is to provide valuable information to the waste stream associations so that they can report back to local government as part of their extended producer responsibility," he says, adding that the company aims to partner with all waste stream associations in South Africa. E-waste, which are electronics that consumers no longer use or want, is the waste stream which producers seem the most interested in claiming back at this stage, says Mark.
Gizzelle Uys, who is Miss Eco 2020/2021 and something of an unofficial ambassador for WasteWhales feels excited by the potential of the app. "I don't just like awareness, I like action. I'd really like to see it flourish" she says. "I hope it's an app that you want to use every day, I hope it's fun, that it changes your social circles and that it changes your life," says Brendan. Jaco adds, "and to change the way people view waste, that it's not just something to ignore or feel guilty about, but to make recycling easy and something that you're proud of."

VISION FOR THE FUTURE

"As a business, we'd like to see the app used globally. We think that could make a huge change. We'd also like to minimize waste that ends up in landfills or polluting our environment," says Mark. "I want to see anyone who needs work be able to sign up as a collector and make an income while helping the environment."

ADVICE ON CIRCULARITY FOR ENTREPRENEURS

Entrepreneurs should make sure they aren't on autopilot. They should take a moment to think about everyday decisions instead of just following the status quo.

Be mindful of what we use and what we throw away. Question why things are the way they are and ask yourself if there's a better way. Maybe you have the solution.

ACE Africa
Accelerating Circular Economy in Africa

ACKNOWLEDGEMENTS

Project Funder:
Fund for Local Cooperation, Finnish Embassy to South Africa

Project Coordinator:
ICLEI Africa

Project Partner:
Stellenbosch University LaunchLab

Authors:
Introduction by Daniel Adeniyi
Profiles by Chris de Beer-Procter

Photography:
Chris de Beer-Procter
With Wendy Hado, Lucas Ledwaba, Adekunle Owolabi, Vhembe Photoshoot na Reza Reza, David Armel Relwende Sawadogo, and Rogan Ward

Design and Layout:
The Ethical Agency
theethicalagency.co.za

ICLEI
Local Governments for Sustainability
AFRICA

ICLEI Africa
Century City, Cape Town, South Africa
www.iclei.africa.org