



EcoPost

Preventing deforestation, combatting pollution and creating youth employment by transforming waste into plastic posts in Kenya

2010 SEED Winner

SEED CASE STUDIES: INSIGHTS INTO ENTREPRENEURIAL SOLUTIONS FOR SUSTAINABLE DEVELOPMENT



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SEED Case Studies Series

Demonstrating Sustainable Development on the Ground Through Locally-driven Eco-entrepreneurship

Social and environmental entrepreneurship, also known as green and inclusive entrepreneurship or eco-entrepreneurship, could play a critical role in achieving a global Green Economy. By embracing the added values of social improvement and wise resource management eco-enterprises that have won a SEED Award are living proof that entrepreneurial partnerships between various stakeholders can create innovative and novel solutions for delivering sustainable development at the grassroots and be economically sustainable.

Over the last ten years, SEED has awarded nearly **180 SEED Awards** to eco-enterprises in 37 countries. While the value of eco-entrepreneurship in delivering sustainable development is increasingly recognised and harnessed in the development sphere, there is still very little data available on the triple bottom line impact of these enterprises and their contribution to sustainable development.

The SEED Case Studies are designed to help fill that gap by generating insights for policy and decision-makers on the role of green and inclusive enterprises in achieving sustainable development, and on enabling factors that can help them overcome barriers and reach scale and replicate.

AT A GLANCE

EcoPost produces posts and building materials from recycled plastic waste in Nairobi. This reduces pollution, preserves forests, and decreases GHG emissions.

By working at the grassroots, **EcoPost** has provided income opportunities to over 2,000 marginalised people while raising awareness about sustainable production and consumption in the community.

PRODUCTS & SERVICES



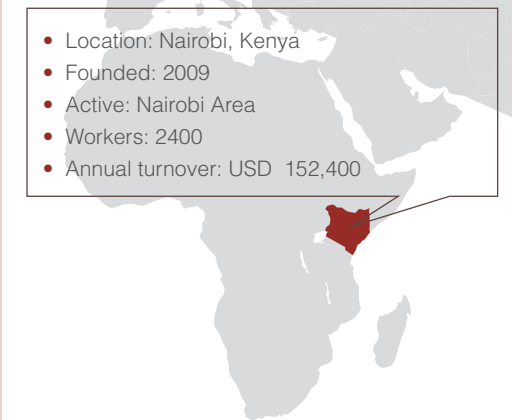
Fencing posts and sign posts from recycled plastic



Environmentally-friendly building and construction material

KEY FACTS

- Location: Nairobi, Kenya
- Founded: 2009
- Active: Nairobi Area
- Workers: 2400
- Annual turnover: USD 152,400



TRIPLE BOTTOM LINE

**Social impacts**

- Provided direct jobs to 220 people and income opportunities to an additional 2,177 people; 80% under the age of 25 and 56% women
- Helped 25 workers register for health insurance
- » *Indirectly improves the livelihood of over 6,000 people in marginalised communities*

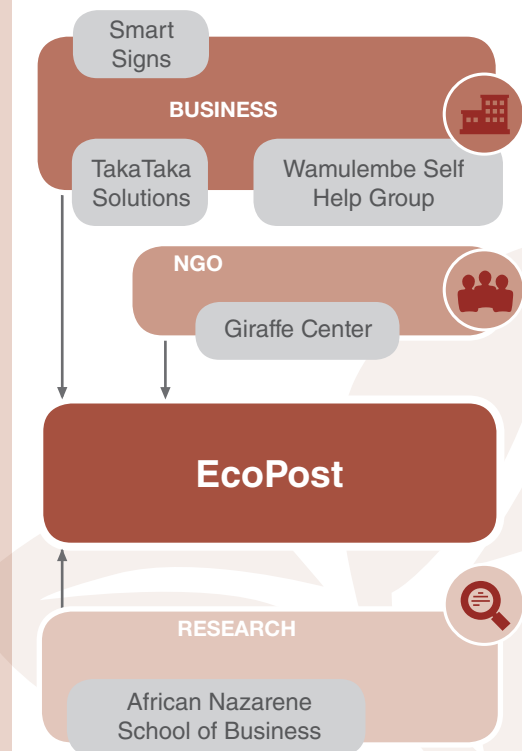
**Environmental impacts**

- Has recycled 600 tonnes of plastic from the environment which saves the lives of animals and plants
- Replaced 60,000 wooden posts, which corresponds to saving approximately 2,400 trees
- Helped mitigate climate change by saving acres of forest land that sequester CO₂ emissions
- » *Trains communities about conservation and sustainable consumption*

**Economic impacts**

- Reduced burdens on infrastructure from plastic.
- Introduced a new value chain that stimulates entrepreneurship and recycling
- » *Reduces costs of deforestation*

ECOPOST PARTNERSHIP



1. Partnering for local solutions

1.1 Local Challenges

When thinking of Kenya, tourists often picture abundant wildlife, the Big Five, the flamingos of lake Nakuru, lush rainforests and savannahs stretching for miles. With over 1.7 million visitors¹ in 2011, Kenya was one of Africa's most popular tourist destinations. But since then the country has faced growing and serious challenges: numerous terrorist attacks; youth unemployment - nearly ¾ of unemployed people are aged 15-34; and depletion and spoiling of natural resources due to inadequate waste management and deforestation.



Poverty and unemployment in Nairobi

Nairobi, with nearly 4 millionⁱⁱ inhabitants, is the capital of Kenya and is the fourth largest city in Africa. This bustling centre is a city of contrasts with thriving businesses and eclectic architecture of historical buildings and modern skyscrapers which sit side-by-side with numerous slums. Here about 60% of the population lives, and Kibera is the second largest slum in Africaⁱⁱⁱ. While in terms of GDP (USD 37.2 billion in 2013) Kenya is the fifth-largest economy in Africa^{iv}, it is estimated that 1/3 to 1/2 of Kenya's urban population lives in poverty, and inequality is



Picture: Kibera slums

particularly high in Nairobi^v. Part of the poverty problem can be attributed to rising levels of unemployment, reported to be sitting at 40% in 2009^{vi}. With services representing about 60% of GDP, of which tourism accounts for 12.5%^{vii}, the latest terrorism attacks and ongoing threats have made a significant contribution to the unemployment rates as the number of visitors has declined significantly.

Unemployment is particularly prevalent among youth (15-34 years old) and women. While youth accounts for approximately 35%^{viii} of the Kenyan population, it is estimated that they represent nearly 70% of the people unemployed^{ix}, equivalent to about 2.5 million young people^x. According to UNDP, unemployment among young females is 10% higher than among young males^{xi}. The main reason for this is the lack of access and opportunities to formal and informal jobs.

Waste management

The nearly 4 million inhabitants in Nairobi produce over 2,000 tonnes of solid waste daily^{xii}. Yet, due to a lack of waste management systems, ineffective by-laws on littering, and illegal dumping^{xiii}, only 850 -1,100 tonnes of this solid waste are collected each day.^{xiv} With over

24 million plastic bags alone handed out each month, plastic accounts for a very high proportion of the Kenyan municipal solid waste, and most ends up in the environment. Depending on the type, plastic can take between 10-500 years to decompose. The consequences of plastic waste are quite dramatic for natural resources, animals and human health, and include choking of animals and soils; blockage of waterways and sewers causing backups and flooding which lead to serious health issues. Burning plastic is not an option as it produces toxic fumes which include climate-altering greenhouse gases and carcinogen-containing smoke.

Deforestation

Kenya harbours a variety of forest ecosystems: lowland and mountain rain forests, dryland forests and woodlands, swamp forests, and coastal mangroves.



© Yannick Beadoin

These are however under stress with high rates of deforestation, estimated at 5,000 ha/yr in 2010^{xv}, due to illegal logging, changing climate and urban and agricultural encroachment^{xvi}. In turn, deforestation engenders loss of biodiversity, soil erosion, drying up of water reserves and a rise in CO₂ emissions. But deforestation has also significant economic costs. According to a recent study from the United Nations Environment Programme (UNEP)^{xvii}, deforestation deprived Kenya's economy of Ksh 5.8 billion (USD 68 million) in 2010, which largely resulted from an estimated loss of 50,000 hectares of forest in the five main water catchments, also referred to as the "water towers"¹. Kenya's five key "water towers" are the main water catchments for

nearly all the main Kenyan rivers. Deforestation of these water towers threatens more than 70% of the country's water supply and 50% of its electricity^{xviii} and the resulting reduced water availability of approximately 62 mill m³ per year has a serious impact on Kenya's highly water dependent economy^{xix}. "This loss far outstrips the Ksh 1.3 billion injected into the economy from forestry and logging each year".

1.2 Creating innovative local solutions

EcoPost, which was launched in 2009, produces and sells fencing posts and some construction products made from recycled plastics, with the goal of creating sustainable jobs for marginalised people while reducing waste and deforestation.

Over two thousand people are involved in the enterprise's supply chain, from plastic collecting, to sorting, to manufacturing the posts. EcoPost secures its supplies of plastic from a number of waste-sorting businesses that in turn have purchased waste from (informal) collectors or collected the waste themselves. They sort the waste into different categories, i.e. plastic, paper/cardboard, organic waste and glass, and the plastics are transported to EcoPost. Once on site, the plastics are cleaned and sorted according to type and quality by EcoPost employees. Subsequently, the plastic is shredded into small strips which are then heated and so compacted before casting it into moulds of various shapes and sizes. The posts are then cooled through a water system. Finally the posts are cut into the required size. To make the poles stronger, EcoPost has also started adding sawdust waste provided by timber companies to the heated mixture. Finally, samples are sent for marketing purposes to institutions, farmers, NGOs and commercial companies. The posts are sold both through a distributor and directly to individuals, farmers and organisations.

Training and awareness-raising are essential parts of the enterprise's model. EcoPost employees receive skills training in the sorting of plastic and production of posts as well as in business administration and management. In addition, partners, collectors and the community, with particular attention to women, receive information on how to recycle waste.

¹ Kenya's five water towers - Mau Forest Complex, Mount Kenya, the Aberdares, Mount Elgon and Cherangani - feed filtered rainwater to rivers and lakes and provide over 75% of the country's renewable surface water resources.

Fast facts

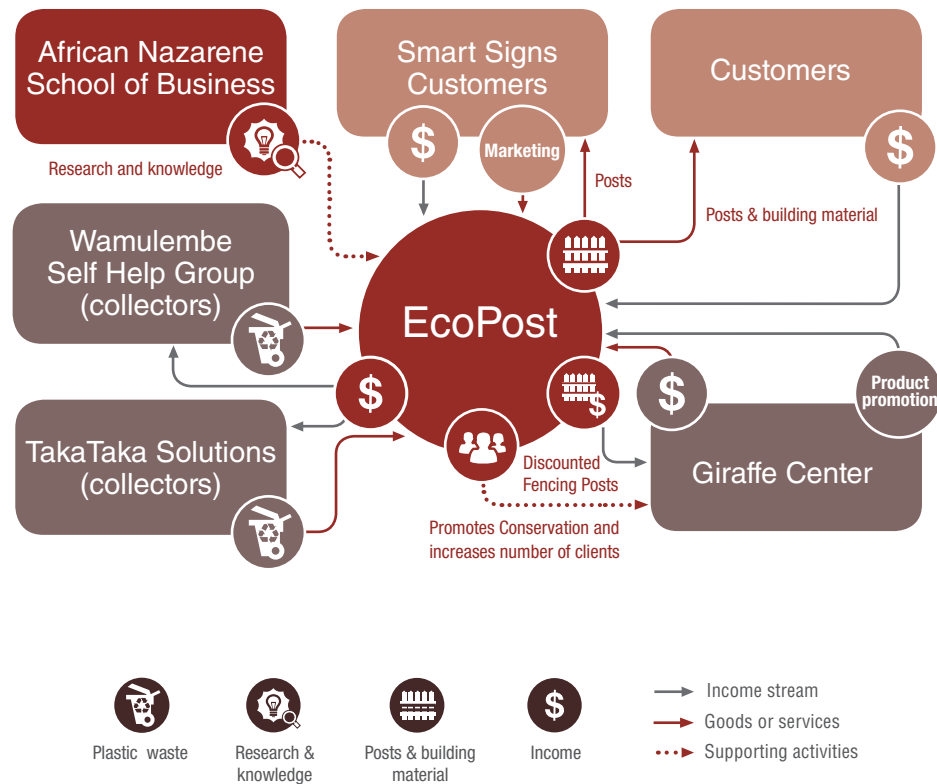


Nearly 70% unemployed in Kenya are aged 15-34

24 million plastic bags are handed out in Kenya each month

2,000 tonnes of solid waste is produced in Nairobi every day, of which only 45-58% is collected

An estimated 5,000 ha of forest is lost each year in Kenya



Local Cooperatives

The Wamulembe Self Help Group (WSHG) is the key partner in the supply of plastic waste. The WSHG members are provided with a stable income that is above national average of per capita income (see 2.2) for collecting and sorting waste, and suitable plastics are picked up twice a week by EcoPost. In addition, WSHG benefits from training provided by EcoPost on how to sort waste and plastic. The more members are trained, the greater the supply of plastic to EcoPost and as a result, more people are able to receive a stable income.

Taka Taka Solutions provides a similar service, albeit on a smaller scale.

Research

African Nazarene University School of Business is an educational partner which contributes research and knowledge to EcoPost's product development. This partnership, in turn helps the university fulfil its research targets regarding sustainable consumption models. Their interaction is on an ad-hoc basis when need arises.

1.3 The power of partnerships

The partnership

EcoPost has chosen its partners strategically to cater for each step in the value chain. The enterprise uses a varied partnership approach whereby some partnerships are formalised under a Memorandum of Understanding (MoU) while others are purely based on a longstanding trust relationship. What they all have in common is that each partner is in direct contact with EcoPost, which makes the enterprise the driver not only of the product but of the entire chain.

Partnership management

The partnership approach is viewed by EcoPost as bringing added value. Nonetheless, the partnerships are dynamic and not without challenges. One challenge encountered by the enterprise is a low level of education of the partners which becomes problematic when trying to explain the different types of plastics. The social conditions in Nairobi pose another challenge as poverty and drug abuse can make partnership arrangements difficult with some members.

Another challenge within the supply chain arose when the city council authorities forced the

WSHG out of their temporary sorting site. This problem recurred several times as the group was never the owner of its sites. To solve the problem, EcoPost provided its suppliers with a workshop for sorting and shredding the material.



While EcoPost does not report a specific need for an additional partner, formalisation of some partnerships would help with setting standards with the suppliers to improve the quality of the materials and the overall productivity.

Local NGO

Another partner is the **Giraffe Center** which is an education centre for nature conservation. The Centre purchased fencing posts from EcoPost in 2009 and 2010 and has so far fenced off about half of its grounds with the plastic posts. While the centre was originally just a client, it is now considered a partner as they not only teach about conservation, but also about recycling for which they use EcoPosts' example. Furthermore, EcoPost also promotes the Giraffe Center which brings it additional visitors. Finally, the Center also helps EcoPost in calculating its carbon offsets. Lately, EcoPost and the Giraffe Centre have been in discussion about formalising the partnership; this might include a free supply of floorboards (made from recycled plastic) to the Centre in return for help with product development.

Business

Smart Signs is a business partner and it is the biggest purchaser of EcoPost's posts. Smart Signs helps EcoPost with marketing, provides them with advance loans and connects them to potential clients. By partnering with EcoPost, Smart Sign can now project itself as an eco-friendly company.

2. Building an inclusive eco-enterprise

After establishing the business concept in 2009, the enterprise was incorporated in 2010. At this point, the enterprise was still a small cottage industry with a site located 8km from Nairobi's central business district. Winning a SEED Award in 2010 helped with start-up capital and publicity for the enterprise and allowed them to scale up and gain recognition. The enterprise struggled to find a suitable worksite but in 2010 was able to set up operations in the Ruaraka district in Nairobi. Since then, they have been scaling up their enterprise with the help of a grant and an investment for equity in 2014 which allowed them to buy more advanced machinery, increase their production capacity, and set up a second factory.



2.1 Financial development

In its first year as an incorporated enterprise, EcoPost grew out of a small grant of USD 12,700 from the Enablis Energy Globe-Safaricom Foundation. The following year, another grant by the business Development Network, called the Nature Challenge, of USD 22,600 helped the enterprise to purchase a second-hand waste recycling machine and to help purchase the waste materials from the waste collectors. In 2014, a turnover of USD 152,400 led to a small loss of USD 10,300. However the enterprise then received a large investment for equity from the Blue Haven Initiative and the Opus Foundation amounting to USD 495,000. Purchasing more advanced recycling machinery from China was now possible, with the likelihood of improving production capacity by 5 times; the first plant produces about 100 posts daily while the new site is expected to produce 500 posts a day. The enterprise had achieved financial sustainability in 2013, but with the latest investments has again to attain break-even point. While they experience difficulties in obtaining loans, the ability to attract capital from agencies outside of the country such as Blue Haven and the Opus Foundation have helped to put the enterprise on a path towards increased production and revenue.

2.2 Employment situation

At the start of 2015, the enterprise reported 2,400 workers including 73 full-time employees, 150 part-time workers and 2,177 casual positions. Of the 9 managers, three are women, and women represent a significant portion of the workforce occupying 39 full-time, 78 part-time and 1099 casual positions. Youth is also highly represented among the workers with 41% of the full-time workers, 47% of the part-time workers, and 92% of the casual worker under the age of 25².



In terms of wages and salaries, the highest full-time salary per year reported is USD 6,800³, with an average of USD 2,700 across all full-time positions, which is quite a bit higher than the per

² The youngest worker is 18 years old

³ Financial figures converted to USD from KSh, using average exchange rates of the respective year

capita income of USD1,250 as estimated by the World Bank in 2013. The enterprise reports 80 formal employment contracts, 25 of which are now registered for health and hospital insurance. Throughout all operations, safety is paramount to the enterprise and they provide health and safety training and protective gear to their direct employees.

Most of the workers are casual waste collectors/sorters and their income remains dependent on the amount of waste they collect or sort, ranging from Ksh.8 to Ksh.12 per kg. The enterprise aims to work with 10,000 people by 2017 and believes that 8,000 direct and indirect jobs will be created by the end of 2016.



	Full-time	Part-time	Casual
Workers	73	150	2,177
Female	39	78	1,099
Male	34	72	1,078

2.3 Business development

The enterprise has made strong progress with regard to increasing its recycling output. The acquisition of new machinery helped them increase their output and work towards their target of recycling 2 mill kg waste per year; however, due to a lack of working capital and at times unreliable supplies of electricity, they are still experiencing difficulties in achieving a high level of production. To tackle this, they are now looking into ways to use alternative and greener sources of energy such as bio-gas and/or solar energy which would be cheaper and more reliable in the long term.

EcoPost also made strong progress toward their revenue target. They want to increase their turnover to USD685,000 in 2015-2016, up from USD150,000 in 2013. The enterprise has increased both production and sales and it has doubled its turnover over the past few months with the addition of new machinery, which is currently only running at 30% capacity.

For the coming years, they are looking for funds to create more collection yards in order to meet the increasing demand while creating more job opportunities. Expansion into the greater East African Region is also a target for EcoPost. They want to set up satellite offices and find partners and clients in the region, though they face a lack of access to liquid capital and their market reach is still limited.



3. Reaching impact

While working towards financial sustainability, EcoPost, as an inclusive and green business, sets out equally to create social and environmental advantages through income generation for local communities, recycling, and reducing the need for wood for fence posts.

3.1 Beneficiaries

The enterprise focuses primarily on providing employment and income opportunities to people in the marginalised communities, particularly for youth and women, and on offering an alternative solution to wooden products such as fencing and signposts, and outdoor furniture. Benefits are created along the entire value chain:

- **Sourcing:** waste pickers and sorters working at the partner organisations Wamulembe Self Help Group and Taka Taka Solutions have a stable source of income and build transferable skills in waste management;
- **Production:** EcoPost offers secure full-time and part-time positions, with above national average salaries, for the cleaning, shredding and sorting of plastics particles and for the production of the poles. In addition those employees build advanced skills in plastic recycling, administration and management;
- **Distributors:** have access to a secure supply of posts that are strong and durable and benefit from the label of green products;
- **Individual consumers:** save money in the long term. While the posts are more expensive (approximately USD7 dollars per post) than wooden ones, they are more durable and therefore do not need to be replaced as often, so also saving human resources;
- **Communities:** the urban communities benefit from a reduced burden of plastic while the rural communities have reduced impact from deforestation;

- **Local governments:** costs incurred from plastic pollution and from deforestation are reduced.

3.2 Social impact

Social impacts result mainly from the procurement and the production steps of the value chain and primarily target the improvement of livelihoods and health of marginalised groups.

Due to the EcoPost business model, over 2,000 people (80% under the age of 25 and 56% women) now have a secure livelihood. In order to increase household incomes, the enterprise targeted the income of its employees and at the start aimed to increase the salaries by 1% each month until they reached a specific level⁴, which they successfully achieved largely by scaling up the business. The enterprise also targeted the yard managers and the sellers of raw materials. While they are not employees, EcoPost aims to improve the incomes throughout the value chain by increasing the purchasing price of plastic waste materials. They are still in the process of teaching the suppliers the specific requirements which will earn these higher revenues.

With an average household size of 3 in Nairobi, the impacts are estimated to trickle down to over 6,000 people in the community. For the waste collectors, many of whom initially lived on the dumpsites, it also means that they are now living in better settlements. In addition, it encourages the entrepreneurial spirit among the waste collectors who now understand how to create an economic value from waste.

EcoPost recognised the hard working conditions of the waste collectors and so instituted arrangements for both employees and casual workers to register for health and hospital benefits, a benefit that very few in Kenya can afford^{xx}.

Externally, the business model helps to clean up the city of Nairobi. Both beneficiaries and partners have noticed a significant decrease in plastic pollution in the areas where the enterprise and its partners are active.

Finally, the strong and durable nature of the posts also have indirect benefits on the communities as

⁴ End salary is dependent on the position

cattle and giraffes are less likely to escape and destroy surrounding crops.



3.3 Economic impact

The economic aspect of the Triple Bottom Line includes the internal economic performance (Section 2) as well as economic advancement for the community.

First, the infrastructure in Nairobi is often stressed due to the accumulation of plastic waste which regularly clogs sewers and canals. This results in flooding which in turn spreads disease and lowers the health and productivity of the workforce, causes delays, property and infrastructure damages, and in some cases the closure of businesses. All of these trigger high government expense.

Second, the enterprise has introduced a technology which had hardly existed, so creating new markets. As it continues to grow through the expansion of markets and production, its economic impact will increase, further reducing the economic costs of plastic waste, and helping to influence other entrepreneurs to open businesses, especially in manufacturing products from waste materials.

Third, costs associated with deforestation are reduced.

3.4 Environmental impact

The environmental impacts are three-fold: plastic waste is removed from the environment and recycled; deforestation and loss of biodiversity is decreased; and conservation and sustainable consumption is promoted.

Ecopost has recycled over 600,000kg of plastic waste since 2009, with 212,000kg in 2014 alone. The amount of waste recycled has increased

each year and EcoPost aims to up its recycling quota to an annual 1,000,000kg by 2016. From the recycled plastic the enterprise was able to sell about 60,000 plastic posts. By offering their plastic as an alternative to wooden posts, EcoPosts has so far saved an estimated 2,400 trees⁵. For every tonne of 'plastic lumber' produced, they reduce the amount of timber that needs to be harvested for wooden posts, as a result saving acre of forest land that sequester CO₂ and help to mitigate climate change.

Plastic waste is often ingested by animals or ends up in the sea causing a serious threat to flora and fauna. By stimulating the collection of plastic, EcoPost and its partners contribute to a healthier environment.

As regards the production process, the enterprise ensures that no waste is created. Discarded parts of the posts are recycled and put back into the heater which is used to mould the posts, and the water used for the cooling is also recycled in the production process, both making the process waste free. EcoPost is considering purchasing solar panels to run the new machinery once they can secure funds to cover the costs of the installation.

Finally, the enterprise contributes to environmental awareness by helping the Giraffe Center's education initiatives. EcoPost also provides their own environmental training and have increased awareness about the impacts of plastics.

3.5 Policy impact

EcoPost is working with national and international institutions including the Kenya Bureau of Standards (KEBS) and the International Labour Organization (ILO) to develop standards as there are currently no industry standards for their product.

While EcoPost has not participated directly in other aspects of policy-making, the enterprise has participated in policy forums for climate change and the environment.

The enterprise also works with the Youth Enterprise Fund (YEF) by providing training programmes.

⁵ Approximately 25 posts save 1 tree

4. Charting green and inclusive growth

ACHIEVEMENTS

Creating a novel product that reduces waste, deforestation and unemployment

EcoPost has successfully developed an innovative green and inclusive value chain to deal with Nairobi's plastic waste while at the same addressing two major issues in the country: (youth) unemployment and deforestation. Their plastic posts, and building and construction materials, offer an alternative to wood products as well as offering with a longer lifespan. After validation of the concept in the local market, the enterprise was able to scale up and it now has two production sites, involving over 2,000 workers and improving the livelihoods of over 6,000 people in marginalised communities.

CHALLENGES

Quality assurance and scaling-up

Obtaining good quality raw materials has proved to be a challenge at times due to the low level of education of some workers. Extensive training and formalisation of the relevant partnerships is expected to help set higher standards with the suppliers.

While scaling-up is a clear sign of success, it presents challenges. EcoPost was able to open a second, more 'high tech' site with new and more efficient machinery. However due to a lack of capital to purchase raw materials the new site is still only running at 30% capacity. An injection of funds from grants and increased marketing is expected to increase the productivity in 2015 and return the enterprise to a break-even point and beyond.

SUCCESS FACTORS

Innovative products and tailored partnerships

The exclusiveness of the product has enabled the enterprise to secure a unique selling point as the quality, endurance and the environmental values of the posts and building materials appeal to a wide range of clients, from individuals, businesses, NGOs and local government. Overall, partnerships across the value chain have been key to success and scale-up so far, as well as long trusted relationships and engagement at community level, which is largely due to the economic and social benefits provided by EcoPost.

Marketing and visibility through awards schemes, such as SEED, have also proved to be highly beneficial to promote the business model.

FUTURE NEEDS

Setting standards and expanding operations

The lack of national standards and certification for products such as those manufactured by EcoPost has made it difficult for EcoPost to get recognition for the triple bottom line impacts of its products and to stand out from competitors that produce wooden and plastic (non-recycled) poles. EcoPost has started to work with national and international institutions including the Kenya Bureau of Standards (KEBS) and the International Labour Organization (ILO) to address that.

Furthermore, EcoPost is looking for partners to expand their operations further in Kenya as well as in neighbouring countries in East Africa.



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About SEED

SEED strengthens the capacity of small grassroots enterprises in developing countries to enhance their social, environmental, and economic benefits, builds bridges between entrepreneurs and policy makers and stimulates exchange and partnership building.

SEED was founded by the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP) and IUCN (International Union for Conservation of Nature) at the 2002 World Summit on Sustainable Development in Johannesburg and is hosted by Adelphi Research gGmbH, based in Berlin, Germany.

Adelphi Research (AR) is a leading think-and-do tank for policy analysis and strategy consulting. The institution offers creative solutions and services regarding global environment and development challenges for policy, business, and civil society communities.

About the lead authors



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Helen Marquard – Helen Marquard has been Executive Director of SEED since 2007. Prior to that she was a senior official in the UK government, responsible for various aspects of environment and sustainable development policy at the EU and international level. Helen holds a PhD from Manchester University.

Notes

This case study is mainly based on interviews and site visits to the enterprise in late 2014 / early 2015, as well as internal documents such as the enterprise's business plan. Additional resources are listed below.

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