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1. Developments in Agriculture

Food production in Africa continues to be a high priority for government leaders, leading to a range of initiatives to stimulate the horticulture sector. Specific sub-sectors are now in sharper focus. The blueberry sub-sector is an interesting example. This report addresses the latest developments in the sector.

RENEWED FOCUS ON BLUEBERRIES

South Africa's blueberry production grew from 11,700 tons in 2018/2019 to 18,000 tons in 2019/2020, evidence of the growing investment in and demand for South African blueberries. Blueberry production is expected to reach 25,000 tons for the 2020/2021 season, despite the impact of the Covid-19 pandemic.

Provinces in South Africa that expect very good production growth by 2025 include Limpopo (growth of 136%) and Mpumalanga (growth of 102%).

Of the 18,000 tons produced in 2019/2020, 12,282 tons were exported in that period, setting a new record. Exports account for 68% of the industry's production. Employment in the blueberry industry increased eightfold, from 1,000 to 8,000 between 2014 and 2019.

Agriculture and food supply sectors were deemed essential services during the national lockdown in response to COVID-19, a decision that enabled farmers to stay on schedule with the planting season.

The well-known immune-boosting properties of berries means they are likely to remain in demand by health-conscious consumers.¹

Blueberries are touted as a solution to the budget challenges confronting South Africa's Finance Minister. According to Justin Mudge, Chairperson of the South African Berry Producers Association (SABPA), the country must improve its export of agricultural products and strive towards achieving the targeted increase of R6 billion (~US\$324 million) in agriculture products over the next decade.

In this regard, South Africa's blueberries have an international reputation for their excellent quality and are subsequently in high demand globally. Potential new target markets include China, South Korea, Thailand and Vietnam.

Observers expect the 2020/2021 season to be as productive as previous years. The earlier growth trend will be even stronger should the industry succeed in developing markets in the east. However, bureaucratic constraints could be a challenge. It can take from 12 to 17 years for a commodity to gain access to one market. This obstacle stifles both export revenue growth and employment in the sector. According to Mudge, at the current pace, the first blueberries will ship from South Africa to China only in 2045, with South Africa losing out to competing producers such as Chile and Peru.²

Why the interest in blueberries? South Africa's blueberry varieties are characterised by high versatility, enabling production in any part of the country. This allows planting in areas of high unemployment. Planting a hectare of blueberries creates 2.64 direct jobs on average. This is the highest employment intensity amongst the major fruits grown in South Africa.

As blueberry farming requires a blend of manual labour and technical skills, the industry provides a development path for youth to progress from low-skilled, seasonal work to careers in horticulture. The blueberry industry also offers the highest wages in the fruit sector, ranging from 15% to 26% above the minimum wage.³

HORTICULTURE SECTOR DYNAMICS

East African countries depend on their horticulture sectors to support export revenue growth. In Rwanda, the sector currently contributes about 50% of non-traditional exports. However, the lack of reliable and sustainable markets reportedly undermines horticulture farming, including the local Rwandan market. Local hotels import most vegetables and fruits from the region and even beyond.

So, despite the intention and willingness of local farmers to use the country's abundant land and good climate to produce sufficient food, they struggle to break into local and regional markets. They often face the choice of receiving very low prices or seeing their crops rot in the fields.

Rwandan farmers face many challenges. These include high transportation costs, a lack of post-harvest storage and cold room facilities, increasingly erratic rains due to climate change, the dominant position of middlemen who rule Rwandan markets, the limited negotiating and bargaining skills of the Rwandan farmers, and a highly fragmented horticulture sector.

According to the National Export Agriculture Board, Rwanda aims to harvest 46,314 tons of horticulture products that will generate annual export revenue of US\$130 million by 2024.⁴

In Kenya, the Covid-19 pandemic led to cancellation of orders from abroad, dealing the country's horticulture sector a massive blow and resulting in huge foreign revenue losses. Within the horticulture sector, flower exports were hit the worst, with almost 100% of the orders cancelled. Some flower farms simply shut their operations down. The closure of the Amsterdam flower auction (where Kenya sells 85% of its flowers) and suspension of flights effectively barred Kenya's produce from access to the world market.

Another example of a negative result is the value of coffee at the weekly auction on 18 March declining by 8% to Sh19,998 (~US\$187) from Sh21,836 (~US\$204) in the previous trading period. Kenya now loses approximately Sh3 billion (~US\$28 million) across the value chain every day, following the lockdown brought about by the Covid-19 pandemic.

Kenya's economy depends on its agricultural sector, with horticulture, tea and coffee exports being the most important drivers.⁵

In Uganda, the Uganda Flowers Export Association (UFEA) warned that the flower sector may not normalise until 2021, unless the country takes measures to mitigate the losses as a result of the Covid-19 pandemic. According to UFEA, exporting flower farms laid off approximately 30% of their workforce due to their inability to sustain salary payments during the pandemic. The floriculture sector experienced a 90% drop in exports and a 50% drop in price.

Unless something meaningful can be done, about 10,000 to 15,000 people will lose their jobs, tax revenue will fall and foreign revenues of US\$85 million will be lost.

Supply chain disruptions are commonplace because aircraft that carry perishable produce abroad have stopped flying to Uganda and cargo companies have suspended flights. Also, many buyers cancelled contracts due to government closures of restaurants and coffee shops.⁶

POINTS OF INTEREST

- Blueberry production of 18,000 tons in 2019/2020 represents strong growth on the prior production year. Viewed against the production of 1,700 tons in 2012, it is clear that blueberry production in South Africa in the last decade has grown exponentially. Not only does the crop create much needed jobs, but entry barriers are very high, especially development costs. Competition in South Africa is thus manageable. Profitability of the fruit is currently very high, which paradoxically can reduce entry barriers. South Africa also enjoys a one-month lead on South American producers such as Chile, bringing its crop in before they start their harvesting cycle and flood the market.
- A number of South African grape farmers and wineries, facing uncertain revenues and long working capital cycles, seek to complement their grape and wine revenue by growing fruit. Blueberries generate annual revenues, which help wine farmers manage their cash flow.
- The growth figures also demonstrate the potential of the berry sector to contribute to National Treasury's goal of growing agricultural exports by R6 billion (~US\$324 million) over the next ten years. However, to achieve this goal, developing market access will be crucial. The China market is, for some reason, not currently viewed as a priority market. . Given the job-creation

potential of the blueberry sub-sector, it is in South Africa's best interest to collaborate to unlock markets wherever possible.

- Urbanisation and the growth of the middle class increase demand for food in many areas in Africa. However, the lack of market development is a challenge in Rwanda, which offers a huge potential to grow more horticulture products. The sector needs to optimise the productivity of the various agricultural value chains to reduce post-harvest losses, etc.
- Covid-19 has had a negative impact on various agricultural sectors, such as coffee and flowers. These are deemed as non-essential in a time of job-losses and vast reductions in disposable income amongst consumers. Other than diversifying into other products, there is little to do about this phenomenon. Unfortunately, diversification after the fact is not likely to help greatly and can be quite expensive.

2. Digital and Mobile Money Developments

Africa has been developing its mobile money opportunities with enthusiasm since the start of M-Pesa in 2007. Given the large portion of the population that is unbanked, the opportunities are vast. To increase the level of financial inclusivity, regulators are embracing non-traditional financial services entities such as telecommunications companies to help address this challenge. This report deals with the latest developments in this sector.

GROWING MOBILE MONEY POTENTIAL IN AFRICA

Africa is currently the leading continent for mobile-money services. 2019 saw 50 million new accounts created on the continent and a 12% increase in registered users. According to the GSMA, the volume of mobile-money services in Sub-Saharan Africa continues to outpace other regions.

The total number of users in Sub-Saharan Africa is now 469 million, of which 181 million are active. These users carried out 23.8 billion transactions in 2019, with a total amount exceeding US\$456 billion. This was an increase of 28% over 2018. This figure is 3.5 times the value of transactions recorded in South Asia, the second-highest ranked region for mobile-money services.

Sub-Saharan Africa, with 144 mobile-money services, has led the global rise of the sector since 2009. The growth of mobile-money services in Sub-Saharan Africa, however, is uneven.

- Southern Africa, with only 3 million active users, shows little interest in mobile money services.
- East Africa has 102 million users, with 54 mobile money services
- West Africa has 56 million users, with 59 mobile money services
- Central Africa has 20 million users, with 17 mobile money services.

Central Africa is currently the most dynamic growth region on the continent. The unclear regulatory environment appears to be evolving toward maturity. Mobile money transactions in this region increased by almost 50% in volume and 33% in value in 2019, reaching US\$30.4 billion.

The Covid-19 pandemic is expected to generate double-digit growth for this sector in 2020.⁷

In Ghana, mobile money transfers across different networks grew by 358% in the first quarter of 2020, compared to the same period last year. The volume of transactions increased from 1.11 million in Q1 2019 to 5.12 million transactions in Q1 2020 (2 million transactions in March 2020 alone). The introduction of the Mobile Money Interoperability (MMI) system in May 2018 enabled this increase. The MMI facilitated easier funds transfers across wallets from different networks and motivated many organisations to set up their systems to accept mobile money payments.

Businesses face the choice between accepting payments from mobile money wallets as one of the default payment modes, or risking the loss of potential revenue.

An analysis of the nature of transactions indicates that the overwhelming majority of the transactions involve wallet-to-wallet transfers. This means that most transactions are cashback transactions, which means that cash is the primary means of making payments.⁸

PAGA ACQUIRES FOREIGN TECH COMPANY TO STIMULATE GROWTH

Lagos-based mobile payments company Paga acquired US-based software development firm Apposit. Apposit operates primarily from Addis Ababa in Ethiopia. The acquisition enables Paga to introduce its services in Ethiopia. Reportedly, Apposit provides Paga with a scalable internal engineering team and strengthens its position to grow its global payment business.

Paga's entry to Ethiopia stems from its perception that Ethiopia has similar cash and payment problems as in Nigeria. Paga believes that Apposit will provide "an instant go-to-market strategy to launch the

Paga service in Ethiopia.” Paga will now also own the tech products in the Apposit portfolio, i.e. the digital agricultural platform Terra and the sales automation platform Tangio.

Paga intends to launch its products in Mexico this year.⁹

VISA EXPANDING ITS PRESENCE IN AFRICA

Global financial services company Visa, and Safaricom, the Kenyan telecoms company and operator of M-Pesa, recently announced their new partnership. The partnership on payments and technology will provide Visa’s global merchant and card network with access to M-Pesa’s own extensive financial services network in East Africa, and vice versa. Visa and Safaricom will also collaborate on the development of products that will support digital payments by M-Pesa customers.

M-Pesa has 24.5 million customers in Kenya, serviced by a network of 176,000 agents. Its mobile money market share in the country has consistently been above 75% for years. It also expanded into other East African countries and added financial options to the platform.

The two parties announced they will strive to facilitate online commerce. They will “offer an expanded set of mobile e-commerce capabilities to merchants and consumers by enabling secure and convenient cashless payment solutions.”

This is not the first activity of this kind launched in Africa by Visa over the last year. The firm recently announced collaborations with payment start-ups Paga and Flutterwave and invested US\$200 million in Interswitch, a Nigerian financial services provider.¹⁰

COVID-19 IMPACT ON MOBILE MONEY SECTOR

In March, Safaricom abolished all fees on all person-to-person (P2P) transactions under 1,000 Kenyan shillings (US\$9) on the mobile money platform M-Pesa, for a three-month period. Fees for higher value transactions were also reduced significantly.

The driving force behind these fee reductions is the intent to attract more low-income users at a time when the Covid-19 pandemic has disrupted all dimensions of civil society. It appears that fintech start-ups and others in the tech ecosystem focus on serving the economically vulnerable, hoping to retain these customers once the crisis passes.

Other stakeholders followed Safaricom’s lead. MTN Cameroon subsequently suspended payment fees for amounts up to 20,000 FCFA (US\$33). The expectation is that more companies may announce similar steps in the short-term future. This will provide low-income earners with much needed reprieve in these very difficult times.

Due to trust issues, however, cash on delivery remains a popular option for e-commerce customers, making it harder for businesses to deliver products door to door without touching cash.

Digital-only lenders such as Carbon, which operates in Nigeria and Kenya, see this crisis as an opportunity. During the pandemic, people may need additional funds to make ends meet. Lenders are therefore gearing to provide short-term loans.¹¹

CREATING A REGIONAL PLATFORM

It was recently reported that Tigo Tanzania partnered with M-Pesa in Kenya, MTN in Rwanda and Uganda and Airtel Rwanda to create a regional platform with cross-platform capabilities among the respective mobile wallet services. This strategy will allow customers to send and receive funds across East Africa.

Mobile money customers in East Africa will be connected to all major mobile money services across the region, a move that will increase transactions for cross-border remittance users. It will also enhance the ease of conducting cross-border trade.¹²

POINTS OF INTEREST

- Paga is developing its ability to scale. The company will benefit from the potential provided by the large local Nigerian market – and may be able to take on M-Pesa as the pre-eminent mobile money company in Africa. It has already entered into a partnership with Visa, to provide a broader product portfolio for its clients in Nigeria. Paga's move into Mexico provides a market development opportunity, and allows it to reduce its dependence on Africa by diversifying its target markets.
- As one of the most well-capitalized and profitable companies in Kenya, Safaricom is no start-up. But the reach of its M-Pesa network will certainly give Visa an extended presence in Africa. The partnership will also expand the global financial services offered to Safaricom's large East African consumer and small business network.
- Safaricom and MTN Cameroon's actions will entice the unbanked population of Africa to enter the banking system. It will also entice individuals to reduce the use of cash, reducing the risk of robberies and fraud. With banks and people more reluctant to use cash, there's greater demand for mobile payments than ever before, providing a significant increase in the use of mobile money platforms. Banks who have not yet identified the risk of being disintermediated by mobile telecommunications companies face the danger of losing their retail market share in many African countries. Covid-19 seems to provide impetus to the growth of mobile money acceptance in Africa.
- Africa's e-commerce potential is increasing. The development of regional mobile money platforms, such as in East Africa, can help Africa's ailing e-commerce companies such as Jumia grow their revenues.
- With Visa becoming an active partner of mobile money players in Nigeria and Kenya, one asks when Mastercard will target this obviously underserved market. Africa's growing middle class is growing strongly (prior to the onset of the Covid-19 pandemic, in any case), and cannot be ignored. In all fairness, in 2019 Mastercard did invest US\$50 million in Jumia, Africa's e-commerce giant. These two are working together on developing fintech services across Jumia's customer network.

3. Developments in the Manufacturing Sector

For many years, South Africa dominated Africa's automobile sector. In the past few years, Morocco took the mantle of the dominant car producer on the African continent. However, major manufacturers are expanding their assembly facilities to a number of other countries in Africa. The sector faces a number of challenges, one of which is access to financing of new cars. This report addresses recent developments in the vehicle manufacturing sector.

FINANCING CUSTOMERS IN THE AUTOMOBILE SECTOR OF AFRICA

Automobile manufacturers such as Volkswagen, Toyota, Nissan and others are keen to invest in new plants in Ghana to target West Africa's 382 million people. However, the main challenge is finding banks that will affordably finance new car purchases. Even if the government were to increase tariffs on used cars, new cars are still too expensive for most people unless financing is available. Banks reportedly finance less than 5% of new car sales.

Ghana's government plans to make it easier to buy new cars by increasing import duties on second-hand cars from 5% - 20% to 35%, and providing tax breaks that improve as companies move from assembly to local production. It also pledged to promote regional exports.

Some banks require employers to redirect part of the purchaser's salary toward repaying the debt, or that the owner take out insurance to cover a default. Massive 22%-30% interest rates make loans very expensive, and essentially unaffordable.

Standard Bank Group Ltd is preparing for future growth by expanding its South African car-financing business to other parts in Africa. The potential target market in West Africa is very small as only about 10% of the region's population can reportedly spend more than US\$11 a day. However, Africa adds approximately 10 million new consumers annually. By 2030, Africa's middle- and upper-income class is expected to exceed 300 million.

Currently, more than 70% of imported cars are second-hand, with older models shipped from the USA are sold at half the price of a new one. Ghana itself imported 30,000 cars in 2018.¹³

ASSEMBLING CARS IN KENYA

The Kenyan government's National Automotive Policy is expected to boost local assembly of motor vehicles, while discouraging imports of used cars and fully built new vehicles. In Kenya, Simba Corporation Group began assembling Mahindra pick-ups locally. This provides benefits in the form of tax incentives and will reduce prices in a market segment that is increasingly competitive. Simba Corporation intends using this high value product to increase consumer access and gain market share in the commercial pick-up segment. This pick-up will provide small and medium-sized enterprise owners with an affordable, high quality vehicle.

The government's target is to create favourable conditions for local assemblers, resulting in jobs and skills. These vehicles are exempt from the 25% import duty levied on fully built imported vehicles.¹⁴

Volkswagen is the second global car dealer to initiate local assembly of special utility vehicles (SUV) in Kenya. PSA Group and Urysia Ltd were the first, when they developed a partnership to assemble the Peugeot 3008 utility car. Volkswagen will assemble the VW Tiguan Allspace in Kenya.

Until now, mini-buses, buses, pickups and trucks largely dominated the local assembly market. VW and Peugeot added passenger salon cars to the locally assembled vehicle market only three years ago.¹⁵

SOUTHERN AFRICAN DEVELOPMENTS

For various reasons, Africa struggled to develop a competitive automobile manufacturing sector through local brands. Most cars are imported, at great cost. Supplier origins are mostly Asian, such as Japan, India, South Korea and China.

Zambia announced in early February 2020 that a vehicle assembly plant will be launched in Zambia's Central Province. The plant will create about 1,000 jobs once operational.

A high roof monocoque bus was designed to be the first bus manufactured according to Zambian laws. According to the company's strategic plan, the vehicle assembly plant will start operations in 2022.

AUVIV intends producing environmentally cleaner, safer, more comfortable and yet more affordable commercial vehicles such as minibuses and panel vans, including ambulances and refrigerated vans.¹⁶

Just south of Zambia, Zimbabwean entrepreneur Tatenda Mungofa developed a new car brand, Mureza Auto Company. Mureza will start assembling its Prim8 (pronounced Primate) vehicle at an assembly plant in Harare, at a rate of 100 cars per month. The car will retail at US\$13,500. Other models in the pipeline include a truck and a Sports Utility Vehicle (SUV).

The components are currently manufactured in Iran and South Africa, but Mureza ultimately intends to design and manufacture vehicles for Africans. Despite the poor economic situation that currently prevails, the business will help create meaningful employment and promote investment in Zimbabwe.

Mureza aims to utilise the region's mineral resources. Local leather, rubber, cotton, glass and even battery producers will benefit from the endeavour. This will help a number of countries in the region to become active in the automotive value chain.¹⁷

DEVELOPING ELECTRIC VEHICLES

The Egyptian government announced its comprehensive vision for its automobile and electric car industry. The country will start with production of its first batch of electric buses in November 2020. The Ministry of Military Production set up a company to develop and install battery-charging stations. They also contracted to run electric buses inside the cities and to establish and operate charging stations.

Foton, a Chinese company, will manufacture 500 vehicles annually for four years for a total of 2000 buses. The Ministry also signed an agreement with Geely, another Chinese company, to manufacture electric passenger cars.

The Minister of Military Production will reportedly be in charge of coordinating with all concerned parties to spread, encourage and localize Egypt's electric car industry.¹⁸

INNOVATION IN THE HORN OF AFRICA

In Ethiopia, high school student Ajame Major invented a vehicle using a motorcycle engine. It can travel 40 kilometres using only one litre of fuel. The car has the capacity to carry four people and weighs 400 kilograms.

Ethiopia's Ministry of Innovation and Technology invited car assembly companies to partner and work with the inventor of the new car.¹⁹

CAR MANUFACTURERS SUPPORTING COVID-19 COUNTER-MEASURES

Kiira Motors Corporation (KMC), automotive manufacturer in Uganda, partnered with the Makerere School of Public Health to develop a low-cost ventilator that can be rapidly deployed for coronavirus patients. The proposed ventilator is based on open access designs from the Massachusetts Institute of Technology, the University of Florida and other Public License Ventilator Technology Developers.

The partners plan to adapt these designs to the African environment and to localise the supply chain to support mass production in Uganda. According to the partners, "the capacity developed in the area for local content participation in the manufacture of low-cost ventilators will be valuable to Uganda even post the Covid-19 Pandemic."

They have expressed the opinion that given the steep rise in demand for the devices, increases in conventional ventilator production are unlikely to satisfy global demand and will come at higher prices. They have secured financing to build the first 40 units of the ventilator.

Various steps will be required to develop and agree a strategy for commercial manufacturing. This will include decisions on component sourcing, the assembly site and route to market.²⁰

POINTS OF INTEREST

- Despite government intentions to boost new car production and sales, and the strong growth of middle and upper-class consumers expected by 2030, it will take time for the second-hand market in Africa to come under serious pressure from new cars. Africa's generally poor road infrastructure requires robust vehicles, such as SUVs. These normally come at a premium, unless second-hand.
- In Kenya, locally assembled vehicles enjoy exemption from the 25% import duty on fully built imported vehicles. This provides local assemblers an opportunity to produce cheaper vehicles and creates a local value chain that supports economic growth in the country.
- Various countries outside of traditional sources now build and assemble vehicles. A few years ago, one would not have thought of countries such as Rwanda, Zambia and Zimbabwe as motor vehicle assemblers. With an economy that is under serious pressure, one has to question the viability of such a plant in Zimbabwe. This goes hand in hand with the next point.
- Some major automobile manufacturers are expanding into areas previously shunned. This is good for the local economies as they create jobs and support import substitution of fully-assembled cars. However, they will compete with and may suppress development of local manufacturers. It will be interesting to see how this dilemma will play out. Some of these markets, such as Rwanda, do not have the market characteristics one would expect for a vehicle manufacturer, with per capita GDP far below the typical benchmark of US\$3500.
- Innovation in Africa frequently succeeds in amazing the world. One example is building 3D-printers from recycled e-waste. Egypt developing electric vehicles is not a new phenomenon for Africa. Uganda has also designed and developed electric and hybrid vehicles over the past few years. This country's development of ventilators to battle the Covid-19 pandemic is another example of necessity being the mother of invention. The continent never ceases to amaze!

4. Developments in Renewable Energy

Africa sees a healthy increase in development of renewable energy projects. Solar, wind, geothermal and hydro projects are under construction all over the continent. This report addresses some of the latest developments in this sector.

SOLAR MINI-GRIDS

Mozambique seeks consultants to prepare feasibility studies and project outlines for 11 solar mini-grids. The sites are in the provinces of Niassa, Nampula, Tete, Sofala and Manica. The country's electricity access body, the Fundo de Energia (Funae), announced that the World Bank's Energy for All program, administered in Mozambique by Funae and state-owned utility Electricidade de Moçambique (EDM), backs these projects.

These mini-grids will support electrification in areas where they represent the least-cost option. It is envisaged that independent power producers will develop the mini-grids as public-private partnerships. EDM will take ownership once a mini-grid is commissioned.

This project follows on a tender launched by Funae in March 2020 for five solar mini-grids, partly financed by Belgium.

According to IRENA, Mozambique's solar generation capacity at the end of 2019 was 55 MW.²¹

BUILD-OPERATE-TRANSFER SOLAR GRIDS

In Mali, the Amea Power Group (a UAE-based company) has won the contract to build and operate a 50 MW PV solar power plant for 25 years. The plant will supply the population of the Koulikoro region with electricity. Amea Power is responsible for raising funds to cover the overall cost of the plant, estimated at approximately US\$75 million.

Currently only 41% of the Malian population have access to electricity. This project will increase this number. Note that 57% of the electricity produced in Mali is based on green energy, particularly hydroelectric and solar power.

Amea Power has other solar projects in Africa, including those in Togo, Egypt, Chad and Tunisia.²²

HYBRID SOLAR GRIDS

Morocco is developing a solar hybrid project at Midelt with an 800 MW capacity, as the world's first solar project to include thermal (heat) storage of PV as well as concentrated solar power (CSP). This unique hybrid solar and shared storage project will deliver electricity at 7 US cents per kWh.

At Midelt, the solar energy from both the CSP plant and the PV plant will be, for the first time, stored in thermal energy storage capability within the CSP portion of the project.

According to technical Director of MASEN Abderrahim Jamrani, MASEN's choice of CSP was made at a time when Morocco was paying up to 30 cents per kWh for fuel oil electricity. Morocco needs five hours of power after dark and is on track to meet its target to have 52% renewable electricity by 2030.

The project marks the first use of PV in a hybrid solar project with CSP to charge the thermal energy storage incorporated in the CSP power block. "If we imagined our energy all coming from renewables – even 10 years ago we could not have imagined it," Jamrani commented. "And as we are making our studies for 2050 we now can see that we can really achieve 100% renewable in our country."

The idea of co-locating PV and CSP and sharing CSP thermal storage is increasingly applicable as renewables make a larger contribution to energy grids and as regulators move from lowest cost to "best fit" procurement. The principle is that instead of dumping PV solar energy when too much is produced on sunny days, it can be fed into existing tanks of low cost molten salts in the CSP. It is then possible

to tap this stored energy to feed into the grid exactly at the time it is needed.²³

WIND ENERGY

In February 2020 Senegal inaugurated its first large-scale wind farm (with 158 MW capacity) that has the ability to supply nearly a sixth of the country's power at full capacity. The wind farm will provide electricity for 2 million people and prevent the emission of 300,000 tons of carbon dioxide annually.

Lekela, a British renewable power company, constructed the wind farm. Lekela also has wind farms in South Africa and Egypt and an upcoming one in Ghana.

Wind farms reportedly are less utilised in sub-Saharan Africa compared with solar plants as they can cost more, take longer to build, and because strong wind is less available than sunshine.

After bringing the wind farm online, Senegal will obtain 30% of its energy from renewable sources. This energy mix greatly reduces the country's dependence on petrol. Outside the cities, much of Senegal is still not electrified. Electricity reached only about 60% of its population in 2017. Senegal has already built a number of solar plants to boost the contribution of renewable energy to the national grid.²⁴

POST-BREXIT UK HAS POTENTIAL IN RENEWABLE ENERGY INDUSTRY IN AFRICA

UK investors learned at the UK-Africa Investment Summit on 20 January 2020 of an opportunity to tap into a US\$24 billion investment that will connect people without electricity access to off-grid home solar power systems. Millions of people in Africa do not have access to electricity, and many use pay-as-you-go home solar packages to rent low-cost solar panels using mobile phones. Once the solar panels are paid off, households own the equipment outright and in effect have free energy. Many then choose to upgrade their packages to add televisions and electric cookers.

The 600 million people without access to an electricity grid represents a huge potential for future investment. The sharp decline in the cost of solar panel technologies and the emergence of mobile banking and increasingly affordable financing in Africa's fast-growing economies provide strong impetus to this opportunity.

According to a report by Kleos Advisory, the combination of solar technology and affordable financing drives an economic transformation in Africa, empowering the 'unbankable' and embedding African consumers in the digital economy.

UK company Azuri Technologies sells its home solar systems in Kenya, Nigeria, Tanzania, Uganda, Zambia, while Bboxx is active in the DRC, Guinea, Ivory Coast, Kenya, Mali, Nigeria, Rwanda, Senegal, and Togo.²⁵

COVID-19 AND THE OIL PRICE DROP BOOST THE RENEWABLE ENERGY BUSINESS MODEL

In its editorial of 28 April 2020, the New Times linked the effects of the Covid-19 pandemic and the drastic drop in oil prices to the boost experienced by the renewable energy sector in Africa.

The current oil crisis has its origins in the collapse of demand throughout the world due to the spread of the coronavirus and the resulting economic paralysis. Factors that contributed to the drastic reduction in the oil price include the almost complete halt of global airline flights, the disabling of huge factories, and the drastic reductions in private vehicle use.

While there was a drastic cut in demand, oil supplies have not diminished. The main reason for this phenomenon is that many oil producers consider not only the price they will receive for producing a barrel of oil, but also the cost of halting operations. As many older oil fields rely on pumping water in the ground to force oil up, "stopping the pump means permanently closing the field and stopping oil production. Therefore, many oil producers prefer to continue to flood the market, no matter the cost."

The author of the Times editorial is of the opinion that while a low price level is very bad news for oil producers, it is great news for the planet and for the renewable energy sector.

At a low oil price, the ROI in oil is much lower than before, and will no longer justify the high risk in the dynamic and ever-changing market. In contrast, clean energy companies now present much lower risk investment opportunities with a stable and solid ROI. The renewable energy sector offers a greener, more sustainable, and responsible investment option, as well as one that is seemingly more economically viable.

“The ‘exchange of power’ between the traditional oil and gas to renewable energy has been on the table for a long time, yet nobody could tell when and where this change will happen. The global crisis and oil price drop are accelerating the trend and moving it a few steps forward. The post-crisis economic reality will not be the same as the one we know; in the energy field, we can expect a revolution and a new world order. The green energy sector will not only be able to survive the crisis but emerge from it as a winner, and present investors with a more sustainable, responsible, ethical, and profitable investment opportunity.”²⁶

POINTS OF INTEREST

- Renewable energy is becoming increasingly more efficient and less costly. According to Forbes, in 2019, hydroelectric power was reportedly the cheapest source of renewable energy, at an average of US\$0.05 per kilowatt hour (kWh), but the average cost of developing new power plants based on onshore wind, solar photovoltaic (PV), biomass or geothermal energy usually fell below US\$0.10/kWh. Offshore wind cost close to US\$0.13/kWh. While these figures are averages for the world at large, the latest Lazard figures indicate that for South Africa, for example, solar PV and wind are both quite cheaper than gas.
- Lazard also found that lithium-ion, particularly for shorter duration applications, remains the least expensive of energy storage technologies analysed and continues to decrease in cost, thanks to improving efficiencies and a maturing supply chain.
- Mini-grids will continue to grow in popularity as the costs come down and the technology becomes more efficient. Whether the rate of cost reductions and efficiency increases will continue at the same pace, remains to be seen. However, given the vast improvements over the last two decades, and the increased flexibility renewable energy such as solar provides to governments and energy regulators, it is doubtful that here will soon be a reduction in the use of solar and other forms of renewable energy. We have also recently remarked upon the use of wind as a source for mini-grids.
- The UK is not the first foreign country to identify the renewable energy market in Africa as an investment target. As indicated, the size of this market is huge. The challenge is to get the electricity to the vulnerable target population, which is usually the poor in remote rural areas. The delivery needs to be done in a way that is affordable for households that live on less than US\$2 or US\$3 per day. Capital costs cannot be borne by this group, and therefore business models need to be designed to convert all costs into an affordable monthly cost. It is doable, as M-Kopa in Kenya has already provided Africa with a proof-of-concept.
- With financial services institutions in Africa, and globally for that matter, increasingly refusing to bank role coal-fired generation and coal operations, the transformation of energy generation to renewable energy is just a matter of time. We will find gas providing a bridge between the status quo where coal and oil are dominant, to a new era in 20 or 30 years where renewable energy would have become the kingpin.

5. Developments in Sustainability

Africa increasingly develops innovative ways to address challenges such as plastic waste pollution, deforestation, waste-water problems and invasive weeds. This report addresses some of the latest challenges in this regard.

CONVERTING PEST WEEDS INTO HUMAN-FRIENDLY BRIQUETTES

In Senegal, entrepreneurs now turn an invasive weed called Typha into a clean energy source. They produce bio-fuel from this weed, which has been a pest in the rice fields of the country for more than 30 years. This bio-fuel is now used in a sustainable manner to cook, build homes, and create economic opportunities in the country.

While the governments of Senegal and Mauritania once struggled to eliminate it, locals now produce bio-fuel from Typha as part of a project led by the French NGO GRET.

The bio-charcoal is made by partially burning Typha in outdoor kilns for six hours at a time. The charred reeds are mixed with water and rice husks. A machine shapes the mixture into briquettes, which are then dried for four days. The resulting briquettes are carbonized Typha.

Typha briquettes both ignite faster and burn longer than wood. They also produce much less smoke, and therefore are a healthier alternative for cooking and heating, as wood-burning can increase the risk of cardiovascular and respiratory diseases. In addition to being used for cooking and heating, Typha can also be mixed with clay to make bricks for construction.

NGOs and locals are researching ways to minimize costs and increase efficiencies, as the cutting of the plant is labour-intensive and transportation costs are high. Each month, approximately 13 tons of Typha are converted into bio-coal.²⁷

CONVERTING WASTE INTO BRIQUETTES

In the DRC, the demand for charcoal drives deforestation. In the DRC this is a serious ecological challenge. In addition, the fuel puts women and children's health at risk. Rising costs also put this once very affordable resource out of reach for many at the bottom of the pyramid.

Recently, a number of women learned to make clean-burning biomass briquettes using household waste. Some women use the briquettes at home and sell them to other homemakers in the city. This "home business" model allows entrepreneurs to offset their expenses.

The Belgian development agency Enabel recently hosted a workshop that taught women to make the briquettes out of charcoal dust, clay and wastewater from brewing. The production process is very simple, and entails combining the ingredients, rolling them into small balls and baking them in the sun. Every briquette can provide heat for 45 minutes.

In addition to the monetary impact, the scheme also has health benefits. The workshop participants also learn how demand for charcoal fuels deforestation. Currently, one million hectares of tree cover are lost each year. Research from the Central African Forest Initiative finds that 96% of the wood harvested in DRC is used for fuel.²⁸

GROWING PARTICIPATION IN THE CIRCULAR ECONOMY

Cote d'Ivoire generates more than five million tons of waste annually, with less than 50% of the current waste being collected, and only about 3% being recycled. At least 94% of stakeholders in the plastic waste economy operate in the informal sector on the fringes of the recycled plastics value chain.

Cote d'Ivoire startup Coliba subsequently developed a recycling and waste management mobile platform. The new company was recently successful in raising funds from German firm GreenTec Capital Partners, who also provide Coliba with assistance to help it scale up its operations.

Coliba participates in the circular economy through its mobile application that connects households and businesses with affiliated plastic waste collectors. Its focus is on tackling the problem of plastic waste in the country, allowing users to earn airtime or discounts on certain products by recycling. The mobile application tracks a user's bottle collection progress and efficiently dispatches agents for collection.

GreenTec's role is to support Coliba to scale its operations to create larger value and impact in Africa's recycled plastic economy. Coliba's platform addresses these issues by offering formal employment opportunities in waste management (currently creating over 50 jobs, of which 77% are women), as well as an easy solution for households to earn rewards for recycling.²⁹

In Tanzania, young female entrepreneur Hellena Silas developed a recycling business that converts plastic waste into building material, e.g. bricks and paving blocks, at its plant in Dar es Salaam. The company currently employs five people that it trained to recycle plastic waste.

Hellena's company Arena collects plastics and reprocess it into building materials. Their bricks are made with plastic polymers as opposed to cement, which means they are anti-corrosive, anti-fungal, waterproof, durable and affordable, unlike cement.

In March 2020, the company collected more than 650kg of plastic packaging waste, to be converted into building eco-bricks. These eco-bricks are made from recycled plastic waste with no cement at all, and consist of plastic waste (80%) and 20% sand. According to Hellena, her project tackles two main problems, i.e. plastic pollution and poor water and sanitation.

The bricks she produces are twice as strong and more durable than regular cement bricks. Compressive force for regular bricks is 40, compared to a compressive force of 80 for Arena's bricks. She plans to expand her company across East Africa and beyond.³⁰

RECYCLING WASTEWATER FOR IRRIGATION

In Egypt, UAE company Metito and Egyptian-based engineering company Hassan Allam Construction built one of the largest agricultural wastewater treatment and reuse plants in the world. This plant recently went into operation. The Egyptian president, President al-Sissi, inaugurated the Al Mahsamma agricultural wastewater treatment plant. The plant covers an area of 42,000 m², with a production capacity of one million m³ per day.

The water is transferred to the plant from the Ismailia Irrigation Drainage Canal, located west of the Suez Canal. The plant's pumping station uses eight vertical turbine pumps, six pumps in operation and two on standby, each pumping at a speed of 7,000 m³/hour. The plant forms an integral part of the Egyptian government's policy to preserve natural water resources by investing in non-conventional water resources such as desalination and reuse of treated wastewater.

According to Metito, treated wastewater from Al Mahsamma will irrigate more than 28,300 hectares in the Sinai Peninsula. The project will also contribute to the clean-up of Lake Al Temsah, west of the Suez Canal. Construction of the Al Mahsamma plant required an investment of US\$100 million.³¹

PRODUCING DIESEL FROM PLASTIC

"How we made it in Africa," an online South African platform, recently profiled EPCM Holdings, a South African-based company that developed a small-scale plastic-to-diesel fuel plant that small businesses and entrepreneurs can set up and run in remote areas. The units are modular and containerised and can be shipped anywhere a truck is able to reach. The system supplies its own power (for the reactor, air coolers and pumps) and can be located at the feed source to minimise the cost of transport.

The plant may be ideal for a small business to operate in remote parts of Africa where the cost of diesel can be expensive, yet the only readily available fuel. The produced fuel products can be sold to customers to power generators, run trucks or back to small refineries for inter-blending. Partnering with a plastic waste sorting business can also secure the feedstock.

EPCM is available to assist in project financing, business case development for loan applications and operations and maintenance advice.³²

POINTS OF INTEREST

- Producing briquettes from invasive weeds and other waste has the benefit of curbing deforestation and supporting the health of women and girl children who are generally tasked with preparing food. The health challenges associated with using wood for food preparation are well documented. The production of the briquettes also creates the opportunity for women in Africa to create their own businesses, providing an energy source that is cheaper and cleaner than coal, and less problematic to nature than chopping down trees.
- Plastic recycling is becoming increasingly popular. We see the use of plastic to develop bricks for school, as an ingredient in the tarmac for roads, for paving in general, and now as an input source for producing diesel fuel.
- The business model used by EPCM has a lot of potential in Africa, for a number of reasons:
 - There is unfortunately more than enough plastic available as input.
 - The modularised units make it easy to ship all over Africa.
 - The relatively small size of the units makes them relatively cheap to procure, whilst still being able to produce 36,000 litres of diesel per month. In Africa this very lucrative business opportunity can also address a major pollution issue.
 - EPCM's willingness to assist with the financing of the unit and operations, should make this business opportunity a no-brainer.
- Egypt's project to recycle wastewater to support irrigation should be a benchmark for other water-stressed countries in Africa, which are unfortunately quite a high number. Twelve of the 17 most water-stressed countries globally are in the Middle East and North Africa (MENA). Reportedly 82% of the region's wastewater is not re-used.
- In 2015, the WHO reported that Sub-Saharan Africa was home to more than 40% per cent of the global water-stressed population. Only an estimated 44% of the urban population and 24% of the rural population had adequate sanitation. About 33% of the African population is affected by water scarcity. This problem will become more acute with the strong growth in urbanisation and the strong population growth forecasted for Africa. The growth in the consumer class will lead to more water use and put already scarce resources under even more pressure. We remember Cape Town running out of water during the prolonged drought of a few years ago. More attention must be focused on recycling and re-using wastewater on the continent. With the majority of African countries having access to the sea, desalination of seawater is reportedly receiving greater attention. The availability of sufficient energy can be problematic. However, access to utility-scale renewable energy plants can play an important role in this regard.

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