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Contents

1. Developments in Agriculture

Notable developments in the agricultural sector over the past few months include avocados becoming the new hit in the market, cannabis emerging in more countries as a new revenue-generating crop, and measures to cope with the impact of Covid-19. This report highlights some of the latest developments in the sector.

CALLS FOR GROWING FOOD PRODUCTION

Nigeria's President Buhari reportedly advised Nigerian farmers to increase their food production, as the country did not have foreign exchange for food importation. He stated that Nigeria had to produce what it needed to eat. Oil revenues largely fund Nigeria's budget. The sharp post-pandemic drop in global oil prices placed the country's budget under severe pressure. Dealing a further shock, the government closed down a large part of its economy to prevent the spread of the Covid-19 virus.

To support farmers, the president recently directed government officials to ensure that the impact of the Covid-19 pandemic on farmers is minimised. Amongst others, the government has started the process of ensuring that agricultural products, as well as inputs, have easy access across the states.

The country has a history of restricting food imports to save foreign currency. It has also closed its borders with its neighbours to cut down on the smuggling of products such as rice, poultry and petrol. Unfortunately, due to corrupt security personnel, the smuggling still continues.[1]

Delegates of a recent webinar hosted by the African Development Institute, who called upon African countries to adopt and implement policies to strengthen their agricultural sectors, echoed this approach of the Nigerian president. This would include agricultural processing, trade and industry.

To avert the potential danger of widespread hunger, aggravated by the Covid-19 pandemic, African countries had to rapidly increase their food reserves, maintain their food supplies and increase their agriculture budgets. The delegates also called for a number of interventions to increase the productivity of farmers:

- African governments must scale up technology for agriculture production, including private sector-led initiatives, to build resilience and develop self-sufficiency in the sector.
- Agriculture and agribusinesses must be prioritised in the national security agendas.
- To deal with Covid-19-caused supply chain disruptions and potential food shortages, in addition to the threat of locust swarms devastating food production, delegates called for the establishment green corridors and domestic food systems and keep inter-regional food supply chains open during the pandemic.
- More agricultural research had to be undertaken national agricultural productivity accelerator funds had to be set up. These would serve to assist small farmers and to boost production by small and medium-sized enterprises.
- Technical support and funding (including cash) should be provided to women farmers, as they formed a major part of Africa's agricultural workforce.[2]

AVOCADOS: A LUCRATIVE CROP

The Tanzanian agriculture sector currently engages 80% of the country's population, with more than 10,000 farmers involved in avocado production. Farmers in some areas replaced coffee crops with avocado production to tap global price increases and meet growing demand.

According to the Tanzania Horticultural Association (TAHA), avocado farmers generated revenues of at least US$12 million annually, up from zero five years ago. Avocado exports grew by 383% from 1,877 tons in 2014 to 9,000 tons in 2019. Meanwhile, farm-gate prices rose from Sh450 (~US$0.19) per kilogram in 2014 to Sh1,500 (~US$0.65) in 2020, mainly due to TAHA efforts to develop the avocado value chain in Tanzania.

Less than 10 years ago, Tanzania exported no avocados. Today, the country is the second largest avocado producer in Africa, after only Kenya. Kenya produces about 190,000 tons per year, and exports between 5,000 and 10,000MT.

The EU market absorbed 85% of Tanzanian avocado exports in 2018. Target markets include France (3,133MT), the Netherlands (2,304MT), and the UK (1,193MT).

Regarding the Asian market, phytosanitary issues restricted imports of local avocados into China. The lack of bilateral arrangements between the two countries bars access to the lucrative China market for Tanzanian exporters. China currently imports avocados valued at US$105 million per annum, a huge potential market for Tanzanian exporters.[3]

NEW DEVELOPMENTS IN CANNABIS

In Zimbabwe, in 2018, the government approved production of cannabis for medicinal purposes. In 2019, it announced that 37 local and private investors were interested in cannabis farming. The Health Ministry recently announced it would offer 100% ownership of their farms and licences to local and foreign investors venturing into production of cannabis for medicinal purposes, with immediate effect. An investor in cannabis farming will be issued a five-year renewal licence.

These measures are intended to improve the competitiveness of the subsector. Previously, production and possession of cannabis was illegal and attracted a sentence of up to 12 years. The recreational use or possession of the drug still remains illegal.[4]

PRESSURE ON THE TOBACCO INDUSTRY

The Covid-19 pandemic led to a delayed selling season in Southern Africa. To curb the spread of the virus, governments in the region have instituted movement restrictions, border closures and a controversial temporary ban on cigarette sales in South Africa. This has led to concerns that the tobacco industry will suffer a serious blow in the time ahead.

In Zimbabwe, farmers maintain that the tight restrictions on movement have made it difficult to sell their produce. A number of factors are causing problems:

- Idiosyncratic police interpretations of national lockdown rules complicate matters further.
- Despite the tobacco season getting underway after a month's delay, farmers are struggling to reach Harare's auction house.
- Exports to Europe have stalled due to limited flights.
- ZimTrade, a local import-export association, is exploring alternative markets in the region to cover the shortfall.
- Some are smuggling cigarettes into South Africa.

In late March, South Africa introduced a ban on both alcohol and tobacco sales in a bid to free hospital beds and protect the vulnerable in its preparation for the pandemic. According to British American Tobacco South Africa, who has a 78% market share of the legal cigarette market, the ban forces consumers into the arms of black marketeers. According to SARS, in April alone the government lost R300 million (US$16 million) in taxes due to the prohibition.

According to the Fair Trade Independent Tobacco Association (FITA), the cigarette ban increased black market trade. FITA points out that uplifting the ban would save jobs, bring money into the state coffers, stimulate the economy, and reduce the psychological impact of the lockdown period on South Africans. However, the WHO maintains that smokers are likely to be more vulnerable to Covid-19.

In Malawi, tobacco accounts for 11% of the country's GDP and more than 60% of its export earnings. Auctions between April and May generated over US$10 million in sales. The industry faces long-term structural challenges. Due to low prices that farmers receive from dealers, many rely on child labour, which has led to restrictions of its tobacco exports to the USA since 1 November 2019.

South Africa's ban on cigarette sales risks further undermining regional supply chains that already struggle with restrictions on movement and border difficulties.[5]

IMPACT ON AGRIBUSINESS IN GHANA

In Ghana the average monthly revenue of agribusiness firms during the COVID-19 restriction period fell by 61.2%. According to a Chamber of Agribusiness Ghana survey, small-scale agribusiness firms suffered the largest revenue shortfalls of about 77 %. Large-scale agribusiness firms experienced the least revenue shortfall over the same period. Some possible reasons for the revenue decline of small-scale agribusiness firms include:

- Undeveloped or poorly developed business linkages
- Weak incorporation of technology, including information communication technology
- Processing capacity
- Poor raw material supply chains and
- Poor inventory management.

In contrast, the lower revenue decline for large-scale agribusiness firms over the same period, is possibly due to:

- Good work or employee arrangements
- Improved raw material supply chains
- Good market arrangements.

The Chamber's research indicated that Ghana has no clear pathway to protect players in the sector against fallout from a global pandemic.

In general, the main effects of the pandemic on agribusinesses are as follows:

- Disruption in normal business operations
- Increase in business expenditure
- Cut in supply/production
- Difficulty in meeting monthly revenue target, and payment of salaries and wages
- Difficulty in honouring tax and debt repayment obligations
- Threat to employees' health and lives. [6]

POINTS OF INTEREST

- Several African countries were early to climb on the avocado bandwagon, including Kenya and Tanzania. South Africa recently joined the avocado boom. The global demand for avocado is reportedly due to the international popularity of guacamole and its global recognition as a "super food" based on health benefits. In these times of pandemic, those that can afford them increasingly embrace such healthy foods. Fruit and vegetables strong on Vitamin C are increasing in popularity. The huge potential market in China is an additional attraction. Tough conditions in the 2019 growing season dampened avocado supplies. These demand and supply issues interacted to increase the attraction of avocados.
- Nigeria went through various iterations of restrictions on food imports. Whenever the oil price takes a sharp drop, there are calls on the agriculture sector to become self-sufficient and to grow what the country needs. We soon see calls to diversify the economy to reduce its vulnerability to oil price volatility. However, whenever the oil price strengthens, the focus shifts elsewhere. The reality is that very few African countries should import food, as Africa has the potential to become the world's breadbasket. Africa, and not just Nigeria, cannot afford to import food, yet it currently imports between US$35 and US$41 billion annually.

- In 2003, African countries also endorsed the "Maputo Declaration on Agriculture and Food Security in Africa," which contained several important decisions regarding agriculture. Prominent among them was the "commitment to the allocation of at least 10% of national budgetary resources to agriculture and rural development policy implementation within five years". Very few countries in Africa have achieved this objective.
- NEPAD developed a scorecard to track the progress African countries are making towards implementing the 2003 accord. Approaching 20 years after the original declaration, the results do not look good. Only 20 of 47 Member States that reported are on track towards the goals. On a scale of 10, Rwanda does the best at 6.1. Below are the scores for the largest economies in Africa:
    - Angola: 2.1/10
    - DRC: 1.4/10
    - Egypt: 3.4/10
    - Ethiopia: 5.3/10
    - Kenya: 4.8/10
    - Nigeria: 3.4/10
    - South Africa: 4.1/10

  The scorecard reflects progress on renewed AU commitments as set out in its 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods. These indicators include Investment Finance in Agriculture; progress in Ending Hunger and Eradicating Poverty through Agriculture; Intra-African Trade in Agriculture Commodities; and Resilience to Climate Variability. The above scores reveal that Africa fails to produce its own food and suggest that food security remains a serious challenge.
- Cannabis production and use in Africa has evolved over the past few months. In South Africa it is now legal to smoke cannabis, and the government is issuing licences for its production. We also see illegal production in Ghana. In Zimbabwe it can be produced for pharmaceutical use. In earlier reports, mention was made of the production of similar drugs in Ethiopia and Kenya, either legally or illegally. While drug farming generates much higher revenues, it shifts the focus from food security, and thus is not in Africa's best interest!
- South Africa's tobacco market is without a doubt the largest in Africa. The ban on tobacco products introduced by this country's cabinet as a countermeasure against Covid-19 dealt the industry a severe blow. The continuation of the ban, reportedly due to the anti-smoking stance of a few ministers, drove South African smokers into the illegal market. The Government's ban now faces a court challenge, and the South Africa smoker population and tobacco producers in the region await the verdict in anticipation.

2. Digital Technology Developments

Digitalisation in Africa experienced a number of exciting developments over the past 2 decades. The M-Pesa mobile money platform is perhaps the most well known digital application. However, various others are coming to the fore, crossing various industries, including agriculture, health, music, financial services, etc. This report deals with some of the latest developments in this sector.

TAPPING INTO DIGITAL TECHNOLOGY TO MANAGE COVID-19

Cargill developed its FarmForce digital farming tool for cocoa farmers working in Ghana and Ivory Coast. FarmForce utilises GPS to map farms and provides a cooperative management system (CMS) and crop traceability. The tool will reach over 1,200 cooperative leaders and lead farmers, and help amplify government safety and sanitation measures designed to inhibit the spread of Covid-19. It will raise local awareness on the coronavirus, sensitize farmers on recommended washing and sanitary practices and encourage them to relay the message to other farmers and local communities.

Cargill's contribution is driven by the fact that farmer cooperatives and lead farmers are crucial channels that help them reach cocoa farmers in rural areas and to disseminate information on the best ways to keep themselves and their communities safe during the Covid-19 pandemic.[7]

DIGITAL APPLICATION FOCUSING ON LAST-MILE DELIVERY

Many industries in Africa are buckling due to the Covid-19 pandemic. Despite this, a small number of industries experience very good growth opportunities. These include e-commerce businesses and the delivery companies that fulfil orders by customers. This growth opportunity is quite strong, especially in the urban areas of emerging economies such as Nigeria.

ShapShap (pidgin for "urgently") is an app-based start-up founded by Khalil Halilu that connects online retailers, potential customers, and a network of riders. Its mission is to enable seamless transactions between customers and vendors. It relies on a range of mobility platforms, such as motorbikes, roller-skates, bicycles, cars and vans, and provides a variety of instant payment options.

ShapShap operates from Lagos, to exploit the following benefits:

- Lagos is the most populous city in Africa, and one of the fastest growing in the world.
- It does not have a citywide railway system, compelling everyone to travel by road.
- Traffic jams frequently last up to four hours.
- The Lagos State government restricted the movement of motorcycles, tricycles, and bike-hailing services on major State roads and highways. This affected tens of thousands of bikes, many accessed by bike-hailing apps. These restrictions do not apply to delivery services.
- With the explosion of e-Commerce ventures in Nigeria, ordering online has become the norm for many Nigerians, especially in the cities.
- Customers placing online orders expect to receive their order as soon as possible, which creates the opportunity for logistics companies.

Early ShapShap customers include Red Star Express, GIG, GMC Logistics and Jaiz Bank. Several big players in the Nigerian logistics industry signed up. ShapShap found an enthusiastic partner in Sterling Bank, keen to actively participate in the Nigerian transport industry. The implementation of the AfCFTA will also provide a boost to ShapShap's growth ambitions.[8]

GROWING FOOTPRINT OF DIGITAL HEALTH

Lagos-based e-health start-up Helium Health applies its flagship Electronic Medical Records/Hospital Management Information System (EMR/HMIS) to digitalize hospitals and clinics. In addition to growing

its current customer base in Nigeria, Ghana, and Liberia, Helium Health seeks to expand into new markets in North Africa, East Africa and Francophone West Africa this year. Helium recently raised US$10 million in Series A funding to expand its footprint in its existing markets and move into new ones. Institutions involved in this round of funding include Global Ventures and Asia Africa Investment & Consulting (AAIC), Tencent, Ohara Pharmaceutical Co, HOF Capital, Y Combinator, VentureSouq, Chrysalis Capital, Kairos Angels and Flying Doctors Healthcare Investment Company.

- Helium also plans to expand its tech product suite beyond its current offering. Its new products aim to help boost operational efficiency, improve revenue generation, expand health financing, monitor public health and improve health outcomes. The new suite of products include:Helium Teleclinic: a platform that enables brick and mortar hospitals to have televisits with their patients
- HeliumPay, a billing and payments solution
- Helium CareCredit, a provider-financing product
- Helium Cover, an enrollee, tariff and claims management product
- MyHelium Patient Superapp, an app that helps healthcare facilities manage patient engagement and retention

According to the Helium Health CEO, the company now focuses on developing "the technology infrastructure to connect a fragmented healthcare sector and power the delivery of quality, affordable, comprehensive care across Africa."[9]

MUSIC STREAMING PLATFORMS

Weetracker research reports that Africa's music streaming space enjoyed steady growth since the introduction of Africa's first music-streaming platform in 2013. Two Nigerian investors acquired Finnish music-streaming platform Spinlet in 2011, then launched the platform in Nigeria. Since then, more than 25 music-streaming platforms appeared in Africa, of which more than 50% were launched since 2013. Of those, 72% are reportedly home-grown while the remaining 28% are international start-ups that ventured into Africa.

During the last two years, telecommunication companies have also started to venture into this sector. In Kenya in 2018, Safaricom launched Songa App, while MTN Group launched MusicTime in South Africa, as well as in other African countries such as Nigeria, Ghana, and Zambia.

However, due to expensive African Internet services, the mass market does not yet embrace music streaming. To address this barrier, Safaricom and MTN offer a music-streaming plan that does not burn through user data allowances. By making music accessible at a reasonable cost, this serves to acquire and retain new customers.

Few large corporates moving into Africa into the music streaming industry have succeeded in their ventures. The industry is still quite young, and it is uncertain how many Africans have disposable income to pay for music. Despite these concerns, PE investors and VCs such as Seas Capital show significant interest in the African music streaming industry.

By 2024, Africa's music streaming revenues are expected to have hit a 12% annual growth that will see the market reach a volume of US$822 million. According to PwC, Nigeria is expected to record music-streaming revenues of around US$65 million by the end of 2020. Revenues in South Africa are reportedly expected to reach US$35 million in 2020.

Despite the identified concerns, "with an estimated population of 420 million youths, as well as music streaming penetration that is expected to grow to up to 14.9% by 2024, Africa might yet become a promising market for music streaming start-ups."[10]

DIGITAL GLOVES FOR THE HEARING IMPEDED

Kenyan entrepreneur and engineer Roy Allela's niece has a hearing impediment. To support her, Allela developed a smart glove that converts sign language gestures into speech. Essentially, this is a sign-to-speech device that enables people with hearing and speaking disabilities to communicate through audio speech. Those that do not know sign language can reportedly also use it.

The glove, called Sign-IO, "converts sign language into audio speech after identifying several letters signed by sign language users and passing along the data to an Android application through which vocalises the sign. Through flex sensors fitted in each finger compartment of the glove, the degree of bend to which a finger is subjected to in the process of signing a letter is captured and quantified. These signals are then processed and sent via Bluetooth to a mobile application, also developed by Roy." Preliminary trials at a special needs school in Kenya provided the opportunity to enhance the speed at which the platform converts sign language into audio.

Through the app that accompanies the glove, users can set preferences such as gender, language, and voice pitch. Allela claims that the gloves currently provide a translation accuracy of 93%.

For his efforts, Allela has received numerous awards and nominations.[11]

POINTS OF INTEREST

- In the African e- commerce subsector, order fulfilment continues to be a challenge. Start-ups such as ShapShap therefore provide a vital and much-needed service. By being nimble, ShapShap enables quick delivery of online orders, enhancing the attraction of e-commerce companies such as Jumia, Konga and Takealot, to name but a few.
- We continue to see new developments in the e-health subsector in Africa. There can be no doubt that digital developments in the health sector have a huge role to play in taking health services to those in remote and rural areas in a fast and affordable manner. It is no longer a novelty and is now a serious instrument in the health toolbox of governments. Polices and health protocols should be developed and adjusted throughout the continent to provide for the serious adoption of e-health practices in Africa. The current high cost and scarcity of health personnel make this an imperative. This has been stated a number of times. It will probably be necessary to state it a number of times more before we will see serious progress along this line. Hopefully we will see regional integration initiatives, such as the AfCFTA, bringing a more integrated approach to this service.
- Digital music platforms in Africa are far from new. But to succeed, African platforms, or African-oriented platforms must consider the unique tastes of the African music-loving population. On average, Apple Music and Spotify have the critical mass to present a very wide variety of music at a relatively low cost. This makes it difficult for African-oriented apps to focus on specific African genres. The latter will mostly only have a country market, and reach at best a regional market.
- We once again see the ingenuity of African digital developers. In previous reports, mention was made of techno-entrepreneurs using recycled e-waste to build 3D-printers. Now we see a world-first where digital technology is used to develop digital gloves for the hearing impaired. Africa as a continent has seen innovations across a wide variety of domains: the world's first heart transplant, the first pool cleaner, pioneering developments in cricket ball-tracking and speed reporting, the first successful penis transplant, and the largest mobile money platform.

3. Energy Developments

Energy in Africa is an increasingly dynamic sector. A large part of the population does not have access to electricity. Climate change forces its governments to consider a move away from coal-fired electricity generation. Russia seems quite eager to sell nuclear plants to the continent's governments. This report addresses some of the latest developments in this sector.

ENERGY PRODUCTS IN MOZAMBIQUE

Mozambican Prime Minister Carlos Agostinho do Rosário recently announced the second phase of the natural gas project in Pande and Temane and the light oil project in Inhassoro in southern Mozambique. These projects are to take place in the 2020-2024 five-year period. They will have priority among the large investments planned over the five-year period. Other large projects include:

- The start of production of the gas exploration and liquefaction project on the Coral Sul floating platform in Area 4 in the Rovuma basin
- The start of the projects in Area 1 of the same basin
- Two natural gas liquefaction modules due to be installed in Afungi, in the Cabo Delgado province, northern Mozambique.

Mozambique also intends to supply power to all of the country's administrative posts after the process of electrification of all district headquarters was concluded.

To achieve this, the following projects will be launched:

- The natural gas thermoelectric plant in Temane is due to be built
- The construction of solar plants in Metoro and Pemba in Cabo Delgado and Cuamba, in Niassa province will be concluded,
- Two mini-hydro plants in Berua, in Zambézia and Luaisse, in Niassa province will be constructed
- The construction of the high-voltage Cuamba-marrupa power transmission line will be finished.

These projects will increase the number of electricity consumers on the national grid by 3.8 million, providing power to 63% of the population by 2024 (up from the current 34%).[12]

OIL PRODUCERS EYEING RENEWABLE ENERGY

Africa's oil and gas producers faced severe challenges even before Covid-19. Plummeting oil prices exacerbated the devastating impact of the pandemic. Increasingly, involvement in renewable energy production potentially leads to alternative business models. A number of factors force this rethink:

- Climate change spooked investors in fossil fuels.
- A conflict between Saudi Arabia and Russia in March 2020 saw oil prices fall to around US$20 per barrel
- The outbreak of Covid-19 stopped people and goods from travelling, which seriously dented global demand for transport.

These dynamics forced Nigeria and others to sell oil at a loss, dealing a further blow to economies dependent on oil revenue. This loss in revenue stretched the resources of African oil producers, which in turn complicated their fight against the pandemic. The severe oil price drop also halted drilling and offshore projects in African countries including Nigeria, Senegal, Mozambique, Ghana and Angola.

According to some experts, it is time for African governments to look beyond oil to renewables. Africa has significant potential in solar, hydro and wind power. African countries increasingly turn to solar PV technology to boost energy supply for its 620 million people who still live without electricity.

Renewable energy technology and costs consistently improve, making these sources increasingly attractive. The major challenge facing producers is electricity storage. Despite the benefits of renewable energy, it will take time for new technologies to replace legacy systems such as coal.[13] Also, a sustained fall in oil prices will have a negative impact on renewable energy adoption rates.

EGYPT STRIVING TO BECOME A REGIONAL ENERGY SUPPLIER

Egypt has an energy surplus of 20,000 MW, which it plans to use to meet the energy needs of its neighbours. This will help Egypt increase its national income and become an attractive market for future energy investment.

The electricity interconnection project between Egypt and Saudi Arabia will launch in mid-June 2020, at an estimated cost of approximately US$1.6 billion. Saudi Arabia will finance US$1 billion and Egypt will pick up the remaining cost. The project will transfer 3,000 MW of electric power daily at peak.

Egypt's parliament sees the establishment of a joint Arab electricity market between Egypt and Saudi Arabia as a step toward economic cooperation, creating significant economic benefits for Egypt. The project will also reduce energy costs.

The first phase, to be complete by 2023, will initially have a 1,500 MW capacity, gradually increasing to reach 3,000 MW. The project will generate foreign currency revenue and provide job opportunities for technicians, engineers and workers.

Seven companies were invited to participate in the tender to build the electrical interconnection with Saudi Arabia. These are Elsewedy Electric, State Grid Corporation of China, Kalpataru, Hyundai, NCC, L&T and KEC. [14]

Egypt has improved its ranking in the index of obtaining electricity from 145th place in 2015 to 77th place, improving 68 places within five years.[15]

AFRICA EMBRACING NUCLEAR ENERGY

A growing number of African countries are considering the shift to nuclear energy. This decision is driven by power shortfalls, demands for greener energy and threats to hydropower from drought. According to the International Atomic Energy Agency (IAEA), 11 of the 30 countries around the world considering adoption of nuclear power are in Africa. These include Ghana, Kenya, Egypt, Morocco, Niger, Nigeria, Sudan, Algeria, Tunisia, Uganda and Zambia. At least seven sub-Saharan African countries have reportedly signed agreements to explore nuclear power with the backing of Russia.

According to Zambia, both Russia and China show interest in financing nuclear projects in that country. These developments are taking place despite increasingly strong evidence that solar power and wind energy may be both cheaper and greener solutions to the expansion of electricity production in Africa.

However, some experts find that while nuclear energy is not a solution to all of Africa's energy problems, it could be part of it alongside renewable energy resources. They see off-grid renewable projects as a smart choice as they do not require expensive connections to the national grid. Given that about 80% of Africans reside in rural areas, decentralised renewable energy makes sense. Solar energy is also safer than nuclear energy as it generates no environmentally hazardous radioactive waste, and requires no huge financial outlay for plant construction.[16]

According to the South African energy ministry, the country is in the process of developing a plan for a new 2,500 MW nuclear power plant. South Africa had earlier in 2018 abandoned their plan to launch a massive nuclear expansion due to excessive costs. The plans are to finalise the procurement of the new nuclear plant by 2024.

The country's Koeberg nuclear plant, with a capacity of approximately 1,900 MW, was added to the grid in the 1980s. Nuclear power is reportedly seen as part of the country's "energy mix" that also includes coal and renewable energy sources. South Africa currently relies on coal for more than 80% of its power generation.

However, financing the country's nuclear plans will be problematic, as its recession-hit economy is being hammered by the coronavirus pandemic.[17]

OIL COMPANY REDUCING ITS FOOTPRINT IN EAST AFRICA

Tullow Oil recently signed an agreement to sell its assets for the Lake Albert Development project and the proposed East African Crude Oil Pipeline System to Total Uganda for US$575 million. Of this, US$500 million will be in cash, payable at completion, with the US$75 million payable following the final investment decision (FID) of the Lake Albert project. This crucial step tells project investors and shareholders that companies are ready to spend on the new project, and that developers expect the project, once fully operational, to earn enough to make the initial investment worth the risks.

Tullow Oil is also bidding for 20% of the 50 per cent shares it owns in Kenya's South Lokichar oil project. According to Tullow, the Ugandan deal is part of its plan to raise more than US$1 billion.

According to Tullow, the Ugandan deal will enable the firm to improve its finances. The sale came as Tullow continues to reduce its assets in East Africa, despite having established itself as a company focused on the African market.[18]

POINTS OF INTEREST

- Oil producers in Africa have long struggled with the global volatility of oil prices. Many have an erratic energy supply in their own countries. One such example is Nigeria, where many businesses and homes purchased generators to mitigate the inconsistent supply of grid electricity. Making a bad situation worse was the recent effort to make importing generators, except for emergency use, illegal. The time has come for oil producers to embrace renewable energy, and to provide a consistent and affordable supply of energy to their population.
- Mozambique's vast gas fields have lot of untapped potential in the energy generation sector. It is interesting to see many oil-producing countries in Africa embracing renewable energy. Various reasons for this phenomenon are outlined above, but the main drivers are the high potential for renewable energy on the continent, the increasingly lower cost and greater efficiency of the technology, the ease and speed of the implementation of many forms of renewable energy, and the ability to go small-scale while remaining financially viable.
- We are again seeing African countries contemplating the purchase of nuclear power plants from either Russia or China. Enough has been said about the benefits and availability of renewable energy. The question is whether Africa can afford the huge costs and inherent risks of nuclear power. It should not come as a shock to hear the answer as a resounding no.
- Tullow Oil is confusing the market by stating it is an African-focused company, while reducing its footprint in East Africa. Granted, the East African oil market is by no means a developed oil market comparable to north, west and southwest Africa. However, the region does show a lot of potential with new oil discoveries in Kenya and Uganda, both onshore and offshore. The Covid-19 pandemic has put oil exports from Kenya on the backburner, while the production of oil in Uganda has been a non-starter for quite a while, despite the potential of massive economic development that comes with such production.

4. Developments in Renewable Energy

Renewable energy - in its hydro, solar, wind and geothermal applications - is rapidly developing in many African countries. This report addresses the latest developments in these growing subsectors.

HYDROPOWER FACES CHALLENGES IN AFRICA

Power Africa, a US government initiative, wants to generate 30,000 MW and provide 60 million connections to link first-time users to electricity by 2030. The approximately 600 million people without access to consistent and affordable electricity in Africa represent a barrier to growth, job creation and poverty reduction. The Grand Inga Dam in the DRC could more than close this current deficit. The complex is designed to exploit the Congo River to provide up to 40,000 MW of power to Africa.

Unfortunately, this may not take place. The existing plan provides for the generation of 11,050 MW under the Inga Dam III project. In contrast, DRC President Félix Tshisekedi prefers a smaller 4,800 MW plant, creating confusion about the overall status of Inga III and ultimately the Grand Inga Dam itself.

To put things in perspective, the African continent could generate up to 350 GW of hydropower, more than ten times the Power Africa target. Achieving this potential is currently problematic:

- Increasing public opposition to hydropower due to the environmental and social impact of large and mega-dams is a political challenge. Hydropower dams may require flooding large land areas, potentially displacing communities and temporarily reducing the flow of water for downstream uses, such as agriculture.
- The adverse impacts of climate change and rainfall variability on hydropower generation are additional challenges.

Other sources of renewable energy can mitigate these challenges. Solar energy, for instance, has potential to produce 1000 GW for Africa. Today solar produces less than 1 GW. Wind energy has the potential to generate 110 GW.

According to the WEF, “distributed renewable energy in Africa – which includes mini-grids and solar infrastructure for households, businesses, and productive purposes like irrigation – already directly employs as many workers as traditional power utilities.”[19]

GEOTHERMAL ENERGY DEVELOPMENTS

Ethiopian Electric Power (EEP) recently signed a power purchase agreement (PPA) with project developers Corbetti Geothermal. The PPA entails construction of a 150 MW geothermal power plant. This project will meet 18% of the Ethiopian government’s geothermal production target by 2025. Project development involves two phases over the next five years. The first phase involves drilling four to six exploitation wells. Steam from these wells will operate a 50 MW power plant by 2023. The second phase will provide an additional 100 MW power plant and facilities. Over the lifetime of the project, developers will construct an access road, a 15 km transmission line and a power substation.

The Corbetti Geothermal power plant will be one of the first two privately developed, owned and operated geothermal IPPs in Ethiopia. InfraCo Africa, Reykjavik Geothermal Ltd, Iceland Drilling Co Ltd, and Berkeley Energy are also involved in realising the project.[20]

South Africa lags behind other countries in Africa and much of the rest of the world in geothermal development. Geothermal energy is a clean energy source. It is useful for electricity generation and for other applications ranging from hot spring holiday resorts to aqua farming.

The South African Council for Geoscience (CGS) recently approached property owners in the Limpopo Province to access their land to conduct physical geothermal tests. The tests seek to determine the possible existence of a hot water aquifer in the Welgevonden Fault system, which contains several hot springs. This is one of the top South African geothermal sources in terms of hot water volume, temperature and quality of water (such aquifers are sulphur free, clear, with no smell).

The CGS research will also investigate the geology of the geothermal area in terms of minerals, water resources, geo-hazards and other environmental factors.

The Limpopo Province houses platinum mines, hot springs and holiday resorts. Tourists visiting the region during holiday seasons boost the local economies of the province. Property owners are excited, as a favourable outcome could have significant potential for the communities in terms of commercial applications and positive environmental impacts.

Note that one of the hot springs in the Welgevonden Fault area is currently for sale.[21]

DEVELOPMENT OF SOLAR DRIERS

Benin recently launched a solar drying project, which may transform its agri-food product chains. The hybrid solar driers are used to dry and preserve agri-food products (vegetables, meat, fish, bananas, tomatoes, beans, apricots, aromatic herbs, flowers, mushrooms, seed, etc.). The driers can also use auxiliary energy, produced by combining plant products with fuel oil, electricity, wood or even gas.

The initiative is one of 10 off-grid electrification projects that the French Development Agency (AFD) and the French Agency for Ecological Transition (ADEME) selected in April 2020. The overall aim of this initiative is to support proposals that generate sustainable economic activities with a high social impact and to promote electrification, including for agriculture.

The solar drying project will provide two women's groups in the region with solar dryers built locally by craftsmen. Producers will also benefit from training. A company will be selected to purchase the production and ensure its packaging and marketing.

The solar drying project will cost ~€5.95 million.[22]

INTER-AFRICA COLLABORATION

Ethiopia and Morocco recently discussed bilateral plans to strengthen their partnership in the renewable energy field. Participants in a virtual meeting held on 22 May 2020 investigated measures to accelerate implementation of the Coalition for Sustainable Energy and Access (ACSEA). Seeking to increase the capacity of their electricity sectors, African delegates formed this coalition at the UN Climate Action Summit in September 2019. The Summit explored proposals to ensure 100% access to electricity in least developed and developing countries by 2030.

Both governments recently launched projects in the renewable energy sector in their respective countries. In Ethiopia, the latest is an ongoing effort to install 25 mini-hybrid mini-grids financed by the African Development Bank (AfDB). The intent is to provide all Ethiopians with access to electricity by 2025.

Morocco plans to increase the share of renewable energies in its energy mix to 52%. The country has, in addition to its solar resources, a very attractive offshore wind resource.[23]

CORPORATES GOING GREEN

Sasol, a South African chemical company, recently issued a call for tenders for the construction of several renewable energy production facilities in South Africa. Qualified independent power producers (IPPs) had until 5 June 2020 to submit their bids.

Sasol's initiative reflects its intent to reduce its carbon dioxide footprint. This is significant, given its operations that convert coal and natural gas into liquid hydrocarbons. Sasol now wants to supply its facilities with electricity from renewable sources by at least 10% by 2030 compared to 2017.

Sasol is embarking on a 600 MW production plant. To reduce greenhouse gas (GHG) emissions from its operations in South Africa, Sasol identified renewable energy as a key driver in its achievement of this objective. The company favours use of wind and photovoltaic technologies to meet its target of preventing emission of 1.6 million tons of CO2 per year.[24]

POINTS OF INTEREST

- A recent Singapore Business Federation webinar addressed investment opportunities in Africa for Singaporean businesses. Renewable energy is a massive opportunity: electricity is in high demand and the development of renewable energy plants is viable. While the current investment climate is subdued due to the Covid-19 pandemic, this will pass. Those with an investment or diversification mandate should do their homework now, and focus on investment in Africa's electricity generation and distribution sector. With a growing population, and the need for African industry to recover post-Covid-19, electricity demand is sure to rise.
- Africa's governments must collaborate to fully tap the benefits of renewable energy. The AfCFTA can make a significant contribution in industries like energy. There are many barriers that slow implementation of the AfCFTA. Electricity generation and distribution, using renewable energy resources, should be a sector that enhances the implementation of the AfCFTA, and directly benefits from it. The Ethiopia-Morocco initiative should be emulated by other African states. Ethiopia has the goal of becoming a regional (East Africa) energy supplier, and also to grow its footprint throughout Africa
- It is not only in the DRC that hydro-electricity creates tension. Ethiopia's plan to develop the Grand Ethiopian Renaissance Dam led to tension between itself and Egypt. Egypt is concerned that damming the Nile River in Ethiopia will have a severely negative impact on its agriculture sector. Despite several talks between the two countries, as well as with Sudan, tensions between Egypt and Ethiopia remain high on this issue.
- Sasol's intention to go green is welcome news. This company has a significant carbon footprint. This initiative will help bring down South Africa's high carbon footprint. Many other large corporates in the country that contribute to pollution should emulate this kind of initiative. South Africa was the world's 14th largest emitter of greenhouse gases (GHGs) in 2018, and is the largest emitter in Africa. Its CO2 emissions are due mainly to its heavy reliance on coal.
- A previous African Digest reported on the development of geothermal energy in non-traditional areas such as South Africa and Zimbabwe. We now see this phenomenon gaining ground, which can help to reduce the use of coal-fired electricity, and consequently reduce the country's carbon footprint.

5. Developments in Sustainability

Many initiatives seek funding in order to increase sustainability by reducing plastic waste, eliminating deforestation, or developing green energy, etc. Yet few are financially self-sustaining. Increasingly, social entrepreneurs develop business models that derive revenue from the process of dealing with waste or other social ills. This report deals with some of the latest developments in this field.

PLASTIC INTO ENVIRONMENTALLY FRIENDLY BRICKS

In Benin, the Sèmè City Development Agency, with support from the UN Children's Fund (UNICEF), will soon build a waste sorting and processing plant to transform plastic waste into bricks. This will reduce the overflow of plastic waste on the country's streets and produce cheaper, lighter and more environmentally friendly construction materials. Benin will be the second country in Africa to host such a facility, as Cote d'Ivoire earlier built a similar plant.

Some of the plastic bricks produced in the Cote d'Ivoire plant went to build several classrooms. The bricks are made entirely of plastic and are fire-resistant. They are 40% cheaper and 20% lighter than clay bricks. They last many years longer than many conventional building materials, and are waterproof, well insulated and designed to withstand strong winds.

Côte d'Ivoire currently needs 15,000 new classrooms. The plant is expected to produce bricks to build 500 classrooms (housing more than 25,000 children) over the next two years, and can potentially increase production volume in future. The plant can recycle 9,600 tons of plastic waste annually, and provides a source of revenue for women living in poverty.

Abidjan produces more than 280 tons of plastic waste every day, of which only 5% is recycled. The rest is dumped in the landfills of low-income communities.[25]

REDUCING FOOD WASTE

Africa could feed 300 million people with the food it wastes each year. Yet thousands on the continent die from hunger and malnutrition. The most often-wasted food products include fruit, vegetables, roots and tubers. Reasons for this waste include poor storage facilities, inadequate value addition techniques and poor infrastructure.

Ugandan engineering graduate Lawrence Okettayot developed a method to address food waste by inventing Sparky. This is a dehydration system that can help farmers dry agricultural produce, including vegetables and fruit, using locally sourced biofuels. His efforts were motivated by the financial losses suffered by his family due to food waste over the past few decades.

Sparky the food dryer runs on biofuel sourced from a farmer's garden to dry the farmers' chosen produce, including grains, roots and tubers and vegetables. It can dehydrate 10kg of mango in two hours, using 2kg of biofuel. The dryer burns with zero-carbon emissions and can be modified to meet the demands of the prospective customer, which in turn will determine the price.

The Royal Academy of Engineering (Africa) shortlisted Sparky Dryer for its top prize for engineering innovation.[26]

INNOVATING THE WASTE MANAGEMENT VALUE CHAIN

Kenya's government will soon finalise to new environmental law intended to improve waste management through reclamation. The new legislation could also create green employment opportunities throughout Kenya's counties. The law will compel every county in Kenya to sort waste at source (i.e. in the neighbourhoods) prior to recovery by public cleaning services.

The act will help Kenya cope with the 22,000 tons of waste produced each day. About 60% of this is organic material, while 35% and 5% are recyclable and non-recyclable materials respectively. The government wants to transform the organic waste into manure for soil fertilization. At least 30% of the

waste will be recycled, 5% will be incinerated and only 5% will end up in landfills. The government also aims to develop regulations on the use of environmentally friendly raw materials and cleaner production technologies.

The envisaged changes will create jobs all along the waste management value chain.[27]

USING PLASTIC WASTE TO PRODUCE PROTECTIVE FACE SHIELDS

Zaidi Recyclers in Dar es Salaam processed wastepaper for export to China and India before the outbreak of the Covid-19 pandemic. In reaction to the pandemic, it switched to producing anti-coronavirus face shields from plastic bottles. This ensured job security for its 38 workers, and its face shields are widely used by hospitals and health centres nationwide, thus contributing to the health of the people fighting against Covid-19.

In just a few weeks, Zaidi Recyclers made 6,000 units that sell at US$2 per piece. The health sector across Tanzania has placed large orders for the locally made personal protection devices.[28]

PET BOTTLES CONVERTED INTO RECYCLED POLYESTER

In South Africa, Woolworths used more than one million 500ml PET bottles to make clothing material as part of its sustainable fashion range for winter 2020. It first converts the bottles into recycled polyester, which will form part of its puffer jackets and gilets, as well as some polar fleece items across men's, ladies' and kids wear.

The recycled polyester is used mainly for the inner "wadding" of the puffer jackets. This gives consumers an alternative material to wearing goose down.

In addition to the jackets, Woolworths is also using recycled PET bottles in duvet fill, reusable shopping bags and packaging. The retailer reiterated its commitment to sourcing sustainable fibres and including recycled materials in products and packaging.[29]

PRODUCING BIOFUEL

Zambian entrepreneur Mutoba Ngoma founded Tapera in 2006. His biofuel company converts used vegetable oil into diesel fuel. The founder had a two-fold mission in mind: to increase Zambia's fuel supply sustainability, and to provide vocational training and stable job opportunities. Tapera Industries has since developed into a diversified eco-friendly business supplying biofuel and organic soap.

In view of Zambia's fuel shortages, Ngoma wondered why there was no local production of biofuel, as this option is both cheaper and more sustainable. He initially sourced vegetable oil waste from local restaurants and hotels in Lusaka. The biofuel produced would power any diesel engine, and was cheaper than the diesel fuel sold in the market. To obtain capital needed to scale the business, Ngoma worked as an aircraft technician at Zambian Airways, and used his earnings to produce enough biodiesel to supply colleagues and friends. His big break came when he entered the public service vehicle market and started to supply fuel to bus drivers.

Eventually, vegetable oil became scarce. After reviewing the use of cooking oil as a raw material for biofuel, the company shifted its focus to soap production. This turned out to be more lucrative than the original biodiesel business model, despite competitors in the market. Production includes a liquid shampoo, a hand wash for industrial workers, and a laundry bar. These products are sold to traders in the informal and semi-informal mass market.

Tapera Industries still produces biodiesel for a handful of clients – around 7,000 litres, depending on raw material supply. However, Tapeera began to supply a raw material – produced from jatropha seeds, which can be used instead of used cooking oil – to other companies in the region looking to produce their own bio-diesel.

While Tapera's business model is still in flux, it plans to expand its outgrower scheme to scale both its biodiesel and soap production businesses. It also wants to start cultivating castor beans as a feedstock

for its biodiesel production.[30]

GROWING THE CIRCULAR ECONOMY

Ghana's 'Alliance to End Plastic Waste' is a not-for-profit organisation consisting of companies that manufacture and process plastic. It recently partnered with the ASASE Foundation on the "Closing the Loop" initiative that supports women entrepreneurs working to reduce plastic waste in their communities. Closing the Loop deploys a circular economy model to enable local communities to benefit from discarded plastic waste by collecting, reprocessing, and then reselling it.

ASASE launched Closing the Loop in 2018 to provide seed money to equip a plastic waste reprocessing plant and provide technical and business management training to women entrepreneurs. The training prepares them to run the recycling plant at a profit. By partnering with the Alliance, the capacity of the reprocessing plant diverted 2,000 (metric) tons of plastic waste per year and created more jobs.

The recycling plant processes a range of plastic waste, including water sachets, shampoo and detergent bottles, and large cooking oil containers, converting it into regrinds. The regrinds are sold to recyclers to produce items such as pavement blocks, sheets for construction, basins and liners, most of which are returned to the community.[31]

POINTS OF INTEREST

- Ending plastic waste in the environment will have a sustainable impact on the well being of local communities. The development and growth of the circular economy is therefore the right step towards reducing waste and reusing recycled products. These initiatives are frequently simple and scalable actions that benefit both the environment and people from the local community. Amongst these, it is especially women that stand to benefit.
- We have seen no limitation on what can be done to reduce waste and pollution, and in the process create businesses. These include generating electricity from waste (Waste to Energy), producing bricks, tiles, clothing and even roads from plastic waste. One of the latest developments is the use of plastic bottles (PET) to produce face shields as protection against the Covid-19 virus.
- We have also seen instances where problem vegetation (hyacinth) is used to generate either animal feed or an energy source. Biofuels have been produced from vegetable oil, while used car oil has been used to generate energy as well.
- It has become essential to innovate value chains in virtually every sector to identify areas where waste can be reduced, if not eliminated in totality. While all the initiatives above do play an important role to reduce waste and pollution once it has occurred, it would be best to redesign value chains to prevent waste in the first place.

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Additional Readings

1. Developments in Agriculture

Anon. 2020. Coronavirus: Ghanaian agribusiness firms monthly revenue falls by 61.2%. *GhanaWeb*. 26 May 2020. Available at https://www.ghanaweb.com/GhanaHomePage/business/Coronavirus-Ghanaian-agribusiness-firms-monthly-revenue-falls-by-61-2-962440. Accessed 6 June 2020.

Campbell, R. 2020. African countries must strengthen their agricultural, especially food, production. *Engineering News*. 25 May 2020. Available at https://www.engineeringnews.co.za/article/african-countries-must-strengthen-their-agricultural-especially-food-production-2020-05-25. Accessed 6 June 2020.

Ikade, F. 2020. Avocado becomes the new green gold for Tanzania. *Ventures Africa*. 12 May 2020. Available at http://venturesafrica.com/zimbabwe-raises-20-million-in-treasury-bill-sales-to-fight-coronavirus/. Accessed 6 June 2020.

Marima, T. 2020. Coronavirus threatens Southern Africa's tobacco industry. *African Business*. 28 May 2020. Available at https://africanbusinessmagazine.com/sectors/health-sectors/covid-19/covid-19-threatens-southern-africas-tobacco-industry/?utm_source=Africa.com&utm_campaign=4511c96c63-EMAIL_CAMPAIGN_2018_06_22_02_06_COPY_01&utm_medium=email&utm_term=0_12683c81a6-4511c96c63-29147709. Accessed 6 June 2020.

Tapfumaneyi, R. 2020. Govt offers Mbanje growers 100% farm ownership. *New Zimbabwe*. 25 May 2020. Available at https://www.newzimbabwe.com/govt-offers-mbanje-growers-100-farm-ownership/. Accessed 6 June 2020.

Udegbunam, O. 2020. Produce more, Nigeria has no money to import food, Buhari urges farmers. *Premium Times*. 24 May 2020. Available at https://www.premiumtimesng.com/agriculture/agric-news/394390-produce-more-nigeria-has-no-money-to-import-food-buhari-urges-farmers.html. Accessed 6 June 2020.

2. Digital Technology Developments

Anon. 2020. Cocoa farmers operating in Ivory Coast and Ghana gain digital support from Cargill. *Confectionery Production*. 17 April 2020. Available at https://www.confectioneryproduction.com/news/29133/cocoa-farmers-in-ivory-coast-and-ghana-gain-digital-support-from-cargill/. Accessed 6 June 2020.

Anyanwu, R. 2020. Transforming last mile delivery in Africa. *This Day*. 7 May 2020. Available at https://www.thisdaylive.com/index.php/2020/05/07/transforming-last-mile-delivery-in-africa/. Accessed 6 June 2020.

Henry, N. 2020. What if sign language could be heard? This Kenyan makes it happen with his "magic gloves." *Weetracker*. 11 April 2020. Available at https://weetracker.com/2020/04/11/kenyan-techie-sign-launguage-audible-gloves/. Accessed 6 June 2020.

Jackson, T. 2020. Nigerian startup Helium Health secures $10m Series A round to expand into new markets. *Disrupt Africa*. 7 May 2020. Available at https://disrupt-africa.com/2020/05/nigerian-startup-helium-health-secures-10m-series-a-round-to-expand-into-new-markets/?utm_source=Africa.com&utm_campaign=53e0b8fc11-EMAIL_CAMPAIGN_2019_05_27_09_40_COPY_01&utm_medium=email&utm_term=0_12683c81a6-53e0b8fc11-29147709. Accessed 6 June 2020.

WT Research. 2020. Successes & shortcomings of music streaming in Africa – mapping 25+ platforms. *Weetracker*. 13 May 2020. Available at https://weetracker.com/2020/05/13/music-streaming-africa/. Accessed 6 June 2020.

3. Energy Developments

Anon. 2020. Government of Mozambique expects new oil and gas projects by 2024. *Macauhub*. 3 April 2020. Available at https://macauhub.com.mo/2020/04/03/pt-governo-de-mocambique-preve-novos-projectos-de-gas-e-de-petroleo-ate-2024/. Accessed 12 June 2020.

Mahmoud, R. 2020. Egypt to export electricity to Saudi Arabia. *Al Monitor*. 21 May 2020. Available at https://www.al-monitor.com/pulse/originals/2020/05/egypt-saudi-arabia-interconnection-electricity-energy-hub.html. Accessed 12 June 2020.

Matiashe, F.S. 2020. Russia, China willing to fund nuclear projects as several African countries explore controversial power source. *News 24*. 10 April 2020. Available at https://www.news24.com/citypress/Business/russia-china-willing-to-fund-nuclear-projects-as-several-african-countries-explore-controversial-power-source-20200410. Accessed 12 June 2020.

Mburu, P. 2020. East Africa: Tullow Oil exit from region almost complete. *All Africa*. 24 April 2020. Available at https://allafrica.com/stories/202004240293.html?aa_source=nwsltr-latest-en. Accessed 12 June 2020.

Okello, C. 2020. Africa's oil producers eye energy independence after Coivd-19. *All Africa*. 25 May 2020. Available at https://allafrica.com/stories/202005260008.html?aa_source=nwsltr-latest-en. Accessed 12 June 2020.

Roelf, W. 2020. South Africa to develop plan for new 2,500 MW nuclear plant. *South Africa News*. 7 May 2020. Available at https://af.reuters.com/article/southAfricaNews/idAFL8N2CP8M8. Accessed 12 June 2020.

4. Developments in Renewable Energy

Magoum, I. 2020. Benin: Hybrid solar dryers break new ground in agribusiness. *Afrik 21*. 29 May 2020. Available at https://www.afrik21.africa/en/benin-hybrid-solar-dryers-break-new-ground-in-agribusiness/. Accessed 5 June 2020.

Magoum, I. 2020. Ethiopia-Morocco: Fostering partnerships in the renewable energy sector. *Afrik 21*. 28 May 2020. Available at https://www.afrik21.africa/en/ethiopia-morocco-fostering-partnerships-in-the-renewable-energy-sector/. Accessed 5 June 2020.

Mulyungi, P. 2020. Ethiopia to construct 150 MW geothermal power plant. *Construction Review Online*. 24 April 2020. Available at https://constructionreviewonline.com/2020/04/ethiopia-to-construct-150-mw-geothermal-power-plant/. Accessed 5 June 2020.

Mwaura, G. 2020. DR Congo's Inga dam and Africa's energy transformation. *The New Times*. 1 February 2020. Available at https://www.newtimes.co.rw/opinions/dr-congos-inga-dam-and-africas-energy-transformation. Accessed 5 June 2020.

Richter, A. 2020. Geothermal scoping study eyed for in Limpopo province in South Africa. *Think Geoenergy*. 3 May 2020. Available at https://www.thinkgeoenergy.com/geothermal-scoping-study-eyed-for-in-limpopo-province-in-south-africa/. Accessed 5 June 2020.

Takouleu, J.M. 2020. South Africa: Sasol bidding for renewable energy/power plants. *Afrik 21*. 18 May 2020. Available at https://www.afrik21.africa/en/south-africa-sasol-bidding-for-renewable-energy-power-plants/. Accessed 18 May 2020.

5. Developments in Sustainability

Anon. 2020. Alliance to End Plastic Waste partners with ASASE Foundation. *Financial Post*. 7 May 2020. Available at https://business.financialpost.com/pmn/press-releases-pmn/business-wire-news-releases-pmn/alliance-to-end-plastic-waste-partners-with-asase-foundation. Accessed 8 June 2020.

Caboz, J. 2020. Woolworths is using more than 1 million plastic bottles to make its puffer jackets. *Business Insider*. 3 June 2020. Available at https://www.businessinsider.co.za/woolworths-sustainable-clothing-recycled-plastic-bottles-puffer-jackets-duvets-2020-6. Accessed 8 June 2020.

Ikade, F. 2020. A recycling plant in Tanzania is making face shields from plastics. *Ventures Africa*. 2 June 2020. Available at http://venturesafrica.com/a-recycling-plant-in-tanzania-is-making-face-shields-from-plastics/. Accessed 8 June 2020.

Magoum, I. 2020. Benin: Brick manufacturing unit, based on plastic waste to be built soon. *Afrik 21*. 21 May 2020. Available at https://www.afrik21.africa/en/benin-brick-manufacturing-unit-based-on-plastic-waste-to-be-built-soon/. Accessed 8 June 2020.

MT. 2020. Ugandan students invents dehydration machine to curb food waste. *How Africa*. 29 May 2020. Available at https://howafrica.com/ugandan-student-invents-dehydration-machine-to-curb-food-waste/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+howafrica+%28How+Africa+and+More%29. Accessed 8 June 2020.

PH. 2020. Meet Mutoba Ngoma, the Zambian man who made a fortune by turning vegetable oil into fuel. *How Africa*. 20 May 2020. Available at https://howafrica.com/meet-mutoba-ngoma-zambian-31-year-old-made-fortune-turning-vegetable-oil-fuel/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+howafrica+%28How+Africa+and+More%29. Accessed 8 June 2020.

Takouleu, J.M. 2020. Kenya: Government prepares new law on waste recovery. *Afrik 21*. 29 May 2020. Available at https://www.afrik21.africa/en/kenya-government-prepares-new-law-on-waste-recovery/. Accessed 8 June 2020.

References

1. Developments in Agriculture
[1] https://www.premiumtimesng.com/agriculture/agric-news/394390-produce-more-nigeria-has-no-money-to-import-food-buhari-urges-farmers.html
[2] https://www.engineeringnews.co.za/article/african-countries-must-strengthen-their-agricultural-especially-food-production-2020-05-25
[3] http://venturesafrica.com/zimbabwe-raises-20-million-in-treasury-bill-sales-to-fight-coronavirus/
[4] https://www.newzimbabwe.com/govt-offers-mbanje-growers-100-farm-ownership/
[5] https://africanbusinessmagazine.com/sectors/health-sectors/covid-19/covid-19-threatens-southern-africas-tobacco-industry/?utm_source=Africa.com&utm_campaign=4511c96c63-EMAIL_CAMPAIGN_2018_06_22_02_06_COPY_01&utm_medium=email&utm_term=0_12683c81a6-4511c96c63-29147709
[6] https://www.ghanaweb.com/GhanaHomePage/business/Coronavirus-Ghanaian-agribusiness-firms-monthly-revenue-falls-by-61-2-962440

2. Digital Technology Developments
[7] https://www.confectioneryproduction.com/news/29133/cocoa-farmers-in-ivory-coast-and-ghana-gain-digital-support-from-cargill/
[8] https://www.thisdaylive.com/index.php/2020/05/07/transforming-last-mile-delivery-in-africa/
[9] https://disrupt-africa.com/2020/05/nigerian-startup-helium-health-secures-10m-series-a-round-to-expand-into-new-markets/?utm_source=Africa.com&utm_campaign=53e0b8fc11-EMAIL_CAMPAIGN_2019_05_27_09_40_COPY_01&utm_medium=email&utm_term=0_12683c81a6-53e0b8fc11-29147709
[10] https://weetracker.com/2020/05/13/music-streaming-africa/
[11] https://weetracker.com/2020/04/11/kenyan-techie-sign-launguage-audible-gloves/

3. Energy Developments
[12] https://macauhub.com.mo/2020/04/03/pt-governo-de-mocambique-preve-novos-projectos-de-gas-e-de-petroleo-ate-2024/
[13] https://allafrica.com/stories/202005260008.html?aa_source=nwsltr-latest-en
[14] http://trendsnafrica.com/2020/05/26/electricity-interconnection-project-between-egypt-and-saudi-arabia-to-be-launched/
[15] https://www.al-monitor.com/pulse/originals/2020/05/egypt-saudi-arabia-interconnection-electricity-energy-hub.html
[16] https://www.news24.com/citypress/Business/russia-china-willing-to-fund-nuclear-projects-as-several-african-countries-explore-controversial-power-source-20200410
[17] https://af.reuters.com/article/southAfricaNews/idAFL8N2CP8M8
[18] https://allafrica.com/stories/202004240293.html?aa_source=nwsltr-latest-en

4. Developments in Renewable Energy
[19] https://www.newtimes.co.rw/opinions/dr-congos-inga-dam-and-africas-energy-transformation
[20] https://constructionreviewonline.com/2020/04/ethiopia-to-construct-150-mw-geothermal-power-plant/
[21] https://www.thinkgeoenergy.com/geothermal-scoping-study-eyed-for-in-limpopo-province-in-south-africa/
[22] https://www.afrik21.africa/en/benin-hybrid-solar-dryers-break-new-ground-in-agribusiness/
[23] https://www.afrik21.africa/en/ethiopia-morocco-fostering-partnerships-in-the-renewable-energy-sector/
[24] https://www.afrik21.africa/en/south-africa-sasol-bidding-for-renewable-energy-power-plants/

5. Developments in Sustainability
[25] https://www.afrik21.africa/en/benin-brick-manufacturing-unit-based-on-plastic-waste-to-be-built-soon/
[26] https://howafrica.com/ugandan-student-invents-dehydration-machine-to-curb-food-waste/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+howafrica+%28How+Africa+and+More%29
[27] https://www.afrik21.africa/en/kenya-government-prepares-new-law-on-waste-recovery/
[28] http://venturesafrica.com/a-recycling-plant-in-tanzania-is-making-face-shields-from-plastics/
[29] https://www.businessinsider.co.za/woolworths-sustainable-clothing-recycled-plastic-bottles-puffer-jackets-duvets-2020-6
[30] https://howafrica.com/meet-mutoba-ngoma-zambian-31-year-old-made-fortune-turning-vegetable-oil-fuel/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+howafrica+%28How+Africa+and+More%29
[31] https://business.financialpost.com/pmn/press-releases-pmn/business-wire-news-releases-pmn/alliance-to-end-plastic-waste-partners-with-asase-foundation

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Nanyang Centre for Emerging Markets

The Nanyang Centre for Emerging Markets (CEM) is a new initiative by Nanyang Business School to establish global thought leadership on business-related issues in emerging markets. It conducts research on pressing and timely business issues in emerging markets through a global research platform of leading scholars and institutional partners. It closely interacts with corporate partners to identify research topics and manage the research process. Its research outputs include valuable and relevant implications for sustained profitable growth for local and multinational companies in emerging markets. It delivers a variety of research reports and organizes forums, seminars, CEO roundtables, conferences, and executive training programmes for broad dissemination of its research outputs.
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Partner Organizations

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